



## Advances in Research

20(1): 1-9, 2019; Article no.AIR.50702  
ISSN: 2348-0394, NLM ID: 101666096

# Physician Burnout and Associated Factors: Orthopaedics vs Anesthesia

John Reynolds<sup>1\*</sup>, Bradley Wiekrykas<sup>1</sup>, Frederick V. Ramsey<sup>2</sup>,  
Christopher Haydel<sup>3</sup> and Meera Gonzalez<sup>4</sup>

<sup>1</sup>Department of Orthopaedic Surgery, Temple University Hospital, Philadelphia, USA.

<sup>2</sup>Department of Clinical Sciences, Lewis Katz School of Medicine at Temple University, Philadelphia, USA.

<sup>3</sup>Department of Orthopaedic Surgery and Sports Medicine, Orthopaedic Surgery Residency, Lewis Katz School of Medicine at Temple University, Temple University Hospital, Philadelphia, USA.

<sup>4</sup>Department of Anesthesiology, Temple University School of Medicine, Philadelphia, PA, USA.

### Authors' contributions

This work was carried out in collaboration among all authors. Author JR helped design the study and wrote the first draft of the manuscript. Author FVR did the statistical analysis. Authors CH and MG wrote the protocol for the study and distributed surveys. Author BW managed the literature searches. All authors read and approved the final manuscript.

### Article Information

DOI: 10.9734/AIR/2019/v20i130147

#### Editor(s):

(1) Jose Eduardo Serrao, Professor of Cell Biology, Department of General Biology, Federal University of Viçosa, 36570-000 Viçosa, MG, Brazil.

#### Reviewers:

(1) Vinotha Sanmugarajah, University of Jaffna, Sri Lanka.

(2) Joe Liu, USA.

(3) Vijaya Krishnan, MGM College of Physiotherapy, India.

Complete Peer review History: <http://www.sdiarticle3.com/review-history/50702>

Original Research Article

Received 12 June 2019  
Accepted 21 August 2019  
Published 05 September 2019

## ABSTRACT

**Background:** Physician burnout has garnered increased attention in recent studies. It is attributed to the intrinsic stresses of medical practice and affects the quality of patient care. Previous studies have reported roughly half of orthopedic surgery and anesthesiology faculty and residents suffer symptoms of burnout.

**Objective:** The purpose of this study is to determine if there is a significant difference in burnout rates among orthopedic surgeons and anesthesiologists, between faculty and residents in both specialties, and possible associated factors that may predispose participants to experience burnout.

\*Corresponding author: E-mail: john.reynolds@tuhs.temple.edu;

**Methods:** Data was gathered using the Maslach Burnout inventory survey (42 questions), which was distributed during the spring/summer of 2017 to orthopaedic surgery and anesthesiology residents and attending physicians, anesthesiology residents, orthopedic surgery faculty, and orthopedic surgery residents from various programs in the northeastern United States.

**Results:** Survey Response rate was 238/666 = 38% response. As compared to attendings, residents scored: worse on Emotional Exhaustion; worse on Depersonalization and worse on Personal Accomplishment. When comparing specialties; for Emotional Exhaustion, Orthopaedic surgery scored better as compared with Anesthesiology. On Personal Accomplishment, Orthopaedic surgery scored better as compared with Anesthesiology. Residents had higher levels of burnout compared to attendings. Regarding specialty, Orthopaedic surgery scored significantly lower with regard to Emotional Exhaustion and Personal Accomplishment. It was also discovered that Orthopaedic surgeons overall have more social events, and more residents have mentors.

**Conclusion:** Residents consistently demonstrated higher levels of burnout than attendings in both anesthesiology and orthopaedic surgery. Having a mentor and more interdepartmental social events may protect against burnout.

*Keywords: Physician burnout; medical practice; patient care; anesthesiology; emotional exhaustion.*

## 1. INTRODUCTION

Physician burnout has become a significant concern in recent years. In 2012, a national study found that 46% of United States physicians reported at least one symptom of burnout [1]. A meta-analysis found that the aggregate rates of suicide were 1.41-2.27 higher in physicians than that of the general population and found that workplace dissatisfaction and burnout were almost three times higher in practicing physicians compared to non-physicians<sup>2</sup>. The same meta-analysis demonstrated mental illness, likely linked to physician burnout, demonstrated a strong correlation to physician suicide [2]. The most commonly accepted definition of occupational burnout syndrome consists of three equally important domains: 1) emotional exhaustion 2) depersonalization, and 3) a perceived lack of personal accomplishment, which are components of the Maslach Burnout Inventory: Human Services Survey (MBI-HSS) [3]. Absenteeism, personnel turnover, cynicism, emotional depletion, and decreased job satisfaction have all resulted from physician burnout and may have a negative impact on co-workers and patients [4].

In 2004, Sargent et al., found that orthopaedic surgery residents reported higher rates of burnout compared to faculty, demonstrating higher rates of emotional exhaustion and depersonalization. In 2009, Sargent et al., surveyed 384 residents and 264 faculty at orthopaedic surgery residency programs using the MBI-HSS [5]. It was found that roughly 30%

of residents and faculty showed high levels of emotional exhaustion and more than half of residents and a quarter of faculty showed high levels of depersonalization.

Burnout affects anesthesiologists as well. In the same 2012 national study, nearly half of the 309 anesthesiologists who responded to the survey also experienced burnout, only slightly lower than the fraction of orthopaedic surgeons<sup>1</sup>. In a 2013 national study of 1508 United States anesthesiology residents, high burnout risk was found in 41%. Residents who were at high risk of burnout and depression also reported more medical errors, more mistakes resulting in negative consequences for patients, and less vigilance in patient monitoring [6].

Lifestyle differences are evident between orthopaedic surgeons and anesthesiologists. Based on the 2017 Medscape Physician Compensation Report, the average annual salary for orthopaedic surgeons and anesthesiologists are \$489,000 and \$364,000 [7]. Anesthesiologists work on average 43-55 hours per week and take call 1.5 nights per week<sup>7</sup>. In 2011, Balch et al, studied 155 private practice and academic orthopaedic surgeons and found that they averaged 51.1 work hours per week and 1.8 nights on call per week, with a career satisfaction rate of 80% [8].

The purpose of this study is to determine if there is a significant difference in burnout rates among orthopaedic surgery and anesthesiology residents and faculty overall, and between

residents and faculty in each specialty. Based on previous studies, it is expected for burnout rates between specialties to be similar, and expect residents to have higher rates of burnout. While burnout at one point in time among these groups has been studied and published in the past using the MBI-HSS survey, no study to date has directly compared these groups.

## 2. METHODS AND STATISTICAL ANALYSIS

Rights to use the validated Maslach Burnout Inventory: Human Services Survey (MBI-HSS) were purchased and permission to perform this study was obtained from the Institutional Review Board. A cross-sectional online survey was distributed during the spring and summer of 2017 to orthopaedic surgery and anesthesiology residents and attending physicians from various urban academic programs in the northeastern United States. The survey, consisting of forty-two questions, included the MBI-HSS survey plus additional questions examining potential indicators of burnout such as socio-demographic and work stressors. A total of 228 surveys were collected from orthopaedic surgery attending's (29), orthopaedic surgery residents (61), anesthesia residents (63), and anesthesia attending's (75). Responses were collected via an online survey tool and responses were completely anonymous.

Statistical analysis was performed by the Temple Clinical Research Institute Department of Clinical Sciences. The dependent variable was professional burnout, measured by three subscales of the Maslach Burnout Inventory survey. Degrees of burnout (low, average, and high) have been used frequently in the literature to compare and contrast burnout among different groups. The cut off values in Table 1 [from the Third Edition of the Maslach Burnout Inventory Manual, Maslach et al.] are typically cited in the literature as representative of low, average, and high degrees of burnout.

High levels of depersonalization and emotional exhaustion or low scores on personal accomplishment indicated professional burnout.

Statistical analyses as categorical variables of the individual question data was performed as well as a statistical analysis of continuous variables of the three core scales relating to the burnout syndrome -Emotional Exhaustion, Depersonalization, and Personal Accomplishment. A statistical analysis of categorical variables regarding the degree of burnout associated with the three core aspects of burnout syndrome was also performed. Lastly, a univariable analyses of Emotional Exhaustion, Depersonalization, and Personal Accomplishment scores based on the partitions created by the responses to Question 25 through Question 41 was performed.

Scores for each of the three core scales were partitioned into low, average, or high categories based on the criteria for each scale (Table 1). The resulting categorical data was assessed using the Chi-Square test (or the Fisher's exact test as appropriate) for each score for each of the three respondent partitioning's. Question 39 in the survey identified respondents as either orthopaedic surgery attending's (29), orthopaedic surgery residents (61), anesthesiology residents (63), or anesthesiology attending's (75).

Derived scores for the three core scales of burnout syndrome (Emotional Exhaustion, Depersonalization, and Personal Accomplishment) were assessed using non-parametric methods. For this study, the Wilcoxon test was used if two groups were compared and the Kruskal-Wallis test was used if three or more groups were compared. Based on statistical analysis, the results of the study were found to have a non-normal distribution based on three tests of normality.

A univariable analysis of the three core scales of burnout was created using responses to questions 25 through 41 using the Kruskal-Wallis and Wilcoxon tests as described above. The data was cleaned as respondent 135 responded 6 (i.e. 'every day') to all 23 burnout questions and identified him or herself as both an anesthesia resident and attending in separate responses.

**Table 1. Maslach core scale values and their interpretations**

Core scale	Low	Average	High	Directional interpretation
Emotional Exhaustion	≤18	19–26	≥27	Higher score suggests higher burnout
Depersonalization	≤5	6–9	≥10	Higher score suggests higher burnout
Personal Accomplishment	≥40	39–34	≤33	Lower score suggests higher burnout

In addition, two respondents seemed to have made “fat finger errors” on Q41 of the survey, in which they identified themselves as residents but responded that they had been practicing for 1-5 years as attending’s. These respondents answered all other questions in the survey as residents consistently.

For selected questions, alternative data sets creating a derived response were created excluding responses of “prefer not to answer” and for those who “did not take any call” in questions 31 – 33. These alternative data sets were created such that only informative answers were analyzed.

### 3. RESULTS

The Survey Response rate was 238/666 = 38% response rate. As compared to attending’s, residents scored worse on Emotional Exhaustion (M 21.50 vs. 24.00, SE 1.25 vs. 1.06,  $p=0.1075$ ); worse on Depersonalization (M 6.0 vs 10.5, SE .64 vs.63,  $p<.0001$ ); and worse on Personal Accomplishment (M 41.0 vs 38.0, SE .59 vs .63  $p=0.0051$ ) (Table 2). For Emotional Exhaustion, orthopaedic surgery scored better compared to anesthesiology (M 20.0 vs 24.5p, SE 1.19 vs 1.07,  $p=0.0181$ ). On Depersonalization, anesthesiology scored better than orthopaedic surgery (M 9.5 vs 7.5, WE .73 vs .60  $p=0.0867$ ). On Personal Accomplishment, orthopaedic surgery scored better as compared with anesthesiology (M 42.0 vs 38.5, SE .67 vs .58  $p=0.0117$ ) (Table 3). It was also discovered that orthopaedic surgeons overall have more social events (Table 4), residents take more overnight call (higher rates of burnout), more anesthesiologists are married (81.5 vs. 69.5  $p=0.0365$ , higher rates of burnout), more anesthesiologists take in-house call (higher rates of burnout), and more residents have mentors (higher rates of burnout).

Inspecting levels of burnout partitioned by role, researchers found a similar trend, particularly with regard to Depersonalization and Personal Accomplishment, with residents showing increased rates of “high” burnout (Depersonalization 54.8% vs 34.6%,  $p= 0.0012$ , Personal Accomplishment 24.2% vs. 13.5%  $p=.0317$ ). Regarding specialty, orthopaedic surgery scored significantly better in Emotional Exhaustion and better in Personal Accomplishment (Emotional Exhaustion 30.0% vs 44.2%,  $p=0.0371$ , Personal Accomplishment 14.4% vs 22.5%,  $p=.0068$ ) (Table 4).

Univariable analysis results demonstrated many statistically significant findings with results reported for those that the authors felt were most revealing. Regarding gender, (Q25alt, excluding those who “prefer not to respond”) male respondents had higher median Personal Accomplishment scores (suggesting lower burnout) as compared with female respondents ( $p=0.0446$ ) (Table S5). Regarding partnerships, respondents in a partnership had lower median Depersonalization scores (suggesting lower burnout) as compared with respondents in that are not in a partnership ( $p=0.0400$ ) (Table S6). For the revised response data (Q29 alt), having fewer social events were associated with higher Emotional Exhaustion scores ( $p=0.0364$ , suggesting higher burnout) and was associated with lower Personal Accomplishment ( $p=0.0066$ ), suggesting higher burnout) (Table S7).

When only considering respondents that take call (Q31 alt), respondents for whom a majority (greater than 50%) of their call was home call (defined as not required to physically remain in the hospital at all times) had a higher median Personal Accomplishment scores (suggesting lower burnout) as compared with respondents for whom a majority of their call was in-house call ( $p=0.0163$ ) (Table S8). A derived response data set was imputed from Q31, Q32, and Q33 identifying whether the respondent takes or does not take any call. Based on this derived data set, respondents that did not take call had lower median Emotional Exhaustion and Depersonalization scores (suggesting lower burnout) as compared with respondents that do take call ( $p=0.0188$  and 0.0148, respectively).

In regards to having a mentor, respondents who had a mentor (Q35) had higher Depersonalization scores (suggesting higher burnout) and lower Personal Accomplishment scores (suggesting higher burnout) as compared with those who had no mentor ( $p<0.0001$  and 0.0185, respectively). However, regarding the reported agreement relative to the benefits of having a mentor (Q35 alt), statistically significant associations between agreement and scores were observed. Those respondents who strongly agreed or agreed that having a mentor benefitted them had lower median Emotional Exhaustion scores, lower median Depersonalization scores, and higher median Personal Accomplishment scores ( $p=0.0487$ ,  $p=0.0195$ , and  $p=0.0002$ , respectively for each score, based on an overall comparison of all five levels) (Table S9).

There was a statistically significant association between Emotional Exhaustion and exercise (Q37) ( $p=0.0389$ ), in which those exercising the least had the highest burnout and those exercising the most had the lowest burnout (Table S10). Regarding sleep (Q38), there was a statistically significant association between Emotional Exhaustion and sleep ( $p=0.0040$ ) where those sleeping the least had the highest burnout and those sleeping the most had the lowest burnout. For Depersonalization and sleep, the association approached statistical significance ( $p=0.0600$ ), in which those sleeping the least had the highest burnout and those sleeping the most had the lowest burnout. Those sleeping less than five hours had the highest burnout (Table S11).

Looking at years of practice for attending's only (Q41 alt), there is a statistically significant association between years of practice and Depersonalization scores ( $p=0.0414$ ). Based on these data, attending's with more than thirty years of practice have lower Depersonalization scores, suggesting lower burnout rates.

Tables can be found in the supplementary section.

#### 4. DISCUSSION

Results of the study demonstrated that overall, residents experience higher rates of burnout than attending's in both orthopaedic surgery and anesthesiology, which is consistent with previous findings. However, our results suggest that anesthesiology residents and attending's experience higher levels of burnout when directly compared to their orthopaedic surgery counterparts, which is inconsistent with previous studies and surprising [1]. This challenges the common belief that surgical specialties carry a higher prevalence of burnout due to increased hours and a more stringent call schedule. A 2011 study of 384 orthopaedic surgery residents and 264 full-time orthopaedic surgery faculty reported residents work an average of 74.2 +/- 20.2 hours per week and faculty 62.8 +/- 18.2 hours per week [9]. This is compared to a 2013 study which found that 76% of anesthesiology residents work less than 70 hours a week and 24% work more than 70 hours per week. The same study found that 56% of anesthesiology residents have less than 5 days between calls while 44% have more than 5 days between calls [10]. An important difference between specialties that was found to

directly correlate with physician burnout is number of social events per year. Orthopaedic surgery was found to have significantly more social events and overall lower rates of physician burnout.

Socialization outside of work settings helps promote teamwork and comradery. This strategy of teambuilding and morale-boosting events outside of the work setting has been utilized and found to be effective in the financial and corporate world. Results of the study indicated an inverse correlation between number of social events and burnout, based on the three core values. One possibility for the observed difference in number of social events between orthopaedic surgeons is that more anesthesiologists were found to be married, which limits time outside of work to be spend with fellow colleagues due to the responsibilities inherent to partnership and family. Married orthopaedic surgery residents who had higher Revised Dyadic Adjustment Scale scores had a greater sense of personal achievement, while married faculty with higher scores was strongly associated with lower emotional exhaustion, lower depersonalization, and higher personal achievement [7]. A 2012 study comparing burnout and satisfaction with work-life balance of 7,288 US physicians and 3,442 working United States adults found that being married was associated with a lower overall risk of burnout [1].

Another possibility is that orthopaedic surgeons tend to come from background of competitive sport where teamwork and the understanding of the importance of supporting one's associate are imperative to success. Social events, focused around team-building activities should be a regular occurrence among residency departments and must involve both residents and attending's, so that the whole department feels engaged in efforts to build relationships and bonds that can be carried over into the workplace. These building blocks, forged away from the familiar hospital setting, can develop relationships that can act as pillars of support and strength should a physician experience the symptoms of burnout. Closer relationships with colleagues may help an attending or resident physician seek help before symptoms severely impact patient care and one's mental health.

Findings of this study highlight that mere involvement in a mentor-mentee relationship does not protect against symptoms of burnout.

**Table 2. Summary statistics and testing of three core scales partitioning by role**

Core scale	N	Mean	Std Dev	Std Err	Min	Q1	Median	Q3	Max	p-Value	Method
<b>Emotional exhaustion</b>										0.1074	Wilcoxon
Attending	104	22.69	12.72	1.25	0.00	12.50	21.50	31.00	54.00		
Resident	124	25.06	11.79	1.06	0.00	17.00	24.00	33.00	52.00		
<b>Depersonalization</b>										<.0001	Wilcoxon
Attending	104	8.08	6.57	0.64	0.00	3.00	6.00	12.00	30.00		
Resident	124	11.68	7.00	0.63	0.00	6.00	10.50	16.50	29.00		
<b>Personal accomplishment</b>										0.0051	Wilcoxon
Attending	104	40.22	6.04	0.59	18.00	36.50	41.00	45.00	48.00		
Resident	124	37.73	6.98	0.63	11.00	34.00	38.00	43.00	48.00		

**Table 3. Summary statistics and testing of three core scales partitioning by speciality**

Core Scale	N	Mean	Std Dev	Std Err	Min	Q1	Median	Q3	Max	p-Value	Method
<b>Emotional exhaustion</b>										0.0181	Wilcoxon
Orthopaedic surgery	90	21.52	11.34	1.19	0.00	14.00	20.00	30.00	50.00		
Anesthesiology	138	25.58	12.60	1.07	0.00	16.00	24.50	34.00	54.00		
<b>Depersonalization</b>										0.0867	Wilcoxon
Orthopaedic surgery	90	10.92	6.93	0.73	0.00	6.00	9.50	16.00	25.00		
Anesthesiology	138	9.46	7.05	0.60	0.00	4.00	7.50	14.00	30.00		
<b>Personal accomplishment</b>										0.0117	Wilcoxon
Orthopaedic surgery	90	40.08	6.40	0.67	17.00	36.00	42.00	45.00	48.00		
Anesthesiology	138	38.08	6.76	0.58	11.00	34.00	38.50	43.00	48.00		

**Table 4. Degree of burnout, four-way partitioning, summary statistics**

Scale	Low	Average	High	Total	p-Value	Test Method	
<b>Degree of burnout - Emotional exhaustion</b>						0.0325	Chi Square
Orthopaedic surgery attending	15 (51.7%)	8 (27.6%)	6 (20.7%)	29 (100.0%)			
Orthopaedic surgery resident	25 (41.0%)	15 (24.6%)	21 (34.4%)	61 (100.0%)			
Anesthesiology attending	28 (37.3%)	16 (21.3%)	31 (41.3%)	75 (100.0%)			
Anesthesiology resident	12 (19.0%)	21 (33.3%)	30 (47.6%)	63 (100.0%)			
Total	80 (35.1%)	60 (26.3%)	88 (38.6%)	228 (100.0%)			

Scale	Low	Average	High	Total	p-Value	Test Method
<b>Degree of burnout - Depersonalization</b>					0.0252	Chi Square
Orthopaedic surgery attending	11 (37.9%)	7 (24.1%)	11 (37.9%)	29 (100.0%)		
Orthopaedic surgery resident	11 (18.0%)	16 (26.2%)	34 (55.7%)	61 (100.0%)		
Anesthesiology attending	33 (44.0%)	17 (22.7%)	25 (33.3%)	75 (100.0%)		
Anesthesiology resident	15 (23.8%)	14 (22.2%)	34 (54.0%)	63 (100.0%)		
Total	70 (30.7%)	54 (23.7%)	104 (45.6%)	228 (100.0%)		
<b>Degree of burnout - Personal accomplishment</b>					0.0008	Chi Square
Orthopaedic surgery attending	21 (72.4%)	5 (17.2%)	3 (10.3%)	29 (100.0%)		
Orthopaedic surgery resident	38 (62.3%)	13 (21.3%)	10 (16.4%)	61 (100.0%)		
Anesthesiology attending	43 (57.3%)	21 (28.0%)	11 (14.7%)	75 (100.0%)		
Anesthesiology resident	18 (28.6%)	25 (39.7%)	20 (31.7%)	63 (100.0%)		
Total	120 (52.6%)	64 (28.1%)	44 (19.3%)	228 (100.0%)		

More residents have a mentor, but experience higher levels of burnout than attending's in both orthopaedic surgery and anesthesiology. However, regarding the reported agreement relative to the benefits of having a mentor, statistically significant associations between agreement and scores were observed. Those respondents who strongly agreed or agreed that having a mentor benefitted them had lower overall rates of burnout than those who disagreed and strongly disagreed. In a study of three hundred and eighty-four orthopaedic surgery residents, Sargent, et al, found that 60% reported having at least one mentor. Levels of emotional exhaustion decreased and personal achievement increased as the frequency of contact between mentor and mentee increased [9]. Higher personal achievement, lower emotional exhaustion, and lower depersonalization scores were also found in those who reported it helpful to speak with their mentors [7].

Often time's mentors are assigned to a resident when they begin residency randomly with no prior relationship between the two. In order to create more valuable mentor-mentee relationships, care must be taken to provide mentees with mentors that are an optimal "fit." If attending's and residents can socialize and familiarize themselves with one another to establish relationships ahead of time, this can be achieved. Random pairing of mentors to mentees can lead to this relationship being suboptimal due to differences in personalities, professional and personal interests, and the parities' overall interest in a mentor-mentee relationship.

One suggestion to help foster this important relationship is to have residents seek out attending's who they would like to have as a mentor based on an already established relationship. This way, residents can choose whether or not they would like a mentor at all. If so, they can select a relationship which they feel will help them grow personally and professionally. Those who may feel this relationship has no benefit, can save themselves the time and strain associated with a mentor that they did not choose, or has little interest in truly being a mentor. One study of a radiology residency program found that residents having self-selected their mentors were significantly more likely to consider their faculty mentor as their primary mentor than those with assigned mentors. They also reported significantly higher

satisfaction with the mentoring program than those with an assigned mentor. [10] Another study of an emergency medicine residency program concluded that an individual's active participation in mentor selection can yield better outcomes, as 44% of residents thought shared academic interest and 44% thought a comfortable personal dynamic were most important to a successful mentor-mentee match. In this program, at the end of intern year, residents provided a list of three possible mentors for the remainder of training and were assigned one of those mentors [11].

## 5. CONCLUSION

Anesthesiologists consistently demonstrate high levels of professional burnout compared to orthopedic surgeons. There are several weaknesses inherent in our study. One weakness is that the surveys were collected during a single time point during the spring and summer months in the northeastern United States. Temporal and seasonal difference may impact survey results, as rates of seasonal depression peak in the winter. We only polled physicians in large urban medical centers. Opportunity for future studies include redistributing surveys over the course of a year (winter vs. summer) to find if seasonal changes may affect the outcomes. Studies could compare burnout rates with non-perioperative specialties with mostly daytime hours and thus no overnight calls and patients without critical illnesses. Comparing rural and urban centers and different areas of the country can give insight to the potential effects of demographic factors. Given our findings about the impact of social events, studies could explore the details about the types of social events, frequency, quality, etc. that could potentially impact burnout rates.

## COMPETING INTERESTS

Authors have declared that no competing interests exist.

## REFERENCES

1. Shanafelt TD, Boone S, Tan L, et al. Burnout and satisfaction with work-life balance among US physicians relative to the general US population. *Arch Intern Med.* 2012;172(18): 1377-1385.



2. Schermhammer ES, Colditz GA. Suicide rates among physicians: A quantitative and gender assessment (meta-analysis). *Am J Psychiatry*. 2004;161(12): 2295-302. ISSN: 0002- 953
3. Maslach C. Jackson SE, Leiter MP. *Maslach Burnout Inventory Manual*, Ed 3. Palo Alto, CA, Consulting Psychologists Press; 1996.
4. Saleh, Khaled J. The prevalence and severity of burnout among academic orthopaedic departmental leaders. *J Bone Joint Surgery*. 2007;89(4):896.
5. Sargent M. Catherine, Wayne Sotile, Mary O. Sotile, Harry Rubash, Robert L. Barack. stress and coping among orthopaedic surgery residents and faculty. *J Bone Joint Surgery*. 2004;86(7):1579–586.
6. Shanafelt Tait D, Charles M. Balch, Gerald Bechamps, Tom Russell, Lotte Dyrbye, Daniel Satele, Paul Collicott, Paul J. Novotny, Jeff Sloan, Julie Freischlag. Burnout and medical errors among American surgeons. *Annals of Surgery*. 2010;251(6):995-1000.
7. Available:<http://www.medscape.com/slides/how/compensation-2017-overview-6008547#4>
8. Balch, Charles M, Tait D. Shanafelt, Jeffrey A. Sloan, Daniel V. Satele, Julie A. Freischlag. Distress and career satisfaction among 14 surgical specialties, comparing academic and private practice settings. *Annals of Surgery*. 2011;254(4): 558-68.
9. Sargent MC, Sotile W, Sotile MO, Rubash H, Vezeridis PS, Harmon L, Barrack RL. Managing Stress in the Orthopaedic Family. *J Bone Joint Surgery*. 2011;93(8): Web.
10. Yamada K, Slanetz PJ, Boiselle PM. Perceived benefits of a radiology resident mentoring program: Comparison of residents with self-selected vs assigned mentors. *Canadian Assoc Radiologist J*. 2014;65(2):186-191. DOI:10.1016/j.carj.2013.04.001
11. Bhatia K, Takayesu JK, Nadel ES. A novel mentorship programme for residents integrating academic development, clinical teaching and graduate medical education assessment. *Perspect Med Edu*. 2016;5 (1):56-59. DOI:10.1007/s40037-015-0236-2

© 2019 Reynolds et al.; This is an Open Access article distributed under the terms of the Creative Commons Attribution License (<http://creativecommons.org/licenses/by/4.0>), which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

*Peer-review history:*

*The peer review history for this paper can be accessed here:  
<http://www.sdiarticle3.com/review-history/50702>*