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Surgical resident burnout and job satisfaction: the role of workplace climate and perceived support

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ABSTRACT

Background: Surgical residents train under immense stress, often manifesting into poor well-being. While recent research identifies methods of coping with stress, few studies empirically investigate the role of the environment on surgical resident well-being. We aimed to assess surgical resident perceptions of workplace climate, organizational support, burnout, and job satisfaction to test a mediation model identifying antecedents to well-being.

Materials and methods: A convenience sampling of program directors from general surgery within the Eastern region of the United States were emailed to request either agenda time to collection data via paper survey or to forward an electronic survey link to their residents between March 2016 and June 2016. The survey included scales demonstrating validity evidence on well-being, climate, and perceptions of support.

Results: Based on 160 general surgery residents (out of 557; 29% response rate) across 19 training programs, our mediation model found that job satisfaction was significantly predicted by workplace climate directly (direct effect = 0.37, 95% CI [0.19, 0.55]) and indirectly (specific indirect effect = 0.07, 95% CI [0.01, 0.13]) through perceived organizational support and burnout, while controlling for training year and gender, $F(5,147) = 53.76$, $P < 0.001$, Rsq. = 0.65.

Conclusions: Medical education requires an additional focus on how the clinical learning environment affects surgical resident well-being. Health systems and training programs will need to collaborate on workplace innovations to improve workplace climate for trainees to address the concerns of well-being with a modern surgical workforce.

Introduction

Healthcare systems and national medical education groups are expanding their focus from the Triple Aim to the Quadruple Aim in the United States,[1] adding provider well-being as a core component to improving patient care. Despite this increased attention, research on surgical resident well-being is often limited to coping strategies or attempts to increase provider resilience, which limits interventions to address the symptoms—not the cause—of poor work environments. However, organizational science may offer a complementary perspective on provider well-being by introducing empirical evidence on how the clinical learning environment may affect surgical residents' well-being.

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Systematic review finds that surgical residents report a lower quality of life and are at a greater risk for burnout compared to attending physicians.[2] A 2016 national study of U.S. general surgery residents indicated that 69% of respondents met the criteria for burnout on at least one of the three subscales, and nearly half of respondents desired to drop out of training and reported, in retrospect, they would not choose a career in general surgery.[3] Despite these troubling findings, on aggregate, surgical resident job satisfaction has been found to correlate positively with several workplace climate factors such as effective ancillary staff/services, empathetic nursing, and attending engagement in teaching, appreciation, and openness to suggestions.[4] Such findings suggest that antecedents to burnout and job satisfaction may include organizational factors including the provision of resources and support to meet the external demands of the environment.

The Job Demands-Resources Model offers one perspective to understand organizational factors that affect well-being. Job Demands-Resources Model research suggests job demands, such as workload, time pressures, and physical environment, are associated with exhaustion, while resources (e.g., feedback, rewards, autonomy, meaningful participation, and leadership support) are associated with engagement.[5] To prevent strain on an individual, organizations provide resources to mitigate the demands created by the environment to maintain organizational commitment and member well-being.[6] Individuals tend to personify organizations so actions of organizational agents (e.g., leadership) are interpreted to be actions of the organization.[7] As a result, individuals develop affective relationships based on perceptions whether their organization cares for, supports, and appreciates its members.[8] Members desire to reciprocate feelings of support back to the organization based on positive affective relationships, leading to increased organizational commitment, better individual performance, and higher job satisfaction.[9]

Our study tested a mediation model to understand how workplace climate positively predicts job satisfaction directly and indirectly through perceived organizational support and burnout for general surgery trainees (Fig. 1). Such relationships have often been studied and supported in nonhealthcare settings, but research with resident populations is limited.

Materials and methods

Residency program directors (n = 344) from general surgery, neurosurgery, otolaryngology, plastics and reconstructive surgery, orthopedic surgery, and urology across the South Atlantic, Mid-Atlantic, and East South Central regions were asked via email to provide 15 minutes during a resident-specific meeting to distribute paper surveys or forward an electronic Qualtrics survey link (Qualtrics, Provo, UT) onto all current residents. Recruitment for our institutional review board–approved study occurred between March 2016 and June 2016. The present study focuses on the findings from the general surgery resident sample to allow for more appropriate interpretations considering the work context likely varies between surgical specialties.

If program directors approved the paper-based survey, then program coordinators were mailed study materials (i.e., surveys, instruction sheet, data collection script, prepaid return envelope) and asked to return completed surveys within 3 wk. Coordinators were instructed to read aloud a recruitment script and ask residents to either complete the survey, or turn in a blank survey if they chose not to participate. Training programs at our home institution allowed a member of the research team to collect the data on behalf of the program coordinator. Participation was noted to be voluntary, and data were collected anonymously through a waiver of consent; however, participants were informed about the study through an information sheet.

Demographic items included program, gender, training year, relationship status, parental status, and interest in fellowship training. Well-being was operationalized as burnout and job satisfaction. We used nine items from the Maslach Burnout Inventory (Mind Garden, Inc, Menlo Park, CA) to measure burnout.[10,11] A seven-point Likert scale (1 = never, 7 = everyday) was used to measure the frequency in which participants experienced three subscales: emotional exhaustion, depersonalization, and diminished personal accomplishment. The Job Satisfaction Scale[12,13] was measured with five items on a five-point Likert scale (1 = strongly disagree, 5 = strongly agree). The Abbreviated Workplace Climate Questionnaire[14,15] was nine items and the short form of the Survey of Perceived Organizational Support[16] was sixteen items; both measures were rated on a five-point agreement Likert scale (1 = strongly disagree, 5 = strongly agree). Workplace climate items measured autonomy, collegial relationships, and workload. Perceived organizational support items measured the affective relationship between resident and his/her training program (e.g., "My residency program values my contribution to its well-being," "My residency program is willing to help me when I need a special favor"). Several other scales and items were included in the survey to address additional related questions[17] in our research agenda.

Group comparisons for parental and relationship status were conducted through independent samples t-tests for workplace climate, perceived organizational support, burnout,

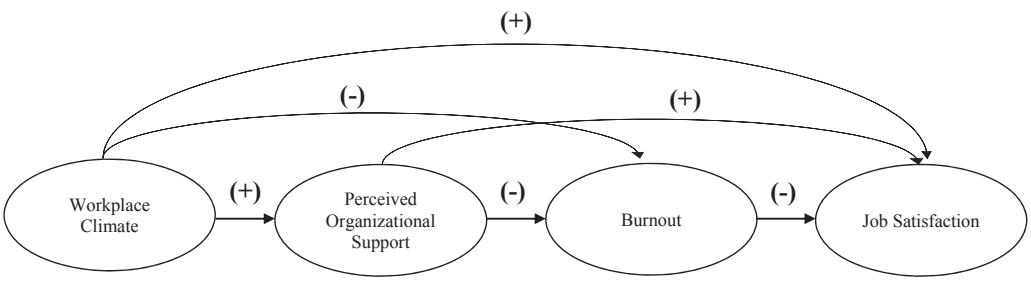

Fig. 1 – Predicted mediation model to identify antecedents to surgical resident well-being.

Table 1 – Participant demographics.

Demographic	n	%
Gender		
Male	101	63%
Female	57	36%
Training year		
PGY1	44	28%
PGY2	39	24%
PGY3	30	19%
PGY4	21	13%
PGY5	17	11%
PGY6	2	<1%
Other	1	<1%
Relationship status		
Has a significant other	116	73%
No significant other	41	26%
Parental status		
Yes	38	24%
No	120	75%
Fellowship plans		
Yes	132	83%
No	21	13%

and job satisfaction. Our mediation model was tested through PROCESS[18] macro, Model 6, in SPSS 23 (IBM Corp, Armonk, NY). The same software was used to calculate a Cronbach's alpha for each scale to inform reliability and run descriptive statistics. Negatively worded items were reverse coded and averaged to create a composite score for each scale before testing for mediation, a form of multiple regression. Mediation analysis is a technique that allows investigation in how variable X (workplace climate) affects variable Y (job satisfaction) through one or more mediating variables M (perceived organizational support and burnout); such analyses allow researchers to better understand the strength of relationships between measured constructs and how study variables relate to one another in a given population. Training year, gender, and parental status were coded as control variables in the mediation analysis with 5000 bootstrap samples. Maslach Burnout Scale and Workplace Climate Scale ideally have three composite scores, one for each subscale; however, due to constraints on survey length, we used shortened versions of each scale and aggregated responses to create a single composite score for each construct in analyses.

Results

One hundred sixty general surgery residents (out of 557; 29% response rate) across 19 general surgery residency programs completed our survey. Response rates by program ranged from 4% to 79%; the nine programs that allowed paper survey data collection had higher program response rates compared to programs that participated through the electronic survey method. An independent samples t-test found no statistical difference between responses collected through paper and electronic format. The general surgery sample had a majority of respondents identified as male ($n = 101$, 63%), had a significant other ($n = 116$; 73%), no children ($n = 120$; 75%), and are interested in completing fellowship ($n = 132$; 83%) (Table 1).

Reliability coefficients ranged from excellent to good, with threshold value of 0.70 for the four scales achieved (Table 2). One job satisfaction item, "I worry about making enough money as a surgeon," was removed from analyses because it did not demonstrate internal consistency with the other four items in our sample.

Group comparisons for relationship status revealed no meaningful differences between general surgery residents with or without a significant other (Table 3). However, general surgery residents with children were found to report less burnout, better work climates, and higher job satisfaction compared to those without children (Table 3). Male general surgery residents (3.59 ± 0.65) were also found to report greater perceptions of organizational support compared to females (3.24 ± 0.86) in our sample, $t(92) = 2.65$, $P = 0.01$ 95% CI [0.09, 0.61].

Our hypothesized model was supported based on the mediation analysis suggesting that well-being is affected by workplace climate and support. We found that job satisfaction was significantly predicted by workplace climate directly (direct effect = 0.37, 95% CI [0.19, 0.55]) and indirectly (specific indirect effect = 0.07, 95% CI [0.01, 0.13]) through perceived organizational support and burnout, while controlling for training year and gender, $F(5,147) = 53.76$, $P < 0.001$, Rsq. = 0.65 (Fig. 2). The direct and indirect findings suggest that workplace climate not only directly influences surgical residents' job satisfaction, but this relationship also exists through perceptions of support and burnout. For the direct mediation, workplace climate positively predicted perceived organizational support ($\beta = 0.91$; SE 0.07, 95% CI [0.77, 1.06]), which negatively predicted variance in

Table 2 – Summary of intercorrelations, means, and standard deviations.

Construct	1	2	3	4	Mean	SD
1. Workplace climate	0.76				3.01	0.56
2. Perceived organizational support	0.72*	0.96			3.47	0.74
3. Burnout	−0.54*	−0.48*	0.81		3.04	0.98
4. Job satisfaction	0.70*	0.67*	−0.66*	0.76	3.37	0.69

Cronbach's alpha reliability coefficients on diagonal.
SD = standard deviation.
* Correlation is significant at the 0.01 level (2-tailed).

Table 3 – Comparisons for parental status, relationship status, gender, mean (SD).

Gender	Male ($n = 101$)	Female ($n = 57$)	Test statistic
Workplace climate	3.03 (0.55)	2.98 (0.60)	$t(156) = 0.51$, P = n.s.; 95% CI [−0.14, 0.23]
Perceived organizational support*	3.59 (0.65)	3.24 (0.86)	$t(92) = 2.65$, $P = 0.01$; 95% CI [0.09, 0.61]†
Burnout	3.07 (1.00)	2.99 (0.98)	$t(156) = 0.48$, P = n.s.; 95% CI [−0.24, 0.40]
Job satisfaction	3.43 (0.64)	3.29 (0.76)	$t(155) = 1.19$, P = n.s.; 95% CI [−0.09, 0.36]
Relationship status	**Significant other ($n = 116$)**	**No significant other ($n = 41$)**	**Test statistic**
Workplace climate	3.06 (0.54)	2.88 (0.61)	$t(155) = 1.80$, P = n.s.; 95% CI [−0.02, 0.39]
Perceived organizational support	3.52 (0.75)	3.32 (0.73)	$t(155) = 1.47$, P = n.s.; 95% CI [−0.07, 0.47]
Burnout	3.00 (0.97)	3.12 (1.03)	$t(155) = -0.67$, P = n.s.; 95% CI [−0.47, 0.23]
Job satisfaction	3.42 (0.67)	3.26 (0.74)	$t(154) = 1.30$, P = n.s.; 95% CI [−0.08, 0.41]
Parental status	**Children ($n = 38$)**	**No children ($n = 120$)**	**Test statistic**
Workplace climate*	3.18 (0.47)	2.96 (0.58)	$t(156) = 2.11$, $P = 0.04$; 95% CI [0.01, 0.43]
Perceived organizational support	3.64 (0.67)	3.41 (0.76)	$t(156) = 1.68$, P = n.s.; 95% CI [−0.04, 0.50]
Burnout*	2.60 (0.81)	3.18 (1.00)	$t(156) = -3.25$, $P = 0.001$; 95% CI [−0.93, −0.23]
Job satisfaction*	3.60 (0.63)	3.31 (0.69)	$t(155) = 2.31$, $P = 0.02$; 95% CI [0.04, 0.55]

SD = standard deviation.
* Significant group difference.
† Unequal variances assumed.

burnout (β = −0.32; SE 0.14, 95% CI [−0.59, −0.04]). Finally, burnout negatively predicted variance in job satisfaction (β = −0.25; SE 0.04, 95% CI [−0.33, −0.17]).

Discussion

Our results suggest that features of workplace climate—autonomy, workload, and collegiality—affect job satisfaction for surgical trainees. Furthermore, this relation exists through perceptions of organizational support and subsequent burnout. Because environmental demands for surgical residents continue to cause strain, it is the duty of residency programs to mitigate negative outcomes such as burnout. One potential solution would be to provide further support and resources, as well as build positive affective relationships with trainees. Female surgical residents may also perceive less organizational support in comparison to male surgical residents, suggesting a need to also focus interventions that engage the needs of both male and female trainees.

Traditionally, healthcare systems focus their missions on improving patient experience, population health, and reducing healthcare costs. The focus on the provider often gets lost among the urgency of providing care and reacting to external demands. The landscape for medical education and the employment relationships between trainees and health systems suggests that the future of successful and effective healthcare requires an additional focus on the well-being of the provider.[19] However, even with the rising level of awareness on the issues related to well-being, surgical departments struggle to cultivate positive reciprocal relationships between surgical residents and their training programs.[20] Academic medical centers require not only a shift in practice but a shift in ideals, which may run counter to the established cultural norms currently found in surgical training programs.[21]

Ahmed et al[22] suggested surgery programs should avoid reliance on external thresholds to dictate how residents train and invest more effort in developing institutional strategies to best support the well-being of residents. Sources of stress for residents include work compression, excessive workload, limited autonomy, stressful relationships with supervisors, and the perception that training programs do not care about residents' personal needs.[23] There is a need to develop creative solutions to the operating room workflow, job redesign of other healthcare team members to alleviate surgical residents of tasks that are not physician-oriented, and investment in wellness programs.[22,24] Similar suggestions were echoed during accreditation site visits, where surgical residents identified the need to increase the number of nurse practitioners and physician assistants within their departments.[24] Perceptions of organizational support can also manifest through effective mentorship, recognition initiatives, and providing a safe climate to surface concerns without the fear of negative repercussion.[3,25-27] However, it is important to note that research suggests individuals value supportive actions of their organizations more when initiatives are neither mandated nor motivated by external forces, such as legal or accreditation requirements.[28] For many academic medical centers, the impetus and investment for developing initiatives to support resident well-being can be linked to disruptive events (e.g., suicide, self-harm, regulation) rather than recognizing that the support of surgical trainees is intrinsically valuable and integral to providing high-quality healthcare.

The Accreditation Council for Graduate Medical Education suggests academic medical centers have a responsibility to facilitate the process of learning for residents.[29] The initial

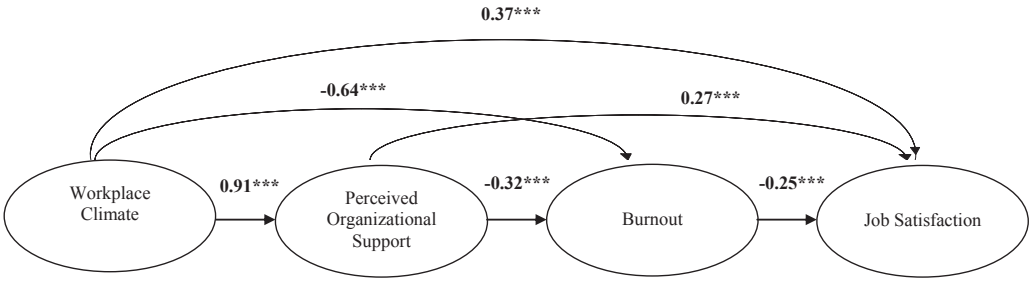

Fig. 2 – Climate significantly predicted variance in job satisfaction directly and indirectly through support and burnout. ***P < 0.001.

Clinical Learning Environment Review report portrayed variation across clinical sites on how medical education is structured within the larger landscape of providing patient care.[30] Some sites had graduate medical education operating independently of other organizational functions.[31] However, trainees exist within the larger organizational context and climate of teaching hospitals. Inherently, the clinical learning environment and the organizational climate of hospitals are indistinguishable, despite the siloing of graduate medical education from other functional areas.[32] To adequately support surgical trainees, health systems must integrate graduate medical education with other functional areas to collaboratively design and implement initiatives that contribute to positive well-being, especially when residents continue to be frontline providers in healthcare systems.

Our study describes relationships between measured constructs, but causation cannot be inferred, and we could not control for training program effects due to low power. Survey methodology can also be subject to social desirability bias, and our job satisfaction scale did not have thorough explanation of validation efforts in prior research as did our other three measures. Finally, our survey methodology was not uniform for all participants, and we depended on the willingness of the program director to allow study recruitment of their residents. We acknowledge that the limitations of our conclusions are also based on the low overall survey response rate.

Future research on this topic includes broadening assessment of workplace climate, perceived organizational support, and well-being to include clinical faculty. The influence of clinical faculty well-being on resident well-being still requires more investigation. Interestingly, surgical residents with children reported more positive workplace climates, less burnout, and greater job satisfaction in comparison to residents without children; greater investigation is needed to better understand why this difference exists. By measuring and monitoring the relations between work demands, sources of support, and well-being of surgical trainees through validated measures, academic medical centers will be better suited to address the needs of its members.

Conclusions

Through the Quadruple Aim, there is hope for increased effort to improve the clinical learning environment. With the emergent concern surrounding provider well-being, the institutions of medicine require workplace innovation to address the concerns of a modern provider workforce by building positive and reciprocal relationships between provider and organization. Initiatives increasing perceptions of organizational support may be one area of focus to sustain the resident wellness needed in surgical training programs.

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Disclosure

The authors reported no proprietary or commercial interest in any product mentioned or concept discussed in this article.

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