The Role of Personal Accomplishment in General Surgery Resident Well-being

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Objective: To investigate the association of personal accomplishment (PA) with the other subscales, assess its association with well-being outcomes, and evaluate drivers of PA by resident level

Background: Most studies investigating physician burnout focus on the emotional exhaustion (EE) and depersonalization (DP) subscales, neglecting PA. Therefore, the role of PA is not well understood.

Methods: General surgery residents were surveyed following the 2019 American Board of Surgery In-Training Examination regarding their learning environment. Pearson correlations of PA with EE and DP were assessed. Multivariable logistic regression models assessed the association of PA with attrition, job satisfaction, and suicidality and identified factors associated with PA by PGY.

Results: Residents from 301 programs were surveyed (85.6% response rate, N = 6956). Overall, 89.4% reported high PA, which varied by PGY-level (PGY1: 91.0%, PGY2/3: 87.7%, PGY4/5: 90.2%; $P = 0.02$). PA was not significantly correlated with EE (r = −0.01) or DP ($r = -0.08$). After adjusting for EE and DP, PA was associated with attrition (OR 0.60, 95%CI 0.46–0.78) and job satisfaction (OR 3.04, 95%CI 2.45–3.76) but not suicidality (OR 0.72, 95%CI 0.48–1.09). Although the only factor significantly associated with PA for interns was resident cooperation, time in operating room and clinical autonomy were significantly associated with PA for PGY2/3. For PGY4/5s, PA was associated with time for patient care, resident cooperation, and mentorship.

Conclusion: PA is a distinct metric of resident well-being, associated with job satisfaction and attrition. Drivers of PA differ by PGY level and may be targets for intervention to promote resident wellness and engagement.

Keywords: burnout, personal accomplishment, surgery resident, well-being

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Physician burnout has been extensively studied in recent years and has far-reaching impacts on providers, their patients, and the healthcare system.[1–4] It is commonly defined and measured using the Maslach Burnout Inventory (MBI), which includes 3 domains: emotional exhaustion, depersonalization, and personal accomplishment (PA).[5] Studies of physician burnout using the MBI have primarily conceptualized burnout using the emotional exhaustion and depersonalization subscales, documenting the negative influences of burnout on providers and their ability to care for patients.[6] Although PA was previously found to be associated with outcomes such as medical errors and suicidal ideation among medical trainees, more recent studies have paid less attention to PA relative to the other subscales.[6–8] This may be because physicians tend to score highly on PA with little variation, which leads some researchers to assume it may not be worthwhile to study because there is little room for improvement. It may also be for conceptual reasons such as a presumed unimportance relative to the other two subscales, or its conceptual divergence from the negative constructs of emotional exhaustion and depersonalization.[6,9,10] In fact, research on the factorial structure of the MBI has suggested that emotional exhaustion and depersonalization represent a unified factor, with PA being a separate, distinct factor.[11] Studies of physician burnout have demonstrated that emotional exhaustion and depersonalization are sufficient and potentially superior to the full inventory in identifying burnout among physicians.[9,12,13]

As a result of this conceptualization of burnout, the role of PA in physician well-being is not well understood. Although potentially not needed to identify burnout, PA may be a distinct construct, more in line with factors at the other end of the well-being spectrum, such as engagement, motivation, and fulfillment.[14,15] The Job Demands-Resources model may help explain the role of PA in well-being.[16,17] It conceptualizes well-being as 2 separate but interrelated processes (Fig. 1): (1) a health impairment process driven primarily by job demands (aspects of work that require sustained effort or skills and come at a physical or psychological cost), negative exposures, and burnout, and (2) a motivational process driven by job resources (which support achievement of goals, stimulate growth, and reduce job demands and associated costs) and engagement.[18] PA may contribute to the motivational process, and would therefore be expected to be primarily associated with job resources, rather than job demands. However, the exact resources necessary for fostering physicians' PA are unknown.

General surgery residents comprise a population at risk for burnout, with 39% reporting emotional exhaustion or depersonalization symptoms at least weekly.[19] We sought to investigate the role of PA in their well-being. Our objectives were to (1) assess the relationship between PA and the other burnout subscales among a national cohort of general surgery residents, (2) evaluate its association with resident well-being outcomes, and (3) determine the drivers of PA by resident postgraduate year (PGY). We hypothesize that job resources are the primary drivers of PA and that the relative importance of specific resources may vary by training level.

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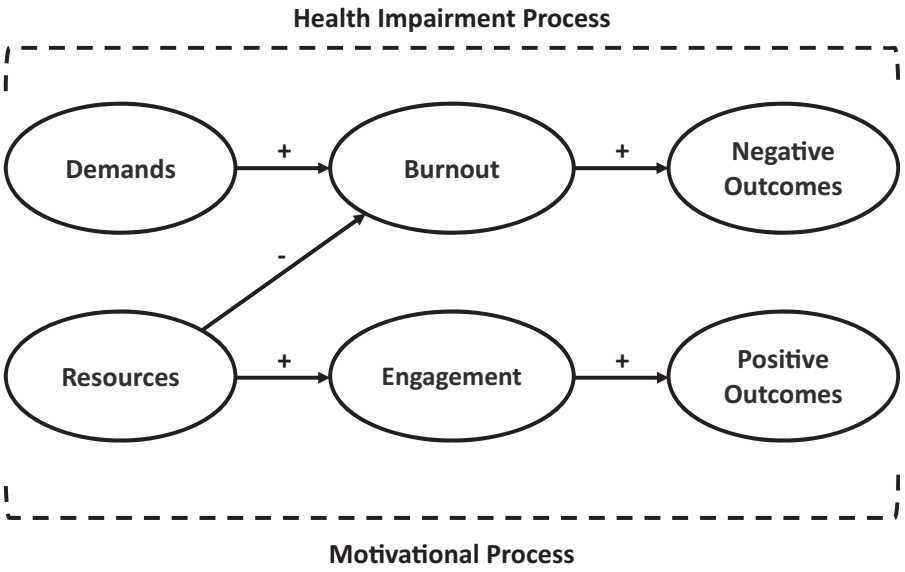

FIGURE 1. Job demands-resources model. Adapted with permission from W. B. Schaufeli. Applying the job demands-resources model: A ''how to'' guide to measuring and tackling work engagement and burnout. Organizational Dynamics (2017) 46, 120-132.

METHODS

Data Collection and Participants

A cross-sectional survey was administered to all general surgery residents following the 2019 American Board of Surgery In-service Training Examination. It was preceded by both written and verbal statements explaining that participation is voluntary and that responses are confidential (ie, de-identified before analysis). The Northwestern University Institutional Review Board reviewed the study and determined that it was exempt from further review.

The survey has been iteratively tested and revised since its first administration in 2015.[20] Items are adapted from previously published instruments wherever possible, as described below. Before its annual administration, extensive pilot testing and refinement is conducted via cognitive interviews and focus groups.

Resident and Program Characteristics

Resident characteristics included self-reported sex, clinical PGY (grouped as PGY 1, 2–3, and 4–5), and race/ethnicity (classified as non-Hispanic White, non-Hispanic Black, Hispanic, Asian, other). Program characteristics included program type (academic, community, military), program size (number of residents, in quartiles: <26, 26–36, 37–50, >50), and geographic region (Northeast, Southeast, Midwest, Southwest, West).

Training Environment Exposures

The survey included questions regarding the residency training environment, adapted from prior work on well-being.[21] Items addressed both job demands (duty-hour violations) and job resources (eg, mentorship and autonomy). The questions asked participants to indicate their agreement with each item on a 5-point Likert scale (strongly disagree, disagree, neutral, agree, strongly agree); responses were dichotomized to strongly disagree/disagree versus neutral/agree/strongly agree for analysis. A full list of training environment survey items is included in Supplemental Data 1, http://links.lww.com/SLA/C931.

Burnout and Resident Well-being Outcomes

The abbreviated MBI includes 3 questions for each of the 3 subscales (emotional exhaustion, depersonalization, and PA) and has been shown to be a valid and reliable screening tool for burnout.[9,22] The PA subscale specifically asks how often participants feel that they deal effectively with their patients' problems, feel like they are positively influencing other people's lives, and feel exhilarated after working closely with patients. Sample questions from the other subscales include: ''I feel emotionally drained from my work'' measuring emotional exhaustion and ''I've become more callous toward people since I began residency'' for depersonalization. Participants are asked to report the frequency with which they experience each item (never, a few times a year, once a month or less, a few times a month, once a week, a few times a week, or every day). As in previous work, we defined symptoms of burnout as experiencing any symptom of either emotional exhaustion or depersonalization at least weekly.[12,19] Similarly, we considered an ''at least weekly'' response to at least 1 of the 3 questions in the PA subscale as a positive response. We also calculated continuous scores for each of the 3-item MBI subscales and conducted additional sensitivity analyses using means and quartiles of the continuous scores in addition to the dichotomization above. For these analyses, a score was assigned to each item (from 0 for ''never'' to 6 for ''every day'') and summed for each 3-item subscale to give a continuous composite score (0–18) for that subscale.[5]

Resident well-being outcomes included satisfaction with the decision to become a surgeon,[23] thoughts of leaving a residency program (attrition),[24] and suicidal thoughts,[25] using previously published instruments. Responses for the satisfaction and attrition questions were dichotomized from a 5-point Likert scale to agree/neutral versus disagree. Suicidal thoughts were assessed by asking if the participant has had thoughts of taking his/her own life in the past 12 months (yes/no).

Statistical Analysis

Correlations between the mean composite scores for PA and emotional exhaustion and depersonalization were analyzed using Pearson correlation coefficients.

The associations between PA and resident well-being outcomes (job satisfaction, thoughts of attrition, and suicidal thoughts) were assessed using Chi-squared tests with responses clustered by residency program. A multivariable logistic regression model with robust clustered standard errors was then constructed for each

TABLE 1. Resident and Program Characteristics Associated With Personal Accomplishment

	Personal Accomplishment*		
	N	%	P†
Sex			0.005
Male	3014	88.1%	
Female	2231	91.0%	
Race/ethnicity			<0.001
Non-Hispanic White	3314	91.5%	
Non-Hispanic Black	234	90.0%	
Hispanic	438	85.4%	
Asian	888	86.4%	
Other	256	83.7%	
Prefer not to say	240	87.3%	
Postgraduate year			0.016
1	1331	91.0%	
2, 3	2114	87.7%	
4, 5	1937	90.2%	
Program type			0.044
Academic	3147	90.3%	
Community	2083	87.9%	
Military	152	91.0%	
Program size			0.004
<26	1352	86.5%	
26–36	1345	89.7%	
37–50	1415	91.2%	
51+	1270	90.3%	
Geographic region			<0.001
Northeast	1746	86.7%	
Southeast	1091	92.5%	
Midwest	1210	90.2%	
Southwest	610	89.6%	
West	725	90.1%	

*Personal accomplishment was defined as at least weekly endorsement of at least 1 of the 3 relevant MBI questions.
†Chi-square tests adjusted for clustering by programs.

outcome, including all 3 subscales and resident and program characteristics as covariates. Separate models were constructed for the weekly versus less than weekly dichotomization of each MBI subscale and the continuous composite subscale scores.

Aspects of the training environment which could be classified as job demands or job resources were assessed as predictors of PA using cluster-corrected chi-square tests and multivariable logistic regression with robust clustered standard errors. Models were stratified by PGY-level to examine differences in factors associated with PA based on progression through training. In addition to the primary analysis using the weekly vs. less than weekly dichotomization of PA, an additional model was constructed evaluating factors associated with being in the lowest quartile (vs. the top 3 quartiles) of the PA composite score as a sensitivity analysis. All analyses were done using Stata/SE 16.0 (College Station, TX).

RESULTS

Residents (N = 6956) from 301 general surgery programs responded to the survey (85.6% response rate). Overall, 89.4% of residents reported at least weekly feelings of PA, with some variation by PGY-level (91.0% for PGY-1, 87.7% for PGY-2/3, 90.2% for PGY-4/5; $P = 0.02$). Female residents reported higher rates compared to males (91.0% vs 88.1%, $P < 0.01$), and White residents had higher rates compared to non-White residents (91.5% vs 86.2%, $P < 0.01$). Residents training in community programs and smaller programs reported lower rates of PA than academic or larger programs (Table 1). Mean composite scores for the PA subscale are reported in Supplemental Table 1, http://links.lww.com/SLA/C932. The mean composite score for PA did not demonstrate significant correlation with emotional exhaustion ($r = -0.01$) or depersonalization ($r = -0.08$), whereas emotional exhaustion and depersonalization demonstrated a moderately strong correlation with each other ($r = 0.68$).

Resident Well-being Outcomes

In multivariable models adjusted for resident and program characteristics, and emotional exhaustion or depersonalization, high PA was a significant independent predictor of higher satisfaction with being a surgeon [odds ratio (OR) 3.03, 95%CI 2.45–3.76, Table 2]. Similarly, high PA was associated with lower odds of thoughts of attrition (OR 0.60 95%CI 0.46–0.78). It was not associated with suicidal thoughts (OR 0.72, 95%CI 0.48–1.09). Sensitivity analyses using composite subscale scores as continuous variables in the multivariable regression found a similar pattern of results with no differences in significance, direction, or relative magnitude of associations (Supplemental Table 2, http://links.lww.com/SLA/C933).

Factors Associated With PA

More frequent duty-hour violations were not associated with PA for any PGY group (PGY-1: 91.0% vs 92.1%, $P = 0.59$; PGY-2/3: 88.4% vs 85.2%, $P = 0.13$; PGY-4/5: 90.1% vs 91.0% $P = 0.69$). For all PGY levels, ''favoritism in the residency program'' was a

TABLE 2. Association Between Burnout Subscales and Resident Outcomes

	Odds Ratio	95% CI	P
Satisfaction with being a surgeon			
Emotional exhaustion	0.29	0.25–0.35	<0.01
Depersonalization	0.40	0.34–0.47	<0.01
Personal accomplishment	3.03	2.45–3.76	<0.01
Thoughts of attrition			
Emotional exhaustion	2.98	2.44–3.62	<0.01
Depersonalization	2.39	1.96–2.91	<0.01
Personal accomplishment	0.63	0.49–0.82	<0.01
Suicidal thoughts			
Emotional exhaustion	2.15	1.58–2.91	<0.01
Depersonalization	2.57	1.90–3.47	<0.01
Personal accomplishment	0.70	0.46–1.06	0.09

Results from multivariable logistic regression models adjusted for resident sex, race/ethnicity, postgraduate year, program size, program type, and geography.
CI indicates confidence interval.

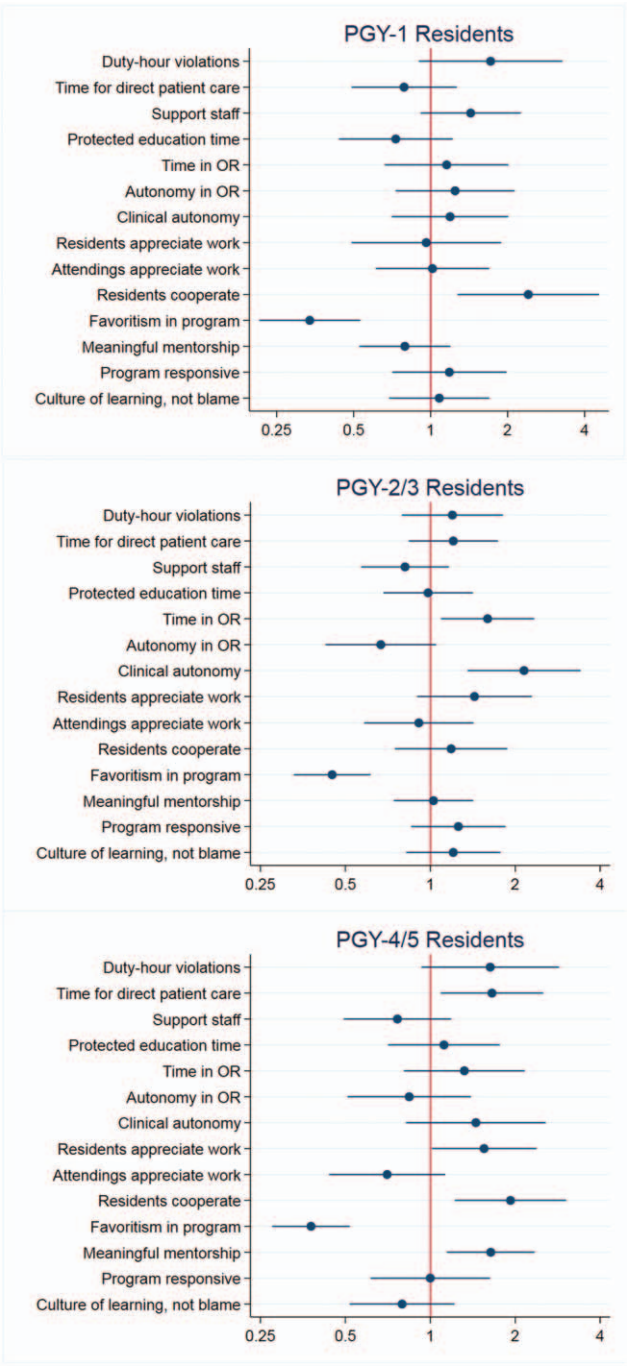

FIGURE 2. Factors Associated with Personal Accomplishment, Stratified by Postgraduate Year. Results from multivariable logistic regression models adjusted for resident sex, race/ethnicity, postgraduate year, program size, program type, and geography, with clustering by program. Solid circles represent odds ratios with 95% confidence interval bands. N = 1296 for PGY-1, N = 2244 for PGY-2/3, N = 2,045 for PGY-4/5. OR indicates operating room; PGY, postgraduate year.

consistent negative predictor of PA. Otherwise, individual items varied in their degree of association with PA based on PGY-level (Fig. 2). Among PGY-1 residents, the only other significant predictor of PA was resident cooperation (OR 2.27, 95%CI 1.21–4.28, $P = 0.01$). For PGY-2/3 residents, time in the operating room (OR 1.65, 95%CI 1.13–2.41, $P = 0.01$) and clinical autonomy (OR 2.16, 95%CI 1.37–3.41, $P < 0.01$) were associated with PA. For PGY-4/5 residents, PA was associated with more time for direct patient care (OR 1.59, 95%CI 1.05–2.42, $P = 0.03$), resident appreciation of their work (OR 1.56, 95%CI 1.03–2.36, $P = 0.04$), resident cooperation (OR 1.93, 95%CI 1.24–2.99, $P < 0.01$), and mentorship (OR 1.59, 95%CI 1.11–2.28, $P = 0.01$). A secondary model evaluating PA categorized as quartiles (low quartile vs top 3 quartiles) found a similar pattern of results as the weekly vs. less than weekly dichotomization, with a few differences in specific significant predictive factors (Supplemental Table 3, http://links.lww.com/SLA/C934).

DISCUSSION

The PA subscale of the MBI has increasingly been considered distinct from burnout and has not been as closely studied in the literature. The drivers of PA remain underexplored, representing a gap in our understanding of physician wellness. Our study demonstrates that PA is a distinct and important aspect of resident well-being, and that it is associated with resident well-being outcomes. Moreover, the drivers of PA differ by resident level.

The PA subscale of the MBI has previously been shown to be a distinct factor in nonphysician populations, perhaps not measuring the same construct as the other facets of burnout.[9] Our findings in a national cohort of surgical residents support this notion, with PA having no correlation with emotional exhaustion or depersonalization.

We found PA to be positively associated with job satisfaction and inversely associated with thoughts of attrition, independent of the effects of emotional exhaustion and depersonalization, indicating its importance to well-being. There was no significant association between PA and suicidal thoughts. This is in contrast to previous studies that found burnout symptoms, including low PA, to be associated with suicidal ideation among medical students and practicing surgeons.[7,25] The Job Demands-Resources framework positions negative exposures, burnout, and negative outcomes as part of a health impairment process, while job resources, engagement, and positive outcomes represent a motivational process. As part of the motivational continuum, low PA may indirectly impact health impairment, but would not be expected to independently predict negative health outcomes such as suicidal thoughts. We also see this difference between PA and the other burnout subscales reflected in the relative magnitude of their associations with resident outcomes. Specifically, the magnitude of the odds ratio between PA and job satisfaction is larger than that for emotional exhaustion and depersonalization, whereas the opposite is true for thoughts of attrition. This suggests that PA plays a larger role in impacting satisfaction with work whereas the other factors may play a larger role in outcomes such as attrition. PA has also been shown to correlate with other positive attributes such as empathy and professionalism.[26,27]

The literature on burnout has largely focused on negative exposures, ignoring potential positive or protective factors in the work environment. Although some have demonstrated a protective impact of grit, a character trait defined by perseverance and passion for long-term goals[28–30] it is thought of as more of an individual trait and the evidence suggests that individual-focused interventions on their own are not sufficient for addressing clinician burnout without changes in the learning and work environment.[31] In contrast, PA reflects environmental and personal influences, and we have highlighted specific factors in the learning environment that programs can target. For example, we found favoritism to be a strong negative predictor of PA for all groups, and perceptions of equity are

changeable (eg, by increasing transparency around the evaluation and appreciation of resident work). Another positive factor under study is self-valuation, which is the constructive prioritization of personal well-being combined with a growth-mindset. This has been shown to be associated with personal fulfillment and lower burnout symptoms.[32]

The Job Demands-Resources model posits that job demands do not directly impact the motivational continuum, while job resources increase employee engagement, and our findings demonstrate a similar relationship with PA. The one clear job demand we evaluated, duty-hour violations, had no association with PA. On the other hand, job resources such as social support, autonomy, and mentorship have been identified as important resources associated with motivation and engagement.[16,17] These findings are also consistent with related theories, such as Herzberg 2-factor theory that distinguishes the factors that drive job dissatisfaction from the factors that lead to job satisfaction and engagement.[33] We found that the relative importance of these resources differs with progression through training: social support is essential to interns, as is autonomy to mid-level residents, and social support and mentorship to senior residents. We believe these findings are consistent with the stages of graduated responsibility and growth that physicians experience throughout residency[34,35]; as the goals and challenges at each level change, so do the necessary supports. Interns first learn to work as essential members of a team, grow into independent practitioners through graded autonomy, and finally lead teams of their peers and seek mentorship in navigating their new role. Emphasizing these factors and targeting interventions to bolster resources in a PGY-specific manner (eg, targeting and tailoring mentorship interventions and resources to senior residents) may be a more effective means of improving resident engagement and wellness.

This study has certain limitations to acknowledge. First, although the survey response rate was relatively high at 85.6%, the possibility of non-response bias remains. We are not able to determine why some residents did not respond, and how their results would differ from those who did. Second, the survey was administered immediately following a lengthy examination, which may have impacted residents' responses, although the directionality of this bias is unclear; stress could have negatively influenced them, while post-exam relief could have positively influenced them. Finally, this study was cross-sectional, and as such, association cannot be presumed to imply causation. Furthermore, while we adjust for certain resident and program characteristics, there remains the possibility of confounding by unmeasured factors in any nonrandomized study.

CONCLUSIONS

PA is a distinct metric of resident well-being, associated with increased job satisfaction and decreased thoughts of attrition. Job resources, including social support, autonomy, and mentorship, impact PA in a PGY-specific manner. These findings suggest that interventions targeted at bolstering resources at each PGY level may help foster PA and improve resident well-being. Future directions include investigating the role of job resources in mitigating the impact of job demands on burnout, and further elucidating how job demands impact PA.

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