Feature Article

COVID-19 Posttraumatic Stress Disorder in Clinical Nurse Specialists

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Purpose:
The purpose of this study was to examine if a relationship exists between the coronavirus 2019 pandemic and posttraumatic stress disorder in clinical nurse specialists.

Design:
The study used a nonexperimental, correlational, cross-sectional design to explore the relationship between exposure to the coronavirus 2019 pandemic and posttraumatic stress disorder signs and symptoms.

Methods:
The National Association of Clinical Nurse Specialists distributed the electronic survey from August to October 2020. State affiliates and accrediting bodies distributed the survey from October to December 2020. The survey consisted of the Impact of Events Scale — Revised, which measures signs and symptoms of posttraumatic stress disorder. The target sample size was at least 100.

Results:
Statistically significant relationships were identified between the participant demographics, coronavirus 2019 exposure, and signs and symptoms of posttraumatic stress disorder in clinical nurse specialists. Of 129 participants, 30% had Impact of Events Scale — Revised scores that are clinically concerning for posttraumatic stress disorder.

Conclusions:
Clinical nurse specialists can guide policy, practice, and education interventions to combat posttraumatic stress disorder due to the coronavirus 2019 pandemic.

KEY WORDS:
clinical nurse specialist, coronavirus 2019, posttraumatic stress disorder

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The novel coronavirus disease 2019 (COVID-19) is a respiratory disease that was declared by the World Health Organization as a global pandemic in March 2020.[1]

It was first reported in the United States in January 2020 and has since exponentially spread across America, greatly impacting the healthcare system and community.[2] Because the United States has had more than 80 million total cases and more than 980 000 total deaths as of April 2022, it is not surprising that many research efforts are ongoing to examine the acute and chronic mental health impact of this catastrophic event.[1]

One such mental health disorder that researchers fear may be prevalent after the COVID-19 pandemic is posttraumatic stress disorder (PTSD), a mental health problem seen in adults and children who have experienced or witnessed a life-threatening event, leading to detrimental effects on individuals.[3,4] According to the National Center for PTSD, about 7% to 8% of the general population experience PTSD at some point in their lives with about 8 million individuals living with PTSD a year.[4] During previous infectious disease (ID) outbreaks such as severe acute respiratory syndrome and Middle East Respiratory Syndrome, healthcare workers (HCWs) demonstrated PTSD rates significantly higher than those of the general population ranging from 20% to as high as 50%.[5–9] The COVID-19 pandemic has shown varying rates in European and Asian studies, ranging from as low as 2.1% to as high as 56.6%[10–20]; preliminary studies in the United States have found rates as high as 55.4%.[21,22]

Clinical nurse specialists (CNSs), despite being master's-prepared (master of science in nursing/master of science) or doctorally prepared (doctor of nursing practice/doctor of philosophy) advanced practice nurses whose practice is highlighted by clinical expertise in a specialty, are not immune to the mental health effects of the pandemic.[23] Because CNSs are tasked with identifying gaps in care, forming collaborative partnerships to lead quality improvement, and innovating to improve healthcare delivery, the

COVID-19 pandemic has created several opportunities through which CNSs could be mentally affected in the patient, nurses/nursing practice, and organizations/systems spheres of impact.[23] Identifying PTSD among CNSs is particularly important because of its link to comorbidities such as anxiety, depression, pain, substance misuse, and suicide and the potential for PTSD to affect their rates of absenteeism, intent to leave the profession, and poorer delivery of care to patients.[4,24] The loss of CNS expertise and leadership would profoundly impact patients, nurses, and healthcare systems alike; therefore, it is imperative to identify their mental health needs as they continue to serve as change agents during this difficult time in our nation's history.[23] By investing in their mental health recovery and well-being, CNSs can continue to demonstrate results in direct patient care, consultation for nursing staff, research, education, and more.[25]

The complete impact of the COVID-19 pandemic has yet to be seen, but a significant psychological impact is expected because of quarantine and social distancing, changes in daily life and society, and personal losses due to the virus.[3] Clinical nurse specialists bear not only these personal burdens but also professional factors related to increased risk of exposure, fears of carrying and transmitting the virus, and workplace stressors.[13,26,27] Because of these significant risk factors and the dependence of the healthcare system on optimally functioning team members, it is imperative that research be conducted to identify the state of the problem among CNSs and to ultimately use this research to minimize the detrimental effects of long-term mental health disorders.

PURPOSE

Posttraumatic stress disorder is known to have detrimental effects on individuals[4,24]; however, it is unknown whether the COVID-19 pandemic has led to PTSD among CNSs. The purpose of this study was to examine if a relationship exists between the COVID-19 pandemic and PTSD in CNSs. The findings of this research may then be used to guide future research as well as policy, practice, and educational interventions to alleviate the potential impact of PTSD on CNSs.

THEORETICAL FRAMEWORK

According to Roy's adaptation model, humans cope with external stimuli through the process of adaptation.[28] This process is mediated by the physiologic/physical, self-concept/group identity, role function, and interdependence subsystems. The physiologic/physical subsystem describes the physical adaptive process that occurs in humans, the self-concept/group identity subsystem involves an individual's beliefs about one's self or group, the role function involves the various societal roles that an individual occupies, and the interdependence subsystem pertains to the transfer of social support between individuals.[29] The result of how these subsystems allow an individual to adapt to an external stimulus is adaptive (or maladaptive) behavior. In this study, Roy's adaptation model provides a theoretical framework in which the COVID-19 pandemic serves as the external stimulus or trauma whereas the signs and symptoms of PTSD are an individual's resultant behavior.

METHODS

This study used a nonexperimental, correlational design. Participants were invited to complete a 1-time online survey administered via Qualtrics.

Instrument

The first part of the survey was a researcher-developed questionnaire requesting demographic data based on the 2018 CNS survey.[30] Participant characteristic data included state of residence, age, gender, race, years as a registered nurse (RN), years as CNS, highest level of education, and population of focus. Participant practice data related to the COVID-19 pandemic included primary role during the COVID-19 pandemic, practice setting during the COVID-19 pandemic, previous military experience, and previous ID experience. Because PTSD is defined as having experienced or witnessed a life-threatening event through at least 1 of 4 specific exposure types — (1) direct exposure, (2) witnessing the trauma, (3) learning that a relative or close friend was exposed to a trauma, or (4) indirect exposure to aversive details of the trauma, usually in the course of professional duties — participants also provided the type of exposure they experienced during the COVID-19 pandemic (criteria A section).[31]

The second part of the survey consisted of the Impact of Events Scale — Revised (IES-R) which measures signs and symptoms of PTSD.[32] The IES-R has been validated and used in previous studies of PTSD among HCWs exposed to an ID outbreak similar to COVID-19 with Cronbach's α ranging from 0.79 to 0.93.[6,7,33–35] Although the IES-R is heavily used in research, it is not used as a diagnostic tool. The IES-R consists of 22 self-administered items using a 5-point Likert scale (0 meaning not at all to 4 meaning extremely) with total scores ranging from 0 to 88. A total IES-R score of greater than or equal to 24 reflects clinical concern for PTSD.[36] Means are calculated for subscale scores for intrusion, avoidance, and hyperarousal symptoms experienced during the past 7 days.[36] Intrusion symptoms include the following: (1) any reminder bringing back feelings about the trauma, (2) trouble staying asleep, (3) other things making one think about the trauma, (4) thinking about the trauma when one did not mean to, (5) pictures of the trauma popping into one's mind, (6) having waves of strong feelings about the trauma, and (7) having dreams about the trauma.[36] Examples of avoidance symptoms include the following: (1) not letting one get upset when thinking about or being reminded of the trauma, (2) feeling

as though the trauma had not happened or was not real, (3) staying away from reminders of the trauma, (4) trying not to think about the trauma, (5) not dealing with feelings regarding the trauma even when one is aware they still have a lot of feelings about it, (6) feelings about the trauma were numb, (7) one tries to remove the trauma from their memory, and (8) one tries not to talk about the trauma.[36] Hyperarousal symptoms include the following: (1) feeling irritable and angry, (2) being jumpy and easily startled, (3) acting or feeling like one was back at that time of the trauma, (4) trouble falling asleep, (5) trouble concentrating, (6) reminders causing physical reactions such as sweating or trouble breathing, and (7) feeling watchful and on guard.[36]

Institutional Review Board
Permission to disseminate the survey electronically was obtained through the National Association of CNSs (NACNS), NACNS state affiliates, and CNS accrediting bodies. Submission of the survey demonstrated implied consent by the participant. Approval was received from the Old Dominion University Institutional Review Board.

Setting
Clinical nurse specialists were invited to participate in the study via NACNS, as well as through state affiliates and accrediting bodies, specifically Alabama, California, Colorado, Florida, Indiana, Maryland, Michigan, Texas, Virginia, Wisconsin, and the American Association of Critical-Care Nurses; however, additional recruitment efforts included network sampling. Recruitment and participation in the survey occurred from August to October 2020 through NACNS and then from October to December 2020 with each additional organization.

Sample
Targeted participants for this study were CNSs practicing in the United States. Inclusion criteria included the following: (1) practicing as a CNS during the COVID-19 pandemic, (2) ability to read English, and (3) the ability to complete the online questionnaire. Exclusion criteria included not practicing as a CNS during the COVID-19 pandemic (ie, student status). Because there were no similar studies to use to conduct a power analysis, the desired sample size was a minimum of 100 participants based on an approximate 10% survey response rate for NACNS's 1373 members per the 2019 annual report.[25]

RESULTS
Analysis
Statistical analysis was conducted using SPSS 26.0 with a significance level of $P < .05$. Descriptive statistics were calculated for the participant demographic survey data. Inferential statistics was used to answer the research question:

Is there a relationship between the COVID-19 pandemic and PTSD in CNSs? Pearson's correlation coefficient and independent samples t tests were calculated to determine relationships between variables (ie, demographic data and total IES-R score).[28]

Demographic Data
A total of 129 participants met inclusionary criteria. Study participants were primarily from states east of the Mississippi River (60.5% of participants, n = 78), which in this sample included Alabama, Delaware, Florida, Illinois, Indiana, Kentucky, Maryland, Michigan, North Carolina, Ohio, Pennsylvania, Vermont, Virginia, and Wisconsin; 39.5% of participants (n = 51) identified as practicing in western states, which in this sample included Alaska, Arkansas, California, Colorado, Idaho, Iowa, Minnesota, Missouri, Nebraska, North Dakota, Oregon, Texas, and Washington. Participants were primarily female (94.5%, n = 121), identified as white (85.2%, n = 109), and were master's-prepared (master of science in nursing/master of science) (67.2%, n = 86). The main population of focus among study participants was adult-gerontology (72.9%, n = 94); 27.1% (n = 35) were practicing in pediatrics, psychiatric/mental health, women's health, neonatal, family/individuals across the lifespan, community/public health, and other populations of focus.

Whereas 12.5% of participants (n = 16) reported their primary role to be providing direct patient care during the COVID-19 pandemic, 87.6% (n = 113) reported primarily practicing in nurse/staff consultation, nurse/staff education, research and evidence-based practice, patient transitional care, student education, organizational/administrative leadership, and other roles. Most study participants (75.2%, n = 97) worked in the acute care setting (to include medical/surgical, stepdown/intermediate care, critical care, and emergency department units), whereas 24.8% of participants (n = 32) reported working in the ambulatory care, private practice, community/public health, nursing home/extended care facility, and other settings. Most participants (94.5%, n = 121) reported not having any previous military experience, whereas 56.6% (n = 73) reported previous experience with recent ID outbreaks (ie, severe acute respiratory syndrome, Middle East Respiratory Syndrome, Ebola, and H1N1 flu). Study participants also reported an average of 24 years of experience (range from 2 to 46) and 11 years of experience (range from 1 to 35) as an RN and CNS, respectively.

Seven percent of participants (n = 9) reported direct COVID-19 exposure through contracting the virus, 51.0% (n = 67) reported witnessing COVID-19 through direct patient care, 40.3% (n = 52) reported they learned that a relative or close friend had COVID-19, 51.2% (n = 66) reported indirect exposure to aversive details of COVID-19 through their job, and 9.3% (n = 12) reported not having any of the

aforementioned exposure types. Participants were able to select multiple applicable exposure types.

IES-R Data

There was a wide variety of IES-R scores. The average total IES-R score was 20.22 with a minimum score of 0 and a maximum score of 74. The average score in the intrusion subscale was 8.44 (range from 0 to 28), the avoidance subscale was 6.59 (range from 0 to 28), and the hyperarousal subscale was 5.21 (range from 0 to 21). On the IES-R, 30.4% of participants reported scores greater than or equal to 24, which is concerning for clinical symptoms of PTSD.[36]

Calculating the Pearson's correlation coefficient and independent samples t tests demonstrated statistically significant relationships at the $P < .05$ level between participant demographic data, exposure type, and IES-R scores. On the basis of sample size in this category, there was a significant difference in the intrusion subscale scores for eastern (M = 7.39, SD = 7.086) and western (M = 10.09, SD = 7.035) states (t = −2.004, $P = .048$); in addition, there was a significant difference in the avoidance subscale scores for eastern (M = 5.75, SD = 5.253) and western (M = 7.93, SD = 5.437) states (t = −2.139, $P = .035$). Participant age (r = −0.187, $P = .047$) and years of experience (r = −0.211, $P = .023$) as an RN demonstrated a statistically significant inverse correlation with avoidance subscale scores. All other demographic data did not demonstrate statistically significant correlations with IES-R scores.

Calculating the independent samples t test for exposure types demonstrated a significant difference in the intrusion subscale scores for those that did not experience a learning type of exposure (ie, learning that a relative or close friend had contracted the virus) (M = 7.28, SD = 6.864) and those participants that reported a learning type of exposure to COVID-19 (M = 10.15, SD = 7.310; t = −2.130, $P = .036$); moreover, those that did not experience a learning type of exposure (M = 17.68, SD = 15.199) and those participants that reported a learning type of exposure to COVID-19 (M = 23.87, SD = 16.081; t = −2.049, $P = .043$) also demonstrated a statistically significant difference in total IES-R scores.

In a sample of 129 participants, it is very sobering that one-third of CNSs experienced symptoms concerning for PTSD. What is more concerning though is that despite age and RN experience showing some protective factor, infection among loved ones still proved to be very impactful on the mental health of CNSs. Although many CNSs may have experienced previous personal traumas or stressful work circumstances, these results suggest that the capacity for CNSs to cope with the COVID-19 pandemic, both professionally and personally, is being tested in a way it never has been before.

DISCUSSION
Summary of Outcomes

The study's sample is congruent with the demographics of CNSs in the United States as compared with the recent 2018 NACNS Census.[30] Most participants were female (94.5% versus 94% in the census), were white (85% versus 85% in the census), reported their highest level of education as MSN/MS (67% versus 75.37% in the census), practiced in adult-gerontology (73% versus 75.87% in the census), and practiced in an acute care hospital setting (75% versus 70% in the census).[30] In this study, 12.4% of CNSs reported a primary role of direct patient care during the COVID-19 pandemic (versus 9.6% in the census).[30] Most CNSs in this sample were also older and more experienced advanced practice nurses with an average age of 49, average years of experience as an RN of 24, and average years of experience as a CNS of 12. Participants also primarily resided in eastern states (60.5%), did not have prior military experience (94.5%), and did have previous experience with ID outbreaks (56.6%). There is no reported data for a comparison of these demographics.

Participants in this survey primarily reported exposure to the COVID-19 pandemic through witnessing (direct patient care) (51.0%) and indirect exposure to aversive details through their job (51.2%), then learning that a relative or close friend had contracted the virus (40.3%), and then through direct exposure to COVID-19 by becoming infected (7%). Although this variable has not been explored in previous studies, these various methods of traumatic exposure may explain the clinically concerning rate of PTSD symptoms in this study (30.4%) and other studies in which rates of PTSD among US HCWs may have been driven by both personal and professional factors.[21,22] The rates in these studies ranging from 30.4% to 55.38% are much higher than those found in several Asian studies that also used the IES-R for PTSD symptom screening, but this may also be attributed to exposure that Asian HCWs had to previous ID outbreaks such as severe acute respiratory syndrome.[13,18,19] Clinically concerning rates of PTSD symptoms according to the IES-R with rates of approximately 30% or greater were also seen in France and Spain.[11,16] COVID-19 studies regarding PTSD among HCWs currently available in the literature (as of April 2021) were also conducted during or right after the first surge of COVID-19 infections in comparison to this study, which was conducted around the time of a second and third wave of infections in the United States; therefore, direct comparison of these rates may not be meaningful.[10–22,37–40]

This study also demonstrated several statistically significant relationships between participant demographics and PTSD symptoms at the $P < .05$ level. Practicing in western states demonstrated a significant difference over practicing in eastern states in both intrusion (t = −2.004, $P = .048$) and avoidance (t = −2.139, $P = .035$) subscales. Although

there is no study for comparison, this relationship may be more reflective of the status of the COVID-19 pandemic at the time that participants completed the survey rather than specific geography. For example, a number of participants from California responded late in the data collection period at the height of the third surge of infections in the United States. Participant age (P = .047) and years of experience (P = .023) as an RN also demonstrated a statistically significant inverse correlation with avoidance subscale scores. Preparedness in knowledge and experience may serve as mitigating factors for developing PTSD symptoms. Youth and inexperience have previously been demonstrated as risk factors for developing PTSD from the COVID-19 pandemic.[11–13,16,18,19,26,38,39]

This study also demonstrated several statistically significant relationships between COVID-19 exposure and PTSD symptoms at the P < .05 level. Learning that a relative or close friend had COVID-19 demonstrated a statistically significant difference with intrusion subscale (t = −2.130, P = .036) and total IES-R scores (t = −2.049, P = .043). Previous studies have demonstrated that HCWs were concerned with the health of their families and the possibility of infecting them.[16,17,39] Although occupational factors are a large area of focus for healthcare systems in supporting employees' mental health, this result demonstrates the need for healthcare systems to recognize and address those personal factors, which also impact the mental health of their CNSs.

The witnessing COVID-19 exposure type (ie, providing direct care to COVID-19 patients) did not demonstrate any statistically significant differences in intrusion subscale, avoidance subscale, hyperarousal subscale, and total IES-R scores. This result is contrary to previous studies, which found that frontline HCWs that provided direct patient care to COVID-19 patients was at risk for developing clinically concerning symptoms of PTSD; however, this phenomenon may have been mitigated by factors such as the increased age and experience of the study sample.[14,19,21,22,39] Although not explored in previous studies explicitly, it is also possible that the use of mental health resources made available by organizations such as the American Nurses Association's (ANA) Well-Being Initiative have also served as a protective factor for this study sample.[41]

Implications for Practice

Clinical nurse specialists, as evidenced by the high rate of PTSD among 30.4% participants in this study, are not immune to the mental health impact of the COVID-19 pandemic. Luceno-Moreno et al[16] discussed how the cultivation of resilience, the ability of individuals to adapt to adversity, can mitigate the impact of traumatic events. As outlined in Roy's adaptation model, interventions can be aimed at several factors in the human adaptive system.[29] By participating in resilience development opportunities (which impacts one's self-concept) and using mental health resources

(which increases one's interdependence), CNSs may be able to move from maladaptive behavior such as PTSD symptoms to posttraumatic growth, especially those CNSs that are younger and less experienced as RNs as seen in this study.[17,29,38,42] The results of the study also suggest the need for screening CNSs for occupational stress and other deleterious mental health effects of the COVID-19 pandemic. In addition to detecting early warning signs of psychological distress, technology can also streamline the process through which CNSs receive mental health resources to address signs and symptoms of PTSD before suffering major long-term effects by creating an automatic referral system based off of early warning sign results, thereby reducing barriers to timely access to community mental health partners.

The National Association of CNSs, an organization dedicated to CNSs, also has an opportunity to provide organizational leadership that could help address PTSD signs and symptoms among its members. By collaborating with longitudinal studies, such as those sponsored by Yale University and Villanova University, NACNS could help discern the immediate and long-term mental health impacts of the pandemic, as well as possibly demonstrate a causal effect that could help tailor the development of appropriate interventions.[43,44] Similar to the *Mental Health and Wellness Survey* distributed by the American Nurses Foundation,[45] NACNS should also explore the specific impact that the pandemic has had on CNSs because their feelings of exhaustion, being overwhelmed, anxiety, and irritability may also be exacerbated by practice barriers experienced by other advanced practice nurses.[25]

Addressing systemic problems within health systems could also impact CNSs' adaptive behavior as seen in Roy's adaptation model.[29] Some examples of interventions that could be implemented are as follows: (1) schedules that are flexible enough to adapt to the ever-changing nature of the pandemic but thoughtful enough to maintain adequate sleep hygiene for staff, (2) providing authentic support to team members and their families, especially given the impact that infections of loved ones can have on one's mental health (especially as demonstrated by the statistically significant difference in scores seen in that exposure type for this sample), and (3) ensuring access to timely mental health resources.[15,22,26,46] Although mental health resources are available, organizations must relieve some of the burden from individuals to seek help because many healthcare professionals inherently excel at taking care of others rather than practicing self-care.[47] Individuals are best served when they have peer support and/or trusted mentoring relationships.[47] Partnerships with community resources and interprofessional colleagues such as mental health and social work could help meet the needs of healthcare professionals before they are severely impacted by PTSD.[42]

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Limitations

Because of the dynamic nature of the COVID-19 pandemic, this study had several limitations. During the survey period of August to October 2020 through NACNS and October to December 2020 through additional sites, the United States experienced an increase in COVID-19 cases, hospitalizations, and deaths; therefore, rather than completing the survey after the initial surge in spring of 2020, several participants may have instead completed their survey while experiencing another surge of COVID-19 infections.[1] Future studies may need to wait until the "conclusion" of the COVID-19 pandemic to accurately assess symptoms of PTSD among CNSs.

In addition, although the study survey was disseminated through NACNS, the initial dissemination period revealed that this distribution approach of convenience sampling limited to members of NACNS greatly limited the number and variety of survey respondents. Although additional sites were included to reach CNSs that are not members of NACNS, there was difficulty contacting several state affiliates and accrediting bodies, notably Washington, where the first American COVID-19 patient was identified, and New York, which was the American epicenter of the pandemic during the first surge of infections.[1,2] More extensive recruiting through social media outlets may be more effective to allow for greater generalizability of study results. The cross-sectional design also limits analysis of cause and effect, which may be better demonstrated through a longitudinal design exploring the long-term psychological effects of the COVID-19 pandemic.

Finally, PTSD is a complex mental health disorder, which oftentimes is accompanied by other comorbidities such as anxiety and depression; however, its impact may be lessened by protective factors such as mental health well-being, experience, and others as seen in recent COVID-19 PTSD studies.[10–20,37–40] Future studies should build on this study's design and include additional tools to screen for factors such as mental health well-being, coping strategies, anxiety, depression, and burnout to gain a more in-depth understanding of the COVID-19 pandemic's mental health impact.

CONCLUSION

As one of the first studies on the psychological impact of the COVID-19 pandemic on CNSs, this study can be used to guide future studies in different populations across the country and worldwide. Most immediately, this study may inform healthcare systems that no one is immune to the psychological impact of this crisis; therefore, there is a need to tailor interventions against PTSD given the pervasiveness of symptoms among a variety of leaders and clinicians. America and the rest of the world are living through unprecedented times, which must be fully understood to best prepare for future pandemics through policy, practice, and education interventions.

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