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Mental Health Concerns of Frontline Registered Nurses

Associated with the COVID-19 Pandemic

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Practice with an emphasis in Family Nurse Practitioner

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Abstract

Problem

COVID-19 caused local healthcare facilities to admit patients with COVID-19 at increasing rates, critically overloading healthcare system resources. Caregiver-related stress associated with the COVID-19 pandemic placed frontline registered nurses (RNs) at risk for mental health consequences (Havlioglu & Demir, 2020; Shechter et al., 2020).

Methods

This quality improvement project used a descriptive design to administer a collection of validated instruments assessing anxiety, depression, posttraumatic stress disorder (PTSD), and demographics. A purposive sample of RNs were recruited from the COVID-19 units in a local hospital, and the survey was distributed via email.

Results

During the implementation period (April 4, 2021-May 15, 2021), 56 RNs began the survey with 47 fully completing and nine partially completing the survey. Participants self-reported symptoms consistent anxiety ($n = 19/56$, 33.9%) and depression ($n = 21/56$, 37.5%). PTSD was marked as a concern for RNs scoring greater than 33 on the IES-R (McCabe, 2019; Nie et al., 2020); 25% of RNs ($n=14/56$) met this criterion. Of all participants, 53.5% ($n=30/56$) self-reported substance use to cope with the stress related to the pandemic. Some RNs admitted to thoughts of self-harm ($n = 5/56$, 8.9%).

Implications for Practice

This project revealed frontline RNs are at risk for mental health issues with inadequate resources to manage potential issues. Expansion of employee assistance programs are essential to follow up on Centers for Disease Control and Prevention [CDC] recommendations and data uncovered in this project.

COVID-19 is a novel infectious disease, causing a worldwide public health emergency. The first confirmed COVID-19 case surfaced in the target county on March 9, 2020, and by March 13, 2020, the county declared a state of Emergency (St. Louis County Cares, 2020). Local healthcare facilities admitted COVID-affected patients at increasing rates, critically overloading healthcare system resources. During this uncertain time, nurses experienced fear in not only contracting the virus, but in also spreading it to loved ones (Havlioglu & Demir, 2020; Zandifar et al., 2020). RNs were placed on the frontline of the pandemic response with little preparation and limited resources to manage what was to come. This placed them at risk for mental health consequences (Havlioglu & Demir, 2020; Shechter et al., 2020) still prevalent more than one year later as the pandemic response continues to unfold.

Frontline RNs are at highest risk of developing a mental illness as they continue to spend most work time caring for COVID-19 patients compared to other hospital staff (Cai et al., 2020; Shechter et al., 2020). Yet, Zandifar et al. (2020) report during the pandemic, RNs are not likely to seek appropriate services to improve potential mental health issues in part due to the stigma associated with mental illness. According to the CDC (2019), even prior to the pandemic, pre-existing poor mental health can negatively impact employees' job performance, productivity, and daily functioning, further negatively impacting patient care (Magtibay, Chesak, Coughlin, & Sood, 2017). Individuals who struggle with mental health issues, such as anxiety or depression, without proper resources may turn to drugs and alcohol to cope, further worsening mental health and job performance (CDC, 2019; United States Department of Health and Human Services [USDHHS], 2019b).

CDC recommends offering employees mental health assessments to identify individuals at risk of mental health concerns, referring to appropriate treatment, or providing resources to improve employee mental health, job productivity, and coping (CDC, 2019). Despite recommendations made by CDC, local hospitals may lack mental health assessment programs and coping resources for frontline RNs. Mental health assessment is appropriate to prevent the long-term effects of the stress nurses endure during the COVID-19 pandemic (CDC, 2019; Nie et al., 2020; Rossi et al., 2020).

The purpose of this quality improvement project was to implement mental health assessments of frontline RNs caring for COVID-19 patients during the pandemic using validated anxiety, depression, and PTSD instruments. The aim was to identify mental health concerns in RNs caring for COVID-19 patients to subsequently provide early intervention during the pandemic. A minimum 30% survey completion rate by the RN sample over a six-week period was anticipated to obtain completion rates consistent with studies from the literature review. Primary outcomes of interest were scores on the validated instruments to quantify severity of anxiety, depression, and PTSD. This project was designed to answer the study question: what are the mental health concerns experienced by RNs who are currently providing direct patient care services in the hospital setting to patients with a COVID-19 diagnosis during the pandemic?

Review of the Literature

A comprehensive review of the literature was conducted to identify research related to frontline nurses' mental health during COVID-19 using CINAHL, Medline, and Cochrane Library. Databases were searched using keywords and Boolean operators "mental health and covid-19" AND "healthcare workers OR nurses OR medical workers

OR healthcare professionals." The initial search returned 128 articles from CINAHL, 266 articles from Medline, and 13 articles from Cochrane Library, for a total of 407 articles. To further limit the search to relevant articles, the following criteria were applied: (1) focus on mental health in healthcare workers related to the COVID-19 pandemic, (2) published in English, (3) published after January 1, 2019, and (4) other countries outside the United States (U.S.). After filters were applied, 11 articles met inclusion criteria and were selected for review.

Literature reviewed identified specific instruments to assess anxiety and depression symptoms during the pandemic. Among them, three studies performed in China, Italy, and New York City use the Generalized Anxiety Disorder 7-item (GAD-7), Patient Health Questionnaire 9-item (PHQ-9), or their shorter 2-item counterparts (GAD-2 or PHQ-2) to report healthcare workers' (HCWs) increased prevalence rates of anxiety and depression (Cai et al., 2020; Rossi et al., 2020; Shechter et al., 2020). The GAD-7 is a validated tool with 89% sensitivity and 82% specificity, whereas the PHQ-9 is a validated tool with 88% sensitivity and 88% specificity, indicating reliable results from both instruments (Kroenke, Spitzer, & Williams, 2001; Spitzer, Kroenke, Williams, & Lowe, 2007). The GAD-7 and PHQ-9 are preferred instruments for assessing anxiety and depression, and because the two conditions often coexist, they are recommended to be assessed concurrently (Kroenke et al., 2007).

Contributing to frontline RNs' anxiety and depression is morbidity and mortality associated with COVID-19 patient care and subsequent feelings of guilt and grief RNs experience (Zandifar et al. 2020). Four cross-sectional studies conducted in China, Italy, Turkey, and New York City ranging from March 2020-May 2020 indicate frontline

HCWs demonstrate increased prevalence rates of anxiety and depression symptoms while caring for COVID-19 patients (Cai et al., 2020; Havlioglu & Demir, 2020; Rossi et al., 2020; Shechter et al., 2020). Anxiety and depression experienced by RNs can lead to personal sleep disturbances related to inadequate coping, which can further worsen their anxiety, depression, and PTSD (Rossi et al., 2020; Shechter et al., 2020; Xie et al., 2020; Yin et al., 2020).

RNs are regularly caring for ill patients diagnosed with COVID-19, predisposing them to mental health concerns of anxiety, depression, and PTSD (Preti et al., 2020; Shechter et al., 2020; Zandifar et al., 2020). In China, two cross-sectional studies completed between February 2020-March 2020 utilized the Impact of Event Scale-Revised (IES-R) instrument to assess increased prevalence of PTSD in frontline HCWs during the pandemic (Nie et al., 2020; Xie et al., 2020). IES-R calculated sensitivity is 86% and calculated specificity is 80%, indicating the instrument is reliable and valid to quantify PTSD (Morina, Ehring, & Priebe, 2013). The IES-R's three subscales assess intrusion, avoidance, and hypervigilance, three main symptoms of PTSD (McCabe, 2019). This instrument is for assessment purposes, not diagnostic use, while there is no specific cutoff point, a score of 33 out of 88 indicates PTSD concerns (McCabe, 2019; Nie et al., 2020).

Providing care for patients during past and present epidemics and pandemics may be perceived as traumatic working conditions, elevating PTSD risk. A meta-analysis on past epidemics and pandemics reported 51.5% of HCWs providing care to infected patients were at risk for PTSD using the IES-R (Preti et al., 2020). These rates are consistent with current COVID-19 pandemic data. Cross-sectional studies in New York

City (51.6% $n=339/657$) and Italy (49.38% $n=681/1379$) completed during March 2020-April 2020 describe presence of posttraumatic stress symptoms in frontline HCWs from caring for COVID-19 patients (Rossi et al., 2020; Shechter et al., 2020). In the United States, RNs have been providing care for COVID-19 patients since March 2020 through the present date, thereby increasing risk of developing PTSD symptoms long term.

The RN workforce predominantly consists of females (90.9%; $n= 3,546,320$ of 3,900,769) in the U.S., and the state of Missouri mirrors national data [91.3%; $n=125,184$ of 135,935] (Missouri State Board of Nursing, 2020, p. 7; Smiley et al., 2019, p. s11). According to the USDHHS, pre-pandemic data demonstrated women are more likely than men to develop PTSD and more than twice as likely to develop anxiety and depression than men (USDHHS, 2019a; USDHHS, 2019b; USDHHS, 2018). Additionally, women often experience PTSD symptoms longer than men before receiving a diagnosis and treatment (USDHHS, 2018). Since RNs are more often female, RNs' risk of developing these mental health issues during COVID-19 is increased. In four prevalence studies during the pandemic, women were found to have the highest rates of any mental illnesses, and three of those studies found RNs to have higher rates of any mental health concern compared to aides, physicians, and advanced practice providers (Havlioglu & Demir, 2020; Rossi et al., 2020; Shechter et al., 2020; Zanidfar et al., 2020).

A local project was implemented based on pre-pandemic CDC workplace recommendations to identify mental health concerns in frontline RNs working on inpatient COVID units. The Plan-Do-Study-Act (PDSA) model served as the framework for this project; PDSA is endorsed by the Institute for Healthcare Improvement [IHI] (IHI, 2020). The *plan* stage detects areas for improvement and develops the strategy for

change. In this stage, the principal investigator (PI) met with management at the facility to discuss implementing mental health assessments to RNs in the COVID-19 units. Feasibility, procedures, aim, purpose, methods, and outcomes were established with management. *Do* is the phase of implementation, in which RNs in a local metropolitan hospital completed a survey with validated instruments for anxiety, depression, PTSD, and demographic questions. After surveys were completed, results were scored as directed by the instrument developer and analyzed in the *study* phase. Based on the literature, CDC recommendations (CDC, 2019), and survey results, the *act* phase consists of customizing the intervention for a future PDSA cycle and test of change.

Prevalence studies completed during the pandemic document increased rates of mental health concerns in HCWs, and long-term impact is not yet clear as current data are limited to cross-sectional, descriptive reports. Furthermore, these studies are limited by HCWs' self-report, calling into question conformity bias and honesty. A common limitation in the studies is a lack of workplace mental health assessments and subsequent coping resources for staff who care for COVID-19 patients. This reveals an area of improvement in the workplace this project addresses, as early identification has been identified to reduce long-term mental health complications in pre-pandemic situations (CDC, 2019; Zandifar et al., 2020).

Methods

Design

This quality improvement project used a descriptive design to assess a purposive sample of frontline RNs' mental health associated with caring for COVID-19 patients during the pandemic. Quantitative prevalence data were collected to assess anxiety, depression, and PTSD. Validated instruments used include: GAD-7, PHQ-9, and IES-R.

Setting

This project was implemented in a metropolitan area with 88 municipalities and 21 hospitals providing acute and chronic care (Missouri Department of Health & Senior Services, 2020). The suburban, Midwestern non-profit hospital can accommodate 426 patients (American Hospital Directory, 2020). The facility's COVID ICU employs 90 RNs, while the medical COVID unit is staffed by 87 general medicine RNs.

Sample

A purposive sample of 90 ICU RNs and 87 medical RNs employed on COVID-19 units were recruited for a total of 177 frontline RN participants from the suburban hospital. Recruitment strategies included fliers posted on the units, emails sent by management promoting the survey, and invitations to participate emailed by the PI on a biweekly schedule. Inclusion criteria were: employed as an RN in the facility's COVID-19 units, caring for patients with COVID-19 between March 2020 and data collection, age 18-years and older, English speaking, and all races and ethnicities. Exclusion criteria were: not an RN, not providing care for patients diagnosed with COVID-19 or not employed in COVID-19 units, not employed by the Midwestern suburban hospital (i.e., agency RNs), less than 18-years old, and non-English speaking. Target number of completed surveys was 53, as this is approximately 30% of the purposive sample recruited and is consistent with survey completion rates in the literature (Nie et al., 2020).

Procedures

The survey was developed in Qualtrics with seven questions assessing anxiety on a four-point Likert scale, nine questions assessing depression on a four-point Likert scale, 23 questions assessing PTSD on a five-point Likert scale, and 16 demographic questions.

A written consent waiver was obtained from the facility to maintain anonymity.

Participants consented to the project by clicking “continue” after reading informed consent. At the end of the survey, local resources, national resources, and healthy coping strategies were available as an information sheet for participants to view and download.

A total of three emails were sent by the PI to all RNs employed in the COVID-19 units over a six-week period, on a biweekly basis. Upon conclusion of the project, May 15, 2021, data from the survey were downloaded into a Microsoft Excel spreadsheet for analysis. Data were saved on the PI’s password-protected computer and will be retained for a period of seven-years by the PI, after which time all data will be destroyed.

Data Collection/Analysis

A total of 56 survey responses were obtained during the six-week data collection period ($n=56/177$, 31.6%). Fully completed surveys totaled 47 of 56; therefore nine were incomplete. Incomplete surveys were included for analysis, with unanswered instrument questions scored as zero. Data collected included anxiety, depression, and PTSD scores calculated from the corresponding Likert scales. Pearson’s correlation test examined the relationship between anxiety, depression, and PTSD. Two MANOVA tests were used to assess if there was a significant difference in anxiety, depression, and PTSD in clinical areas and if there was a difference in the assessed mental health between genders.

Approval Process

The PI obtained approval from the doctoral committee, exempt approval from the University IRB, and full board review from the facility. All results were anonymous with no personal identifiers collected. Risks to participants were minimal.

Results

In the six-week implementation period between April 4, 2021-May 15, 2021, a total of 56 RNs ($n=56$, 31.6%) completed the survey. There were 47 surveys completed in full and nine partially completed surveys. The sample majority was female ($n=43/56$, 76.8%), Caucasian ($n=45/56$, 80.7%), and between the ages of 18-39 years ($n=42/56$, 75%). ICU RNs represented majority of the sample ($n=34/56$, 60.7%) compared to RNs in general medicine ($n=22/56$, 39.2%).

Of all participants, 33.9% ($n= 19/56$) scored moderate to severe anxiety on the GAD-7, with a score greater than or equal to ten (Figure 1). Moderate to severe depression was indicated by a score of greater than or equal to ten on the PHQ-9 and accounted for 39.2% ($n=22/56$) of participants (Figure 2). PTSD concerns were noted with a score greater than or equal to 33 on the IES-R, with 25% ($n=14/56$) of RNs meeting this cutoff criterion (Figure 3) (McCabe, 2019; Nie et al., 2020).

A concern demonstrated by survey results center around reported coping mechanisms. Of RNs who participated, 44.6% ($n= 25/56$) indicated they have been “coping somewhat poorly” or “coping very poorly” with their mental health during the pandemic. Additionally, 53.5% ($n=30/56$) self-reported using a combination of the following: alcohol, marijuana, tobacco, and controlled substances such as opioids or benzodiazepines without a prescription to cope with the stress related to the pandemic. Seven participants selected “prefer not to answer” regarding substance use.

Further results indicated five of 56 participants reported thoughts of self-harm in the PHQ-9. Of them, three worked in general medicine and two worked in the ICU. Four

of the nurses with thoughts of self-harm reported use of some combination of substances to cope with pandemic-related feelings.

Pearson's correlation analysis identified statistically significant positive correlation between anxiety, depression, and PTSD. The correlation analysis assessed relationships using an alpha level of 0.05. A statistically significant positive correlation between anxiety and depression ($r_p = 0.76$, $p = < .001$), anxiety and PTSD ($r_p = 0.59$, $p = < .001$), and depression and PTSD ($r_p = 0.67$, $p = < .001$) were demonstrated.

Two MANOVA tests were used to assess differences in anxiety, depression, and PTSD when comparing patient care areas and gender. Results were statistically insignificant, with similar scores of anxiety, depression, and PTSD between the COVID ICU and medical COVID floor, $F(3,49) = 0.79$, $p = 0.505$, $\eta^2_p = 0.05$. Analysis of anxiety, depression, and PTSD between genders were statistically insignificant $F(6, 98) = 1.42$, $p = 0.216$, $\eta^2_p = 0.08$, which is inconsistent with findings in the literature.

Discussion

This quality improvement project used the PDSA framework to assess mental health concerns of frontline RNs during COVID-19. ICU RNs and general medicine RNs working in COVID-19 units exhibited statistically significant positive correlations between anxiety, depression, and PTSD with large effect sizes. Consistent with the literature, anxiety and depression coexisted in this sample. PTSD scored the lowest positive assessment rate; however, this one-year pandemic assessment may be too early to fully assess PTSD in the frontline RN population. Longitudinal studies would be ideal to gauge if PTSD becomes a health problem long term, as literature shows PTSD to be a lasting effect in previous epidemics and pandemics (Prete et al., 2020).

CDC (2019) and USDHHS (2019b) report substance use can further worsen mental health. This is consistent with findings from this project, as half of participants admit to using substances to cope with COVID-19 patient care, and five RNs reported thoughts of self-harm. Based on findings of elevated mental health assessment scores and results related to coping mechanisms, crisis counseling or referral for mental health treatment should be offered to staff (CDC, 2019).

A noteworthy limitation in assessing mental health issues is delay in distributing the survey, while at the same time vaccine distribution in the facility made progress. The survey was developed prior to vaccine distribution, and when the survey was released to employees, the facility already administered 10,960 vaccines to healthcare staff. Nearly halfway through implementation of the assessment, April 21, 2021, the facility experienced the first day with zero COVID-19 patients. These positive milestones in the timeline of the pandemic could potentially alter responses to reflect less mental health consequences of the pandemic. Further limitations include not knowing pre-pandemic, pre-existing mental health of participants, incomplete surveys potentially underestimating mental health issues, no control for variables, and responses limited by self-report.

Moving forward, longitudinal studies need to be completed including all HCWs, to see if mental health impacts of providing direct care to COVID-19 patients has long-term effects in frontline HCWs. Nursing management can incorporate means to monitor employees for signs of mental illness or inadequate coping related to patient care. Expanding employee assistance programs (EAP) is recommended to help address healthy coping strategies and substance use identified in this population. Early identification of

mental health issues is essential to prevent long term negative health outcomes for employees (CDC, 2019).

Implementing early assessments in conjunction with referral for treatment can assist hospital administration anticipate mental health consequences in staff during the COVID-19 pandemic and future times of stress, disasters, or tragedies. CDC reports mental health issues can reduce cognitive performance by about 35% (CDC, 2019). Magtibay et al. (2017) document HCWs need to perform at the best ability to not compromise patient safety, quality of care, and patient outcomes. When tied to other research, these mental health concerns can negatively impact the individual employee, job performance, work environment, and patient outcomes (Havlioglu & Demir, 2020; Magtibay et al., 2017; Shechter et al., 2020), further reinforcing the necessity for mental wellness initiatives in the hospital.

Conclusion

More than one year into the COVID-19 pandemic, frontline HCWs continue to lead the pandemic response for patient care. The persistent exposure to COVID-19 places these HCWs at risk for mental health concerns (Havlioglu & Demir, 2020; Shechter et al., 2020). With the end date of the pandemic still unknown, lasting impact on HCWs' mental health is not well-understood. This project is the beginning of long overdue mental wellness in the workplace to address the mental health effects healthcare workers face. By bringing awareness to the mental health consequences of the COVID-19 pandemic, this hospital administration, management, and the doctoral-prepared advanced practice nurse may be prepared for potential mental health issues from possible future emergencies. They play a vital role in implementing evidence-based recommendations

into practice to reduce adverse mental health effects in HCWs and streamline mental health initiatives to reduce poor coping.

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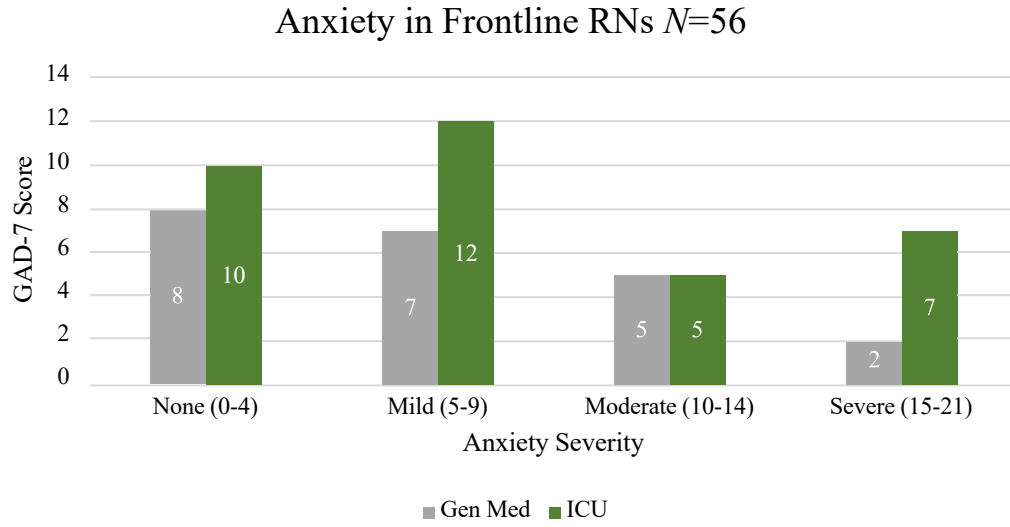


Figure 1. *Anxiety in Frontline RNs*. This figure shows results of anxiety in General Medicine and ICU nurses. Anxiety is identified using a cutoff score of 10.

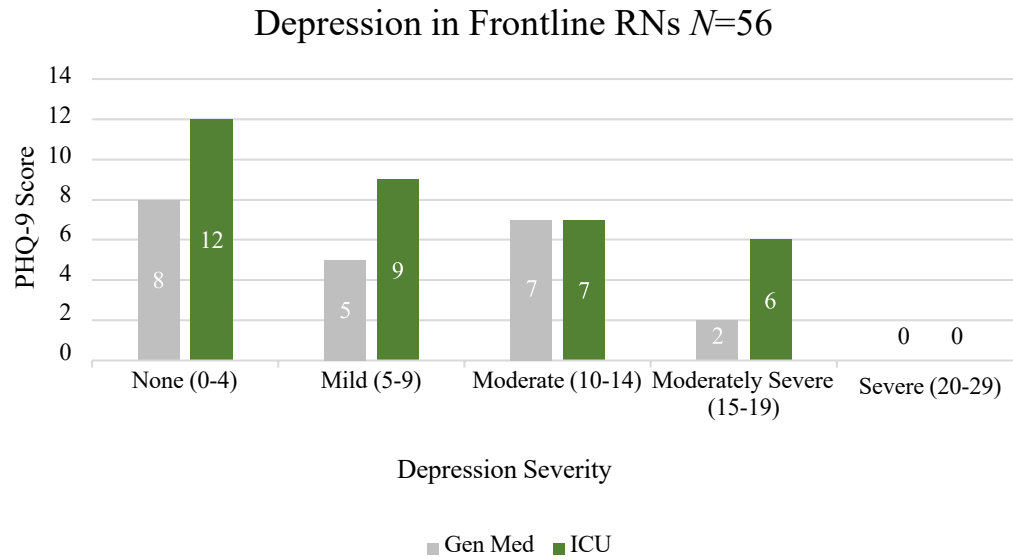


Figure 2. *Depression in Frontline RNs*. This figure shows results of depression in General Medicine and ICU nurses. Depression is identified using a cutoff score of 10.

PTSD IN FRONTLINE RNS N=56

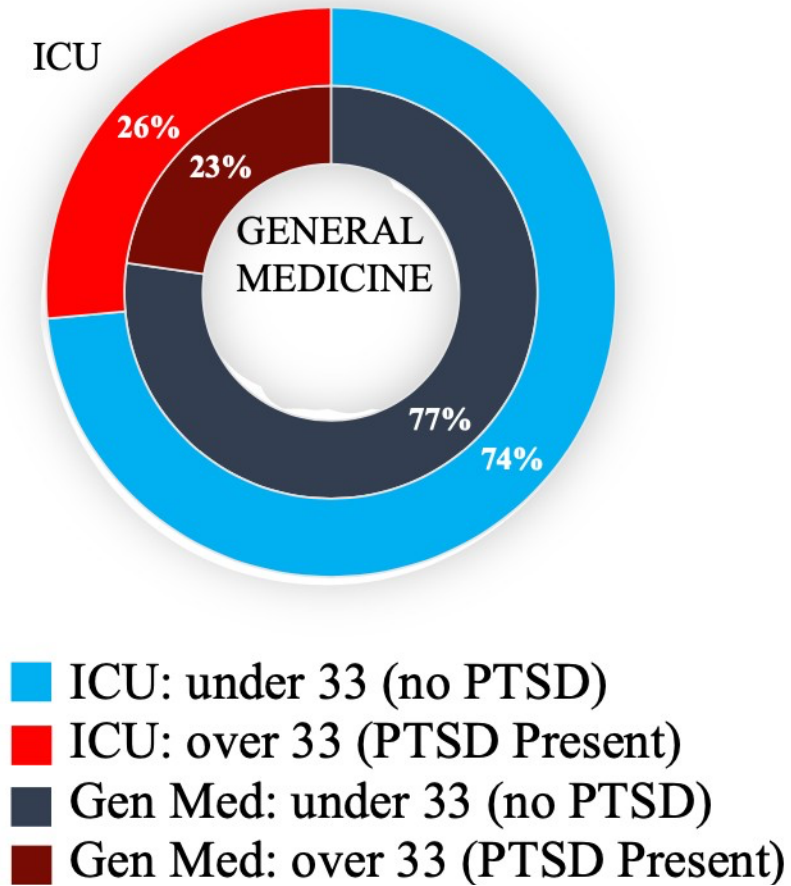


Figure 3. *PTSD in Frontline RNs*. This figure shows results of PTSD in General Medicine and ICU nurses. PTSD is identified using a cutoff score of 33.