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BRIEF COMMUNICATION

Burnout and Resilience Among Neurosciences Critical Care Unit Staff

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Abstract

Background: Preventing burnout and promoting resiliency are important for health professionals' well-being and quality of patient care, as individuals with high levels of burnout are more likely to self-report suboptimal patient interactions. The purpose of this study was to characterize resiliency and burnout among health care professionals in the neurosciences critical care unit (NCCU) at a tertiary care center.

Methods: All NCCU clinical staff were invited to participate in a Qualtrics® electronic survey between November 2016 and August 2017. The survey assessed burnout using the abbreviated Maslach Burnout Inventory (aMBI) and resiliency using the ten-question Connor–Davidson Resilience Scale (CD-RISC 10). Higher scores on each aMBI subsection (range 0–18) indicate higher levels of each characteristic; larger resiliency scores (range 0–40) indicate higher resiliency. Categorical variables were compared using the Chi-square test and continuous variables using the Mann–Whitney U test or independent samples t test.

Results: A total of 65 participants (65/70, 93%) were included in the final analysis. Of respondents, 49 (75%) were nurses, 49 (75%) were female, and mean age was 34 years. Median emotional exhaustion, depersonalization, and personal accomplishment scores were as follows: 8 (IQR 6–11), 3 (IQR 0–6), and 15 (IQR 13–16). High emotional exhaustion scores and high depersonalization scores were reported in 45% ($n = 29$) and 28% ($n = 18$) of participants, respectively. Longer time working in the NCCU (1–5 years vs. less than 1 year) was independently associated with higher emotional exhaustion scores ($p = 0.012$). When compared to agnostic/atheist backgrounds, Catholicism was independently associated with higher personal accomplishment scores ($p = 0.026$). The median resiliency score was 31 (IQR 28–36). Older age was independently associated with higher resiliency scores ($p = 0.044$).

Conclusions: This study is the first to characterize levels of burnout and resiliency among NCCU providers. A significant minority of participants reported high levels of emotional exhaustion and depersonalization, with those working longer in the NCCU more likely to experience emotional exhaustion. Efforts to improve the current work environments to optimally support the emotional needs of staff are needed to allow care providers to thrive and to promote longevity among NCCU providers.

Keywords: Chaplain, Critical care, Neurological critical care, Staff, Nurses, Physician, Burnout, Resilience

Introduction

Intensive care staff face unique demands, including management of end-of-life concerns, family decision making, intense and prolonged care, and issues of medical futility.

The neurosciences critical care unit (NCCU) may be a particularly challenging work environment due to high numbers of patients with brain death as well as a high incidence of uncertainty regarding survival, functional outcome, and health-related quality-of-life prognostication [1]. Indeed, the highest rates of physician burnout—defined as mental, emotional, or physical impairment resulting from work-related stress—are among neurology

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and critical care providers (48% in each) [1, 2]. A related concept to burnout is that of resiliency, or the ability to endure and recover from challenges [3]. Preventing healthcare staff burnout and promoting resiliency is also important for the quality of patient care, as providers with high levels of burnout are more likely to self-report suboptimal patient interactions [3].

To the authors' knowledge, no papers have yet characterized burnout and resiliency levels among healthcare staff in an academic center NCCU. This paper seeks to report burnout and resiliency levels and to identify associated demographic variables that may impact them. We hypothesized that older staff and those with more experience in the NCCU would have lower burnout and higher resiliency scores.

Methods

Study Design
Cross-sectional study assessing NCCU staff burnout and resiliency.

Participants and Setting
Study participants were NCCU faculty, nurses, nurse practitioners, and fellows who spent two or more weeks in the NCCU at an academic institution between August 2016 and June 2017.

Survey Content
Participants completed a 33-question survey designed to assess levels of burnout and resiliency among clinical staff. Burnout was assessed using the abbreviated Maslach Burnout Inventory (aMBI), a survey which has been validated among rural-based medical practitioners [4]. The abbreviated form, or aMBI, encompasses three subsections: emotional exhaustion, depersonalization, and personal accomplishment. Prior studies have delineated cutoffs for high emotional exhaustion (9 or greater) and high depersonalization (6 or greater) [5]. Resiliency was assessed using an abbreviated Connor-Davidson Resilience Scale (CD-RISC 10) which consists of ten questions [6] and has been validated among rehabilitation inpatients and university students [7, 8]. Larger resiliency scores (range 0–40) indicate higher resiliency.

Data Collection
Qualtrics® was used to deploy and manage the e-mail survey (Qualtrics Labs, Inc). The questionnaire was sent at two separate time points during the fall and summer and surveys were available for approximately 4 weeks. An informed assent statement appeared at the beginning of the survey, and no identifying information was collected. The study was granted exempt status by the Institutional Review Board.

Table 1 Participant characteristics

Characteristic	Value
Participants (*n*)	65
Age (mean, SD)	34 (10)
Gender (*n*, %)	
Female	49 (75)
Male	16 (25)
Race (*n*, %)	
African-American	6 (10)
Asian	6 (10)
White	47 (75)
Other	4 (6)
Role (*n*, %)	
Faculty	6 (9)
Fellows	4 (6)
Nurses	49 (75)
Nurse practitioners	2 (3)
Other	4 (6)
Faith orientation (*n*, %)	
Agnostic/atheist	10 (16)
Catholic	26 (42)
Muslim	2 (3)
Jewish	3 (5)
Protestant	15 (24)
None	6 (10)
Marital status (*n*, %)	
Cohabitating	3 (5)
Married	23 (35)
Separated/divorced	4 (6)
Single	35 (54)

SD standard deviation

Table 2 Abbreviated Maslach Burnout Inventory component scores

Scores	Value
Emotional exhaustion (median, IQR)[a]	8 (6–11)
High [9 or higher; *n* (%)]	29 (45)
Depersonalization (median, IQR)[a]	3 (0–6)
High [6 or higher; *n* (%)]	18 (28)
Personal accomplishment (median, IQR)[b]	15 (13–16)

IQR interquartile ranges

[a] Higher scores on the emotional exhaustion and depersonalization subsections (range 0–18) indicate higher levels of each characteristic and thus more burnout

[b] Higher scores in the personal accomplishment subsection (range 0–18) indicate less burnout

Data Analysis
Continuous variables were summarized as median values with interquartile ranges (IQR), while categorical

variables were reported as whole numbers and percentages. Categorical variables were compared using the Chi-square test and continuous variables using the Mann–Whitney U test or independent samples t test. All data were analyzed using SPSS 24 (IBM, SPSS Inc., Chicago, Illinois, USA). A p value of less than 0.05 was deemed statistically significant.

Results

A total of 112 possible participants assigned to clinical duties in the NCCU were emailed a link to the survey. Of these, 85 (76%) opened the link and 70 completed some or all of the survey (70/85, 82%). To ensure that respondents had spent more than 2 weeks in the NCCU, residents were excluded from the analysis. A total of 65 participants (65/70, 93%) were included in the final analysis. Of respondents, 49 (75%) were nurses, 49 (75%) were female, and mean age was 34 years. Remaining participant demographics are shown in Table 1.

Median emotional exhaustion, depersonalization, and personal accomplishment scores were as follows: 8 (IQR 6–11), 3 (IQR 0–6), and 15 (IQR 13–16) (Table 2). High emotional exhaustion scores and high depersonalization scores were reported in 45% ($n = 29$) and 28% ($n = 18$) of participants, respectively. Longer time working in the NCCU (1–5 years vs. less than 1 year) was independently associated with higher emotional exhaustion scores ($p = 0.012$). Gender, role, age, race, and marital status had no effect on these outcomes (all $p > 0.05$). A provider role (fellows, faculty, and nurse practitioners) was independently associated with lower emotional exhaustion scores than a non-provider role (clinical technicians, medical assistants, and nurses) ($p = 0.0047$), but there were no significant differences among other categories. When compared to agnostic/atheist backgrounds, Catholicism was independently associated with higher personal accomplishment scores ($p = 0.026$). Other faith orientations had no relationship with aMBI subsection scores. Identifying with a faith group (versus agnostic/atheist background) had no association with aMBI subsection scores.

The median resiliency score was 31 (IQR 28–36). Older age was independently associated with higher resiliency scores ($p = 0.044$). No other demographic variables were associated with resiliency scores (all $p > 0.05$).

Discussion

Our study is the first to characterize resiliency and burnout levels among NCCU staff. Among NCCU staff, a longer time working in the NCCU was associated with higher emotional exhaustion. Older age alone was independently associated with higher resiliency scores.

Longer time working in the NCCU (1–5 years vs. less than 1 year) was independently associated with higher emotional exhaustion scores. Time pressure and heavy workload have been identified as the primary causes of burnout, specifically with regard to the emotional exhaustion component [9]. It is conceivable that years of stress caring for acutely ill patients and distraught family members have a cumulative impact on the emotional state of NCCU healthcare staff. Of note, this finding appears contrary to many other studies which found that longer time in the intensive care unit (ICU) setting is associated with lower levels of emotional exhaustion [10, 11] and also seems contradictory to our finding that older age was associated with higher resilience. Notably, however, age was not associated with higher emotional exhaustion scores, suggesting that it is the length of time in the NCCU itself rather than cumulative life experience that contributes to emotional exhaustion.

Our study did find that older participants had higher mean resiliency scores than younger participants. Prior research performed in the UK National Health Service reported similar results, finding a weak positive correlation between age and resilience with older healthcare workers having higher levels of resilience [12]. Mealer et al. [13] found that older age was significantly associated with high resilience among ICU nurses, as measured using the Connor-Davidson Resilience Scale. Several clinical studies in the ICU setting have also identified young age as a risk factor for burnout, which often correlates with lower resiliency. Ayala and Carnero [14], for example, found that young age of acute and critical care military nursing personnel was associated with the development of burnout in the depersonalization and emotional exhaustion domains. Aytekin et al. [10] reported lower rates of burnout in neonatal intensive care nurses ages 36 years and older, as measured by the personal accomplishment domain. It is possible that these findings, including our own, indicate a selection bias. That is, staff with lower resilience may move on to other employment before they reach an older age, such that older staff who were surveyed are more likely to have higher resilience.

The results of this study will be used as pilot data to lead focus groups with NCCU providers. In these sessions, participants will explore potential sources of burnout or low resiliency. Furthermore, we propose routine screening of NCCU staff at the beginning of their employment to identify those at highest risk of burnout and early exit from the NCCU. For individuals who endorse symptoms of burnout, there are several potential interventions that could be helpful. The first is professional coaching for medical providers, which has been shown to decrease burnout and increase life satisfaction in employees in

the healthcare and education sectors [15]. The second is implementation of small groups that allows professionals to form a community, a sense of connection, and a larger meaning for their work. An intervention for physician burnout based on facilitated small-group sessions significantly decreased rates of emotional exhaustion and depersonalization [16]. A mindfulness meditation education program for staff members is also possible. In a recent systematic review of interventions for burnout, mindfulness medication was shown to significantly decrease emotional exhaustion and depersonalization scores [17].

There were several limitations to this study. First, the majority of respondents were white, female, and in the nursing profession, which may limit generalizability to other populations providing care in the NCCU. The sources of burnout and occupational stressors likely differ among provider roles, and more nuanced qualitative methods may be more effective at ascertaining these role differences. Second, we did not ask participants whether they had experience working in other critical care or palliative care settings prior to working in the NCCU. It is possible that individuals with previous work experience in high intensity care settings reported higher levels of burnout. Third, although the confidentiality of the survey was made clear to participants, it is possible some were hesitant to disclose high levels of burnout or reveal low levels of resiliency. Fourth, we performed our study at a single-center tertiary care hospital which may limit the generalizability of our results. Finally, we recognize that individuals affected by burnout or those with low resiliency may be more unlikely to complete a survey. If this is true, our study likely underestimates the true burden of burnout in this population.

Conclusions
To our knowledge, this study is the first to characterize levels of burnout and resiliency among care providers in the NCCU. A significant minority of participants reported high levels of emotional exhaustion and depersonalization, with those working longer in the NCCU more likely to experience emotional exhaustion. Efforts to improve current work environments to optimally support the emotional needs of staff are needed to allow care providers to thrive and to promote longevity among NCCU providers.

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Human and Animal Rights
All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki Declaration and its later amendments or comparable ethical standards. This article does not contain any studies with animals performed by any of the authors.

Ethical Approval/Informed Consent
Full ethical approval was not obtained for this study. Rather, the IRB granted an exemption for this study because no identifying information was collected about participants, and the survey administered was deemed to be of minimal risk to participants. Informed consent was not required by the IRB given the exempt nature of this study.

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