Survey Based Assessment of Burnout Rates Among US Plastic Surgery Residents

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Purpose: The purpose of this study was to analyze the rates of burnout and contributory factors among US plastic surgery residents.

Methods: The Maslach Burnout Inventory Human Services Survey was emailed to program coordinators of American College of Graduate Medical Education–accredited plastic surgery residencies. Scores are provided for 3 subscales: emotional exhaustion (EE), depersonalization (DP), and personal accomplishment. Normative scoring tables (low, average, high) were used for comparison. Residents were asked questions relating to their personal life (age, postgraduate year, marital status, and program characteristics).

Results: One hundred thirteen residents responded. The average age was 31.6 years (range, 25–43 years) and postgraduate year of 4.6 (range, 1–10). There were equal male and female respondents. Most were from integrated-only residencies (n = 59, 52.2%). On average, the majority reported working 50 to 80 hours per week (n = 93, 82.3%), spending the majority of time in tertiary referral centers (n = 107, 94.7%). Most received and took 3 weeks of vacation per year (n = 68, 60.7%). Furthermore, 65.5% met the definition of burnout by their scores from at least 1 subscale.

The number of hours worked per week significantly correlated with increased scores in the EE and DP subscales. Residents who worked more than 80 hours per week had significantly higher scores in the EE and DP categories. Residents who had less than 2 weeks of vacation per year trended toward experiencing more EE (EE; 46.0, $P = 0.077$). The type of program (independent vs integrated), sex, having a significant other outside of the home, kids, and local family support did not significantly affect burnout scores for any subscales.

Conclusions: Burnout exists among plastic surgery residents especially in the DP subscale. Working longer hours and less vacation correlates with increased rates of burnout among residents.

Key Words: burnout, residents, education, wellness, social, psychological, training, special topic, prevention, health care professionals, program director, ACGME

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Burnout syndrome is a complex pathologic condition that develops during prolonged periods of occupational stress.[1] Most often, burnout is characterized by cynicism, emotional fatigue, and poor efficacy triggered by professional stressors.[1,2] Dr Maslach described this phenomenon to exist in 3 dimensions: emotional exhaustion (EE), depersonalization (DP), and decreased feelings of personal accomplishment (PA).[2,3] Burnout has been associated with increasing job demands and occupational stress.[4,5] When the employee's occupational stressors exceed the ability of the worker to meet these demands, feelings of EE, DP, and lack of PA ensue.[1,6]

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One of the most studied groups has been attending physicians.[7–13] Health care professionals are especially prone to experiencing symptoms of burnout. New technologies that create need for continuous training,[14] increased demands of health care systems on workers,[11] new legislation, and organizational structures that have led to uncertainty in reimbursement as well as the increased emphasis on the patients' experience have all created new and constantly changing stressors to physicians.[15] According to a national survey of 7905 surgeons conducted by the American College of Surgeons, more than 40% of US surgeons suffer from some or all of the symptoms of burnout.[12] Strikingly, this number is even higher among US surgical trainees, which show burnout rates upwards of 70%.[14,16]

The reasons for concern relates to decreased work performance. This decline often is manifested by increased medical errors,[17] decreased effectiveness, decreased patient satisfaction, poorer patient outcomes, and potentially early retirement.[3,17] Additionally, burnout is linked to increased rates of substance abuse and depression.[18,19]

Despite the increased focus on physician wellbeing, relatively little is known about risks for burnout posed to resident physicians. To better understand the incidence and risk factors for burnout among US resident physicians, we conducted a survey-based assessment to analyze the rates of burnout and potential contributing factors among plastic surgery residents in the United States in 2018.

METHODS

This is a prospective, cross-sectional, survey-based assessment of the presence of burnout among plastic surgery residents in the United States.

Participants

All US plastic surgery residents from accredited American College of Graduate Medical Education (ACGME) programs were eligible for participation. The survey was administered via email link sent directly to program directors and coordinators. They were asked to distribute the link to their residents. Because this was not a sponsored study, the actual number of residents who received the survey was unable to be calculated. The survey remained active from January 2018 to March 2018. Only surveys with complete data were included. Participants were notified that participation was voluntary and all responses were anonymous. There was not any compensation provided for participation. The survey was hosted by www.mindgarden.com. Our institutional review board approved this study.

Survey

The previously reliable and validated Maslach Burnout Inventory Human Services Survey for Medical Personnel (MBI-HSS [MP]) was used as the assessment tool for burnout among the residents. The MBI-HSS is considered the criterion standard in assessment of burnout. The MBI-HSS (MP) is a 22-item survey assessment designed for use among professionals working with patients and is appropriate for professionals working in the medical setting.

The items of the MBI-HSS (MP) are written in the form of a statement about the personal attitudes. Respondents answer based on their feelings in 2 scopes: frequency and intensity (Fig. 1). Each question is graded on a 7-point Likert scale (range, 0–6).

Item 8: I feel burned out from my work.							
	0	1	2	3	4	5	6
How often?	Never	A few times a year or less	Once a month or less	A few times a month	Once a week	A few times a week	Every day

FIGURE 1. Example question from MBI-HSS (MP).

Scales of MBI-HSS (MP)

The MBI-HSS (MP) assesses the global term burnout by 3 scales that make up the core aspects of burnout: EE, DP, and lack of PA. Each scale is graded independently.

- Emotional exhaustion (range, 0–54) assesses respondents' feelings of being emotionally overextended and exhausted by work. Higher scores correlate with greater burnout.
- Depersonalization (range, 0–30) measures how one's response toward patients is impersonal. Higher scores correlate with a greater degree of burnout
- Personal accomplishment (range, 0–48) assesses feelings of proficiency and achievement at work. Lower scores denote higher feelings of burnout.

In addition to the MBI-HSS (MP), participants were asked a series of questions about personal demographics and program characteristics for a total of 30 question survey.

Scoring of MBI-HSS (MP)

Each respondents' survey responses provides a summative score for each of the 3 subscales previously. Importantly, there is not truly a single composite score that denotes *burnout*. Rather, the concept of burnout exists on a continuum.

However, for the purpose of analysis, in addition to the overall calculated score, previously published normative data[1] was used to determine how each resident's score compared with the general population of health care professionals. The normative data were derived from metagroups of respondent data that was divided into thirds to create groups of *low*, *moderate*, and *high* (*Maslach Burnout Inventory Manual*, *Third Edition*).[1] Although there is not a true *diagnostic* cutoff for burnout, similar to previous reports, we have chosen to designate scores in the highest tercile of EE and DP and lowest of PA to define burnout.

RESULTS

Resident Demographics and Program Characteristics

A total of 113 residents responded to the survey. There was an equal number of male and female survey respondents (Table 1). Most residents were from programs with integrated residents only (n = 59, 52.2%). Residents were from a wide range of postgraduate years (PGYs): 1 to 11, but the majority were from PGY years 5 or below (n = 77, 68.1%). The program size ranged from 2 to 30 residents. Most residents were married (n = 53, 46.9%) and worked 50 to 80 hours per week (n = 93, 82.3%). Residents were most often from university programs (n = 107, 94.7%) and rotated between 3 and 5 facilities (n = 52, 46.0%). Most residents took 3 weeks of vacation a year (n = 68, 60.7%). One third of residents reported having children (n = 32, 28.3%). The majority said that they did not have local family support (n = 74, 65.5%).

Maslach Burnout Inventory Scores by Subscale

Burnout Rates

For the purposes of our analysis in concordance with previous studies,[20] scores in the highest tercile of EE and DP and lowest of PA were chosen to define burnout. Of the residents surveyed, 41.6% (n = 47) scored in the highest tercile of EE. Fifty-four percent (n = 61) scored in the highest group of DP, and 31% (n = 35) in the lowest third of PA. Of the residents who responded, 65.5% meet the definition of burnout by their scores from at least 1 subscale. From the residents surveyed, 23.9% met burnout criterion from 1 subscale, 24.8% from 2 subscales, and 16.8% met the criterion on all 3 subscales.

Residents from programs with less than 6 residents had significantly higher rates of burnout than those from larger programs with 7 or more residents (P = 0.024). Additionally, residents in PGYs 7 to 10 had significantly lower rates of burnout than those in PGY 1 to 3 or PGY 4 to 6 (P = 0.048). There was not a significant difference in the rates of burnout based on a residents' sex, type of program, marital status, number or type of facility time spent, number of weeks' vacation, having children, or presence of local family support (Table 2).

Emotional Exhaustion

For the cohort as a whole, the score from the EE was 22.92 (range, 0–49; SD, 12.6), which falls into the moderate category. Residents who worked more than 80 hours per week reported higher levels of EE (P = 0.061). Additionally, residents who had less than 2 weeks of vacation a year had much higher levels of EE than those with more than 2 weeks (P = 0.071). The number of residents in each program influenced the level of EE with significantly higher levels in smaller programs (1–6 residents: score, 34.8; high) and lower levels in larger programs (28+ residents: score, 13.0; low, P = 0.002). There was not a difference in the level of EE based on a resident's sex, type of program (independent vs integrated vs both), relationship status, type of facility spent majority of time, number of facilities time spent, having children, PGY year, and local family support (Table 3).

DP Subscale

The overall score for the DP subscale was 10.68, which is considered high. Residents who spent the majority of their time in a county or city hospital reported significantly higher levels of DP (Table 4; 18.3, P = 0.042). Additionally, residents in their PGYs 1 to 3 and those in their PGYs 4 to 6 reported significantly higher levels of DP than those in their PGYs 7 to 10 (P = 0.012). Residents from smaller programs with 1 to 6 residents had significantly higher levels of DP compared with those in programs with 28 or more residents (P = 0.009). Of note, residents from all sexes reported high levels of DP.

PA Subscale

The overall score for the PA subscale was 37.1, which is in the moderate category. In contrast to the other subscales, higher scores denote *lower* levels of PA. Low levels of PA correlate with symptoms of burnout. Residents who worked more than 80 hours per week had a lower sense of PA than those working less than 50 hours per week

TABLE 1. Resident Demographics and Program Characteristics

Sex	
Male	60 (53.6)
Female	52 (46.4)
Type of program	
Independent	14 (12.4)
Integrated	59 (52.2)
Both	40 (35.4)
PGY year (including research and other training years)	
1–3	41 (36.3)
4–6	45 (39.8)
7–10	26 (23.0)
11+	1 (0.9)
How many residents in total are in the program	
1–6	12 (11.1)
7–13	38 (35.2)
14–20	33 (30.6)
21–27	19 (17.6)
>27	6 (5.6)
No. residents per year	
1–6	12 (11.1)
7–13	38 (35.2)
14–20	33 (30.6)
21–27	19 (17.6)
28+	6 (5.6)
Marital status	
Single	40 (35.4)
Married	53 (46.9)
Committed	19 (16.8)
Divorced/separated	1 (0.9)
How many hours worked per week	
<50	1 (0.9)
>50–80	93 (82.3)
>80–100	19 (16.8)
Type of facility where you spend time	
Community	2 (1.8)
County or city hospital	4 (3.5)
University	107 (94.7)
How many facilities?	
1–2	45 (39.5)
3–5	52 (46.0)
>5	16 (14.2)
How many weeks of vacation do you take?	
<2	2 (1.8)
2	6 (5.4)
3	68 (60.7)
4	36 (32.1)
Do you have kids?	
Yes	32 (28.3)
No	81 (71.7)
Local family support	
Yes	39 (34.5)
No	74 (65.5)

(Table 5, $P = 0.071$). Residents from programs with 6 or less residents reported significantly lower scores in the PA subscale compared with those in programs with more than 6 residents ($P = 0.024$).

DISCUSSION

Given the association with job performance and burnout, it is concerning that 65.5% of US plastic surgery residents met the criterion for burnout. Nevertheless, according to previous studies, this is within

TABLE 2. Rates of Burnout by Resident Demographics and Program Characteristics

	Burnout	*P*
Sex		0.432
Male	61.7	
Female	69.2	
Type of program		0.288
Independent	50.0	
Integrated	71.2	
Both	62.5	
Marital status		0.462
Single	70.0	
Married	62.3	
Committed	68.4	
Divorced	0.0	
Type of facility		0.306
Community	50.0	
County or city	100.0	
University	64.5	
Average no. hours worked per week		0.123
<50	100.0	
>50–80	61.3	
>80–100	84.2	
No. facilities		0.923
1–2	64.4	
3–5	67.3	
>5	62.5	
Weeks of vacation		0.632
<2	100.0	
2	50.0	
3	66.2	
4	66.7	
Having children		0.272
Yes	56.3	
No	69.1	
Presence of local family support		0.306
Yes	59.0	
No	68.9	
PGY year		0.048
1–3	70.7	
4–6	73.3	
7–10	46.2	
No. residents in program		0.024
1–6	91.7	
7–13	60.5	
14–20	72.7	
21–27	63.2	
>27	16.7	

the national average of specialty burnout ranges from 27% to 75%.[11,19–21] Plastic surgery residents fall within the higher end of this spectrum but have similar rates of burnout compared with a previous reports of residents.[20–22] According to Lebares et al,[20] in a study of 566 surgery residents, the rate of resident burnout was 69% using the same survey and definition of burnout as this present study. The presence of burnout itself is not necessarily the problem with surgical training, but it is that burnout has been well established to be associated with a decline in patient safety, increased medical errors, and physician dissatisfaction.

TABLE 3. Scores for EE Subscale

		Burnout Risk Category
Sex		
Male	21.8	Moderate
Female	23.7	Moderate
Program type		
Independent	24.9	Moderate
Integrated	23.2	Moderate
Both	21.9	Moderate
Relationship status		
Single	26.1	Moderate
Married	21.4	Moderate
Committed	21.3	Moderate
Divorced/separated	6.0	Low
Hours worked per week		
<50	26.0	Moderate
>50–80	21.6	Moderate
>80–100	29.1	High
Type of facility where you spend majority of the time		
Community	24.0	Moderate
County or city	32.3	High
University	22.6	Moderate
No. facilities where you spend time		
1–2	22.8	Moderate
3–5	23.9	Moderate
>5	20.2	Moderate
Weeks of vacation taken per year		
<2	46.0	High
2	20.5	Moderate
3	22.6	Moderate
4	22.7	Moderate
Having children		
Yes	22.3	Moderate
No	23.2	Moderate
Local family support		
Yes	20.3	Moderate
No	24.3	Moderate
PGY year		
1–3	24.8	Moderate
4–6	22.8	Moderate
7–10	21.0	Moderate
No. residents in program		
1–6	34.8	High
7–13	20.3	Moderate
14–20	23.5	Moderate
21–27	23.0	Moderate
>27	13.0	Low

TABLE 4. Resident Scores for DP Subscale

		Burnout Risk Category
Sex		
Male	10.8	High
Female	10.4	High
Program type		
Independent	9.2	Moderate
Integrated	11.1	High
Both	10.5	High
Relationship status		
Single	12.6	High
Married	10.0	High
Committed	9.0	Moderate
Divorced/separated	2.0	Low
Hours worked per week		
<50	22.0	High
>50–80	10.1	High
>80–100	12.9	High
Type of facility where you spend majority of the time		
Community	15.5	High
County or city	18.3	High
University	10.3	High
No. facilities where you spend time		
1–2	10.8	High
3–5	11.2	High
>5	8.9	Moderate
Weeks of vacation taken per year		
<2	10.5	High
2	6.0	Moderate
3	11.1	High
4	10.8	High
Having children		
Yes	9.6	Moderate
No	11.1	High
Local family support		
Yes	9.9	Moderate
No	11.1	High
PGY year		
1–3	12.9	High
4–6	10.5	High
7–10	7.9	Moderate
No. residents in program		
1–6	15.7	High
7–13	9.3	Moderate
14–20	11.6	High
21–27	10.4	High
>27	5.2	Moderate

Importantly, increased burnout has also shown to lead to resident depression and is an independent risk factor for suicidal ideation and substance abuse.[10,23] Whereas resident well-being is of utmost importance, so is patient safety. Physicians and residents who experience burnout are more likely to experience medical errors and have a lower rate of following best safety practices.[10,24] Additionally, these same clinicians are more inclined to have problems with interpersonal relationships and professionalism compared with those that do not experience burnout symptoms.[24,25]

TABLE 5. Scores for PA Subscale

		Burnout Risk Category
Sex		
Male	38.1	Moderate
Female	36.2	Moderate
Program type		
Independent	36.1	Moderate
Integrated	37.2	Moderate
Both	37.3	Moderate
Relationship status		
Single	36.7	Moderate
Married	37.6	Moderate
Committed	36.1	Moderate
Divorced/separated	43.0	High
Hours worked per week		
<50	41.0	Low
>50–80	37.8	Moderate
>80–100	33.5	High
Type of facility where you spend majority of the time		
Community	35.5	Moderate
County or city	35.5	Moderate
University	37.2	Moderate
No. facilities where you spend time		
1–2	37.5	Moderate
3–5	36.3	Moderate
>5	38.4	Moderate
Weeks of vacation taken per year		
<2	29.5	Low
2	36.2	Moderate
3	36.3	Moderate
4	39.0	Moderate
Having children		
Yes	38.2	Moderate
No	36.7	Moderate
Local family support		
Yes	39.2	Moderate
No	36.0	Moderate
PGY year		
1–3	37.5	Moderate
4–6	36.4	Moderate
7–10	37.2	Moderate
No. residents in program		
1–6	30.4	High
7–13	37.6	Moderate
14–20	38.6	Moderate
21–27	37.0	Moderate
>27	40.0	Low

Evidence also shows that surgical residents have lower levels of well-being compared with their age-matched peers in other professions and may contribute to having a lower quality of life, higher levels of depression, and exhaustion.[26] Because residents spend a substantial amount of their time caring for patients and play an integral role in the patients' experience at academic institutions, their well-being and quality of care will remarkably influence patient outcomes. Therefore, ensuring their health and well-being should be a priority.

Unique to resident physicians is the influence of program characteristics that may change their feelings of EE, DP, and PA. In all 3 subscales, residents from smaller programs (1–6 residents) had higher burnout compared with programs with 7 or more residents. This was interesting, as at first thought it might seem that larger programs may allow some residents to get lost in the shuffle of so many or to feel as though they are doing fewer operations and more clerical work (ie, consults, writing notes, changing dressings, clinic). Nevertheless, the programs with fewer residents had significantly higher levels of EE and DP with lower levels of PA. Likely in smaller programs, residents often find themselves feeling exhausted from the sheer amount of work to be done, detached from their patients, irritable, and professionally inefficient as the amount of work and demands of their job may exceed their ability to complete tasks timely. Given that we only performed a univariate analysis, we cannot elucidate whether smaller programs also led to more work hours and potentially higher rates of burnout from hours worked. However, in many previous reports, the number of hours worked itself was not necessarily the only factor that led to burnout.[22] A combination of risk factors was required including feeling detached from program decisions, not reciprocal relationships with hospital employees, and stressful life events led to burnout.[14–16,27–29]

Perhaps not as surprising is that lower level residents PGY years 1 to 3 had significantly higher levels of burnout and had the highest DP scores (PGY 1–3, 12.9). In most programs, as the levels of training progress, the amount of overnight call, clerical work, and time outside of the operating room often decreases. This is likely related to the declining amount of DP felt by the more senior residents, as DP is influenced by the amount of cynicism and detachment from the job at hand. Additionally, as time progresses, the residents' ability to cope with their stressors may also improve. The majority of residents reported working 50 to 80 hours per week (82.3%). Those that worked more than 80 hours certainly had higher rates of burnout and DP. However, work hour reform alone has not been shown to decrease resident physician burnout because the majority of our study participants still reported being emotionally exhausted.[22] In a study of 665 general surgery residents by Elmore et al,[2] 69% of general surgery residents met the criterion for burnout, and similar to our study, the majority fell within the ACGME 80-hour work week. Our study and that of others have shown that resident burnout is prevalent despite the ACGME-mandated work hour restrictions so that methods to decrease burnout should go beyond work hour restrictions.

Importantly, we did not find any association between burnout and age, sex, marital status, having kids, or having local family support. This is in contrast to some studies that have shown that female sex is associated with higher rates of physician burnout and depression,[10] whereas others did not show a sex distinction.[30] The lack of definable differences suggests that the occupational stress experienced by resident physicians may largely be related to the large demands created by surgical residency and may be a transient reality while in training. Throughout the generations, the demographics of surgical residencies has changed. The results of our study emphasize that actual resident demographics do not necessarily influence their ability to cope with the stressors of surgery residency and may not influence their feelings of burnout as much as individual program characteristics. This finding is in concordance with other reports of resident physicians where demographics themselves do not necessarily portend higher rates of burnout.[31]

The limitations of our study are largely related to the response rate. Because this was not a sponsored study, we cannot guarantee that our survey was disseminated to all the plastic surgery residents in all programs, so we are unable to calculate an accurate response rate. There are estimated to be 1100 US plastic surgery residents, so assuming that we were able to reach them all, our response rate would be approximately 10%. We did not offer any incentive to participate and were not able to guarantee that all residents even received the survey.

The strengths of our study include using a previously reliable and validated survey, the MBI-HSS, which has been previously shown to be the correct form for health care workers. We also created a clear definition of burnout in accordance with previous reports, which allowed us to establish a cutoff and analyze variables associated with burnout among residents. Additionally, our survey asked a variety of other questions about the programs itself, which allowed us to show that program characteristics have a large impact on physician burnout not just social factors as has been previously postulated.

CONCLUSIONS

Symptoms of burnout are prevalent among plastic surgery residents especially in the DP subscale. Working longer hours and less vacation correlates with increased rates of burnout among residents. Additionally, smaller programs are at increased risk for resident burnout. Tactics to combat burnout should focus on resilience and mindfulness.

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