

The Coronavirus Disease 2019 Pandemic Impacts Burnout Syndrome Differently Among Multiprofessional Critical Care Clinicians—A Longitudinal Survey Study

OBJECTIVES: To determine the impact of coronavirus disease 2019 on burnout syndrome in the multiprofessional ICU team and to identify factors associated with burnout syndrome.

DESIGN: Longitudinal, cross-sectional survey.

SETTING: All adult ICUs within an academic health system.

SUBJECTS: Critical care nurses, advanced practice providers, physicians, respiratory therapists, pharmacists, social workers, and spiritual health workers were surveyed on burnout in 2017 and during the coronavirus disease 2019 pandemic in 2020.

INTERVENTIONS: None.

MEASUREMENTS AND MAIN RESULTS: Burnout syndrome and contributing factors were measured using the Maslach Burnout Inventory of Health and Human Service and Areas of Worklife Survey. Response rates were 46.5% (572 respondents) in 2017 and 49.9% (710 respondents) in 2020. The prevalence of burnout increased from 59% to 69% ($p < 0.001$). Nurses were disproportionately impacted, with the highest increase during the pandemic (58–72%; $p < 0.0001$) with increases in emotional exhaustion and depersonalization, and personal achievement decreases. In contrast, although burnout was high before and during coronavirus disease 2019 in all specialties, most professions had similar or lower burnout in 2020 as they had in 2017. Physicians had the lowest rates of burnout, measured at 51% and 58%, respectively. There was no difference in burnout between clinicians working in ICUs who treated coronavirus disease 2019 than those who did not (71% vs 67%; $p = 0.26$). Burnout significantly increased in females (71% vs 60%; $p = 0.001$) and was higher than in males during the pandemic (71% vs 60%; $p = 0.01$).

CONCLUSIONS: Burnout syndrome was common in all multiprofessional ICU team members prior to and increased substantially during the pandemic, independent of whether one treated coronavirus disease 2019 patients. Nurses had the highest prevalence of burnout during coronavirus disease 2019 and had the highest increase in burnout from the prepandemic baseline. Female clinicians were significantly more impacted by burnout than males. Different susceptibility to burnout syndrome may require profession-specific interventions as well as work system improvements.

KEY WORDS: burnout syndrome; clinician well-being; critical care; intensive care unit; multiprofessional; team

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The World Health Organization declared the coronavirus disease 2019 (COVID-19) a pandemic on March 12, 2020. Since then, over 100 million patients have been infected, and millions of deaths have been reported (1). The pandemic has emerged as an unprecedented healthcare crisis, placing

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clinicians under extreme pressure (2–4). Critical care clinicians have been shouldering additional psychologic and moral burdens. The risk of exposure to the virus, potentially infecting loved ones coupled with staffing shortages and increased COVID-19 patient workloads, are associated with the highest prevalence of mental burden (2, 4, 5). Critical care clinicians globally have been impacted significantly due to patient surges and, subsequently, limited resources. Clinicians who directly took part in the diagnosis, treatment, or care of COVID-19 patients are at higher risk for adverse mental health outcomes (2, 4, 6–8). COVID-19 has generated a mental health emergency in healthcare workers and, specifically, critical care clinicians (2).

Burnout syndrome, conceptualized as resulting from occupational stress, such as the highly contagious severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), includes three defining symptoms: high emotional exhaustion, high depersonalization (i.e., cynicism), and a low sense of personal accomplishment from work (9). Before the pandemic, the prevalence of burnout syndrome among critical care professionals ranged between 28% and 61% (10–12). In addition to impacting the affected clinician, burnout syndrome also impairs the clinician's ability to provide patient-centered care. Dissatisfied physicians and nurses are associated with lower patient satisfaction (13–16), reduced health outcomes (13, 17, 18), and may increase healthcare costs related to staff turnover, medical errors, and increased rates of hospital-acquired infections (18–21). Burnout has been identified as a key determinant of medical error in physicians (22).

Cross-sectional studies addressing burnout syndrome in critical care clinicians during the COVID-19 pandemic have so far been limited to one or two professions (2, 8, 23, 24). However, the ICU team is multiprofessional, and findings in a single specialty are not generalizable to all. Therefore, this present study aims to assess whether burnout syndrome during the COVID-19 pandemic differs among members of the multiprofessional team and to identify factors associated with burnout that might be specific to the COVID-19 pandemic.

MATERIALS AND METHODS

Study Design and Setting

Two cross-sectional surveys were conducted at a large academic center. The first survey was performed

from March to May 2017 and the second during the COVID-19 pandemic, from June to December 2020. E-mails were sent to all ICU clinicians in all ICUs in all hospitals within the Emory Healthcare System requesting them to complete the survey. Survey completion was voluntary and anonymous. Two additional e-mail reminders were sent to optimize response rate. In 2017, Emory Critical Care Center included 15 ICUs with 270 beds in four hospitals. In 2020, Emory had 16 ICUs with 302 beds in five hospitals (Emory Decatur Hospital was merged into the healthcare system). This includes three medical, three cardiovascular, two surgical, two neuroscience, three coronary care, and three medical-surgical ICUs (two in 2017). In response to increased patient volume secondary to COVID-19 surges, an additional 50 ICU beds were temporarily opened. COVID-19 patients were managed in either COVID-19 specific or hybrid ICUs that had both COVID-19 and non-COVID-19 patients, separated in a manner approved by infection control teams. A very small number of patients were admitted to specialty non-COVID-19 ICUs if they were found to incidentally have COVID-19 when being admitted for a different diagnosis. The multiprofessional ICU teams include nurses, advanced practice providers (APPs), physician intensivists, respiratory therapists, social workers, spiritual health workers, and pharmacists. Understanding that each profession is unique, responses from the latter four were merged into a category termed “other critical care clinicians (OCs)” due to their overall small numbers. Throughout the article, the term clinician is used as defined by the National Academy of Medicine as “healthcare professionals who provide direct patient care” (9) and thus refers to all members of the multiprofessional ICU team.

Outcome Measure and Data Collection

Burnout was measured by the Maslach Burnout Inventory (MBI) of Health and Human Service (25, 26) using 22 variables grouped into three domains—emotional exhaustion, depersonalization, and personal accomplishment. Clinicians were classified as having high burnout levels when the MBI was greater than -9 (2, 8, 26–30). The Areas of Worklife Survey (AWS) was used to identify the areas of worklife that drive burnout (31, 32). AWS looks at six work environment areas: workload, sense of control, reward, community, fairness, and values. Total and average scores were calculated for each MBI and

AWS domain. This project was approved by the Emory University Institutional Review Board (IRB) (Atlanta, GA; IRB number 00000826). Informed consent was waived, as participation in the surveys was voluntary and anonymous.

Data Analysis

Data were analyzed using SAS 9.4 (SAS Institute Inc., 2013, Cary, NC). Descriptive statistics, including arithmetic mean, percentages, and SD, were used to describe the study population. Multiple regression analysis was done to determine specific areas that were significantly associated with burnout syndrome. For AWS differences per profession, the Mann-Whitney *U* test was performed. Chi-square test was used to compare the prevalence of burnout syndrome between clinicians who treated patients with and without COVID-19, professions, and gender. Trending analysis was used to correlate the level of experience with burnout rates. The level of significance selected was 5% ($\alpha = 0.05$); results were considered statistically significant if *p* value is less than 0.05.

RESULTS

The prepandemic survey was sent to 1233 critical care clinicians, of which 572 responded (46.5%). Of the 1422 clinicians, 710 (49.9%) responded to the pandemic survey. Response rate was over 50% for nurses, APPs, and physicians (highest for APPs at 79%) and lowest for OCs at 29% (Table 1). Sociodemographic data and work characteristics of respondents are shown in Supplemental Table 1 (<http://links.lww.com/CCM/G807>).

Burnout Syndrome Worsened in the Multiprofessional ICU Teams During the Pandemic, With Disproportionate Increases in Nurses

Before the COVID-19 pandemic, 59% of respondents demonstrated the burnout syndrome increasing to 69% during the pandemic ($p < 0.001$) (Table 2). Nurses had the highest increase in burnout during the pandemic (58–72%; $p < 0.0001$). In contrast, although burnout was high before and during COVID-19 in all specialties, most professions had similar or lower burnout in

TABLE 1.
Clinician Response Rates for the Burnout Surveys in 2017 and 2020

	Prepandemic Survey (572)	Pandemic Survey (710)	<i>p</i>
Gender, <i>n</i> (%)			
Female	408 (71.3) ^a	529 (74.5) ^a	
Male	127 (24.9) ^a	146 (20.5) ^a	
Female gender by profession, <i>n</i> (%)			
Nurses	323 (76)	372 (82)	
Advanced practice providers	41 (77)	84 (73)	
Physicians	9 (21)	16 (27)	
Other critical care clinicians	35 (69)	55 (66)	
Burnout prevalence, <i>n</i> (%)			
Female	245 (60)	375 (71)	< 0.001
Male	69 (54)	88 (60)	0.32

n = number of individuals.

Other critical care clinicians are respiratory therapists, pharmacists, social workers, and spiritual health workers.

Response rates within professions are shown for the pandemic survey only (no data available for 2017).

2020. Physicians had the lowest rate of burnout at 51% and 58% before and during COVID-19. Clinicians with 3–5 years of experience had the highest prevalence of burnout syndrome both before and during the pandemic (Supplemental Fig. 1, <http://links.lww.com/CCM/G808>; legend: Prevalence of burnout symptoms by time in practice at the institution).

Emotional exhaustion ($p < 0.0001$) and depersonalization ($p = 0.03$) both increased, whereas the levels of personal achievement ($p < 0.01$) decreased during the pandemic (Supplemental Table 2, <http://links.lww.com/CCM/G809>). Specialty differences were noted, with the biggest differences seen in nurses. Nurses had the worst absolute score in each domain in 2020, whereas physicians had the best score on emotional exhaustion.

In areas of worklife, workload was the only domain significantly increased across all professions ($p < 0.001$) (Supplemental Table 2, <http://links.lww.com/CCM/G809>). Reward, sense of community, and

TABLE 2.
Comparison of Burnout Syndrome Prevalence Between Different Professions at Baseline in 2017 and During the Coronavirus Disease 2019 Pandemic in 2020

	Baseline Survey (572)	Pandemic Survey (710)	<i>p</i>
Burnout prevalence, all clinicians, <i>n</i> (%)	337 (59)	490 (69)	< 0.001
Professions, <i>n</i> (%)			
Nurses	245 (58)	334 (72)	< 0.001
Advanced practice providers	36 (68)	71 (62)	0.44
Physicians	22 (51)	34 (58)	0.52
Other critical care clinicians	34 (67)	51 (61)	0.49

n = number of individuals.

Other critical care clinicians are respiratory therapists, pharmacists, social workers, and spiritual health workers. Boldface values indicate significant *p* values ($p < 0.05$).

fairness all worsened during the pandemic, predominantly driven by nurses and APPs. Control and value were not affected as a result of COVID-19 with identical scores in 2017 and 2020.

The Impact of Treating Patients With COVID-19 on Burnout

A total of 399 respondents self-reported managing patients with COVID-19, whereas 308 did not (three clinicians did not answer). Prevalence of burnout syndrome was not different between clinicians who managed patients with COVID-19 and those who did not (71% vs 67%; $p = 0.26$) (Supplemental Table 3, <http://links.lww.com/CCM/G810>). A small increase in emotional exhaustion in clinicians managing COVID-19 was dominantly driven by differences in nurses. The only difference seen in worklife was an increase in workload, again driven dominantly by changes reported by nurses.

The Impact of Gender on Burnout Before and During COVID-19

Females made up over 70% of respondents before and during the pandemic (Supplemental Table 1,

<http://links.lww.com/CCM/G807>). All specialties had female predominance except for physicians. Before the pandemic, 60% of female clinicians had burnout, whereas 54% of male clinicians reported burnout ($p = 0.25$) (Table 3). Burnout increased disproportionately in female clinicians (60–71%; $p < 0.01$) and was higher compared with male clinicians during the pandemic (71% vs 60%; $p = 0.01$).

DISCUSSION

This is the first longitudinal cross-sectional survey study exploring burnout syndrome during the COVID-19 pandemic that addresses the entire multi-professional ICU team. Our data indicate that burnout syndrome was already high across ICU clinicians at baseline and further increased during the pandemic. Unfortunately, these results highlight just how pervasive burnout is in the entire ICU team, since more than half of clinicians had evidence of burnout syndrome

TABLE 3.
Gender-Related Burnout Specifics for the Prepandemic and Pandemic Surveys: Response Rate, Gender in Professions and Burnout Prevalence by Gender

	Prepandemic Survey (572)	Pandemic Survey (710)	<i>p</i>
Gender, <i>n</i> (%)			
Female	408 (71.3) ^a	529 (74.5) ^a	
Male	127 (22.2) ^a	146 (20.5) ^a	
Female gender by profession			
Nurses	323 (76)	372 (82)	
Advanced practice providers	41 (77)	84 (73)	
Physicians	9 (21)	16 (27)	
Other critical care clinicians	35 (69)	55 (66)	
Burnout prevalence			
Female	245 (60)	375 (71)	< 0.001
Male	69 (54)	88 (60)	0.32

^aNumbers do not add up as in 2017, 37 clinicians (6.5%), and in 2020, 35 clinicians (4.9%) chose not to answer a gender question. Other critical care clinicians are respiratory therapists, pharmacists, social workers, and spiritual health workers.

both before and during the pandemic, regardless of their profession. This is alarming and should act as a call to action since even the specialty with the lowest prevalence of burnout (physicians) had baseline levels of 51%, increasing to 58% during the pandemic. At the same time, our findings demonstrate that burnout is not equally felt across all professions with both highest levels of burnout and highest increases reported during the pandemic identified in nurses.

A multiprofessional team manages patient care in the ICU. However, prior studies of burnout during COVID-19 have dominantly focused on physicians and/or nurses. Our broader approach yields new insights into burnout in equally vital members of the ICU team and allows for comparison 1) between professions in the same healthcare system and 2) to published profession-specific literature. The high level of burnout during the COVID-19 pandemic reported herein is similar to a 50–70% burnout rate described in North American intensivists (2). Additionally, the odds of experiencing burnout during COVID-19 have been reported to be 2.5 times greater for critical care nurses than physicians (8). Although we did not find a discrepancy of this magnitude, we did replicate the finding that burnout is higher in nurses than in physicians. Emotional exhaustion, depersonalization, and lack of personal accomplishment scores in all professions were rated worse in this survey than in a large-scale study of nurses in mainland China and Taiwan during the pandemic (23). However, differences in both healthcare delivery systems between countries and potential cultural differences make direct comparisons difficult.

Unexpectedly, our data showed highest levels of burnout in clinicians with 3–5 years of experience both before and during the pandemic. This was not consistent with a commonly held belief that many with the least experience struggle in the ICU setting, potentially leading to increased burnout early. It was also not consistent with the hypothesis that there is a “shelf life” for working in the ICU due to the emotional and physical strain, and clinicians with the most experience might have higher levels of burnout. Although we did not measure the age of respondents, there is a general correlation between age and experience. However, studies investigating the relationship between age and occurrence rate of burnout syndrome in healthcare professionals have been inconclusive. Published

results range from no evidence of age-related differences (33) to emotional exhaustion initially increasing with age before decreasing around the age of 60 (34) to depersonalization rates decreasing with age (35). Further research is needed to identify why clinicians transitioning from early-mid career stage would have the highest level of burnout in the ICU.

Notably, although over half of the surveyed APPs and OCs reported burnout symptoms in this study, levels of burnout did not increase during COVID-19, and prevalence trended down. These results must be put into the context of relatively modest numbers of respondents, an increase in respondents between 2017 and 2020, and the differential response rate. Further research is required to determine if these findings are related to 1) increases in absolute numbers as staffing levels may be related to burnout, 2) differences in who filled out the survey, or 3) uniqueness of these professions, making them less likely to be impacted by the pandemic. It is important to distinguish these professions’ day-to-day responsibilities as the stressors felt are likely to be different. APPs directly provide patient management, and working frontline has been associated with adverse mental health impacts (5, 36, 37). In this context, it is surprising that APP burnout did not rise during the pandemic, although this may have been related to the fact that it was already very high (68%) at baseline. Considering the increasing role APPs play in the ICU, APP burnout represents an underappreciated problem requiring increased attention. In contrast, most OCs have less bedside responsibilities, and the reasons behind their baseline high level of burnout (67%) require further investigation.

Drivers of burnout are related to different areas of worklife (38). Workload was the only measurement of worklife rated worse during the pandemic, with each profession reporting significantly higher levels. This is not surprising considering the additional large COVID-19 patient population superimposed upon an existing high patient load in ICUs. Increased workload is also directly relevant since prolonged working hours and staff shortages are associated with high mental strain (2, 39). In contrast, although other areas of worklife were different before and during the pandemic (reward, community, fairness), these differences were not identified in all professions. This highlights the importance of not considering the ICU team as a single entity but tailoring interventions to individual professions.

Nurses had both the highest prevalence and the highest increase in burnout when surveyed in 2020. Understanding the etiology of these findings is critical for addressing solutions. Although a survey, by design, cannot explain these findings, we speculate that underlying causes are multifactorial. The ratio of healthcare professional:patient is significantly lower for nurses than other members of the multiprofessional ICU team, and thus nurses spend considerably more time directly caring for patients. The amount of clinical care time spent at bedside may itself contribute to burnout due to the inherent intense nature of spending multiple hours each day with a critically ill patient—which might be further exacerbated during the pandemic. Further, increases in workload (27) combined with a lack of professional activities outside bedside care (such as involvement in a workgroup or research team) exacerbate burnout syndrome (27, 40–42). Additionally, although our survey did not examine whether changes in nurse:patient ratio occurred over the course of the pandemic, nursing shortages in New York and Illinois during the COVID-19 pandemic were associated with increased odds of burnout amidst high patient volumes and pandemic-related anxiety (43). These findings highlight that simply working in an ICU does not result in the same experience for different professions and should result in both profession-specific research into causes of burnout and then profession-specific interventions.

Surprisingly, clinicians directly caring for patients with COVID-19 did not suffer significantly higher levels of burnout. On the surface, it might have been expected that managing patients with a new—and highly contagious—infection that requires additional personal protective equipment would translate into higher levels of overall burnout. Taking care of known SARS-CoV-2 positive patients is independently associated with higher levels of anxiety, fear, depression, and work exhaustion (39, 44–46). However, overall burnout rates were similar between nearly 400 ICU clinicians who cared for COVID-19 patients and over 300 who did not. We believe it is important to juxtapose the overall increase in burnout in 2020 with the finding that burnout was generally independent of whether a clinician cared for COVID-19 patients. This suggests that other elements were responsible for increased burnout. One potential explanation is that overall increased stress related to life in a pandemic coupled with an inability

to perform many activities previously used to destress led to increased burnout. Alternatively, changes in the healthcare system may have played a role: not having visitors in the ICU, working in a hospital where overall risk might be perceived to be elevated, and challenges in staffing and supplies. These results are critical for understanding that burnout is pervasive throughout the healthcare system during the pandemic as opposed to only in COVID-19 ICUs.

Our results demonstrated that female clinicians were affected more by burnout syndrome during the COVID-19 pandemic, in terms of both overall prevalence and increase from 2017. Gender does not have a clear association with burnout as some studies show associations (26, 47, 48), whereas others suggest that after controlling for age and other variables, gender may not be a consistent risk factor (49). However, female clinicians are at increased risk for stress, burnout, and depression during the COVID-19 pandemic. Individual factors such as lack of social support or family status can trigger burnout (50). The pandemic has significantly increased the burden of unpaid care, disproportionately carried by women (51). Female physicians reported a higher burnout rate in a large-scale global survey during COVID-19 (24). Within this context, it is worth noting that the profession most impacted in our study was nursing, which had a higher percentage of females in our survey, consistent with a general preponderance of females in the nursing profession.

The COVID-19 pandemic has highlighted the damaging mental health consequences faced by clinicians (52). In addition to the detrimental effects of burnout syndrome on clinicians, burnout is associated with reduced quality of care, increased medical errors, and lower patient satisfaction (49, 53–56). As such, clinician wellness might not only benefit the individual clinician, but it could also be vital to the delivery of high-quality patient-centered healthcare (57).

Ideally, recognition of burnout should be tied to tangible efforts that focus on increasing clinicians' professional fulfillment rather than just mitigating burnout (38), and sustained clinician well-being programs should address different stressors in individual professions (58).

Our study has several limitations. First, it reflects the experience of a single large academic healthcare center, and it is unclear how generalizable the results are. Second, the response rate for both surveys was

approximately 50%. Although this is similar to response rates before (24.8–96%) and during the pandemic (20–50%) (2, 8, 10), the “healthy worker effect” is a bias related to burnout studies as individuals suffering from burnout symptoms return on average fewer surveys (59). As such, it is possible the burnout rates were even higher than reported here. At the same time, there might also have been self-selection of clinicians with burnout being more likely to return their surveys because they wanted to share their experience, which could have resulted in an overestimation of burnout prevalence. Third, we may have missed important information since there was a widespread variation in the percentage of surveys returned by profession. This is especially pertinent in the OC group—the only group with a less than 50% response rate. Fourth, most respondents of the survey were female, and there were gender differences in the percentage of respondents for each profession. This could potentially have biased the results in a number of different ways. It is also possible that either gender differences or profession-specific differences seen in burnout might have been reflective of the fact that the majority of respondents in both surveys were female nurses. Fifth, we combined multiple disparate professions into the OC group. The rationale was that each profession’s numbers were small, which would make it difficult to see differences simply based upon sample size. However, the strategy of lumping together disparate professions with different responsibilities and stressors could obscure important specialty-specific observations. More globally, the relatively modest number of respondents in all professions except nursing might have obscured differences easier determined with larger sample size. Sixth, we surveyed an additional hospital in 2020, and we do not know if these ICU clinicians would have had baseline burnout levels similar to those seen in the other four hospitals. The impact from this would likely be modest, representing only 10.5% of beds in the final survey. Seventh, there were three years between the baseline and pandemic survey, which means that there will have been some turnover in the multiprofessional team. Eighth, the survey asked clinicians if they had recently managed patients with COVID-19. However, it did not distinguish between clinicians taking care of COVID-19 patients exclusively for months at a time from those that worked in hybrid units or those that worked in a non-COVID-19 ICU but “floated” intermittently

to COVID-19 ICUs. Levels of burnout might have changed based upon length and degree of exposure to managing COVID-19 patients. Finally, although we assume that changes seen in the 2020 survey were due to the pandemic, burnout syndrome as a whole appears to be increasing in healthcare over time. As such, it is possible the increase in burnout seen was not directly attributable to COVID-19 but rather was due to other unmeasured variables instead.

CONCLUSIONS

Despite these limitations, these results are a sobering reflection of the severity of burnout across the multiprofessional team and the heightened levels of burnout seen in ICU clinicians during a pandemic. Further, they demonstrate that not all professions or genders are equally impacted, with a disproportionate increase in burnout in nurses and female clinicians. Our results demonstrating similar levels of burnout by ICU clinicians regardless of whether they manage COVID-19 patients strongly suggest that simply practicing critical care during a pandemic puts all members of the multiprofessional critical care team at risk. Efforts toward improving well-being should be designed accordingly.

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