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Current Infrastructure in Mitigating Burnout Syndrome

Kwame Asante Akuamoah-Boateng*, Audis Bethea, Carrie Griffiths, John Whitcomb, Damayanti Samanta, Stuart M. Lowson and Curtis N. Sessler

Department of Surgery, Division of Acute Care Surgical Services, Virginia Commonwealth University Health, USA

***Corresponding author: Kwame A. Akuamoah-Boateng,** Email: Mr.kwameboateng@gmail.com

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Abstract

Purpose: Over fifty percent of critical care clinicians experience some component of burnout syndrome (BOS). Limited data exist evaluating supportive infrastructure to mitigate BOS. This study aims to assess the incidence, work-related associations, and current infrastructure available to support clinicians experiencing BOS.

Methods: All chapter members in the Carolinas/Virginias Chapter of SCCM were invited to complete an anonymous, cross-sectional survey. The survey consisted of 3 sections: (i) Demographics, (ii) the Mini-Z burnout survey and (iii) four questions created by the study's authors to assess the impact of BOS and the presence of supportive infrastructure. T test or Mann-Whitney U test was conducted for continuous variables. Categorical variables were compared using chi square or Fisher's exact test. All comparisons were performed at a level of significance of $p \leq 0.05$. Significant variables from univariate analyses were further evaluated via a logistic regression in order to determine if they were independently associated with BOS.

Results: One hundred respondents, representing 35% of the chapter's members, completed the survey. Burnout syndrome was reported by 53% of respondents. Institutions with an infrastructure in place to address BOS, were represented by 26% of survey respondents respectively. Individuals reporting BOS were less likely to have exposure to such programs compared to those with BOS (15.6% vs. 41.0%, p=0.014). Burnout syndrome had a positive, independent association with job stress (OR 15.23, 95% CI 4.29 to 53.98) and negative, independent associations with satisfactory time available for documentation (OR 0.34, 95% CI 0.11 to 0.98), high value alignment with institution/employer leadership (OR 0.25, 95% CI 0.08 to 0.76) and available resources to address burnout in critical care practitioners (OR 0.25, 95% CI 0.08 to 0.79.

Conclusions: This study demonstrates that few institutions have programs in place to address BOS. Available resources, and alignment of values with institutional leadership were independently predictive of lower BOS rates. Respondents reporting BOS had less access to infrastructures to foster clinician wellness suggesting that the implementation of supportive programs may have a positive impact on the incidence of BOS.

Keywords: Burnout syndrome; Resources; Critical care clinicians; Infrastructure; Resources

Introduction

Healthcare has become recognized as one of the most common professions that predispose practitioners to the development of burnout syndrome (BOS). Burnout syndrome is associated with the development of fatigue, and a decreased sense of personal fulfillment [1]. Current data evaluating the incidence of BOS indicate that approximately 25% to 33% of critical care nurses manifest symptoms of severe BOS and up to 86% display at least 1 of the 3 classic symptoms [2-4]. The incidence of BOS among physicians is also substantial, with severe symptomatology reported in up to 45% of critical care practitioners [1,5]. Higher rates of BOS have been reported in pediatric critical care physicians where the incidence of BOS is 71%, more than double the rate seen in general pediatricians [2,6-8]. Recent research comparing burnout among physicians and individuals with non-medical doctoral degrees found that physicians carry a 47% higher risk of developing BOS as compared to their peers with non-medical degrees [9]. Among Advance Practice Providers (APP), a recent survey of 24 critical care APPs, reported severe symptoms of BOS in 25% of respondents [10].

High turnover has been associated with practitioners experiencing burnout syndrome [11,12]. Current literature estimated the recruitment of nurses cost as high as 1.2 to 1.3 times their salary and for physicians' recruitment costs can range from the thousands to more than 1 million [13]. Due to the high frequency of BOS and its significant impact, the Carolinas/Virginias Chapter of the Society of Critical Care Medicine (CVCSCCM) endeavored to assess the incidence of BOS among critical care practitioners in the Carolinas/Virginias region. In addition, the Chapter sought to assess current infrastructure in place to address BOS in the various healthcare institutions across the region; and correlate practitioners' risk of experiencing BOS with the presence of support infrastructure.

Material and Methods

A cross-sectional, survey-based study was conducted in 2018 through the Carolinas/Virginia Chapter of the Society of Critical Care Medicine, (n=288), a multidisciplinary critical care organization of healthcare professionals (e.g. doctors, pharmacists, nurses, etc). All members had the opportunity to participate in this survey. Accordingly, chapter members received an emailed link to the survey including instructions on survey completion. Survey links remained active for 2 weeks. Following this two-week period, an additional email was sent to chapter members providing an updated link to access and complete the survey. The software used to facilitate the emailing of survey links excluded members who had previously completed the survey from this second electronic mailing in order to prevent duplication of survey responses. The software used to facilitate the electronic mailing of survey links-maintained investigators' blinding to specific information concerning chapter members' survey completion status as well as the email addresses that were included in the second emailing of survey links. An additional opportunity to complete the survey was provided to members who attended the chapter's Annual Scientific Symposium. Symposium attendees who had not yet completed the online version were provided an opportunity to voluntarily complete a written version of the survey in person. Consistent with the online survey, identifying information was not collected with the surveys completed during the Scientific Symposium in order to maintain anonymity of survey respondents.

The survey consisted of 3 sections: (i) Demographics, (ii) the Mini-Z burnout survey and (iii) four questions created by the study's authors to assess the impact of BOS and the presence of supportive infrastructure. Mini-Z survey items were coded using the scoring key provided by Linzer et al. [8]. The Mini Z survey was developed by Dr. Mark Linzer. Reliability and validity of this instrument has been assessed through yearly administration of this survey in all departments at Hennepin County Medical Center in Minneapolis. The overall internal consistency of the Mini Z survey is good with a Cronbach's alpha value of 0.8 for all 10 items. Accordingly, the Mini Z has been provided as a short

tool to assess for burnout and contributory workplace stressors [7,8]. Institutional Review Board approval was granted by the Charleston Area Medical Center West Virginia University (CAMC/WVU).

A descriptive analysis was conducted for each variable. Means and standard deviations were reported for continuous variables, and proportions and frequencies were computed for categorical variables. To assess statistically significant associations, T test or Mann-Whitney U test was conducted for continuous variables. Categorical variables were compared using chi square or Fisher's exact test. A logistic regression was conducted to evaluate for an independent association of burnout with other significant, univariate study variables. All comparisons were performed at a level of significance of $p \leq 0.05$. Analyses were done using SPSS Version 22.0 (Armonk, NY: IBM Corp).

Results

Demographic characteristics of respondents

There were 100 respondents from the chapter's 288 members (response rate 35%). Ninety percent of the study's respondents practiced in North Carolina and Virginia. The mean age of respondents was 44.1 ±10.9 years with 59% of the respondents being female. Overall demographics, including respondents' profession, reflected the current composition of the chapter's membership (Table 1).

Mini-Z burnout survey

Fifty-three percent of survey respondents reported feeling burned out. Overall responses for the remaining domains of the Mini-Z are listed in Table 2. Responses suggesting a negative perception of CVCSCCM members' jobs or work environments included: chaos in my primary work area (59.6%), a great deal of stress because of my job (66.0%), satisfactory control over workload (48.0%), satisfactory time available for documentation (43.0%), and high value alignment with institution/employer leadership (48.5%). Responding practitioners did, however, report a high level of satisfaction with their job (77.0%), team working efficiently together (85.0%), and proficiency with electronic heath record (EHR) (94.9%) [8].

Institutional recognition and support for mitigation of burnout

The final section of the survey assessed infrastructure available to members within the region to identify, manage, and/or prevent BOS. Approximately, 41% of respondents reported practicing in a critical care area that acknowledged burnout as a potential barrier to the provision of patient care. Remaining questions evaluated the infrastructure available to practitioners. Less than 10% of respondents reported that their practice area had a program or process in place through which critical care practitioners experiencing burnout could be identified. Supportive infrastructure or a dedicated department for assisting practitioners experiencing burnout was reported by 14.1% and 26.3% of respondents respectively (Table 3). Respondents were able to free text examples of structured processes that were in place to

Table 1: Demographic Characteristics of Survey Respondents.

Demographics		N=100	
		N	Mean ± SD or N(%)
Age		99	44.07 ± 10.8
Years in current clinical practice		99	13.38 ± 10.4
Gender	• Female • Male • Prefer not to disclose	100	59(59.0%) 39(39.0%) 2(2.0%)
State of practice	• North Carolina • Virginia • South Carolina • West Virginia	100	49(49.0%) 41(41.0%) 5(5.0%) 5(5.0%)
Profession	• Physician • Advanced Practice Provider (NP/PA) • Pharmacist • Nurse • Respiratory Therapist • Other	100	39(39.0%) 25(25.0%) 21(21.0%) 8(8.0%) 3(3.0%) 4(4.0%)
Critical care setting	• Trauma ICU • Medical ICU • Mixed ICU • Cardiothoracic ICU • Neonatal/Pediatric ICU • Neuroscience ICU • Multiple ICUs • Surgical ICU • Virtual critical care	100	22(22.0%) 19(19.0%) 18(18.0%) 13(13.0%) 11(11.0%) 8(8.0%) 6(6.0%) 2(2.0%) 1(1.0%)
Size of ICU (# beds)	• 5-10 • 11-15 • 16-20 • >20	100	6(6.0%) 25(25.0%) 25(25.0%) 44(44.0%)

*NP = Nurse practitioner, PA= Physician assistant, ICU = Intensive Care Unit

Table 2: Mini-Z Burnout Survey Result.

	N=100	
	N	Yes N (%)
Satisfaction with my job	100	77(77.0%)
Great deal of stress because of my job	100	66(66.0%)
Burnout	100	53(53.0%)
Satisfactory control over my workload	100	48(48.0%)
Satisfactory time available for documentation	100	43(43.0%)
Chaos in my primary work area	99	59(59.6%)
High value alignment with institution/employer leadership	99	48(48.5%)
Team works efficiently together	100	85(85.0%)
Too much time on EHR at home	100	35(35.0%)
Proficient with HER	99	94(94.9%)

EHR= Electronic Health Record

Table 3: Burnout Management and Prevention.

	N=100	
	N	Yes N (%)
Burnout is recognized as a potential barrier to the provision of patient care in critical care area of practice	99	41(41.4%)
Critical care area of practice has a specific program or process in place to identify critical care practitioners who maybe experiencing burnout	99	9(9.1%)
Critical care area of practice has a formal process to support practitioners who may be experiencing the symptoms of burnout	99	14(14.1%)
• Educational opportunities (2) • ICU wellness / Burnout Syndrome prevention program (4) • Others (5) • Peer group sessions (2) • Peer group sessions; ICU wellness / Burnout Syndrome prevention program; Educational opportunities; Grand rounds (1)		
Practice area or hospital has a dedicated office (or department) with a focus on supporting practitioners experiencing burnout, and promoting wellness	99	26(26.3%)

support practitioners experiencing BOS in their practice areas. Written examples included: Intensive care unit (ICU) wellness/BOS prevention program (n=4), educational opportunity (n=2), and peer group session (n=2).-

Demographics comparison of burned out vs. non-burned out respondents

Demographic endpoints compared between respondents reporting burnout versus those who did not report burnout are detailed in Table 4. There were no significant differences in burnout rates when respondents were compared based on their age, critical care practice setting, profession, or the size of the ICU in which they practiced. There was a significant difference in gender between respondents reporting burnout (p=0.043) with male practitioners having a significantly higher burnout rate (64.1% vs. 35.9%, p=0.013) as noted in Table 4.

Mini-Z burnout survey comparison of burned out vs. non-burned out respondents

There were 5 questions of the Mini Z BOS survey in which responses were significantly different when comparing burned out practitioners versus those were not (Table 5). Domains in which burned out practitioners' responses were significantly lower included: satisfaction with job (67.9% vs. 87.2%, p=0.031), satisfactory control over workload (30.2% vs. 68.1%, p<0.001), time available for documentation (28.3% vs. 59.6%, p=0.002), and high value alignment with institution/employer leadership (35.8% vs. 63.0%, p=0.007).

Table 4: Demographic Characteristics of Survey Respondents Reporting Burnout versus No burnout.

Characteristic		N	Burnout (N=53)	No Burnout (N=47)	P Value
			Mean±SD or N (%)	Mean±SD or N (%)	
Age		99	44.90±9.94	43.15±11.81	0.4
Years in current clinical practice		99	14.15±9.95	12.52±11.02	0.4
Gender	• Female	59	26(44.1%)	33(55.9%)	0.043
	• Male	39	25(64.1%)	14(35.9%)	
	• Prefer not to disclose	2	2(100.0%)	0(0.0%)	
State of practice	• North Carolina	49	26(53.1%)	23(46.9%)	0.666
	• Virginia	41	21(51.2%)	20(48.8%)	
	• South Carolina	5	2(40.0%)	3(60.0%)	
	• West Virginia	5	4(80.0%)	1(20.0%)	
Profession	• Physician	39	21(53.8%)	18(46.2%)	0.869
	• Advanced Practice Provider (NP/PA)	25	13(52.0%)	12(48.0%)	
	• Pharmacist	21	11(52.4%)	10(47.6%)	
	• Nurse	8	3(37.5%)	5(62.5%)	
	• Respiratory therapist	3	2(66.7%)	1(33.3%)	
	• Other	4	3(75.0%)	1(25.0%)	
Type of institution	• Academic	41	19(46.3%)	22(53.7%)	0.258
	• Non-academic institutions	57	33(57.9%)	24(42.1%)	
Critical care setting	• Trauma ICU (surgical + neuro)	22	11(50.0%)	11(50.0%)	0.171
	• Medical ICU	19	11(57.9%)	8(42.1%)	
	• Mixed ICU	18	10(55.6%)	8(44.4%)	
	• Cardiothoracic ICU	13	8(61.5%)	5(38.5%)	
	• Neonatal/Pediatric ICU	11	7(63.6%)	4(36.4%)	
	• Neuroscience ICU	8	4(50.0%)	4(50.0%)	
	• Multiple ICU	6	0(0.0%)	6(100.0%)	
	• Surgical ICU	2	1(50.0%)	1(50.0%)	
	• Virtual critical care	1	1(100.0%)	0(0.0%)	
Size of ICU (# beds)	• 5-10	6	4(66.7%)	2(33.3%)	0.532
	• 11-15	25	12(48.05)	13(52.0%)	
	• 16-20	25	16(64.0%)	9(36.0%)	
	• >20	44	21(47.7%)	23(52.3%)	

Table 5: Mini Z Burnout Survey: Results for Survey Respondents Reporting Burnout vs No burnout.

	Burnout (N=53)		No Burnout (N=47)		P Value
	N	Yes N (%)	N	Yes N (%)	
Satisfaction with my job	53	36(67.9%)	47	41(87.2%)	0.031
Great deal of stress because of my job	53	45(84.9%)	47	21(44.7%)	<0.001
Satisfactory control over my workload	53	16(30.2%)	47	32(68.1%)	<0.001
Satisfactory time available for documentation	53	15(28.3%)	47	28(59.6%)	0.002
Chaos in my primary work area	53	33(62.3%)	46	26(56.5%)	0.561
High value alignment with institution/employer leadership	53	19(35.8%)	46	29(63.0%)	0.007
Team works efficiently together	53	45(84.9%)	47	40(85.1%)	0.978
Too much time on EHR at home	53	21(39.6%)	47	14(29.8%)	0.303
Proficient with EHR	53	51(96.2%)	46	43(93.5%)	0.533

EHR= Electronic Health Record

There was a significantly higher percentage of practitioners with burnout, who reported experiencing a great deal of stress secondary to their job (84.9% vs. 44.7%, p<0.001). No significant associations were identified between the two groups on the questions evaluating practitioners' perception of chaos in their primary work area, team working efficiently together and time on EHR.

Institutional recognition and support for mitigation of burnout for burned out vs. non-burned out respondents

There were no significant differences in response rates between burned out practitioners and those who were not. Less than 50% of responding practitioners regardless of burnout status indicated that their practice area acknowledged BOS as a limitation to the provision of patient care. In addition, less than 10% of all responders indicated that there was a program or process through which practitioners experiencing burnout could be identified in their practice area. The incidence in which practice areas had a dedicated office with a focus on supporting practitioners experiencing BOS was 16% lower in practitioners who were currently burned out. This finding, however, did not reach statistical significance (18.9% vs. 34.8%, p=0.073). The incidence in which practice areas had a process in place to support practitioners experiencing burnout was 10.2% lower in burned out practitioners (9.4% vs. 19.6%, p=0.163), however, this finding also failed to reach statistical significance (Table 6). The responses to the third and fourth questions were combined in order to facilitate a more global evaluation of available infrastructure. This comparison suggested that significantly fewer burned out practitioners had resources available (18.9% vs. 43.5%, p=0.008) as compared to those who reported not being burned out.

Logistic regression analysis

A logistic regression was conducted to evaluate for an independent association of burnout with other univariately significant, univariate study variables. Results showed positive independent association with job stress (OR 15.23, 95% CI 4.29 to 53.98) and negative independent associations with satisfactory time available for documentation (OR 0.34, 95% CI 0.11 to 0.98), high value alignment with institution/employer leadership (OR 0.25, 95% CI 0.08 to 0.76) and available resources to support practitioners (OR 0.25, 95% CI 0.08 to 0.79) (Table 7).

Discussion

Numerous factors have been associated with the development of BOS in healthcare practitioners; however, they can typically be grouped into 4 major categories: organizational factors, personal characteristics, exposure to end-of-life situations, and quality of working relationships [2,3]. Organizational factors that have been associated with BOS include a lack of control of the work environment, increasing workload, dysfunction in the work community, and inadequate rewards [1,5]. The current study, to the best of the investigators' knowledge is among the first to provide insight into the availability of infrastructure designed to mitigate BOS across ICU practitioners. Accordingly, the current study provides initial data supporting the potential efficacy of programs designed to detect, manage, or mitigate BOS in critical care practitioners as evidenced by the negative association seen in the regression analysis comparing the availability of resources targeting BOS and the incidence of BOS.

The current study shows that the majority (59%) of respondents' practice areas do not acknowledge BOS as being impactful in their ability to provide patient care. For practitioners experiencing BOS, the sequelae can be quite significant. Further, the impact reaches beyond the health care professional, frequently adversely affecting the provision of patient care. Literasture supporting this paradigm

Table 6: Burnout Infrastructure (Burnout vs No burnout)

Burnout Management and Prevention	Burnout (N=53)		No Burnout (N=47)		P Value
	N	Yes N (%)	N	Yes N (%)	
Burnout is recognized as a potential barrier to the provision of patient care in critical care area of practice	53	24(45.3%)	46	17(37.0%)	0.402
Critical care area of practice has a specific program or process in place to identify critical care practitioners who maybe experiencing burnout	53	5(9.4%)	46	4(8.7%)	1.000
Practice area or hospital has a dedicated office (or department) with a focus on supporting practitioners experiencing burnout, and promoting wellness	53	10(18.9%)	46	16(34.8%)	0.073
Critical care area of practice has a formal process to support practitioners who may be experiencing the symptoms of burnout	53	5(9.4%)	46	9(19.6%)	0.163
Burnout • ICU wellness / Burnout Syndrome prevention program (2) • Others (1) • Peer group sessions (2) **Not Burned Out** • Educational opportunities (2) • ICU wellness / Burnout Syndrome prevention program (2) • Others (4) • Peer group sessions; ICU wellness / Burnout Syndrome prevention program; Educational opportunities; Grand rounds (1)					
Burnout Management and Prevention	**Burnout (N=53)**		**No Burnout (N=47)**		**P Value**
	N	**Yes N(%)**	**N**	**Yes N(%)**	
Presence of Resource(s)	53	10(18.9%)	46	20(43.5%)	0.008

Table 7: Logistic Regression Determining Independent Association between Burnout and other Study Variables.

	P value	Odds ratio	95% CI	
Great deal of stress because of my job	<0.001	15.23	4.29	53.98
Satisfactory time available for documentation	0.046	0.34	0.11	0.98
High value alignment with institution/employer leadership	0.014	0.25	0.08	0.76
Resource	0.019	0.25	0.08	0.79

suggests that the presence of BOS results in an increased frequency of medical errors, higher rates of healthcare-associated infections, and 30-day mortality [2,11-18]. In a meta-analysis conducted by Panagioti and colleagues, physician burnout was associated with an increased risk of patient safety incidents (OR, 1.96; 95% CI, 1.59-2.40) [16]. Another study conducted by Shanafelt and colleagues, evaluated the effect of BOS in USA surgeons. In this study, 9% of surgeons suspected that they had committed a medical error during the preceding quarter. These practitioners' suggested that their suspicion of error resulted in a significant impact on their mental quality of life, burnout, and the development of symptoms of depression [17]. Ultimately, the investigators advocate that these data should provide sufficient evidence for institutions to consider placing a similar degree of awareness and resources towards practitioner wellness, prevention and management of BOS that mirrors that dedicated towards patient safety. As noted, 41% of respondents whose practice areas acknowledged the impact of BOS did not appear to consistently have access to resources through which BOS could be identified, mitigated, or prevented. Only 26.3% of respondents had access to an office or department with a focus on supporting practitioners experiencing burnout. Programs, support groups, and wellness offices are a rarity, as evidenced by the low rate in which respondents affirmed access to these types of resources.

Historically, BOS has been explored from an individual standpoint instead of within the scope of a healthcare organization's responsibility. The amount of excessive bureaucracy in the workplace, overwhelming burden of regulatory expectations and endless administrative requirements may directly lead to practitioner's feeling of depersonalization [19]. The concept of wellness offices could focus on many of the factors examined in this, and other studies, that have been identified as stressors for burnout. In fact, The Mayo Clinic has recognized the role that healthcare organizations play in the development of practitioner burnout. Accordingly, Swensen and Shanafelt provide The Mayo Clinic's framework for reducing professional burnout and bringing joy back to clinical practice. The authors discuss 3 outcomes and 6 evidence-based actions that leaders can employ to achieve these outcomes [20].

Addressing the growing prevalence of burnout will serve everyone involved in health care delivery at all levels. This study's findings suggest that infrastructure designed to mitigate BOS and/or promote wellness is an independent predictor of lower rates of practitioners reporting BOS. Healthcare system leadership and the federal government sectors that provide oversight over healthcare systems can help champion this notion through funding and regulations to ensure every practitioner have access to practitioner wellness resources. It is so much easier to simply blame an individual for their inability to cope with frustration and stress as opposed to addressing the root cause of that stress and call it what it is – a system failure. If burnout is to be truly addressed, the focus should not be on the individual, but the institution, as we know in a root cause analysis, it is not about the individual but the process. We have reached a critical point to change course and start working closer together. Current literature supports this notion and suggests that more institutions, like the Mayo Clinic, must take a closer look introspectively as acknowledged in their paper, "Nine Organizational Strategies to Promote Engagement and Reduce Burnout." Burnout is a convoluted issue: burnout syndrome has been consistently viewed as an issue with an individual clinician and not as an institutional, systems issue. Accordingly, individual practitioners have been taxed with the responsibility of prevention and management which has impeded the development of programs and the implementation of infrastructure capable of providing oversight on resources and outcomes [21].

Limitations

Extrapolation of the results of this survey to larger populations is limited by the modest response rate of 35% despite multiple approaches to increase survey completion and by the relatively small number of respondents (n = 100). This response rate, however, is consistent with the average response rate for organizational, survey-based studies (37.2%) [22]. Approximately 90% of the study respondents practiced in North Carolina and Virginia, which may present some limitations to the broad application of these findings to all critical care practices and practitioners. Additionally, there were several questions where one respondent did not answer; however, the investigators do not feel that this has substantially influenced the study's results. Further, the multi-professional nature of the chapter membership is a strength when examining this issue of importance for multiple professions involved in the provision of critical care.

Conclusion

This study supports the paradigm of critical care practitioners having a high rate of self-reported burnout. Despite the deleterious impact of BOS on practitioners' provision of care, minimal infrastructure is in place to mitigate their wellness. High value alignment with institution/employer leadership and resources dedicated to the promotion of wellness, detection and mitigation of BOS are independently associated with a reduction in its frequency. Institutional recognition of BOS, routine evaluation for its presence in practitioners, and implementation of an infrastructure for its mitigation is warranted in order to ensure practitioner wellness.

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References

1. Maslach C, Leiter MP. The Truth About Burnout. San Francisco, CA: Josset-Bass Publishers. 1997.
2. Moss M, Good VS, Gozal D, Kleinpell R, Sessler CN. An Official Critical Care Societies Collaborative Statement: Burnout Syndrome in Critical Care health Care Professionals: A Call for Action. Am J Respir Crit Care Med. 2016; 194:106-13.
3. Poncet MC, Toullic P, Papazian L, Kentish-Barnes N, Timsit JF, Pochard F, et al. Burnout syndrome in critical care nursing staff. Am J Respir Crit Care Med. 2007; 175:698-704.
4. Mealer M, Jones J, Newman J, McFann KK, Rothbaum B, Moss M. The presence of resilience is associated with a healthier psychological profile in intensive care unit (ICU) nurses: results of a national survey. Int J Nurs Stud. 2012; 49:292-299.
5. Embriaco N, Azoulay E, Barrau K, Kentish N, Pochard F, Loundou A, et al. High level of burnout in intensivists: prevalence and associated factors. Am J Respir Crit Care Med. 2007; 175:686-692.
6. Garcia TT, Garcia PC, Molon ME, Piva JP, Tasker RC, Branco RG, et al. Prevalence of burnout in pediatric intensivists: an observational comparison with general pediatricians. Pediatr Crit Care Med. 2014; 15:e347-e353.
7. Linzer M, Poplau S, Babbott S, Collins T, Guzman-Corrales L, Menk J, et al. Worklife and Wellness in Academic General Internal Medicine: Results from a National Survey. J Gen Intern Med. 2016; 31:1004-10.
8. Linzer M, Levine R, Meltzer D, Poplau S, Warde C, West CP. 10 bold steps to prevent burnout in general internal medicine. J Gen Intern Med. 2014; 29:18–20.
9. Tait D. Shanafelt, Colin P. West, Christine Sinsky, Mickey Trockel, Michael Tutt, et al. Burnout among physicians compared with individuals with a professional or doctoral degree in a field outside of medicine. Mayo Clin Proc. 2019; 94:1681-1694.
10. MacNabb M, Ricker M, Singh J. 1056: Burnout in critical care advanced care practitioners [abstract]. Crit Care Med. 2019; 47(1):505.

11. Shoorideh FA, Ashktorab T, Yaghmaei F, Alavi Majd H. Relationship between ICU nurses' moral distress with burnout and anticipated turnover. Nurs Ethics. 2015; 22:64–76.

12. Ackerman AD: Retention of critical care staff. Crit Care Med. 1993; 21:S394–S395.

13. Dyrbe LN, Shanafelt TD, Sinsky CA, Cipriano PF, Bhatt J, et al. July 5, 2017. National Academy of Medicine. 1-11. https://nam.edu/wp-content/uploads/2017/07/Burnout-Among-Health-Care-Professionals-A-Call-to-Explore-and-Address-This-Underrecognized-Threat.pdf. Accessed May 31, 2019.

14. Cimiotti JP, Aiken LH, Sloane DM, Wu ES. Nurse staffing, burnout, and health care-associated infection. Am J Infect Control. 2012; 40:486–490.

15. Poghosyan L, Clarke SP, Finlayson M, Aiken LH. Nurse burnout and quality of care: cross-national investigation in six countries. Res Nurs Health. 2010; 33:288–298.

16. Panagioti M, Geraghty K, Johnson J, Zhou A, Panagopoulou E, Chew-Graham C, et al. Association between physician burnout and patient safety, professionalism, and patient satisfaction: A systematic review and meta-analysis. JAMA Intern Med. 2018; 178:1317-1330.

17. Shanafelt TD, Balch CM, Bechamps G, Russell T, Dyrbye L, Satele D, et al. Burnout and medical errors among American surgeons. Ann Surg. 2010; 251:995–1000.

18. Merlani P, Verdon M, Businger A, Domenighetti G, Pargger H, Ricou B. STRESI+ Group: Burnout in ICU caregivers: a multicenter study of factors associated to centers. Am J Respir Crit Care Med. 2011; 184:1140–1146.

19. Chlan LL. Burnout syndrome among critical care professionals: a cause for alarm. Critical

20. Swensen SJ and Shanafelt T. An organizational framework to reduce professional burnout and bring back joy in practice. The Joint Commission Journal on Quality and Patient Safety. 2017; 43:308-313.

21. Shanafelt TD and Noseworthy JH. Executive leadership and physician well-being: Nine organizational strategies to promote engagement and reduce burnout. Mayo Clin Proc. 2017; 92:129-146.

22. Baruch Y, Holtom BC. Survey response rate and trends in organizational research. Human Relations. 2008; 61:1139-60.