

Global Resilience in Plastic Surgery Study (GRIPS): Resilience is Associated with Lower Burnout Rates

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Background: Burnout has earned notoriety in medicine. It affects medical students, residents and surgeons, causing a decrease in career satisfaction, quality of life, and increased risk of depression and suicide. The effect of resilience against burnout is yet unknown in plastic surgery trainees.

Methods: A survey was sent via email to the members of plastic surgery societies (ICOPLAST) and the trainees from (ASPS) Resident Council from November 2021 through January 2022. The data included: demographics, training program characteristics, physician wellness resources, and single item Maslach-Burnout Inventory and Connor-Davidson Resilience Scale questionnaire.

Results: One-hundred seventy-five plastic surgery trainees responded to the survey. Of these, 119 (68%) trainees from 24 countries completed the full survey. Most respondents 110 (92%) had heard of physician burnout, and almost half of respondents (45%) had burnout. The average Connor-Davidson Resilience Scale score varied significantly amongst trainees self-reporting burnout and those who did not (28.6 versus 31.3, $P = 0.008$). Multivariate logistic regression demonstrated that increased work hours per week were associated with an increased risk of burnout (OR = 1.03, $P = 0.04$). Higher resilience score (OR = 0.92; $P = 0.04$) and access to wellness programs (OR = 0.60, $P = 0.0004$) were associated with lower risk of burnout.

Conclusions: Burnout is prevalent across plastic surgery trainees from diverse countries. Increased work hours were associated with burnout, whereas access to wellness programs and higher resilience scores were “protective.” Our data suggest that efforts to build resilience may mitigate burnout in plastic surgery trainees. (*Plast Reconstr Surg Glob Open* 2023; 11:e4889; doi: 10.1097/GOX.0000000000004889; Published online 10 April 2023.)

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INTRODUCTION

Every year, an estimated \$7600 per physician is lost due to healthcare burnout.¹ Burnout, which is often marked by a lack of accomplishment, exhaustion, and diminished empathy, is also linked to lower levels of productivity, quality of life, career satisfaction, and an increased risk of divorce and suicide.²

When compared with other physicians, most plastic surgeons are either very satisfied (43.3%) or satisfied (23.1%) with their career choice after a few years into practice.³ However, with the rising prevalence of burnout, many leading plastic surgery journals and affiliated professional societies across the world are urging members to address burnout in medical school or early on during residency.^{4–7}

Disclosure statements are at the end of this article, following the correspondence information.

Related Digital Media are available in the full-text version of the article on www.PRSGlobalOpen.com.

Most studies addressing burnout have focused on retrospective surveys to measure its prevalence across different specialties and professions. However, to date, little information has been reported about potential protective factors. There are limited reports on the concepts of grit and resilience in general surgery trainees; these studies highlight the impact that grit (ie, perseverance and passion for long-term goals) and resilience (ie, the ability to thrive in the face of adversity, rather than to merely survive) may have in enduring surgical training and its association to burnout, but none have been explored in the plastic surgery literature.^{8–10} We present the first international collaborative multi-institutional survey to address burnout, resiliency and related factors within plastic surgery.

METHODS

The study was IRB exempt, resolution 021-220, due to low harm potential and use of de-identified survey data as institutional protocols. An electronic survey was sent to all the international members of International Confederation of Plastic Surgery Societies (ICOPLAST) trainees, members of American Society of Plastic Surgery (ASPS) Resident Council, through the months of November 2021–January 2022. (See survey, Supplemental Digital Content 1, which displays the digital global survey. It provides an example of the survey distributed among trainees from different countries. <http://links.lww.com/PRSGO/C473>.)

In addition, a link to the survey was promoted through social media platforms using Instagram, Twitter and WhatsApp during the same time period. The survey contained 15 questions, which included demographics (country of training, age, gender), program size, hospital size, years of training, working hours, sleep hours, knowledge of physician burnout, abbreviated Maslach-Burnout Inventory, and the Connor-Davidson Resilience Scale (CD-RISC) 10. The 10 item CD-RISC is a proprietary validated abbreviated version of the original CD-RISC 25 scale,¹¹ consisting of 10 items using a five-point Likert scale, ranging from 0 (not true at all) to 4 (true nearly all of the time). Total scores range from 0 to 40, with higher scores showing more resilience.

We hypothesized that resilience and burnout might be associated, and participants with higher resilience scores might present lower rates of burnout. No compensation was offered. Study data were collected and managed in an online encrypted database using Research Electronic Data Capture hosted at Baylor Scott-White, Central Texas.¹² The primary outcome of the study was to measure resilience across international plastic surgery trainees and the secondary outcome was to characterize burnout and its related factors. For categorical variables, Fisher exact or Pearson χ^2 were used, and for continuous variables, a two-sided *t* test or ANOVA, logarithmic regression analysis was done. All tests with a value of *P* less than 0.05 were considered statistically significant. The analyses were performed using R statistical software (2020), Vienna, Austria.

Takeaways

Question: Is there any association between burnout and resilience?

Findings: Burnout is prevalent in an international cohort of diverse plastic surgery trainees. Higher resilience scores were associated with less burnout rate.

Meaning: Resilience training might be one exploratory strategy to mitigate burnout.

RESULTS

A total of 175 plastic surgery trainees responded to the survey. Of these, 119 (68%) trainees across 24 countries and six continents completed all questions and were included in the final analysis. Only full responses were included in the analysis. Because the survey was distributed electronically via a link and/or email, it was designed to be answered either in a smartphone or in a regular desktop computer, and if the respondents omitted any answer, they were deemed incomplete and not included in the analysis. Respondents predominately identified as men [*n* = 67 (57%)]. The mean age was 31.6 years old. Approximately half of trainees were from North America [*n* = 63 (53%)], followed by Europe (*n* = 27), South America (*n* = 12), and Africa (*n* = 9). Most respondents (80%) were within the first 6 years of training; a small percentage were currently enrolled or recently finished fellowship [*n* = 16 (13.4%)]. Most of the respondents [*n* = 110 (92%)] had heard of physician burnout, with a self-reported burnout rate of 44.5% (Table 1).

Trainees reported a range of work environments, as shown in (Table 2). Sixty-four percent of trainees reported working at large (>500 bed capacity) hospitals and reported working an average of approximately 72 hours per week. The majority of respondents (81%) reported some form of work hour restrictions—most commonly an 80 work hours per week restriction. Seventy-seven percent of trainees reported seeing fewer than 50 patients per week. Average sleeping time per week was 43.5 hours (approximately 6 hours/day) and 13 hours spent on non-work activities.

Resilience

The average CD-RISC 10 score varied significantly amongst trainees with burnout and those without (28.6 versus 31.3, *P* = 0.008). Multivariate logistic regression demonstrated that increased work hours per week were associated with an increased risk of burnout (OR = 1.03, *P* = 0.04). Interestingly, higher CD-RISC scores (OR = 0.92; *P* = 0.04) and an increased number of wellness programs (OR = 0.60, *P* = 0.0004) were associated with a lower risk of burnout. Sleep hours per week and hours spent on non-work activities per week were not statistically significant factors associated with burnout (Table 3).

Self-perceived Burnout Characteristics

Clinical documentation/filing clerical patient related information (eg, insurance authorization) and perceived time pressure were identified as contributing factors to

Table 1. Demographics

Characteristic	n (%)
Gender	
Men	67 (56)
Women	51 (43)
Nonbinary	1 (1)
Age range (mean)	25–43 (31.6)
Region	
North America	63 (53)
Europe	27 (23)
Asia	2 (2)
Middle East	3 (2)
South America	12 (10)
Africa	9 (8)
Australia	3 (2)
Postgraduate year	
1	14 (11.7)
2	10 (8.4)
3	20 (16.8)
4	17 (14.2)
5	21 (17.6)
6	13 (10.9)
>7	24 (20.1)
Fellowship training	
None	103 (86.5)
Microsurgery	5 (4.2)
Aesthetics	3 (2.5)
Hand	4 (3.3)
Other	4 (3.3)
Heard of physician burnout	
Yes	110 (92)
No	9 (8)
Self reported burnout	
Yes	53 (44.5)
No	66 (55.5)

Demographics of the study population are provided with adequate representation of residents in different stages of training and from multiple geographical areas. Most respondents were not enrolled in a fellowship; self-reported burnout rate is 44.5%.

Table 2. Work Environment Characteristics

Characteristic	n (SD, range)
Hospital size	
<100	7
101–250	10
251–500	26
501–750	36
>750	40
Outpatients visits/wk	
< 25	35
25–50	57
51–75	14
>75	13
Mean work, h/wk	72,1 (15.7; 40–127)
Mean hours spent on activities/wk	13,3 (8.9; 2–48)
Mean hours for sleep/wk	43,5 (7.4; 24–73)
Work hour regulations	
<40 hours of work per week	7
<60 hours of work per week	24
<80 hours of work per week	65
No work hour restriction	23

Work characteristics, representing a variety of sizes in hospital beds, with an average of working hours around 72.1 and 42 hours of sleep per week.

burnout in over half of the trainees (56%) (Table 4). Curiously, perception of a chaotic environment or pace of practice were not factors respondents attributed to burnout. The presence of family was not viewed as a factor contributing to burnout. Trainees also demonstrated a range of access to formal wellness programs at their respective institutions, as shown in Supplemental Digital Content 2. (See table, Supplemental Digital Content 2, which displays the factors affecting burnout. Multivariate logistic regression of the different factors associated with burnout, including regional variation, sex, number of wellness programs, working hour restrictions, and chaotic work environment. * $P < 0.05$ statistically significant. <http://links.lww.com/PRSGO/C474>). The most common wellness programs were in-person wellness programs (55%), with an average of two per institution, and access to mental health professionals (49%).

Burnout rates varied significantly across gender and region, along with the number of patients seen per week and the number of wellness programs. Interestingly, postgraduate year, fellowship status, clinical documentation, family, pace of practice, or time pressure did not seem to vary as much.

Multivariate Logistic Regression

Taking into account the concern for interaction and resulting multi-collinearity between multiple variables (eg, work hours and work hour restrictions), we identified six independent variables for the analysis, including age, CDR-RISC 10 score, hours of work per week, hours of sleep per week, hours spent on nonwork activities per week, and the number of wellness programs (Table 5). Increased work hours per week was associated with an increased risk of burnout (OR = 1.03, $P = 0.04$). Higher resiliency CD-RISC scores and access to wellness programs were negatively correlated (OR = 0.92, $P = 0.04$; OR = 0.60, $P = 0.0004$, respectively).

DISCUSSION

To date, there is no simple solution to combat physician burnout. Many healthcare systems have instituted mindfulness programs and increased access to mental health resources. Although these are well-intentioned interventions to lessen the impact of burnout, they can be interpreted by physicians experiencing burnout as if they are solely responsible for their symptoms (ie, shifting the responsibility from the system to the individual).¹³ Understanding factors that can influence the longevity and satisfaction of physicians is a priority in healthcare.¹⁰ Even before the COVID-19 pandemic, the American Medical Association and Agency for Healthcare Research Quality started task group committees to further understand burnout.¹⁴ In this study, we present resiliency as a “protective” factor against burnout in an international cohort of plastic surgery trainees.

Our survey had a burnout rate of 44.5%. The prevalence of burnout rate is concordant with those of similar studies, which range from 36% to 51% in North American plastic surgery residents and other graduates.^{7,10,15} Although the numbers are concerning, they are lower

Table 3. Factors Contributing to Physician Burnout

Burnout Factors	Clinical Documentation	Family	Chaotic Environment	Pace	Time Pressure	Other*
Yes	67	24	47	54	67	32
No	52	95	72	65	52	87

*“Other” involves those not included in the prior categories described by some of the respondents: factors such as increased administrative burden, lack of autonomy, program politics, toxic culture, lack of positive leadership, too many working hours, and so on.

Table 4. Institutional Resources for Burnout

Burnout Resources	Wellness Program	Online Wellness Program	Mental Health Professional	Protected Time	Exercise Program	Other
Yes	65	41	58	24	10	5
No	54	78	61	95	109	114

Almost half of the trainees have access to wellness programs (in-person or online), while protected time or exercise programs, are only present in a minority of programs.

when compared with those of general surgery residents (68.9%).⁹ Of note, in our study, burnout was present with some regional variations—contrary to the common belief that variations in work-culture across nations are protective against burnout. Burnout was also more prevalent in women (56.8%) versus men (34.3%), and correlated with a higher number of patients seen per week and people working in a chaotic environment. This is in line with previous studies across several subspecialties.¹⁰

Our study demonstrated that increased work hours per week was associated with an increased risk of burnout (OR = 1.03, *P* = 0.04), a finding that has been supported by other studies that also found an increased risk after working over 70 hours per week and being on call more than two nights.^{16,17}

Many training programs around the world have tried to address safe working hours with restricted hours, such as the European Working Time Directive. This article is not to debate if restricting hours is of benefit to training, but if it can assist in limiting burnout. The UK’s experience since the implementation of the European Working Time Directive in 1998 has not been highly positive, with one publication suggesting that complex rotating schedules and multiple handovers have in fact created more fatigue and more medical errors. Also, the expected improvement in work-life balance with restricted hours has not been observed.¹⁸

We sought to better characterize the impact resilience may have in preventing burnout. Resilience,

defined as the capacity to recover from or adjust easily to adversity or change, has been identified as a protective factor against stressors before. The three characteristics that all resilient individuals possess are acceptance of reality, a deep belief that life and their occupation are meaningful, and the ability to improvise. We think these are important qualities for all physicians to have.¹⁹ In 2013, Warren et al. studied over 100 trauma surgeons and showed that those with higher CD-RISC scores demonstrated decreased symptoms of post-traumatic stress disorder and secondary traumatic stress.²⁰ The mean CD-RISC 10 score for our survey respondents was slightly lower than those of trauma surgeons (30.1 versus 33.4) and the general population (30.1 versus 31.8).²⁰ Despite lower average CD-RISC scores, our study population demonstrated a significant difference between those who experienced burnout and those who did not (28.6 versus 31.3). This would suggest that amidst a population there may be distinct cutoffs in perceived resilience and protection against burnout. It is important to emphasize that the value of this score should not be used as another screening tool for residency or job applications, but rather to possibly identify individuals who are at risk of experiencing burnout.

Another protective factor seems to be the access to wellness resources. Having access is not a synonym with usage; we did not evaluate actual usage in our survey. Even though access to mental health and other services was linked to less burnout, it is very important that these services be anonymous and keep records private from their employer (unless required by law or to protect the individual or others), as physicians are concerned that seeking mental health services might have further implications in medical licensing and applying to hospital privileges or that they might be ostracized by colleagues. Furthermore, the utilization of these resources needs to be further investigated—that is, does simply offering a resource indicate physicians will actually use it? The practice of implementing wellness resources or building a culture of work-life balance is not limited to a select few countries. A positive intervention to promote a culture of wellness is illustrated by Sanford Health in Fargo, North Dakota, where physicians have access to a concierge service that helps with resources to schedule babysitting,

Table 5. Regression Analysis of Factors Associated with Burnout

Variable	Coefficient	Odds Ratio	<i>P</i>
Age	-0.061	0.94082324	0.33
CD-RISC score	-0.088	0.91576088	0.04*
Work hours	0.032	1.03251751	0.04*
Sleep	-0.025	0.97530991	0.34
Activities	-0.009	0.99104038	0.73
Number of wellness programs	-0.512	0.59929579	0.0004*

Regression assessing for collinearity analysis of burnout characteristics, demonstrating a positive correlation with the amount of work hours and negatively associated “protective” with amount of own’s institutional wellness programs and higher CD-RISC score.

*Statistically significant *P* < 0.05.

travel arrangements, and reduced gym memberships. Probably the most noteworthy of these resources would be setting the culture of not encouraging their physicians to go over 60 hours per week to avoid burnout.²¹ Measuring how these initiatives affect wellness and burnout rates before and after interventions seems to be the most logical approach to increasing job satisfaction and, potentially, physician career longevity.

As such, given burnout's pervasiveness from medical school, residency, and independent practice, interventions early in training may provide some insight as to how to ameliorate this complex multifactorial problem. Such is the case of a randomized control study on mindfulness-based-stress resilience intervention in surgery interns that consisted of 20 minutes of daily meditation complemented by a live 2-hour mindfulness-based stress resilience practice. Although limited by a small sample size (n = 21), the project was deemed feasible even amongst busy surgical interns.²²

We have examined burnout across a number of factors, including differences in perceived cultural work-life balance, institution of wellness resources, and the role resilience may have in mitigating burnout. There is one area in particular we would like to draw attention to. This is the role of setting a culture of resiliency. This is best stated by Menon et al, who comment that “a personal resilience intervention will likely be unsuccessful within an organization entrenched in an unhealthy culture and an inefficient and unsupportive work environment.”²³ Therefore, potential solutions should include input from the physicians—ie, the population that is being targeted to help. For instance, a major time-consuming element of dissatisfaction constitutes unnecessary or absurd “meaningful required electronic health records documentation.” Oftentimes, this is linked to a punitive compensation method, and physicians who do not meet a target of 95% of the required documentation are penalized with 1%–5% of their base pay. We believe actions like this are detrimental for physician morale and show disconnection from leadership and their employees. In contrast, programs such as Getting Rid of Stupid Stuff, implemented in Hawaii Pacific Health in Honolulu, queried their employees to nominate anything in the electronic health records (Table 6) that they thought was poorly designed, unnecessary, or plain stupid, leading to removal of 10 of 12 frequent “alerts” for physicians, and even an intervention for nurses, which saved on average 1700 hours of missed clicks.²⁴

Potential limitations to the wider generalizability of the results can include the risk of selection and sampling bias. A true denominator of the number of trainees across the world at a certain time is currently unknown, and therefore, a true standard response rate cannot be accurately calculated. In general, people who respond to surveys on a specific topic such as burnout usually are acquainted or would like to expand their knowledge on the subject, which renders the possibility that we are sampling a population interested in wellness and work-life balance. The nonresponder bias and lower response rate in the health-care personnel has been previously studied by Simonetti et al, who found in a veterans administration survey with a 19.2% response rate that adjusting for nonresponse rate did not affect the overall burnout estimate.²⁵ In other

Table 6. Examples of Programs That Have Been Developed to Address Physician Burnout

Initiative	Objective
European Working Time Directive	Restrict trainees working hours
American Medical Association (AMA)	Steps Forward Campaign (improving efficiency in electronic health records, team building strategies, obtaining organizational support)
Sanford Health in Fargo, North Dakota	Access to concierge services organizing childcare, limiting work hours <60 h/wk
GROSS (Getting Rid of Stupid Stuff) in Hawaii Pacific Health	Reduce the unnecessary electronic health records documentation required, and excessive alerts/clicks

words, our estimate of burnout prevalence using a survey that does not include the entire population could still be generalizable. Another potential limitation of the article is that the survey and its tools were restricted to English-speaking trainees. Some cultural and language barriers could have hindered the low response rate among trainees from China or Japan. Lastly, although we included a worldwide accessible online questionnaire, there were some countries in Africa and the Middle East where access was limited to certain websites. In those circumstances, we recommended to the trainees to use a virtual private network connection; two of the respondents were able to access it after the prior step. Unfortunately, there is a fee associated with these online services, which could potentially be another limitation to take part in surveys from regions with limited access to the internet.

CONCLUSIONS

Burnout is prevalent across plastic surgery trainees from diverse countries. In this international sample of plastic surgery trainees, resilience is associated with a lower burnout rate. Increased work hours were associated with burnout, whereas access to wellness programs and higher resilience scores were “protective.” Our data suggest that efforts to build resilience may mitigate burnout in plastic surgery trainees.

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DISCLOSURE

Rodriguez-Unda is the North American Resident ICOPLAST regional representative. All the other authors have no financial interests to declare in relation to the content of this article.

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