Traumatized Residents — It's Not Surgery. It's Medicine

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BACKGROUND: Post-traumatic stress disorder (PTSD) has been shown to be more common in surgical residents than the general population. This may be due to the rigors of a surgical residency. This study aims to compare the prevalence of screening positive for PTSD (PTSD+) among 7 medical specialties. Further, we intend to identify independent risk factors for the development of PTSD.

METHODS: A cross-sectional national survey of residents ($n = 1904$) was conducted from September 2016 to May 2017. Residents were screened for PTSD. Traumatic stressors were identified in those who reported symptoms of PTSD. Potential risk factors for PTSD were assessed using multivariate regression analysis with stepwise backward elimination against 30 demographic, occupational, psychological, work-life balance, and work-environment variables.

RESULTS: Residents from anesthesiology ($n = 180$), emergency medicine ($n = 222$), internal medicine ($n = 473$), general surgery ($n = 464$), obstetrics and gynecology ($n = 226$), psychiatry ($n = 208$), and surgical subspecialties ($n = 131$) were surveyed. No statistical difference was found in the prevalence of PTSD between specialties. Prevalence ranged from 14% to 23%. Eight independent risk factors for the development of PTSD+ were identified: higher postgraduate year, female gender, public embarrassment, emotional exhaustion, feeling unhealthy, job dissatisfaction, hostile hospital culture, and unsafe patient load.

CONCLUSIONS: The prevalence of PTSD in surgery residents was not statistically different when compared to those in other medical specialties. However, the overall prevalence of PTSD (20%) remains more than 3 times that of the general population. Overall, 8 risk factors for PTSD were identified. These risk factors varied by specialty. This may highlight the unique challenges of training in each discipline. Specialty specific interventions to improve resident wellness should be emphasized in the development of our young physicians. (J Surg Ed 76: e30−e40. © 2019 Association of Program Directors in Surgery. Published by Elsevier Inc. All rights reserved.)

KEY WORDS: Posttraumatic stress disorder, Physician burnout, Residents, Trauma, PTSD, Wellness

COMPETENCIES: Patient Care, Professionalism, Interpersonal and Communication Skills

INTRODUCTION

Surgery has been reputed as the most arduous educational process in medicine.[1] The transformation of a medical student into a surgeon is a slow process marked by small steps forward in dexterity, judgement, and confidence.[2] Long days and nights are spent caring for high acuity patients while learning how and when to operate. Intense, life-saving care delivered by surgeons leads to repeated exposure to life changing events.[3]

Given the long hours and work-related stressors, it may be no surprise that the prevalence of post-traumatic stress disorder (PTSD) is 3 times that of the general population.[4,5] PTSD is a stress-related disorder characterized by the re-experiencing of a traumatic event causing distress and functional impairment.[6] The inciting traumatic event involves direct or indirect exposure to serious injury or death. Symptoms include increased arousal, hypervigilance, nightmares, and avoidance.[6]

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Aside from the individual ramifications due to the development of PTSD, psychological distress among surgeons exerts negative effects on patient care, and an association between PTSD and physician burnout (PBO) has been described.[4,5] Similar to PTSD, PBO is a stress-based syndrome. Originally defined by Dr Christina Maslach, it consists of 3 core components: overwhelming emotional exhaustion, feelings of depersonalization, and a sense of ineffectiveness or lack of accomplishment.[7,8] More than 45% of physicians experience at least 1 symptom of PBO.[9] Burnout can lead to reduced patient satisfaction, increased medical errors, physician turnover, and a higher prevalence of alcohol abuse, drug addiction, and physician suicide.[10-12]

While it has been reported that PTSD occurs at an increased rate among surgical residents,[4] few studies have delineated its prevalence in other specialties. Work-related stressors exist among all medical specialties, but the degree to which these stressors exist may be limited as compared to the physical and mental challenges of the surgeon. This study aims to compare the prevalence of screening positive for PTSD (PTSD+) among 7 medical specialties. Furthermore, we intend to identify risk factors for the development of PTSD. We hypothesize that surgery residents will have a higher prevalence of PTSD when compared to other disciplines in medicine.

MATERIAL AND METHODS

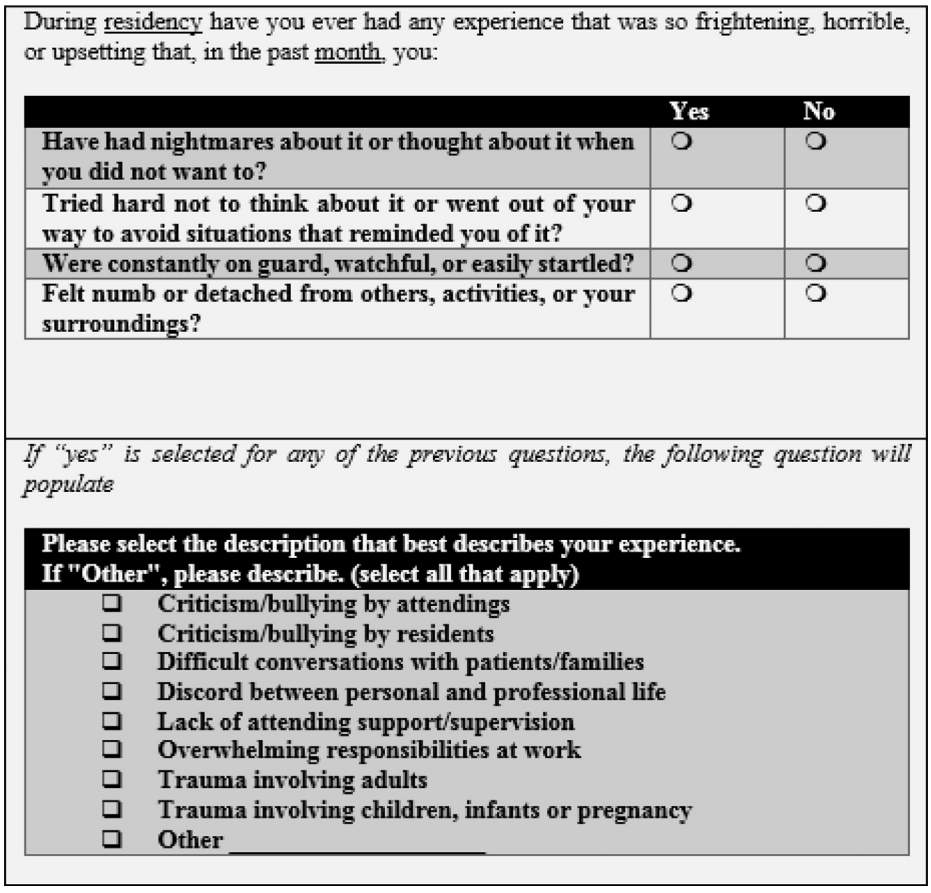
Following Institutional Review Board approval, a cross-sectional national survey of residents was conducted from September 2016 to May 2017. A database of resident emails was manually created using the American Medical Association's FREIDA Online Database. The survey was distributed to residents with an embedded link. Specialties represented in the cohort included anesthesiology, emergency medicine, general surgery, internal medicine, obstetrics and gynecology, psychiatry, and surgical subspecialties. Surgical subspecialties were comprised of residents in cardiothoracic surgery, neurological surgery, ophthalmology, orthopedic surgery, otolaryngology, plastic surgery, urology, and vascular surgery. Three additional reminder emails were sent to improve participation. Opening the survey link was considered a received invitation. Recipient participation was voluntary and anonymous. The survey included questions related to demographic and occupational characteristics, work-life balance, work-environment, career satisfaction, and psychological factors such as screening for PTSD and PBO.

Age, gender, ethnicity, and geographic location made up the demographic variables collected. Occupational characteristics included specialty, postgraduate year (PGY), residency program size, type of institution (community vs university), and average hours worked per week. Psychological variables were assessed to include frequency of public embarrassment, screening for PTSD, and screening for 2 of the 3 components of PBO (emotional exhaustion and depersonalization). Work-life balance questions pertained to time for family and friends, time for extracurricular activities, feeling well-rested, and overall feeling healthy. Work-environment variables characterized satisfaction with autonomy, residency support, camaraderie, patient diversity, hospital culture, graduated responsibility, safe patient load, educational didactics, salary, ownership, time to study, and frequency of violating duty hours. Career satisfaction was delineated by overall job satisfaction and happiness with career choice.

A Likert-type scale was used for all questions pertaining to public embarrassment, work-life balance, work-environment, and career happiness. Frequency of public embarrassment options included "never," "once," "occasionally," "frequently," and "always". "Frequently" and "always" responses were categorized as frequent public embarrassment. Response options for wellness questions included "never," "a few times a year," "once a month or less," "once a week," "a few times a week," and "every day." A response of "never," "a few times a year" or "once a month or less" was considered unhealthy. Work-environment question responses included "agree," "somewhat agree," "neutral," "somewhat disagree," and "disagree." A response of "somewhat disagree" and disagree" were grouped as dissatisfied. Lastly, career satisfaction responses were comprised of "yes," "probably yes," "neutral," "probably not," and "no". A response of "probably not" and "no" was categorized as unhappy with one's career choice. The validated abridged Job in General scale was used to screen for job satisfaction. Respondents were grouped into less satisfied and more satisfied using the median split.

A screen for PTSD was performed using the Primary Care PTSD Screen (PC-PTSD) (Fig. 1), which was chosen for to its brevity and equivalence when compared to longer screening tests.[13,14] An established optimal cutoff score of 3 has a sensitivity and specificity of 100% and 87% for men and 83% and 83% for women, respectively.[15] Thus, respondents who answered "yes" to 3 or more questions were classified as screening positive for PTSD (PTSD+), while those who answered "yes" to 1 or 2 questions were considered "at risk." Even though the PC-PTSD screen is considered the optimal screening tool for PTSD, the diagnostic accuracy is limited to 65% for those who screen positive.[16]

Establishing PTSD as a diagnosis requires a clinician to identify both a traumatic stressor and confirm resulting sequela.[6] Thus, respondents who answered "yes" to any of the PC-PTSD questions were further prompted to choose the type of traumatic stressor experienced (Fig. 1). On statistical analysis these traumatic stressors were regrouped for simplicity into bullying, care for the critical, overwhelming work responsibilities, work-life discord, poor patient outcomes, and lack of support. A free text


During residency have you ever had any experience that was so frightening, horrible, or upsetting that, in the past month, you:

	Yes	No
Have had nightmares about it or thought about it when you did not want to?	❍	❍
Tried hard not to think about it or went out of your way to avoid situations that reminded you of it?	❍	❍
Were constantly on guard, watchful, or easily startled?	❍	❍
Felt numb or detached from others, activities, or your surroundings?	❍	❍

If "yes" is selected for any of the previous questions, the following question will populate

Please select the description that best describes your experience. If "Other", please describe. (select all that apply)

- ❑ Criticism/bullying by attendings
- ❑ Criticism/bullying by residents
- ❑ Difficult conversations with patients/families
- ❑ Discord between personal and professional life
- ❑ Lack of attending support/supervision
- ❑ Overwhelming responsibilities at work
- ❑ Trauma involving adults
- ❑ Trauma involving children, infants or pregnancy
- ❑ Other _____

FIGURE 1. PC-PTSD screen and traumatic stressor survey questions. Each respondent was asked the 4-question PC-PTSD screening tool. Three or more "yes" responses to the PC-PTSD were considered a positive screen for PTSD. One or 2 "yes" responses to the PC-PTSD screen were considered "at risk" for PTSD. A "yes" response to any question populated an additional question to categorize the type of traumatic stressor experienced.

"other" option was provided for stressors that did not fit any prepopulated category.

Screening for PBO was performed using a validated tool adapted from the Maslach Burnout Inventory.[17] Questions pertained to the emotional exhaustion and depersonalization subcomponents. Similar to other large scale national studies, responses were categorized as low-, moderate-, and high risk. Those grouped as high risk for either subcomponent or both were classified as high risk for Burnout Overall.[9,18] In contrast to PTSD, a diagnosis of PBO does not require a clinician.[18]

Data analysis was performed using IBM SPSS Statistics for Windows, version 23 (IBM Corp., Armonk, NY). A chi-squared or Fisher's exact test for large or small sample sizes, respectively, was performed for ordinal variables to assess variance in demographic and occupational characteristics, prevalence of screening positive for PTSD, and prevalence of PBO. Hypothesis tests were 2-sided, and a p value of less than 0.05 was considered statistically significant. All variables were considered for multivariate analysis aside from geographic location. A univariate analysis was performed to assess potential modifiable and nonmodifiable risk factors associated with screening positive for PTSD. Factors with $p \leq 0.1$ were used in a multivariate binary logistic regression model with backward elimination. A $p < 0.05$ was considered significant. Odds ratio with 95% confidence intervals were reported.

RESULTS

From September 2016 to May 2017, the survey was sent to 11,860 US medical residents. A total of 1904 respondents completed the survey (16%). Specialties represented in the cohort include: anesthesiology ($n = 180$), emergency medicine ($n = 222$), general surgery ($n = 464$), internal medicine ($n = 473$), obstetrics and gynecology ($n = 226$), psychiatry ($n = 208$), and surgical subspecialties ($n = 131$). Expected variations in demographic and occupational variables were demonstrated between specialties (Table 1).

Overall, 20% ($n = 373$) of respondents screened PTSD+ and an additional 30% ($n = 573$) were found to be "at risk" for PTSD. The prevalence of PTSD varied between specialties, ranging from 14% among emergency medicine

TABLE 1. Comparison of Demographic and Occupational Variables Between Medical Specialties

	Anesthesiology (*n* = 180)	Emergency Medicine (*n* = 222)	General Surgery (*n* = 464)	Internal Medicine (*n* = 473)	Obstetrics and Gynecology (*n* = 226)	Psychiatry (*n* = 208)	Surgical Subspecialties (*n* = 131)	p Value
Gender, *n* (%)								
Female	72 (41%)	94 (43%)	219 (48%)	257 (55%)	191 (86%)	121 (59%)	67 (52%)	<0.001
Male	103 (59%)	126 (57%)	236 (52%)	211 (45%)	32 (14%)	83 (41%)	62 (48%)	
Age, *n* (%)								
18-29	81 (46%)	103 (46%)	198 (43%)	236 (50%)	120 (53%)	76 (37%)	59 (45%)	0.002
30-39	83 (47%)	99 (45%)	233 (50%)	188 (40%)	91 (40%)	99 (48%)	58 (44%)	
40+	13 (7%)	20 (9%)	33 (7%)	48 (10%)	15 (7%)	33 (16%)	14 (11%)	
Ethnicity, *n* (%)								
Arabic/Indian/ Middle East	13 (7%)	6 (3%)	35 (8%)	49 (10%)	7 (3%)	21 (10%)	9 (10%)	<0.001
Asian	27 (15%)	20 (9%)	57 (12%)	116 (25%)	25 (11%)	31 (15%)	19 (15%)	
Black	13 (%)	6 (5%)	16 (3%)	22 (5%)	15 (7%)	16 (8%)	3 (2%)	
Hispanic	6 (3%)	10 (5%)	22 (5%)	22 (5%)	13 (6%)	13 (6%)	7 (5%)	
White	121 (67%)	180 (81%)	334 (72%)	264 (56%)	165 (73%)	126 (61%)	93 (71%)	
Geographic location, *n* (%)								
Midwest	52 (29%)	88 (40%)	132 (29%)	178 (38%)	92 (41%)	67 (32%)	45 (35%)	<0.001
New England	55 (31%)	48 (22%)	136 (29%)	117 (25%)	47 (21%)	60 (29%)	47 (36%)	
South	45 (25%)	48 (22%)	137 (30%)	110 (23%)	46 (21%)	51 (25%)	33 (25%)	
West	26 (15%)	37 (17%)	57 (12%)	66 (14%)	39 (17%)	30 (14%)	5 (4$)	
PGY, *n* (%)								
PGY 1	37 (21%)	101 (45%)	107 (23%)	206 (44%)	62 (27%)	71 (34%)	27 (21%)	<0.001
PGY 2	60 (33%)	62 (32%)	97 (21%)	153 (32%)	71 (31%)	53 (25%)	30 (23%)	
PGY 3	47 (26%)	46 (22%)	94 (20%)	103 (22%)	58 (26%)	57 (27%)	22 (17%)	
PGY 4	34 (19%)	14 (6%)	71 (15%)	8 (2%)	34 (15%)	28 (13%)	28 (22%)	
PGY 5+	2 (1%)	0 (0%)	98 (21%)	3 (1%)	1 (0%)	0 (0%)	23 (18%)	
Residency size, *n* (%)								
1-5 residents/year	10 (6%)	6 (3%)	202 (43%)	14 (3%)	118 (52%)	29 (14%)	106 (81%)	<0.001
6-10 residents/year	30 (17%)	69 (31%)	214 (46%)	77 (16%)	79 (35%)	111 (53%)	15 (12%)	
11-20 residents/ year	90 (50%)	130 (59%)	28 (6%)	160 (34%)	23 (10%)	57 (27%)	8 (6%)	
21+ residents/year	50 (28%)	17 (8%)	23 (5%)	222 (47%)	5 (2%)	12 (6%)	2 (2%)	
Type of institution, *n* (%)								
Community	7 (4%)	70 (31%)	140 (30%)	227 (48%)	96 (43%)	35 (17%)	5 (4%)	<0.001
University	173 (96%)	153 (69%)	325 (70%)	246 (52%)	129 (57%)	173 (83%)	126 (96%)	
Average hours work per week, *n* (%)								
<60 h	55 (32%)	107 (53%)	6 (2%)	67 (15%)	8 (4%)	134 (68%)	7 (6%)	<0.001
61-70 h	83 (49%)	79 (39%)	25 (6%)	177 (40%)	58 (27%)	47 (24%)	25 (22%)	
71-80 h	30 (18%)	11 (5%)	251 (61%)	168 (38%)	124 (58%)	14 (7%)	56 (49%)	
>80 h	2 (1%)	7 (3%)	131 (32%)	27 (6%)	24 (11%)	3 (2%)	27 (24%)	

residents to 23% in obstetrics and gynecology residents, but this was not statistically significant (p = 0.271) (Table 2).

Traumatic stressors were compared between specialties. In general, there were similar trends between specialties. The most common traumatic stressor was bullying by attendings, residents, or hospital staff (25%). It was reported as the most frequent traumatic stressor by all specialties excluding anesthesia where overwhelming work responsibilities was more prevalent.

Similar to PTSD+, the overall prevalence of Burnout did not vary between specialties (Table 3). However, when examining each subcomponent individually there was a statistical difference in screening high risk for depersonalization (p = 0.03). Psychiatry residents had the lowest rates of depersonalization (24%) whereas Ob-Gyn and surgical subspecialty residents had the highest rates (30%).

The univariate and multivariate analysis of potential modifiable and nonmodifiable risk factors for PTSD+ among all specialties are demonstrated in Table 4. Of the surveyed demographic and occupational characteristics, female gender (p = 0.002), age over 30 years old (p = 0.023), postgraduate year 2 or more ($p \leq 0.001$), and working more than 70 hours on average per week ($p \leq 0.001$) were significant. All psychological, work-life balance, work-environment, and career satisfaction variables were found to be significant ($p < 0.05$). With multivariate analysis, 8 significant variables remained: postgraduate year 2 or more, female gender, frequent public embarrassment, emotional exhaustion, feeling unhealthy, hostile hospital culture, unsafe patient load, and overall job dissatisfaction (Table 4).

Univariate and multivariate analyses were performed on each specialty individually. The multivariate analysis of potential modifiable and nonmodifiable independent risk factors for screening PTSD+ is demonstrated in Table 5. Significant variations exist between specialties. Emotional exhaustion and feeling unhealthy were the 2 variables that overlapped most frequently. Eight risk factors were identified for internal medicine residents whereas emotional exhaustion was the only risk factor noted for psychiatry residents.

DISCUSSION

Work-related stressors exist among all medical specialties, but the type and degree to which these stressors impact a resident vary between fields. While surgical training is historically thought by many as the most arduous educational process in medicine, our data demonstrate that each medical specialty brings forth its own physical and psychological challenges.[1]

Our study found similar rates of PTSD and PBO between each of the 7 medical specialties surveyed. Overall, 20% ($n = 373$) of respondents screened PTSD+.

TABLE 2. Comparison of Screening Positive for PTSD Between Medical Specialties

	Anesthesiology ($n = 180$)	Emergency Medicine ($n = 222$)	General Surgery ($n = 464$)	Internal Medicine ($n = 473$)	Obstetrics and Gynecology ($n = 226$)	Psychiatry ($n = 208$)	Surgical Subspecialties ($n = 131$)	p Value
PTSD, *n* (%)								
PTSD+	35 (20%)	31 (14%)	100 (22%)	92 (20%)	52 (23%)	38 (18%)	25 (20%)	0.271
PTSD−	141 (80%)	188 (86%)	355 (78%)	374 (80%)	173 (77%)	170 (82%)	101 (80%)	
At risk for PTSD, *n* (%)								
PTSD+	88 (50%)	113 (52%)	238 (52%)	230 (49%)	123 (55%)	90 (43%)	64 (51%)	0.332
PTSD−	88 (50%)	106 (48%)	217 (48%)	236 (51%)	102 (45%)	118 (57%)	62 (49%)	

PTSD = post-traumatic stress disorder, PTSD+ = positive post-traumatic stress disorder screen; PTSD− = Negative post-traumatic stress disorder screen.

TABLE 3. Comparison of Screening High Risk for Physician Burnout Between Medical Specialties

	Anesthesiology (*n* = 180)	Emergency Medicine (n=222)	General Surgery (n=464)	Internal Medicine (n=473)	Obstetrics & Gynecology (n=226)	Psychiatry (n=208)	Surgical Subspecialties (n=131)	p Value
Emotional exhaustion, *n* (%)								
Low risk	67 (39%)	87 (40%)	165 (37%)	148 (32%)	60 (27%)	79 (38%)	43 (35%)	0.141
Mod risk	67 (39%)	82 (38%)	181 (40%)	196 (42%)	108 (48%)	75 (36%)	57 (46%)	
High risk	40 (23%)	49 (23%)	105 (23%)	119 (26%)	56 (25%)	53 (26%)	23 (19%)	
Depersonalization, *n* (%)								
Low risk	73 (42%)	65 (30%)	159 (35%)	174 (38%)	62 (28%)	93 (45%)	41 (33%)	0.030
Mod risk	55 (32%)	92 (42%)	168 (37%)	160 (35%)	95 (43%)	64 (31%)	45 (37%)	
High risk	46 (26%)	61 (28%)	124 (28%)	130 (28%)	66 (30%)	50 (24%)	37 (30%)	
Burnout overall, *n* (%)								
Low risk	51 (29%)	49 (23%)	107 (24%)	108 (24%)	37 (17%)	59 (29%)	28 (23%)	0.348
Mod risk	65 (37%)	95 (44%)	186 (41%)	193 (42%)	107 (48%)	80 (39%)	52 (42%)	
High risk	58 (33%)	74 (34%)	158 (35%)	162 (35%)	80 (36%)	68 (33%)	43 (35%)	

Prevalence ranged from 14% among emergency medicine residents to 23% in Ob-Gyn residents. Given the 65% diagnostic accuracy of the PC-PTSD screening tool, the predicted overall prevalence rate of 13% remains more than 3 times that of the general population (13% vs 3.5%).[16,19] Similar to PTSD+, there was no statistical difference in the prevalence of PBO between medical specialties for Burnout Overall with 34% screening high-risk. It is important to note on multivariate analysis of risk factors for PTSD+, an association between PTSD and the emotional exhaustion subcomponent of PBO was noted.

Occupational stress among emergency service personnel leading to elevated prevalence of PTSD is not a new concept. Studies have demonstrated increased prevalence of PTSD as compared to the general population among firefighters, emergency workers, and policemen.[20,21] Rescue workers in an oil rig disaster demonstrated rates of PTSD of 24%.[22] Wagner et al. found PTSD symptoms among 18% of professional firefighters,[21] and reported rates of PTSD among police officers range from 7% to 19%.[23] Exposure to events outside the range of usual human experience is part of the job description for these professions, as well as physicians. It seems the psychological consequences of these fields are inherent to the work. Thus, the question at hand is what is an acceptable rate of PTSD for physicians and physicians in training?

Residents who responded "yes" to 1 or more of the PC-PTSD screening questions were asked to characterize their traumatic stressors. Bullying by attendings, residents, and other hospital staff was the most commonly reported traumatic stressor in each medical specialty aside from anesthesia where overwhelming work responsibilities were more prevalent (Fig. 2). Perhaps this can be attributed to the daily schedule of anesthesia residents where learning takes place predominantly in the operating theater with reduced emphasis on team rounding.

It is not surprising that bullying was listed as the most common stressor among residents. Bullying has been described in the literature on medical education and has been particularly salient in surgery due to the hierarchical nature of the field.[24-26] It has been reported that approximately 50% of medical residents experience bullying, mostly from attendings and nurses. This may come in the form of belittling, unjustified criticism, or attempts to humiliate.[27] Bullying may be particularly traumatic to internal medicine and Ob-Gyn residents given our findings that frequent public embarrassment was a risk factor for the development of PTSD+ (OR 5.6 and 2.8, respectively).

In contrast to other specialties, anesthesia residents reported overwhelming work responsibilities as the most common traumatic stressor, and among the surveyed variables, an unsafe patient load was found to be the primary risk factor for PTSD+. The daily stressors of

TABLE 4. Univariate and Multivariate Analysis of Potential Risk Factors for Screening PTSD Positive Between All Medical Specialties

Variables	Univariate analysis			Multivariate analysis		
	p Value	OR	CI 95%	p Value	OR	CI 95%
Demographic						
Postgraduate year 2+	<0.001	1.6	1.3-2.1	<0.001	1.9	1.3-2.5
Female gender	0.002	1.5	1.2-1.8	0.004	1.5	1.1-2.0
Age > 30 y old	0.023	1.3	1.0-1.6			
Psychological						
Frequent public embarrassment	<0.001	7.8	5.1-11.8	<0.001	2.8	1.6-4.7
Emotional exhaustion	<0.001	4.5	3.5-5.7	<0.001	2.0	1.5-2.8
Depersonalization	<0.001	3.5	2.8-4.5			
Work-life Balance						
Feeling unhealthy	<0.001	3.5	2.7-4.5	<0.001	2.0	1.5-2.7
Feeling tired	<0.001	3.2	2.5-4.1			
Insufficient time with family/friends	<0.001	2.1	1.7-2.7			
Insufficient time for extracurriculars	<0.001	2.0	1.5-2.5			
Work-environment						
Residency support	<0.001	4.3	2.6-7.0			
Hostile hospital culture	<0.001	4.0	3.0-5.3	0.001	1.8	1.3-2.6
Unsafe patient load	<0.001	4.0	2.9-5.4	0.002	1.8	1.2-2.5
Lack of patient ownership	<0.001	3.3	1.9-5.7			
Graduated Responsibility	<0.001	3.1	1.7-5.5			
Camaraderie	<0.001	3.0	2.1-4.2			
Lack of autonomy	<0.001	2.8	1.6-4.8			
Frequent duty hour violations	<0.001	2.7	2.0-3.5			
Limited time to study	<0.001	2.7	2.1-3.5			
Poor educational didactics	<0.001	2.7	2.1-3.5			
Insufficient salary	<0.001	1.8	1.4-2.3			
>70 h of work per week	<0.001	1.6	1.3-2.1			
Patient diversity	0.034	1.6	1.0-2.6			
Career satisfaction						
Job dissatisfaction	<0.001	3.9	3.1-5.1	0.001	1.7	1.3-2.3
Unhappy with career choice	<0.001	3.0	2.3-4.0			

PTSD, post-traumatic stress disorder.

a specialty different from one's own can be ambiguous. But from the perspective of the anesthesiologist, the field of anesthesia is unpredictable. Days are filled with intense demands, limited control, and situations with the potential for morbidity and mortality.[28,29]

Similarly, psychiatry may not initially be thought of as an intense or high-stress field, but psychiatry residents are faced with the unique stressors of personal threats by violent patients and patient suicide.[30,31] Younger psychiatrists are often affected by patient suicide more than older more experienced colleagues.[30] Thus, it may be no surprise that emotional exhaustion was the only risk factor for PTSD+ among psychiatry residents. This is consistent with other findings of elevated rates of emotional exhaustion among psychiatry trainees as compared with other specialties.[31]

From the perspective of specialty recruitment, this study should provide some degree of comfort to medical trainees as they embark on the residency match process. It appears one specialty does not carry a higher degree of psychological stress as compared to other medical specialties. Rather, different fields invoke different types and degrees of occupational stress. Finding a field that provides a level of personal achievement and stimulation is an essential component to career longevity and PBO prophylaxis. Aside from variations in the specialty-specific daily experience, aberrations in residency training expectations may explain differences in PTSD risk factors. The literature has demonstrated an increased prevalence of harassment towards medical students on surgical and Ob-Gyn rotations.[32] Further, medical student career expectations have shifted with an increased focus on work-life balance compared with previous generations, and many enter the fields of primary care with this point of view.[33,34] Internal medicine residents may have chosen their field in part to avoid cultural hostility and poor lifestyle.[32,33,35] As such, training programs requiring more than 70 hours of work per week or hospital cultures that spur frequent public embarrassment may be particularly impactful in terms of mental health for internal medicine residents.

Another possible explanation regarding deviations in specialty-specific risk factors is some specialties may not encounter the risk factors analyzed. For example, a

TABLE 5. Multivariate Analysis of Potential Risk Factors for Screening PTSD Positive Between All and Individual Medical Specialties

Variables	All Specialties OR (CI 95%)	Anesthesia OR (CI 95%)	Emergency Medicine OR (CI 95%)	General Surgery OR (CI 95%)	Internal Medicine OR (CI 95%)	Obstetrics and Gynecology OR (CI 95%)	Psychiatry OR (CI 95%)	Surgical Subspecialties OR (CI 95%)
Postgraduate year 2+	1.9 (1.3-2.5)				1.9 (1.0-3.6)			
Female gender	1.5 (1.1-2.0)							
Age > 30 y old					2.1 (1.1-3.9)			
Public embarrassment	2.8 (1.6-4.7)				6.5 (1.8-24.4)	3.7 (1.2-11.4)		
Emotional exhaustion	2.0 (1.5-2.8)			2.4 (1.3-4.5)	2.5 (1.3-4.8)		3.5 (1.6-7.8)	
Depersonalization			3.9 (1.6-9.4)					
Feeling unhealthy	2.0 (1.5-2.7)		3.4 (1.3-9.0)	2.7 (1.3-5.5)	2.4 (1.2-4.6)			
Feeling tired						4.2 (1.7-10.4)		
Hostile hospital culture	1.8 (1.3-2.6)			3.4 (1.7-7.0)				
Unsafe patient load	1.8 (1.2-2.5)	6.1 (1.2-32.1)						
Lack of autonomy						15.1 (2.1-107)		
Limited time to study				2.1 (1.0-4.4)				3.4 (1.1-10.7)
Poor didactics								6.3 (1.9-21.1)
>70 h of work per week					2.3 (1.2-4.3)			
Patient diversity						5.8 (1.4-24.3)		
Fellowship interest						2.3 (1.1-5.0)		
Job dissatisfaction	1.7 (1.3-2.3)	3.5 (1.3-9.2)			4.1 (2.0-8.5)			
Unhappy with career					2.1 (1.0-4.3)			

PTSD, post-traumatic stress disorder.

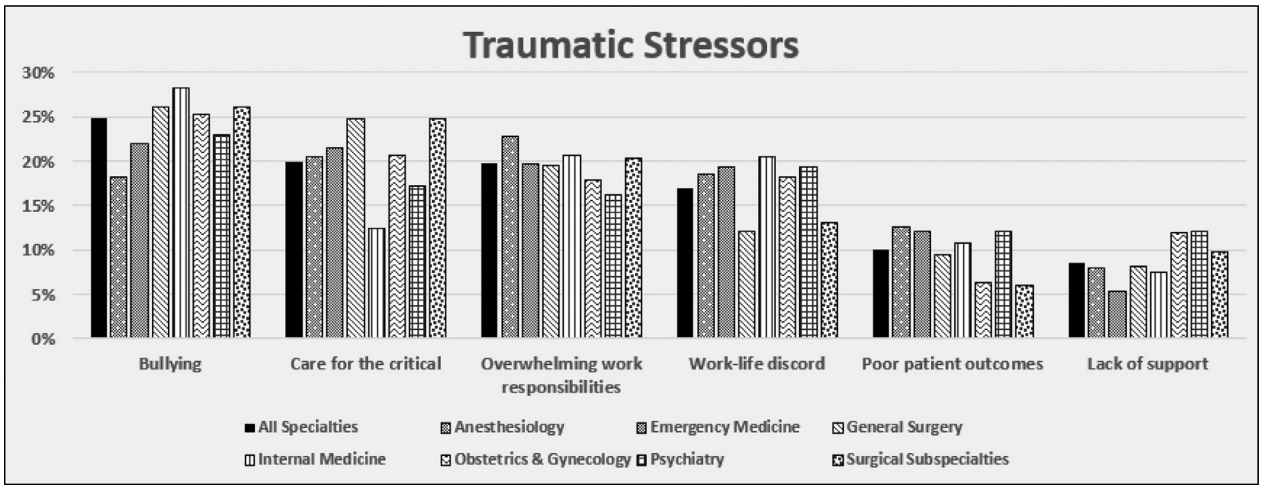


FIGURE 2. Reported traumatic stressors by specialty. Respondents who answered "yes" to 1 or more of the PC-PTSD screening questions were further queried to delineate the most common types of traumatic stressors experienced. The most common traumatic stressor overall was bullying by attendings, residents, or hospital staff (25%). This was true for all specialties excluding anesthesia where overwhelming work responsibilities was more prevalent.

psychiatry resident may not exceed 70 hours per week on a frequent enough basis to qualify as an occupational stressor. Table 1 demonstrates this point best where 92% of psychiatry residents report working less than 70 hours per week in contrast to only 8% of general surgery residents. Occupational stressors go hand in hand with the healthcare industry.[10,29,30] The healthcare environment often integrates high-stress and high-stakes situations. For a surgical resident these high-stakes situations may involve a gunshot victim. Whereas an internal medicine resident may relate more commonly to an end-of-life discussion with the family of an elderly septic patient. Understanding, respecting, and empathizing with each of our colleagues and the specific nuances of their careers is fundamental in creating a successful and supportive hospital culture.[36,37]

Historically, healthcare has focused on the rights of the patient,[38] but what about the rights of the physician? Physicians deserve respect, understanding, compassion, support, and transparency just as the patient does.[39] Now more than a decade after the Triple Aim initiative was conceptualized, many have argued that the healthcare provider was a forgotten variable in the healthcare equation.[38,40] Physician wellness or rather unwellness is a patient care issue. Burned out physicians have higher rates of depression, alcohol/illicit drug abuse, and suicide.[4,5] Burned out physicians are more costly and lead to the ordering of unnecessary tests, decreased job satisfaction, reduced productivity, increased job turnover, and earlier retirement.[4,5] Changes in residency structure and the incorporation of specialty-specific wellness programs may lead to the reduction of PTSD among physicians-in-training and thus inherently improve patient outcomes.

The majority of the resident reported traumatic stressors involve patient care (care for the critical, overwhelming responsibilities, poor outcomes, lack of support). These stressors can produce "second victims" who sustain psychological harm resulting in career attrition.[39,41] A "second victim" is a healthcare provider who is involved in a patient adverse event that subsequently leads to emotional and sometimes physical distress.[42] Often these symptoms resemble those experienced in PTSD. This study highlights that many residents report situations leading to symptoms related to PTSD including nightmares, avoidance, numbness, and detachment.

Whether the etiology is due to a hostile hospital culture, such as bullying, or occupational stress from overwhelming work responsibilities, these stressors ultimately can lead to the chronic and lifelong condition of PTSD.[4] Learned behavior in medical training can lead to cyclical behaviors as residents become attendings.[36] The House of God by Samuel Shem is a medical cult classic. It's a satirical novel that describes the psychological harm and dehumanization of residency training during the 1970's.[43] While residency training has certainly improved since those days, the fatigue and psychological harm persists.

As a cross-sectional survey this research has inherent limitations. The PC-PTSD screen, while considered the optimal screening tool, has inherent limitations including a diagnostic accuracy of 65%. Response bias may limit the applicability of our findings to a larger population. Despite the use of a US email database with the intent to represent the nation as a whole, there was potential for invalid emails leading to nonresponse and selection bias. However, the impact of this nonresponse bias may be lower

with physician studies as compared to the general population.[44] Additionally, the information gathered was self-reported and may be influenced by fear of retaliation if anonymity was not maintained. While this study has highlighted the variability of PTSD risk factors and stressors based on medical specialty for residents-in-training, future studies should identify if this variability continues as residents transition to attending physicians.

CONCLUSIONS

The prevalence of PTSD was not elevated among surgical residents when compared to residents in other medical specialties. However, the overall prevalence of PTSD remains more than 3 times that of the general population. Overall, 8 risk factors for PTSD were found including the emotional exhaustion subcomponent of PBO. Significant variation was noted in the risk factors for the development of PTSD between medical specialties. Interventions to improve resident wellness and prevent PTSD should be emphasized in the professional development of our young physicians.

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SUPPLEMENTARY INFORMATION

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