



Investigating First Year Surgery Residents' Expectations of Demand, Control, and Support During Training

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OBJECTIVE: To provide a more granular understanding of the expectations of general surgery interns regarding workplace demand, control, and support prior to starting training.

SUMMARY/BACKGROUND DATA: General surgery (GS) interns are at highest risk for burnout and attrition. Maslach frames burnout as resulting from a mismatch between workplace expectations and reality. Occupational science demonstrates workplace demand, control, and support (DCS) as strong influencers of job strain. GS interns' realistic expectations of demands are associated with decreased likelihood of attrition, but their expectations regarding this factor are poorly understood.

METHODS: Semi-structured interviews were conducted with 14 incoming surgical residents at UCSF: University of California, San Francisco (57% women, 71% non-White), exploring expectations regarding workplace DCS. Transcripts were uploaded to analytic software and coded in dyads using an iterative approach to consensus. Transcripts were thematically analyzed using inductive and deductive reasoning, applying job-demand-resource theory frameworks, and following a published 6-step approach.

RESULTS: Four main themes emerged: past experiences, expected rewards, anticipated challenges, and the desire to belong. Past experiences describes the expectation to successfully cope with future stressors via self-reliance. Rewards such as professional mastery, personal growth, and sense of meaning were expected outcomes seen as balancing anticipated challenges. Anticipated challenges included low control, toxic cultural elements, and

discrimination. Desire to belong (i.e., earned recognition as a peer, inclusion in an elite culture) emerged as a powerful motivator, with survival connotations for women and non-Whites.

CONCLUSION: Our results suggest incoming interns overestimate the efficacy of self-reliance for coping; count on specific rewards; express realistic expectations regarding challenges; and see inclusion among surgeons as an aspiration that off-sets prolonged effort. Further study is warranted to understand expectation-reality mismatch and potential interventions to target dissonance.

MINI-ABSTRACT: In this institutional study of general surgery interns, we provide a more granular understanding of the expectations of general surgery interns regarding workplace demand, control, and support prior to starting training, and how we might target "expectations-reality" mismatch and the "desire to belong" as a means of mitigating burnout and minimizing attrition from training. (J Surg Ed 81:474–485. © 2024 Association of Program Directors in Surgery. Published by Elsevier Inc. All rights reserved.)

KEY WORDS: expectations, surgery, interns, belonging, burnout

COMPETENCIES: Professionalism, Interpersonal and Communication Skills

INTRODUCTION

Surgical trainees are at highest risk for attrition early in residency,¹ with higher burnout greatly increasing these odds.² Burnout, instigated by prolonged workplace stressors, is a state of mind characterized by low personal accomplishment (PA), high emotional exhaustion (EE),

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and high depersonalization (DP).³ Efforts to reduce burnout among trainees have yielded only limited success, in part due to treating the effects of burnout without fully understanding the cause.^{1,4}

Maslach's original conception of burnout frames it as the product of mismatch between one's work expectations and reality.⁵ Not surprisingly, general surgery interns with realistic expectations of the demands of residency and life as an attending are more likely to complete training and be satisfied with their career choice.⁶ However, the expectations of in-coming surgical interns regarding their impending residency experience are poorly understood, making it impossible to correct misconceptions or accommodate key expectations. Further, an extensive body of work in occupational science based on Job Demand-Resource theory, demonstrates that workplace factors such as psychological demand, control latitude, and social support mediate workplace absenteeism and overall job satisfaction versus strain.⁷ Thus, we aimed to explore the expectations of incoming general surgery interns through the lens of Job Demand Resource theory by conducting semi-scripted interviews and analyzing data for emergent themes as well as gender and race differences.

METHODS

Participants

This qualitative study was reviewed by the University of California, San Francisco Institutional Review Board and found to be exempt. The original motivation for this study was quality improvement, looking for informed ways to augment the preparation of surgery interns and improve their training experience and retention. Incoming interns at our institution were selected and invited to participate in a 1-hour interview in exchange for a \$20 gift card. To ensure diverse perspectives, purposeful selection was utilized, specifically aiming for 50% women, 50% underrepresented in medicine (UIM), and 50% general surgery (as opposed to other surgical subspecialties) participants. Participant demographics are included in Table 1. Interviews were conducted before the start of intern year to explore trainees' expectations prior to any exposure to the realities of residency.

Data Collection

An interview script was developed guided by the Job Demand Resource theory, literature regarding job strain and job satisfaction in the workplace,⁸ and extensive discussion within the research team. A complete interview guide is shown in Appendix 1. To elicit honest responses, semi-structured interviews were conducted via Zoom by a

TABLE 1. Interview Participants' Demographics

Characteristic	No. (%) (n = 14)
Gender	
Female	8 (57.1)
Male	6 (42.9)
Race	
Non-White	10 (71.4)
White or Caucasian	4 (28.6)
Sub-specialty	
General surgery	6 (42.9)
Ophthalmology	3 (21.4)
Orthopedic surgery	2 (14.3)
Plastic surgery	1 (7.1)
Urology	1 (7.1)
Preliminary	1 (7.1)

research fellow with no prior or future professional relationship with the participants. Permission for audio recording was obtained from each participant. Participants were informed that no department faculty would have access to the participants' identities and that research staff would transcribe and deidentify interview content, prior to destroying recordings.

Coding and Analysis

Analysis of the semi-structured interviews was carried out using qualitative data software Dedoose. Audio files of interviews were transcribed, and identifying information was redacted by research staff. A code book was developed, informed by Job Demand Resource theory, our past work, and in collaboration with expert qualitative researchers (MvS). Through a grounded theory approach, we then used an iterative, inductive, and deductive coding process to identify themes within the transcript excerpts that reflected interns' expectations of the demands of training, expected resources that would be available to them professionally, expected resources that would be available to them personally, and expected positive and negative experiences. All transcripts were read through multiple times to get a global understanding of the participants perspective and voice.

The first cycle of coding was an open coding phase whereby all transcripts were reviewed independently by 2 research staff (F.O. and C.L.) and coded using pre-established codes from the JDR theory-derived code-book. Simultaneously, reviewers were allowed to tag excerpts with new codes in an eclectic coding approach. We then employed in vivo coding to identify salient words or phrases within the dialogue, simultaneous coding to identify two or more different codes for a single qualitative datum in different dimensions, descriptive coding to summarize topics, process coding to identify actions, emotion and value coding to identify

emotions, attitudes, and perspectives, and domain and taxonomic coding to identify beliefs surrounding surgical culture. All transcripts, memos, and codes were then reviewed by researchers in an iterative analysis process, with axial coding then employed to synthesize the codes and emerging themes into a codebook in the second coding phase, in collaboration with expert qualitative researchers (MvS). The complete codebook is shown in [Appendix 2](#). All transcripts and the codebook were then uploaded to Dedoose, and researchers used the software to manually extract and code excerpts, allowing for identification and incorporation of emergent codes into the codebook.⁹ Each transcript was coded separately by dyads (F.O. and either P.G., R.G., A.E., or C.L.) and then compared to reduce bias in code application. In the third coding phase, high frequency codes and salient themes were analyzed, with 4 major themes emerging. All coding was reviewed, and any disagreements resolved by the senior author (C.L.), who also re-coded all excerpts to reflect major emergent themes.

To enhance the trustworthiness and credibility of the data, we observed saturation of responses which we found to occur at 13 participants. We kept an audit trail of how data were collected, how categories were derived, and how decisions were made to demonstrate how the results were consistent with the data collected.

To reduce bias, and in awareness of how researchers may influence the research process, reflexivity was an essential part of the process. The research fellow conducting the interviews was not an insider in the target group. This was thought to facilitate interviewees willingness to share professional and personal experiences without fear of repercussions. At all times, the fellow tried to reflect on what it would be like to be “in the shoes” of the interviewees and was aware of the importance of attentive listening and of deep critical reflection on commonalities between participants. This enabled the fellow to ask questions that went beyond the surface to elicit deeper meaning. The fellows took notes on their own observations and assumptions and discussed these in meetings with the senior author (C.L.) and the larger research group. The group included those involved in and those distant to the topic under study, allowing the data to be seen from a variety of perspectives.

RESULTS

Interviews were conducted in June of 2020. Fourteen participants were recruited with 8 (57%) female and 10 (71%) non-White participants ([Table 1](#)). Intern interview participants included 3 ophthalmology, 2 orthopedic, 1 plastic surgery, 1 urology, 1 general surgery preliminary, and 6 general surgery categorical interns.

In regard to expectations around residency/job demands, control, and support/resources, 4 major themes emerged: past-experiences, anticipated rewards, expected challenges, and the desire to belong ([Tables 2–5](#)). Interns frequently and repeatedly expressed that their expectations regarding residency were heavily influenced by their experiences as sub-interns, which shaped their perceptions in relation to all 4 major themes.

Past Experiences (Expecting the Future to be Like the Past)

Interns frequently and repeatedly expressed the expectation that past techniques for successfully managing high work demands would remain efficacious in the context of residency. For example, coping with stress using previously successful techniques like exercise, self-discipline, and time management skills; leaning on the social support of family and personal friends; or simply exerting tremendous willpower.

Paradoxically, participants also repeatedly expressed the concern that previously effective coping methods would become inaccessible during residency due to demanding schedules (i.e., little time to engage in personal hobbies or meet with family, friends, and co-residents (less accessible due to dispersion at multiple work sites)). Few interns had alternative coping methods prepared when asked ([Table 2](#)).

Anticipated Rewards (Expecting Desirable Experiences)

Interns frequently expressed the expectation of rewards in the form of professional mastery and personal growth. Regarding professional mastery, interns expressed the expectation that residency would increase their technical/clinical skills (including fund of knowledge, efficiency, technical mastery, and capability). Regarding personal growth, interns expressed the expectation that residency would increase their resilience (including emotional regulation and adaptability), and strengthen self-perception (confidence, capability, and sense of accomplishment). Interns repeatedly expressed the expectation that these “rewards” would confer an increased sense of meaning to an arduous experience. Specifically, interns commonly expressed that residency would reward them with the satisfaction of serving patients and the fulfillment of a personal sense of purpose ([Table 3](#)).

Anticipated Challenges (Expecting Difficulties Due to Residency)

Participants frequently expressed anticipated challenges due to residency, including low job control (scheduling, lack of protected time, low resource

TABLE 2. Concepts and Exemplar Quotes for Emergent Theme, *Past Experiences*

Concept	Exemplar Quote
Past techniques will remain efficacious	<p>"Through medical school, I always really prioritized a work life balance and was able to do it through intensive study period for step one. And through third year and fourth year. And so my motto is, when I'm at work, I'm at work. And when I'm not, I don't think about work." (NUX3)</p> <p>"I actually feel. . . pretty optimistic because I think that I've just been able to get through some of my tougher rotations during medical school and was still able to actually be pretty good. So I think I'll be able to maintain the things that I enjoy despite the very long hours." (OAX1)</p> <p>"I felt like. . . throughout medical school, I did fairly well in. . . busier times. . . it's hard to pinpoint exactly why that may be. But I feel like I've always been able to handle stress well. You know, it's part of the reason why I've chosen surgery is that I feel comfortable working longer hours or . . . having emotional situations. . . you certainly see levels of burnout [in surgery]. I'm not. . . crazy concerned that that's going to happen to me. But, of course, you have to be open to the possibility that you are going to be kind of tired. . . probably the most realistic, bad thing would just be a little bit of. . . general fatigue. . . one of the challenges is the continual learning, I think [that] can be mentally very exhausting. That's true. And you see it in medical school as well. But I think when you add really long hours of work that also expects a lot of learning. . . that can be mentally exhausting. . . it's not like that . . . beats up on my wellness or something, but it's just something that's hard to do." (NUY1)</p>
Coping methods	<p>" . . . those feelings [concerns about coping with the unique demands of residency] are, I think, sentiments around the unknown. I know that it's hard . . . approaching an unknown territory. . . particularly. It . . . makes me nervous. I don't really have. . . a plan . . . an attack plan to tackle those emotions or sentiments." (LSY1)</p> <p>" . . . I do vent to other people, so I do fine. There is some truth to catharsis. But I also run. . . any time I have. . . strong emotions. . . that is also something that I wonder whether or not it will be available to me in residency because the schedule can be so bad, but I hope that I can maintain it." (OTX1)</p>
Medical school informs perception of preparedness	<p>" . . . as a medical student . . . I got pretty resilient to. . . the abuse of surgery. . . you know, yelling at you, or saying you're doing something wrong, or pimping you on something you have no idea about. . . I think I was really good during my Sub I's. . . it was really tough at first. I definitely cried every now and then, but I got good at. . . being numb to the negativity and just taking it as positively as I could. . . like. . . 'OK, I need to really study this anatomy, or I really need to learn this kind of case better'." (ROX1)</p> <p>"I don't want to be disappointed. . . I know that this is demanding. . . So I don't want to be at work and be like, oh man, I wish I had more time off. . . I think that's why I set the expectations low . . . based off what I've seen. That's just what residency is like. That's what I've seen in medical school rotations at different institutions, and that's what I'm expecting. . . I'd like to think that it would have no effect. But I think the reality would be that it can be isolating and depressing because you are like so isolated socially. There's no time to do things. And I'm sure that that gets depressing after a while." (LSY1)</p>

accessibility, inadequate pay), high workload (work hours, time-pressure, interprofessional conflict), social demands (pressure from home), toxic cultural elements (low organizational transparency, backroom judgment, and "hidden curriculum"), personal demands (neglect of personal well-being), affective changes (stoicism and the development of cynicism), and discrimination (racism, sexism). Challenges had different connotations depending on race and gender. Both women and men expressed the expectation that

women would face more obstacles professionally, especially regarding stereotyping, judgment, lack of recognition, and enduring abuse from patients. Non-White participants anticipated biased evaluation by superiors and desired acceptance and inclusion as a professional necessity (for survival) not just a professional achievement or reward (Tables 4a and 4b). Associated feelings and affect regarding expected challenges varied from resignation and a "matter-of-fact" attitude to being fearful or resentful.

TABLE 3. Concepts and Exemplar Quotes for Emergent Theme, *Rewards*

Concept	Exemplar Quote
Personal growth and professional mastery	<p>"I will grow a lot on a personal and professional level. And I think that it's rewarding, being handed more greater responsibility, and feeling more competent and confident. You know, it's been a while since I've felt that way. I think med school kind of does a good job of... making you feel like an idiot. Most of the time, I still feel like an idiot... I have to know stuff... rising to the challenge, I think will be fun... getting to see patients again. It's also been a while since I've done that. I enjoyed that." (OTY1)</p> <p>"But the good stuff about residency... I definitely will become more resilient. I'll be able to critically think about problems and treat patients... and become a better surgeon and better mentor and teacher, and hopefully learn to deal with frustrating feelings... I think it'll probably help me be more efficient, too, because you're so limited on time." (ROX1)</p> <p>"... I hope that... my years of training, I can hone... skills. I can safely practice medicine and surgery, and care for patients through my training. I hope to come out... a compassionate physician... to gain the skills to be an academic physician as well... to come out on the other side a very... competent surgeon and a good teacher." (NUX1)</p> <p>"I think it will make me a more resilient human being. I think I will be more clinically competent. I think it will make me more excited about my chosen field... in terms of professional growth and some personal growth, that will be very positive changes." (OTX1)</p>
Increased sense of meaning	<p>"I think the most rewarding part of medicine is when it's just you and the patient in a room and you can just work out whatever problem... you just ask the right questions and... do the right things. Then they'll be happier for it or better for it. It's definitely the best part." (OTY1)</p> <p>"I think, for good, it'll change me just because... after I'm done with surgical residency, then I'll feel like, I climbed like the highest mountain that you can climb... you see the light at the end of the tunnel, essentially, once you reach the peak, which would be in your fifth year in surgical residency. So then you'll be a little bit more... relieved and proud about what you accomplished." (NUY2)</p> <p>"Well, I think for good... it will give me knowledge and skills that I desperately want, and that will help me serve others. It will give me a lot of purpose in my life." (NUX2)</p>

Desire to Belong (Expecting to Attain Inclusion Among Surgeons)

Interns frequently and repeatedly expressed the desire to belong to the world of surgeons, emphasizing the importance of earning recognition as a peer (fulfillment of attendings' expectations, worthiness, equality), inclusion in an elite culture (formation of bonds, peer to peer interaction), and decision-making entrustment (with surgical decisions, surgical patients, and technical surgery) (Table 5). As mentioned above, there were challenges related to belonging (i.e., lack of recognition, biased evaluation) that had different connotations depending on gender and race. Belonging encompassed the perceived worthiness of occupying the OR: Odds ratio as a sacred space and the respect merited when evolving into a leader in the communal effort of patient care. These specific elements were expressed as critical in the formation of identity and reputation as a surgeon.

DISCUSSION

This study of incoming surgical interns' expectations regarding workplace demand, control, and support

revealed 4 key findings. First, interns expect to manage the unique stressors of residency based on their past experiences of high capability and self-reliance in medical school. Second, interns anticipate rewards from training which literature suggests may or may not exist. Third, interns' expectations of challenges during residency are largely realistic. Fourth, the "desire to belong," i.e., the formation of social identity and being accepted among surgeons as a peer, is a powerful and potentially underutilized motivator.

Our first finding, that interns expect to manage the unique stressors of residency based on past experiences of high capability and self-reliance in medical school, is evidenced by recurrent reference to plans for employing coping strategies used in medical school and the belief that those strategies will remain effective in the context of residency. The tenuousness of this assertion is alluded to by concomitant worries expressed about the practicality of those strategies in this new and demanding context of residency. This combination of being dauntless in the face of being potentially underprepared echoes previous work in surgical residents highlighting a culture of self-reliance that makes it difficult for residents to ask for help, thus contributing to attrition.¹⁰ Another study assessed the identification of signs of stress, depression, and suicide among surgical

TABLE 4A. Concepts and Exemplar Quotes for Emergent Theme, *Challenges*

Concept	Exemplar Quote
Low job control	<p>"...it's kind of ridiculous that we work that much, and we're certainly not paid... We're paid less than minimum wage if we divide our pay by hours. So after all of the debt that we incur from undergrad and medical school, we're put into this long training for seven years where we're getting paid less than minimum wage and working double what an average person works outside of medicine. And we have no control over that whatsoever." (NUX3)</p> <p>"But I also find that sometimes with those classes...a frustration is that...they can teach ... we should meditate, or you should go out and get some physical activity. But in practice... there's no time or space for that... We can know what to do to relieve stress or frustration. But often times, practically speaking, it's hard to carry out when we do have a responsibility." (OTX1)</p> <p>"We like to think that the resources are great and available, and you know if you need to use them, you should use them. But they're not typically very accessible...counseling services, for example, are not usually available on weekends or after hours or evenings. ... It's not enough to make them available. They need to be easily accessible. And in my experience, that's been a huge disconnect." (LSY1)</p>
High workload	<p>"I think the challenge will be a kind of amassing all of the clinical knowledge to take care of patients on any given service. I think also, you know, a lot of the time will be spent rotating in other departments that are not necessarily our chosen field. So I think that will be another challenge of learning that and then moving on to another rotation. You know, another challenge will be sort of the physical toll of working long hours. I think those are kind of the main challenges as all of the professional growth of learning that we have to do and then also kind of the physical toll of bearing the workload." (OTX1)</p> <p>"I think for me, one of the challenges is like the continual learning, I think can be mentally very exhausting. That's true. And you see it in medical school as well. But I think when you add really long hours of work, that also expects a lot of learning, I think that can be mentally exhausting." (NUY1)</p>
Toxic cultural elements	<p>"Everyone knows that surgeons are... if someone's going to be mean, it's going to be them in the hospital...surgical culture... you're expected to abide by whatever the attending's rules are...and their operating room is their domain. So that's not... necessarily relevant to any other non-surgical specialties where they have an actual area that's considered theirs, you know... So people are really hostile about their environment... if they feel that you're not worthy of...being in their OR... then you'll hear it." (NUY2)</p> <p>"And I think there's this like, you know, hidden curriculum in... surgery that you can leave, but... you want to... be there for everything. If there's an extra case, you want to be the person who stayed late and did the case- you don't want to be known as the person who... went home when they could. I think that's a very real thing in most surgical subspecialties." (OAY1)</p> <p>"It's hard to guarantee everyone eight hours of sleep every day when you need them to do that work that needs to get done. So I feel like in many ways there are like direct conflicts of labor. And then in the end...hospitals are all like businesses and they need to have enough cases and make money...at the end of day, that's going to win out over...how much sleep a resident gets." (OTX2)</p>

residents, suggesting that nearly 50% are unable to identify when they are in distress.¹¹ Together, these works suggest that high self-reliance, combined with lack of awareness regarding experienced stress and being under-equipped to manage profound stress, limits interns' ability to recognize and respond to their own needs. These situations can be further aggravated by a culture that stigmatizes interns who ask for help outright.^{12,13} Moving forward, codified curricular interventions that focus on training residents to identify mounting stress (i.e., the embodied experience of stress), to recognize and report signs of distress in colleagues,¹¹ and to cope with stress in evidence-based ways could be

impactful.^{14,15} Additionally, cultural destigmatization of asking for help can be promoted by designating faculty champions with whom residents can disclose issues in confidence, and purposefully facilitating sharing by senior surgeons of stressful personal and professional experiences and how they were managed.^{16,17}

Our second finding, that interns anticipate rewards from training which literature suggests may or may not exist, is supported by recurrent comments regarding professional mastery and personal growth.

Regarding professional mastery (described here as the process of acquiring technical and clinical skills) has

TABLE 4B. Concepts and Exemplar Quotes for Emergent Theme, *Challenges*

Concept	Exemplar Quote
Toxic cultural elements	"... that happens in surgery and that's something and that's part of their culture... people are really hostile about their environment... if they feel that you're not worthy of being in their environment, being in their OR, or an endoscopy suite... then you'll hear it...that's surgical culture in terms of demanding that you're worthy of being in that environment." (NUY2) "Honestly ...sometimes in the hospital, I find the culture of ...like a blame game that goes on and people don't really take a step back and... they don't always treat each other with respect... in almost any other workplace...certain aspects of [surgical culture]...would not fly at any other workplace. ... like the way people treat each other. The amount of expectations that are put on you...I think it's not always the most reasonable." (OTY1)
Personal demands	"I think that's one of the hard things in residency is things like social support, eating or eating well... doing your hobbies. Those are all things that [are] our second priority. Or like third priority... throughout a lot of residency. So that'll be an adjustment." (OTY1) "Challenges in terms of taking care of myself mentally and things like feeding yourself, going to the bathroom...actually physically taking care of yourself can get hard sometimes." (LSY1)
Affective changes	"[I'll] Probably become more cynical because everybody seems to. ... there's a sort of like cultural understanding of defaulting to kind of cynical responses." (NUPX1) "I would fear...especially when we're so overburdened with work, the depersonalization... this jadedness that can occur where... you're faced with so much human suffering, so much stress all the time, that you... become a little detached...from the humanity of it all. And I hope that...I will stay vigilant, that it doesn't happen...in moments where there's a heavy workload..." (NUX1)
Discrimination	"Basic rule of thumb that everybody has told me ever since they suspected I wanted to go to medicine, or surgery is just that you've got to be better than all of your [male] counterparts to be treated equally. But that's fine. I can do that. It'll be harder. My emotions will be judged more harshly. Pretty much everything will be under a tighter lens. I personally, like I said, I react strongly to feedback at first. Sometimes I tear up. Sometimes I have obvious facial reactions ... to harsh criticism, but I continue soliciting it because it's important to grow. But I think that...as a woman being seen as emotional will... be a challenge for me that I will have to overcome." (NUPX1) "I had a discussion with a good mentor of mine. ... African-American female. ... she definitely had a tough time. ... this culture was not very friendly to her. ...there are a lot of things that happen behind your back, too. Her advice was [being African American you should have] people on your side early on in the process. ...developing relationships with the people that will vouch for you if something starts to go awry." (OAY1)

been the focus of much work in recent years that examines how to individualize the formative process for residents. Focus has been on creating a trajectory that balances the need for patient safety with resident growth and autonomy by tailoring entrustable activities based on the individual resident's skill level rather than their year of training.¹⁸⁻²⁰ This individualized approach is a major focus of the ACGME for the development of clinical competencies,²¹ and in light of our findings, a tailored approach may be framed not only as a critical component of teaching excellence,²² but also as a means of enhancing residents' internal sense of reward, potentially mitigating experienced challenges and increasing satisfaction with the arduous process of training. Thus, our second finding, though not surprising, underscores that residents perceive rewards and expectations which are part of the currency for undertaking the universally challenging experience of becoming a surgeon.

Regarding personal growth (described here as strengthened resilience and self-perception) research in surgical residents is scant, but growing evidence reveals the value of both resilience and self-perception in performance, work satisfaction, and attrition. In the case of resilience, a national survey of general surgery residents in the United States demonstrated association between higher resilience and decreased attrition and suicidality.²³ Further, resilience (by definition high performance under difficult circumstances),²⁴ has been shown to increase in surgical residents as a result of codified training, particularly in emotional regulation and mindfulness skills, with benefits to performance and mental health.^{25,26} Anton et al.¹⁵ showed in 2 separate randomized controlled trials that emotional-regulation based mental skills training in general surgery residents resulted in significantly less self-reported and physiologic stress as well as higher objective skills ratings in

TABLE 5. Concepts and Exemplar Quotes for Emergent Theme, *Desire to Belong*

Concept	Exemplar Quote
Recognition as a peer	"...being worthy means that...your technical skills are up to par. Your knowledge is up to par. Your ability to recognize things in the operating room [is] up to par. And so I think in surgery that's really... appreciated because that means that you're taking time out of the basic curriculum to do extra work and try to work on whatever skills or whatever knowledge is necessary to be worthy in that environment." (NUY2)
Decision making entrustment	"...positive feedback ... like 'You did a great job... I want to invite you into my operating room'. That's them saying, 'You're doing an awesome job. I want to work with you', or even, getting corrections while you're doing the physical task in the operating room, like,... 'Here's how you can do it even better'. It's a message." (NUX2) "...it [positive feedback from an attending] would help... to...feel comfortable in any setting...for example, someone says, 'Wow, your technical skills are really good.'...Then you're like, 'OK, wow. So this attending surgeon has confidence in me. So next time I'm in the OR, I'm going to be...more bold about asking to do stuff'. " (NUY2) "... definitely skill... the ability to realize...your limitations...to really recognize the humanity in our patients, in our team and our colleagues...surgery is very much a class and it takes years of training to be able to perform these skills and to do them well... as a surgeon, you have to be a teacher... a good communicator... those would be my traits of a good surgeon... these are traits that I value and that I really seek to cultivate in myself, because these are traits I admire in the surgeons that I look up to...I hope to develop them throughout the course of my residency, and in my practice." (NUX1)
Inclusion in an elite culture	"I think it's probably speaks more truly to surgery than perhaps other specialties within medicine. I think... when you're going through kind of difficult situations, you can...create stronger bonds through that...you're having a challenging residency experience that requires a lot of mental energy, focus, and long hours. I think that, in some ways, can create kind of stronger bonds that you can come out with." (NUY1) "[Surgical residency]...will give me knowledge and skills that I...desperately want, and that will help me serve others. It will give me a lot of purpose in my life...You know you're going to help people...that's definitely what I want in the job...That's what surgical residency will give me... there will be a lot of camaraderie with my co residents...and the other folks who work in the hospital." (NUX2)

both simulated and live tissue surgery.²⁷ In 2 randomized trials of mixed-specialty surgery residents we found that codified and tailored mindfulness-based mental skills training significantly decreased burnout and improved executive function.^{28,29} Taken together, this research suggests both value and 2 evidence-based approaches to increasing resilience among trainees. The current study suggests that developing greater resilience is also part of the expected currency of reward for residents undertaking surgical training.

In the case of positive self-perception (defined in this study as confidence, capability, and a sense of personal accomplishment) this has been shown to be significantly predictive of higher reported well-being and lower attrition in surgical residents.^{30,31} Multiple studies in surgical residents suggest that faculty encouragement and technical preparation outside the OR (i.e., skills lab training) heighten both confidence and sense of capability,^{32,33} but there is a paucity of work on methods for increasing residents' sense of personal accomplishment.³¹ Again, the current study suggests that training environments

that purposefully promote positive self-perception among residents are adding increased value and reward to the trainee experience.

Our third finding, that interns expect realistic challenges from their work, is supported by frequent comments anticipating an uncontrollable lifestyle, long or even excessive work hours, sleep deprivation, potential personal neglect, and even toxic cultural elements. While growing literature cites uncontrollable lifestyle as contributing to surgical resident attrition,^{34,35} and exceeding the 80-hours per week work limit as correlating with higher burnout,³⁶ work in more senior residents suggest that *expecting* such hardships may decrease odds of attrition. For example, in a study of more senior residents, those who expected to (1) work more than 80 hours per week as an attending, (2) to have a very stressful life, and (3) be the subject of malpractice litigation at some point in their career, were less likely to experience attrition from their residency program (OR, 0.90; 95% CI, 0.82-0.98).⁶ This speaks to the importance of increased exposure of medical students to the realities of managing surgical training, (i.e., in the form of sub-

internships or surgical boot-camps that are undiluted, and purposeful exposure to how residents manage inherent challenges).³⁷ Additional interventions to reduce attrition and dissatisfaction include purposeful guidance from senior residents and faculty regarding self-care strategies, and organizational-level support and expectation-setting for trainees' significant others.³⁸

Our fourth finding, that the "desire to belong" (i.e., the solidification of one's social identity as a surgeon) is a powerful motivator with potential to mitigate anticipated challenges, was supported by recurrent comments from all demographic groups describing the ultimate goals of being recognized as a peer, included in an elite culture, and entrusted with high stakes decision-making and action. This finding reflects substantial work in social and behavioral science which have shown that a strong social identity and sense of group belonging are incredibly powerful assets that augment personal resilience and can mitigate both chronic and otherwise overwhelming stressors (such as poverty or a devastating loss).³⁹⁻⁴¹

In social science, social identity is understood as "that part of an individual's self-concept which derives from the knowledge of ...membership [in] social groups [and] the value and emotional significance attached to that membership."⁴² Tajfel's social identity theory posits "tribal"/social-identity formation as augmenting individual resilience, especially under high strain.⁴³ Among minority groups, the association between identity achievement (exploring and understanding the meaning of one's identity) and psychological well-being is mediated by identity affirmation (developing positive feelings and a sense of belonging to one's social group).⁴⁴ Among surgical residents, "social belonging" has a significant positive correlation with well-being, and a negative correlation with thoughts of leaving surgical training.^{45,46} Conversely, lack of belonging is a significant predictor of risk of attrition.⁴⁵ Therefore, the development of a sense of belonging to a highly exclusive group such as surgery may confer psychological benefits,^{47,48} as implied in our interviews. This suggests the opportunity for interventions designed to enhance belonging among surgical interns as a potential powerful target for increased resilience and well-being.

Regarding UIM individuals, a randomized controlled trial of Black American college students demonstrated that a social belonging intervention was successful at significantly increasing career satisfaction and psychological well-being 7 to 11 years post-intervention.⁴⁹ The intervention consisted of a 1-hour exercise within which social and academic adversity in the transition to college are represented as non-threatening, common, and temporary.¹⁷ Racially/ethnically diverse older students shared personal stories of everyday challenges inherent in the transition to college and how their experiences

improved with time. These stories represented challenges to belonging as normal and temporary, "due to the transition itself—not evidence of a permanent lack of belonging on the part of the self or one's group." The authors posit that "...a single targeted exercise that shifts how people make sense of their experiences at a key time may alter the recursive cycles that play out between an individual and their social context over time."^{50,51} Though this intervention was implemented in rising Black college students there are non-racially-based fundamental similarities with surgical interns: identification with an exclusive group with unique challenges, a major transition within the realm of academia, and anticipation of toxic cultural elements that can contribute to perceived exclusion and belonging insecurity. There is potential for future work to test the adaptation of such successful social belonging interventions to the unique climate of surgery.

While the desire to belong was expressed by all residents, UIMs and women also viewed belonging as necessary for survival. For UIMs, belonging was perceived as a shield against discrimination, negative (potentially biased) evaluations by superiors, and risk of dismissal from training. For women, belonging was a shield against stereotyping, judgment, lack of recognition, and harassment. It may be beneficial to consider the survival component of belonging when adapting social belonging interventions for UIMs and women.

LIMITATIONS

While this study provides important insights, our findings should be viewed in the context of several limitations. First, our study was exploratory, with only 1 program included, which may limit the generalizability of our results. Thus, though we provide potential interventions as guideposts for future work in our population, there should be caution in the implementation of proposed interventions. The selection of interns is a non-random process, which may be reflected in the sentiments expressed by interns in our study. However, many of the sentiments expressed were supported by the literature, including in other populations and at other institutions. Our paper serves as the foundation for a larger study in our study population across multiple institutions. Though our interviewee sample is purposefully diverse, the limited number of individuals in each demographic group should inspire caution in assuming our findings speak for these groups as a whole. Additionally, we were unable to member-check our interview findings with a representative sample of our participants. These limitations underscore the need for further qualitative work in this domain.

CONCLUSION

We've conducted a single-institution exploratory study with findings that suggest potential high-yield actions to explore in future work as informed by current literature, with the goal of preventing expectation-reality mismatch in GS interns. These include training to identify signs of stress, guidance in self-care strategies and support for significant others, and promoting belonging by adapting successful interventions from other fields and emphasizing milestones of incremental acceptance and inclusion. Future work can focus on assessing interns' expectations and the feasibility and acceptability of proposed interventions in larger samples across multiple institutions.

CONSENT

Informed consent was obtained from all individual participants included in the study.

ETHICS APPROVAL

This study was exempted by the Institutional Review Board at the University of California, San Francisco (UCSF) as part of quality improvement.

DATA AVAILABILITY

The datasets generated and analyzed during the current study are available from the corresponding author upon reasonable request.

AUTHORS' CONTRIBUTION STATEMENTS

Study conception and design: Lebares, Ojute; Acquisition of data: Ojute; Coding of data: Ojute, Gonzales, Ghadimi, Edwards, Lebares; Analysis and interpretation of data: Lebares, Ojute; Drafting of manuscript: Ojute, Lebares; Review and editing: Lebares, Ojute.

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SUPPLEMENTARY INFORMATION

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