



Wellness in Graduate Surgical Medical Education

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Abstract

Purpose of Review Burnout disproportionately affects healthcare providers and impacts patient care and providers' quality of life (QoL). This review sought to define and dissect techniques used across the country to combat burnout during graduate surgical medical education.

Recent Findings Growing literature exploring the effects of burnout interventions demonstrate the increased commitment and importance placed on these topics by residency programs and the Accreditation Council for Graduate Medical Education. Resiliency training, mindfulness teachings, mentorship, and other strategies have had measurable success on residents' self-reported mental health and QoL. Resident-driven interventions such as improvements to their work environment have significantly improved measurements of stress, job satisfaction, emotional intelligence, emotional exhaustion, and life satisfaction.

Summary While encouraged by the many wellness initiatives undertaken around the country, further work is needed to better identify, standardize, and compare wellness interventions to determine how to best serve this group of medical providers.

Keywords Surgical graduate education · Wellness in surgery · Resident wellness

Introduction: Burnout and Wellness in the Surgery Resident

Burnout, a syndrome resulting from work-related stress and characterized by emotional exhaustion, depersonalization, and a low sense of personal accomplishment is becoming a growing concern among medical professionals. The overall burnout rate of residents is reported at 60%, and in comparison to age and education-matched peers, medical students and residents show a higher proportion of emotional exhaustion, depersonalization, and are more likely to screen positive for depression [1]. Surgery residents, in particular, have reported rates of burnout as high as 69% and have corresponding high levels of emotional exhaustion and depersonalization [2–5]. Burnout among surgery residents has been associated with high rates of stress, depression, and suicidal ideation [5]. Burnout has also been linked with alcohol abuse, self-reported suboptimal patient care, and greater difficulty concentrating at work [6–10].

In an effort to combat burnout, the concept of wellness has gained traction and has become an area of focus within the medical profession. Wellness, however, is not just a lack of burnout, but is a fully formed concept that includes a culture and individual sense of being challenged, thriving, and achieving success in one's personal and professional life [11]. Unfortunately, wellness is not well defined in medical literature. In a systematic review of the physician wellness literature, only 14% of papers explicitly define wellness, and the majority of studies place the greatest emphasis on burnout [12]. The lack of clear parameters and metrics on which wellness is defined can limit the ability of readers to understand how success is measured and further hamper the ability to determine which interventions should be adopted and which do not lead to meaningful outcomes. The good news is wellness

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research is becoming more prominent. Despite a paucity of data historically, since 2003, there have been 17,415 articles indexed on PubMed regarding surgical resident wellness versus only 2431 total prior to 2003. This aligns with national efforts to enhance credibility and value to surgical resident wellness by the Accreditation Council for Graduate Medical Education (ACGME). In 2003, the 80-h work week was enacted amidst concerns for both resident and patient safety after several political groups pursued federal intervention to regulate resident duty hours. A meta-analysis reviewing the impact of the 80-h work week included 7 studies assessing resident burnout and found that in 3 of the 7 studies, burnout was significantly reduced after the policy was established [13]. Additionally, a single-center, longitudinal study from 2001 to 2012 showed a decreasing rate of burnout and depression as progressive work hour limitations were enforced [14].

In 2011, the ACGME mandated further duty hour restrictions and limited interns to 16-h shifts. This change was made due to a 2009 review by the Institute of Medicine that evaluated resident performance and recommended a 16-h shift limit to increase the amount of sleep during residency to prevent acute and chronic sleep deprivation and minimize the risk of errors related to fatigue [15]. Evidence would eventually suggest, however, that while these changes were well-intentioned, they did not have the desired impact of improving resident wellness. A meta-analysis of 27 studies showed that the 2011 duty hour restrictions did not impact patient care or resident wellness but did negatively impact resident education [16]. The Flexibility in Duty Hour Requirements for Surgical Trainees (FIRST) trial, a large national randomized controlled trial involving 117 general surgery residency programs was also conducted comparing flexible duty hours to the 2011 standard duty hour restrictions. The primary outcome was patient safety and showed that the flexible duty hour group had non-inferior outcomes in comparison to the standard duty hour group. Residents working in the flexible duty hour group reported having less time for extracurricular activities, family and friends, rest, and health. Despite this, only 14% of residents preferred the standard duty hours, and there was no significant difference in perception of education quality or satisfaction regarding well-being. In addition, the concerns over having less time outside of work were less prevalent among residents in the PGY2-3 and PGY4-5 group [17]. Another trial, iCOMPARE, evaluated the 2011 duty hour restrictions among residents randomly assigned to either standard or flexible duty-hour policies in 63 internal medicine programs. This study showed non-inferiority in sleep duration and sleepiness between the two groups but showed higher dissatisfaction with education in the flexible hours group [18]. In 2017, the ACGME reversed the 16-h limit for interns to the current

standards (as of 2021) allowing all levels of residents to work 24 consecutive hours with 14 h free of clinical work after a 24-h shift and maintaining the 80-h work week cap. Of note, in the reversal the ACGME also made explicit mention of resident wellbeing as a requirement. This act demonstrated a shift to increasing awareness and importance of wellness in graduate medical education and highlighted that achieving wellness could not be simply obtained by changing the hours or structure of hours worked.

How and Who can Improve Wellness

The ACGME's attention and commitment to reducing burnout and raising awareness about wellness has resulted in a growth of research, intervention and strategy across graduate medical education. A few institutions around the country have begun to identify Wellness Vice Chairs or Medical Directors to lead programs for both faculty and residents. While studies on wellness are often limited by heterogenous and small sample sizes, lack of validated research tools and methods, and immature endpoints, their results and efforts shed light on the large-scale cultural shift that true wellness requires. Further, it is obvious that tackling wellness requires multifaceted and evidence-based interventions.

Strong standardized evidence on effective wellness programs that can be easily integrated into surgical training are lacking; however, many groups have published on their institutional programs. Some have chosen to focus on wellness education through didactic sessions to promote mindfulness and resiliency. Rutgers New Jersey Medical School developed a 12-week curriculum which was offered to multiple residency specialties on a weekly basis in the form of a mandatory 60-min didactic with practicum [19]. These small group sessions were led by a peer wellness champion and averaged 10 residents to one champion. Exercises outlined in a handbook were practiced and addressed during these 60-min sessions, and included reframing, listing positives, and breathing exercises. Additionally, residents voluntarily competed as a department to record steps and flights of stairs taken weekly [19]. The authors also attributed the frequent check-ins and feedback sessions a key part of the program's success as it allowed for iterative improvement to the program and ensured the program addressed current resident needs. This study did not objectively measure effects of their wellness intervention but focused on the curriculum and defined success as residents from all involved departments electively choosing to continue the weekly sessions. Studies like this highlight the importance of teaching wellness

skills to residents and incorporating physical fitness into interventions.

Group therapy has been demonstrated to be effective across a variety of domains and populations, so it may be used to combat burnout and depression in surgical residents. Mueller et al. recommended a facilitated-group approach to teach surgery residents coping strategies and bolster work relationships. Sessions were held once every 6 weeks for 90 min and were led by a clinical psychologist. Topics were tailored toward the groups of trainees' post-graduate year [20]. Sessions were mandatory, and the residents were protected from clinical obligations. The utilization of an expert certified coach may offer evidence-based strategies to teach residents coping skills and allow for a culture of mindfulness and wellbeing that is built on validated methods.

Mindfulness interventions have been studied in residency programs as a way to enhance coping skills and to help residents learn to manage emotionally and physically demanding situations. Lebares and colleagues initiated an Enhanced Stress Resilience Training (ESRT) program modified from Mindfulness-Based Stress Reduction and evaluated its effects on stress and burnout in a randomized controlled trial for both surgery residents and non-surgery residents in their first post-graduate year [21]. Residents met for 2 h in eight weekly sessions and engaged in meditation and focused discussions on stress management skills. The control groups also met weekly during a two-hour time block, protected from clinical responsibilities, and they participated either in article discussions or a flipped classroom learning environment on work-stress related topics. In surgery residents, the ESRT was associated with higher executive function and mindfulness scores, and in non-surgery residents, the ESRT was associated with lower emotional exhaustion and depersonalization scores. Perceived stress was not affected by ESRT, but the improvement in other measures suggest a role for mindfulness interventions in improving resident wellness [21].

There remains a large role for mentorship and one-on-one coaching programs. Mentorship is commonly identified as a key component in preventing burnout and attrition in surgical residents, yet formal mentorship is not found in all training programs. Bingmer et al. surveyed all general surgery residents within their academic institution before and after the implementation of a year-long mentorship program [22]. The authors found that residents who attended at least one event were more likely to feel comfortable approaching faculty to seek performance feedback or discuss personal concerns and were more likely to be satisfied with the amount of mentorship received [22]. Beyond mentorship, the formation of Wellness Groups or other formalized programs can support those in medical

training. Vanderbilt University Medical School was the first published formalized wellness program for medical students. Launched in the fall of 2006, it focused on mentoring and advising, student leadership opportunities, and personal growth [23]. This strategy provided one-on-one faculty and peer mentorship and offered a unique and personal support network for residents. Mentorship programs such as these are dependent on both mentor and mentee commitment and insight and rely on a high level of empathy and coaching skills.

Resident engagement and buy-in should be a primary focus when wellness initiatives are undertaken. Wellness initiatives led by residents allow for key stakeholder engagement and capitalize on the fact that residents are uniquely poised to understand and relate to what their peers are experiencing. In one resident-driven wellness initiative, an improvement in overall resident satisfaction and perception of work environment was demonstrated [24]. This group utilized needs assessment surveys with their cohort, such that interventions could be directed towards true resident pain points [24]. The hypothesis of this work was that when residents' concerns are heard and addressed, more impactful interventions can be undertaken. This was demonstrated by statistically significant changes in perceptions of wellness opportunities, time for wellness, work/life balance satisfaction, and improved quality of life (QoL) after resident-led interventions were enacted [24]. Mari et al. also has highlighted the benefit of implementing resident-led wellness programs and evoking continuous feedback from both residents and leadership [25]. Their surveys identified resident needs that included improving residents' on-call experience, increasing social activities, supporting preventative care, and promoting wellness education as high opportunity areas [25].

A culture of wellness is one in which trainees are encouraged to take care of themselves, can recognize when they are struggling, and can seek support when needed. A large, multi-institutional study examined the relative contribution of residency specialty and institution on resident workload satisfaction and learning environment satisfaction and revealed that institution had a statistically significant greater influence than specialty [26]. Studies like this suggest creating multispecialty interventions and institution-wide changes will have a more profound effect than department-wide changes.

The emotional and physical toll of residency is experienced by individuals in unique and personal ways. It is essential that institutions, faculty, co-residents, staff, and administrators do their part to destigmatize mental illness by continuing discussions of resident distress, depression, anxiety, and burnout. Mental illness will continue to exist, perhaps at higher rates due to the nature of the profession and training but having an open dialogue can put emphasis

on prevention instead of crisis control. Additionally, the “good surgeon” or “model intern” should be described as one who acknowledges their humanity and not just “toughs it out” [27]. Realizing and appreciating vulnerabilities is one of the strongest ways residents can connect and support their patients. There is an obvious and well-studied intimate relationship between physician wellbeing and compassionate patient care. Capitalizing on this fundamental connection may be a future strategy of wellness initiatives.

Wellness Initiatives Impact Residents

The impact of resident wellness is most apparent in the individual resident. The literature on burnout in physicians, as a whole, has shown that wellness helps to prevent burnout [28], but more specifically, wellness can have a targeted effect on mental health and QoL of individuals. Several studies have evaluated the impact wellness initiatives have on these key metrics in residents.

In a general surgery residency program, resident-directed interventions of improving resident workspace, providing additional meal funds, and two protected weekday personal days per year were significantly associated with improved perceptions of work-life balance and QoL ($p < 0.05$ for both) [24]. This demonstrated that active changes to address specified resident needs could translate to improving residents' QoL. Other programs' wellness initiatives have similarly increased residents' perception of their QoL even when they focused on other aspects of wellness. An incentivized team-based exercise program was studied in a cohort of 245 residents and fellows and compared to a control group ($n = 383$). Those in the exercise program reported significantly higher QoL ($p < 0.001$) at the conclusion of the program suggesting that some form of wellness contributed to the improved QoL whether it be physical activity, camaraderie, appreciation via incentives, or a combination of factors [29]. These studies show that wellness can be approached from several angles to reach the same goal.

Wellness initiatives have also been shown to affect resident psychologic health and sleepiness. A study in a neurosurgery residency cohort evaluated the effects of a 1-year wellness initiative that incorporated biweekly wellness lectures and weekly, hour-long team-based exercise sessions on psychologic health and sleepiness [30]. They used the validated 8-item Personal Health Questionnaire Depression Scale, the Generalized Anxiety Disorder 7-Item Scale, the QoL scale, and the Epworth Sleepiness Scale (ESS) to assess residents' baselines and scores after the intervention. Scores were significantly improved in measures of anxiety ($p = 0.039$), QoL ($p = 0.007$), and sleepiness ($p = 0.019$). Feelings of sleepiness have also been associated with

physical health. Alami and colleagues showed that resident ESS scores are significantly negatively correlated to metrics of physical functioning, role limitations due to physical health, body pain, and general health [31]. Although correlation does not signify causation, sleep duration and quality has been identified to be independently related to physical health. These studies support the use of wellness initiatives to improve mental health, feelings of sleepiness, and physical health for residents.

Resident physical and mental health can influence the clinical care that they provide [32]. Burnout is the manifestation of physical exhaustion and psychologic deterioration, which causes depersonalization, cynicism, and decline in productivity. These qualities are not conducive to effective patient care. Physicians with burnout have self-reported to be significantly more likely to provide suboptimal care or make errors [33–35]. In a prospective cohort study, of pediatric residents, depressed residents were 6.2 times more likely to make medication errors ($p < 0.001$) [10]. Wellness also has a role in relating to one's patients; one study identified wellness programs to correlate with wellness scores and empathy scores [36]. Depersonalization scores improved in a randomized controlled trial of pediatric residents that engaged in a 2-month self-care workshop ($n = 37$) compared to a control group ($n = 37$) ($p = 0.031$) [37]. This data suggests that improving resident wellness and physical and mental health will likewise improve and translate to better patient care.

Conclusions and Limitations

The study of wellness and burnout among surgery residents is a growing area of research interest. At present, many of the early studies are limited by non-randomized design, small cohorts, use of instruments that are not validated in the cohort of interest, and a heterogeneous cohort being studied. Yet, with recent awareness on the importance of wellness, randomized controlled trials are beginning to emerge in the literature. Many of the studies on wellness initiatives have been in a pilot phase to determine feasibility and now are expanding to outcomes of effectiveness, as seen by Lebares and colleagues' mindfulness Enhanced Stress and Resilience Training [21]. Many studies rely on self-reported feelings on one's own wellness and mental health which may introduce bias as it has been reported that physicians are usually not an accurate judge of their own wellness [38]. To combat this bias, studies may need to employ mixed methodology that uses both quantitative and qualitative data to identify trends that can better recognize wellness in an individual. Additional work is needed to understand how we can best quantify and study wellness, in order to accurately evaluate the impact of interventions.

As burnout and wellness are better defined, at-risk groups can be identified and interventions can be meaningfully targeted. A survey of all clinically-active surgical residents revealed the heterogeneity in burnout symptomatology [•39]. The over 7375 resident respondents were grouped into five unique phenotypes based on survey response: burned out, overextended, disengaged, fatigued, and fully engaged. Significant differences were noted between these groups in terms of gender, ABSITE score, 80-h violations, satisfaction with duty hour regulations, and satisfaction with time for rest. Female gender was associated with more emotional exhaustion symptoms, and high levels of mistreatment (including gender and racial discrimination) were associated with the ‘burned out’ phenotype [•39]. This study supports future use of a person-centered analytic approach to discover and appreciate the heterogeneity in burnout symptomatology.

A culture of wellness requires a multi-faceted approach that may be unique to individual programs and residents. Wellness exists in the workplace, but also in residents’ relationships, nutrition, physical fitness, and outside interests. Mindfulness, coping skills, physical activity, nutrition, and comradery are essential in sustaining a well individual, regardless of chosen vocation. Wellness programs work; they have demonstrated measurable improvements in stress, job satisfaction, emotional intelligence, emotional exhaustion, and life satisfaction [20]. Wellness programs and institutional cultural changes take time to build, but through constant and careful iterations, resident-led interventions, and skills teaching, there can be a lasting impact on physicians’ personal and professional wellbeing. Future work to help identify early predictors or groups more susceptible to burnout is needed to aid in early intervention and prevention.

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Compliance with Ethical Guidelines

Conflict of interest The authors declare that they have no conflicts of interest.

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