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Psychosocial Effects of Providing Nursing Care to Patients from a Multi-Casualty, School-Associated Shooting Event

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To the Graduate Council:

I am submitting herewith a dissertation written by William Travis McCall entitled "Psychosocial Effects of Providing Nursing Care to Patients from a Multi-Casualty, School-Associated Shooting Event." I have examined the final electronic copy of this dissertation for form and content and recommend that it be accepted in partial fulfillment of the requirements for the degree of Doctor of Philosophy, with a major in Nursing.

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Dedication

This dissertation is dedicated to my wife Laura and our children Daisy and Liam. Thank you for your support, patience, and encouragement in all of my professional and academic pursuits.

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Abstract

Secondary traumatic stress describes symptoms consistent with post-traumatic stress disorder but that result from witnessing or experiencing the trauma of another individual through a helping relationship. The associated symptoms include intrusions, avoidance, and hyperarousal. Secondary traumatic stress is also associated with the development of compassion fatigue and burnout. The current state of the science identifies that secondary traumatic stress may affect those nurses who provide care to critically ill or injured patients. Research has most commonly examined the prevalence of secondary traumatic stress, compassion fatigue, and burnout among nurses in emergency department settings. While attention is frequently given to the actual and projected shortages in the nursing workforce in support of increasing the number of graduate nurses, there is a need to foster increased efforts to promote welfare, resilience, and retention of nurses in clinical settings.

The purpose of this research was to explore the phenomena of secondary traumatic stress through the experiences of emergency department and trauma unit nurses who provided care to patients injured in a multi-casualty, school-associated shooting event to understand the psychosocial effects on their roles with these patients and to identify opportunities for strategies and interventions to mitigate secondary traumatic stress. Emergency nurses would typically experience a shorter duration of exposure to these patients but these encounters would be in the most acute phases of the traumatic event. In contrast, trauma specialty nurses would routinely experience longer exposure to these patients across the clinical work shift with additional exposure to family members of the patients.

Using qualitative case series methodology, this research identified themes and findings that have implications for nursing practice and education, public policy, social change, and future

research. These implications may translate to the development and implementation of primary, secondary, and tertiary prevention strategies to alleviate the prevalence of secondary traumatic stress among nurses and mitigate the incidence of mass shooting events. Benefits of this research may ultimately include improved mental health among nurses who care for critically ill and injured patients, better patient outcomes from the receipt of care from proficient nurses, retention of tenured nurses to serve as mentors for nurses entering clinical specialties, and abatement of rising health care costs through decreased expenses associated with nurse burnout and turnover.

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Abbreviations and Symbols

BO	Burnout
CDC	Centers for Disease Control and Prevention
CF	Compassion Fatigue
CMS	Centers for Medicare and Medicaid Services
ED	Emergency Department
PTSD	Post-traumatic Stress Disorder
RN	Registered Nurse
STS	Secondary Traumatic Stress
WIZQARS	Web-based Injury Statistics Query and Reporting System

Chapter I: Introduction

Within the United States, over 150,000 people die from trauma every year. Another 3 million non-fatal injuries occur in the United States annually. Worldwide, more than 5 million deaths per year occur due to injuries (WHO, 2014). The causes of these injuries include violence against others, self-harm, traffic crashes, burns, drownings, falls, and poisonings (WHO, 2014). According to the Centers for Disease Control and Prevention (CDC) Web-based Injury Statistics Query and Reporting System (WIZQARS) database, 246,041 deaths occurred in the United States in 2019 (n.d.). Of these deaths, the database reports 70.3% as accidental, 19.3% as suicide, and 7.8% as homicide (CDC, n.d.). The remaining deaths are classified as undetermined intent and legal intervention.

Data indicate that 18.3% of all emergency department visits in 2017 were the result of injuries with a known cause (Weiss et al., 2020). These injuries with a known cause accounted for over 26 million emergency department visits and an additional 2.4 million emergency department visits were related to injuries with no reported cause (Weiss et al., 2020). People who suffer traumatic injuries often receive medical care in emergency departments and may undergo further evaluation and treatment during hospital admissions. Of emergency department visits in 2017, 10.1% of visits associated with all injury causes resulted in hospital admission. However, the percentage of patients admitted or transferred to another facility from an emergency department for additional treatment of suffocation, firearm injury, or poisoning was greater than 30% in 2017 (Weiss et al., 2020). The number of injury-related visits to emergency departments grew to 35 million in 2018 (CDC, 2021).

Traumatic injuries that affect patient populations are often gruesome in appearance, cause severe pain and suffering to the affected individual, and may result in death despite the efforts of the health care clinicians tasked with providing medical care. The Diagnostic and Statistical

Manual of Mental Disorders, Fifth Edition, identifies that post-traumatic stress disorder (PTSD) may affect those individuals who witness or experience the trauma of others (American Psychiatric Association, 2013). These symptoms include thought intrusions, avoidance, and arousal. In professions where there is exposure to the trauma that others experience, the concept of secondary traumatic stress has been developed to describe the effects that may develop through helping relationships with traumatized individuals.

Secondary traumatic stress was defined by Figley (1999) as being observed in helping professions and who characterized a resulting "syndrome of symptoms nearly identical to post-traumatic stress disorder except that exposure to a traumatizing event experienced by one person becomes a traumatizing event for the second person" (p. 11). A concept analysis of secondary traumatic stress within the clinical specialty of nursing clarified that the empathic nature of nursing, combined with the occurrence of emotionally challenging situations, may yield consequences that negatively impact nurses. The concept analysis provided the definition that

> "secondary traumatic stress, characterized as a PTSD-like condition, is the constellation of physical and emotional symptoms that results from empathetic engagement with others who are undergoing traumatic experiences. [Secondary traumatic stress] has the potential to be life-altering, impacting future empathetic work resulting in an altered worldview and interpersonal difficulties" (Arnold, 2020, p. 152).

As outlined in the Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition, Arnold (2020) describes secondary traumatic stress as including symptoms that fall within biological, psychological, and social dimensions.

In addition to the secondary traumatic stress symptomatology that nurses may experience, the sequelae of compassion fatigue and burnout have been described as affecting nurses who

witness or experience the trauma of their patients. Compassion fatigue, a term that has been used interchangeably with secondary traumatic stress (Coetzee & Klopper, 2010), was further defined as

> "a preventable state of holistic exhaustion that manifests as a physical decline in energy and endurance, an emotional decline in empathetic ability and emotional exhaustion, and a spiritual decline as one feels hopeless or helpless to recover that results from chronic exposure to others' suffering, compassion, high stress exposure, and high occupational use of self in the absence of boundary setting and self-care measures" (Peters, 2018, p. 470).

As empathy is an essential dynamic in the nursing profession, the loss of the ability to effectively and compassionately care for others is detrimental for patients as well as nurses.

Burnout involves negative responses to stress and may include emotional exhaustion, decreased feelings of accomplishment in personal and work efforts, impaired compassion and interactions with patients or clients, and depersonalization (Hinderer et al., 2014). As research has identified higher burnout scores among individuals who score higher for secondary traumatic stress (Hinderer et al., 2014), further research is needed to explore this correlation to understand those exposures and variables that are most contributive to burnout among nurses. As 17.4% of new nurses will leave their first positing within a year of entering the workforce (Kovner et al., 2014), there are benefits to exploring those variables correlated with nurse burnout.

An integrative review of the literature on secondary traumatic stress identified that more research has been conducted among nurses who provide care for trauma patients in emergency departments than in specialized trauma patient care units. To contrast these two nursing care areas, it would be expected that emergency nurses would have a shorter duration of exposure to

trauma patients, have more limited interactions with family members of traumatized patients, and be less aware of the outcomes of trauma patients after their disposition to a trauma center or trauma specialty care area. Trauma nurses would typically have more frequent and longer duration of exposure to trauma patients, may have increased interactions with the family members of trauma patients, and are more likely to learn of the outcomes of patients who are admitted to trauma intensive care units for management of their injuries.

The symptoms associated with secondary traumatic stress may negatively impact the personal and professional lives of the nurses who provide care for trauma patients. Experienced nurses are needed to support workforce needs, provide quality care to patients, and serve as mentors and educators for nurses who are entering nursing specialties. Further understanding of the relationship between exposure to patients who have suffered traumatic injuries, the prevalence of secondary traumatic stress, and the incidence of compassion fatigue among nurses who care for trauma patients is needed to promote nurse welfare. This research is needed to further understand and define the effects of caring for trauma patients to support the development and implementation of processes and interventions aimed at mitigating secondary traumatic stress and the related sequelae of compassion fatigue and burnout.

The theory of secondary traumatic stress identified the value of qualitative research and specified that the data provide "targeted information and specific insights that unearth valuable, unique information and opens new lines of research" (Ludick & Figley, 2017, p. 118). As data indicate that those situations identified as being most distressing to nurses involve children, adolescents, and sudden death (Adriaenssens et al., 2012; Alzghoul, 2014; Healy & Tyrrell, 2011; Lavoie et al., 2016), research focusing on the experiences of nurses who provide care to these patients is needed to further understand secondary traumatic stress among these

professionals. As the incidence of multiple-victim, school-associated shooting events increased between July 2009 and June 2018 (Holland et al., 2019), these events provide opportunities to learn from those who provide care for the patients injured during these events. Through exploration of nurses' experiences with providing nursing care to the patients injured during these incidents, increased awareness for the prevalence of symptoms indicative of secondary traumatic stress and the identification of the need for interventions aimed at preventing and alleviating these symptoms may be gained.

The aims of the current research were to explore the phenomena of secondary traumatic stress among emergency and trauma nurses by synthesizing existing literature and examining the psychosocial effects that nurses may experience in their clinical roles. This research was performed to further understand how nurses were affected by caring for patients who were injured during a situation that would be perceived as being particularly stressful for the involved clinicians, examine factors associated with the incidence of secondary traumatic stress, and identify strategies for mitigating secondary traumatic stress, compassion fatigue, and burnout. By examining the experiences of emergency department and trauma unit nurses who provided care to patients who were injured during a multi-casualty, school-associated shooting event, the current research may further define how nurses in differing settings are affected by their experiences providing nursing care to critically ill or injured patients.

Case series research allows for the inclusion of participants who are sampled based on an exposure or an outcome (El-Gilany, 2018). The research enrolled greater than four participants from both the emergency department and trauma specialty care area as greater than four cases should be included in case series research (Abu-Zidan et al., 2013). The common exposure to the participants who participated in this research were nurses from the emergency department and

trauma unit who provided care to one or more patients received at a Level 1 academic trauma center after sustaining injuries during a multi-casualty, school-associated shooting event that occurred in 2018 in the Southeastern United States.

The public news media reported that a single shooter was responsible for the incident. The age of the victims was reported as ranging from 14 to 18 years (Yan et al., 2018). Five of the injured students were airlifted to the trauma center (Arrodondo et al., 2018) and were received in the emergency department and subsequently admitted to the facility for further medical care (Alund & Allision, 2018). One patient reportedly died at the scene and another died at the receiving trauma center (Alund & Allison, 2018). The patients who were transported by air to the trauma center were reported as being males between the ages of 15 and 18 years (Alund & Allison, 2018).

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Chapter II: Secondary Traumatic Stress among Nurses in Emergency and Trauma Care: An Integrative Literature Review

This manuscript (Scholarly Paper #1) has been prepared for submission to the *Journal of Trauma Nursing*. The required citation format for this journal is that of the American Psychological Association, 7th Edition.

Abstract

Objective: The purpose of this study was to explore the incidence of secondary traumatic stress in emergency and trauma nurses and identify interventions that may be effective in promoting coping and resilience in nurses.

Methods: A literature search of articles published between 2010 and 2020 was performed to gain knowledge related to the incidence of secondary traumatic stress, post-traumatic stress disorder, compassion fatigue, burnout, and impaired compassion satisfaction in emergency and trauma nurses. Studies that assessed interventions and coping skills to mitigate these conditions were reviewed.

Results: Twenty-four studies were identified and reviewed to gain an understanding of the current literature and interventions. Researchers reported that secondary traumatic stress affects nurses who care for trauma patients. Younger nurses were more susceptible to secondary traumatic stress. Interventions and methods of managing these stresses were tested and some benefit in symptom mitigation was observed.

Conclusions: Longitudinal studies that evaluate interventions aimed at improving stress symptoms and promoting resilience in emergency nurses are indicated to support the workforce. Interventions and coping strategies instituted early in nursing education or development may alleviate symptoms of secondary traumatic stress and improve nurse resilience and retention.

Keywords: Secondary traumatic stress; Compassion fatigue; Burnout; Post-traumatic stress disorder

Secondary Traumatic Stress among Nurses in Emergency and Trauma Care: An Integrative Literature Review

Introduction

Nurses who practice in emergency departments and trauma care areas may be subjected to a higher incidence of stress than colleagues in other settings (Adriaenssens et al., 2011) and are at risk for developing secondary traumatic stress as they often provide care to patients who have experienced traumatic injuries. These injuries may be the result of violent actions by others, natural disasters, or unexpected events such as motor vehicle collisions, falls, or other accidental trauma. The traumatic events described as being most distressing to nurses are those that involve sudden death, children, or adolescents (Adriaenssens et al., 2012; Alzghoul, 2014; Healy & Tyrrell, 2011; Lavoie et al., 2016). Nightmares, intrusive memories of disturbing cases, retrospectively questioning clinical decisions, and increased worry and risk perception for one's own family members were described by research participants as symptoms of secondary traumatic stress (Berg et al., 2016).

Figley (1999) defines secondary traumatic stress as a resulting "syndrome of symptoms nearly identical to post-traumatic stress disorder except that exposure to a traumatizing event experienced by one person becomes a traumatizing event for the second person" (p.11). Symptoms of secondary traumatic stress include thought intrusion, avoidance, and arousal, as well as emotional numbing that result from exposure to the trauma suffered by others (Figley, 1999). While compassion fatigue is a term that has been used interchangeably with secondary traumatic stress (Coetzee & Klopper, 2010), it was described by Figley (1999) as being more commonly used in caring professions and "better describes the causes and manifestations of their duty-related experiences" (p. 20). Secondary traumatic stress has more recently been identified

as appropriate for describing this symptomatology in more diverse professional populations (Ludick & Figley, 2017). However, a nursing concept analysis of secondary traumatic stress further identified the individuality of the term and described it as a disorder similar to post-traumatic stress disorder and differing from compassion fatigue (Arnold, 2020).

In addition to compassion fatigue, burnout is identified as another sequelae of secondary traumatic stress. Burnout involves negative responses to stress that include emotional exhaustion, decreased feelings of accomplishment in work or personal efforts, impaired compassion and interactions with patients, and depersonalization (Hinderer et al., 2014). Research has identified higher burnout scores among individuals who score higher for secondary traumatic stress (Hinderer et al., 2014). Hamdan and Hamra (2017) provided that burnout affects health care professionals mentally and physically. Further, burnout ultimately negatively impacts patient outcomes as quality of care and patient satisfaction may suffer and health care systems are likely to experience increased absenteeism, employee turnover, and increased operational costs associated with staffing challenges (Hamdan & Hamra, 2017). Therefore, efforts to promote awareness and alleviate the prevalence of secondary traumatic stress may mitigate nurse burnout.

Personal and professional challenges are likely to impair compassion satisfaction among nurses who provide care in departments or units with higher levels of associated stress. Compassion satisfaction, which is identified as opposing compassion fatigue in the professional quality of life model (Stamm, 2010), has been identified as including characteristics of well-being, fulfillment, reward, accomplishment, joy enrichment, invigoration, inspiration, revitalization, gratitude, and hope among nurses (Sacco & Copel, 2018). Sacco and Copel (2018) provided “compassion satisfaction occurs when empathy drives altruistic behaviors on the part of the helper and results in the alleviation of patient suffering; thus, allowing the caregiver to cope

with the negative aspects of their work-life (p. 76-77). Interventions have aimed at mitigating the negative effects of secondary traumatic stress and compassion fatigue while improving compassion satisfaction and decreasing burnout among nurses. Research that evaluates the efficacy of interventions and seeks to identify those personal and professional variables most commonly associated with secondary traumatic stress, compassion fatigue, and burnout are needed.

The Emergency Nurses Association (Emergency Nurses Association, 2017) Executive Synopsis: Emergency Nurse Retention identified that experienced emergency nurses are likely to leave their positions in search of employment with less stress and physical demands. Experienced nurses in emergency departments and trauma care areas are essential to providing quality care to patients with high-acuity complaints or injuries and for mentoring new nurses entering these nursing specialties. The effects of secondary traumatic stress in nurses can weaken resilience (Emergency Nurses Association, 2015), which may ultimately contribute to burnout and departure from the nursing profession (Guo et al., 2017). Understanding the psychological challenges of providing nursing care to critically ill and injured patients in emergency departments may promote awareness and provide evidence for interventions aimed at promoting nurse welfare, resilience, and retention.

Actual and projected shortages will continue to worsen as the demand for nursing professionals rises. The United States Department of Labor projected that the occupation of Registered Nurse would see a 19.4% increase in demand in the ten years following 2012 (U.S. Bureau of Labor Statistics, 2019). While efforts to increase the number and capacity of nursing education programs may increase the number of nursing professionals entering the workforce, efforts to promote nurse welfare and resilience may improve compassion satisfaction, alleviate

burnout, and promote nurse retention. Efforts to understand further those factors associated with secondary traumatic stress, compassion fatigue, and burnout are appropriate to combat the shortage of nurses that impacts health care systems. This integrative review of the literature was performed to describe the current state of the science regarding secondary traumatic stress among nurses who are frequently exposed to patients with traumatic injuries through clinical practice in emergency and trauma nursing specialties.

Methods

The integrative review method of Whittemore and Knafl (2005) was utilized to analyze sources from CINAHL, PubMed, Scopus, and PsycINFO. This review method includes five stages: identify the purpose of a review, literature search, data evaluation, data analysis, and presentation of findings (Whittemore & Knafl, 2005). Key search terms used were as follows: secondary traumatic stress, PTSD, compassion fatigue, traumatic stress, trauma, delayed stress, distress, nurs*, emergenc*, emergency department, emergency room, critical care, intensive care, tertiary care, trauma center, retention, retain, acute, burnout, fatigue, and resilien*. The inclusive years of the search were 2009 to 2020. For this review, emergency and trauma nurses were defined as registered, staff, or professional nurses who function in the emergency department or trauma specialty care areas.

All titles identified in the electronic searches were reviewed by the first author. Those titles identified as providing content assessing secondary traumatic stress, compassion fatigue, and post-traumatic stress disorder among emergency or trauma nurses were further evaluated. Identified studies that examined the incidence of burnout, impaired compassion satisfaction, depersonalization, emotional exhaustion, and low personal accomplishment as a consequence of witnessed trauma also were included to obtain further understanding of symptoms related to

secondary traumatic stress (Hamdan & Hamra, 2017; Schooley et al., 2016). Articles were studied in their entirety when abstracts indicated that qualitative, quantitative, mixed methods, or intervention study data were obtained and provided. Studies that were not primary research, not written in or translated into English, and/or did not include nurses in emergency departments or trauma care areas were excluded from the review.

Results

Twenty-four articles were identified and included in the literature review. The number or search results from each database, many of which were duplicates, and the process for determining inclusion in the literature review are provided in a flow diagram (Figure 1). Identified articles included results from studies conducted in Australia, Belgium, Brazil, Canada, China, Ireland, Italy, Jordan, Palestine, Scotland, Turkey, and the United States. Of the 24 articles that were identified, 18 used quantitative methods, five used qualitative methods, and one used mixed methods. Two of the quantitative studies provided data related to the efficacy of interventions. Resources identified as relevant for understanding potential coping strategies and interventions, yet not focused on emergency or trauma nursing (Chesak et al., 2015; Hevezi, 2016), are discussed in this review but excluded from the literature matrix (Table 1).

Quantitative Assessment Instruments

The Secondary Traumatic Stress Scale (STSS) assesses intrusive thoughts, avoidance, and arousal using Likert scale statements and yields a total score of 17 to 85. The criterion for diagnosis of secondary traumatic stress is a score of 38 (Bride, 2007). The Professional Quality of Life (ProQOL) assessment tool consists of 30 Likert scale statements and gauges symptoms of compassion satisfaction, secondary traumatic stress, and burnout (Flarity et al., 2013). Low levels of compassion satisfaction are evidenced by scores of ≤ 22 while scores of 23 to 41 are

indicative of average compassion satisfaction, and scores ≥ 42 or greater show high levels of compassion satisfaction (Flarity et al., 2013). Low levels of secondary traumatic stress and burnout are indicated by scores of ≤ 22 while high levels are evidenced by scores of ≥ 42 (Flarity et al., 2013).

The Penn Inventory also uses Likert scale statements and evaluates the presence and severity of post-traumatic stress disorder symptoms (Hammaiberg, 1992). The minimum possible score is zero and the maximum possible score is 78. A score of 35 is considered indicative of post-traumatic stress disorder (Von Rueden et al., 2010). Other measurement tools reported in the literature include the Impact of Event Scale, Brief Symptom Inventory, Holmes-Rahe Life and Stress Inventory, Trauma and Loss Spectrum Self-Report, Work and Social Adjustment Scale, Maslach Burnout Inventory, Clinical Events Questionnaire, Traumatic Stress Schedule, and the Post-Traumatic Growth Inventory. Relevant conclusions of research and the observed prevalence of secondary traumatic stress, compassion fatigue, burnout, compassion satisfaction, and other related symptoms reported in the reviewed articles are included in Table 1.

Prevalence of Secondary Traumatic Stress and Related Sequelae

Research among emergency nurses in the United States has identified the presence of secondary traumatic stress. One study concluded that 32.8% of nurses reported experiencing all three symptoms of secondary traumatic stress (Dominguez-Gomez & Rutledge, 2009). Another study identified moderate to high levels of secondary traumatic stress among 60% of emergency nurses (Flarity et al., 2013). Hinderer (2014) identified that 7% of nurses had scores indicative of secondary traumatic stress, 35.9% had scores diagnostic of burnout, and 27.3% had scores that met criteria for compassion fatigue. Other research found that 82% of nurses had moderate to

high levels of burnout while 86% had moderate to high levels of compassion fatigue (Hooper et al., 2010).

Research in countries outside of the United States also has identified the presence of secondary traumatic stress, compassion fatigue, and burnout. For instance, nurses in two studies conducted in Italy identified that 15.7% to 21.4% of nurses reported symptoms of post-traumatic stress disorder (Carmassi et al., 2016, 2018). In Ireland, one study found that 82% of nurse participants had scores diagnostic for secondary traumatic stress (Duffy et al., 2015). Nurses in Ireland also were found to report experiencing stress frequently or very frequently (Healy & Tyrrell, 2011). Another study among emergency nurses in Ireland identified a mean STSS score of 42.05 ± 13.31, which exceeds the diagnostic score of 38 (McAleese et al., 2016). Research among emergency nurses in Scotland found 39% met criteria for secondary traumatic stress (Morrison & Joy, 2016). In Jordan, research identified 40% of emergency nurses had scores indicative of severe secondary traumatic stress, while 12.3% and 22.2% had scores consistent with high secondary traumatic stress and moderate secondary traumatic stress, respectively (Ratrout & Hamdan-Mansour, 2020).

Themes Identified With Qualitative Research Methods

The feelings described by nurses providing care to trauma patients in Scotland included "upsetting, stressful, horrible, vulnerable, distressing, worried, draining, terrible, and traumatic" (Alzghoul, 2014). Themes identified during qualitative exploration of nursing in Scottish emergency departments included "picturing trauma patients," "experiences with patient responses to trauma," "trauma care as a specialized job," "experiencing the emotional challenge," and "surviving the trauma work" (Alzghoul, 2014), "acute stressors," and "nursing culture" (Morrison & Joy, 2016). "Social networks and support," "infrastructure and support,"

"environment and lifestyle," "learning," "leadership," "stress," and "suggestions for building psychological wellness in nurses" were themes identified in Australia (Drury et al., 2014).

Themes identified by research in the United States included "positive aspects of the job," "stress triggers," "stress symptoms," "coping with stress," (Berg et al., 2016), "preparation and preparedness," "coping and support mechanisms," and "reflections and closure"(McCall, 2020). Research often identified that nurses with less experience were at greater risk for developing symptoms consistent with secondary traumatic stress, post-traumatic stress disorder, and burnout (Hamdan & Hamra, 2017; Lavoie et al., 2011; McAleese et al., 2016; Morrison & Joy, 2016).

Coping Strategies

Von Rueden et al. (2010) reported that the lower incidence of secondary traumatic stress seen in experienced nurses who participated in their study may be the result of coping strategies and available support systems. Hamdan and Hamra (2017) felt more-experienced nurses had developed mechanisms to help cope with occupational stress and had improved resilience to combat burnout. While not specific to emergency nurses, one study identified that nurses in the "Millennial" generation were more likely to experience high levels of burnout and secondary traumatic stress as well as low levels of compassion satisfaction compared with nurses in the "Generation X" or "Baby Boomer" generations (Kelly et al., 2015). With nurses from this younger generation entering the workforce, these findings indicate a need to promote symptom awareness and the implementation of interventions aimed at mitigating secondary traumatic stress, compassion fatigue, and burnout.

Activities such as talking to colleagues, spouses, or children and engagement in hobbies (Drury et al., 2014; Von Rueden et al., 2010) were identified as beneficial for coping with secondary traumatic stress. Other suggested interventions and strategies include team-building

activities, reading, exercise, meditation, massage (Dominguez-Gomez & Rutledge, 2009), and humor (Craun & Bourke, 2014). Emergency nurses identified cooking, exercising, walking, hiking, kayaking, humor, or talking with peers as being preferred coping strategies (McCall, 2020). Drury et al. (2014) reported data revealing the importance of peer support and suggested nurses' levels of stress decreased through access to mentors, preceptors, and clinical supervisors.

Qualitative research among pediatric emergency nurses identified critical incident stress debriefings may be beneficial for those nurses who care for trauma patients. The researchers recommended formal sessions that provide positive feedback and critique, discuss the events surrounding the patient's injuries, and occur before the end of the shift and within 12 to 24 hours of the event (Clark et al., 2019). Reflective pauses, which serve as a grounding mechanism for clinicians after the death of a patient, also have also been identified as a practice that may reduce associated stress and resulting burnout (Cunningham & Ducar, 2019).

Activities that promote health among nurses who practiced in a community facility were found to be associated with improvements in compassion fatigue, burnout, and compassion satisfaction. Such activities included biking, structured exercise classes, gym activities, walking, running, swimming, hiking, riding horses, and engagement in holistic practices such as massage, meditation, or essential oil therapies (Neville & Cole, 2013). Schmidt and Haglund (2017) identified benefits of a Personal Reflective Debrief to promote resilience and combat compassion fatigue. This debrief was described as an introspective reflection during which the nurse describes a recent professional event that was distressing and identifies positive events regarding the event and considers what they would change during future events (Schmidt & Haglund, 2017). Mindfulness was found to have associations with decreased anxiety, depression, and

burnout and was identified to have moderating effects on the effects on professional stressors of mental health and burnout among a group of emergency nurses (Westphal et al., 2015).

Intervention Studies

Flarity et al. (2013) assessed 73 emergency nurses using the ProQOL instrument before and after providing a training program called "Compassion Fatigue Resiliency." The provided program consisted of a four-hour seminar covering prevention of compassion fatigue, promotion of resilience, and maintaining fitness. The program subsequently provided written, video, audio, and electronic resources aimed at the prevention of compassion fatigue and burnout. The researchers found a 19% decrease in the number of participants who reported moderate to high levels of secondary traumatic stress following the intervention. There also was a 34% improvement in the number of participants who reported moderate to high levels of burnout (Flarity et al., 2013).

Wei et al. (2017) conducted a randomized controlled trial to evaluate the efficacy of an active intervention on job burnout levels among emergency nurses. The control group received regular management and the intervention group received additional classes that included methods to improve communication skills, conflict approaches, elevation of efficacy, emotional control, and working skills. The study showed statistically significant improvements in emotional exhaustion and depersonalization in the intervention group (Wei et al., 2017). The researchers concluded that active intervention may decrease burnout among emergency nurses. However, the study was limited by the small sample size of 102 nurses and relatively short study duration of six months.

While not specific to emergency and trauma nurses, the implementation and evaluation of the Stress Management and Resiliency Training (SMART) program was performed in two

sessions of the nurse orientation program of a large academic health care system (Chesak et al., 2015). The intervention group (*n*=19) participated in a session lasting 90 minutes and received handouts at defined intervals. Participants assigned to the control group (*n*=21) received a single lecture discussing stress and work-life connections (Chesak et al., 2015). While the researchers did not identify statistically significant results between the groups, they did identify favorable results suggestive of possible clinically significant improvements among those participants who received the SMART intervention (Chesak et al., 2015). Future studies evaluating interventions aimed at preventing and alleviating secondary traumatic stress, compassion fatigue, and burnout may identify benefits of such programs.

Additionally, a meditation intervention to reduce secondary traumatic stress and burnout while improving compassion satisfaction among oncology nurses was described by Hevezi (2016). Participants who participated and completed the study included 15 female nurses. The study evaluated the efficacy of meditation performed five days per week over an interval of four weeks. Hevezi (2016) identified statistically significant improvements in ProQOL scores and participants reported feeling improvements in their well-being. Despite the low number of participants who were from a single nursing specialty, the study suggests that meditation may be useful in other specialties where nurses experience secondary traumatic stress, compassion fatigue, and burnout.

Discussion

Analysis of the literature showed that secondary traumatic stress affects emergency and trauma nurses as determined by Secondary Traumatic Stress Scale and ProQOL scores (Berg et al., 2016; Duffy et al., 2015; Flarity et al., 2013; Hooper et al., 2010; Manning-Jones et al., 2017; McAleese et al., 2016; Ratrout & Hamdan-Mansour, 2020). Other assessment tools also

identified the incidence of post-traumatic stress disorder, compassion fatigue, burnout, and decreased compassion satisfaction (Adriaenssens et al., 2012; Carmassi et al., 2016; Hamdan & Hamra, 2017; Von Rueden et al., 2010). Also concerning is that one study reported that 74% of their survey participants indicated they had received no employer assistance to help them deal with stress. From those participants who indicated that they did receive employer assistance, 52% reported this assistance was inadequate and 26% felt it was very inadequate (Healy & Tyrrell, 2011). These findings indicate a need for further research to examine the experiences of emergency and trauma nurses who are at risk for secondary traumatic stress, compassion fatigue, and burnout and to evaluate the effectiveness of personal and professional coping and mitigating strategies.

While researchers expected to find a higher incidence of secondary traumatic stress among tenured nurses who had cumulative exposure to stressful events, they typically found that nurses with less experience were at higher risk (Hamdan & Hamra, 2017; Lavoie et al., 2011; McAleese et al., 2016; Morrison & Joy, 2016; Von Rueden et al., 2010). Researchers also identified intrinsic traits and extrinsic coping and self-care strategies mitigate the incidence of secondary traumatic stress, compassion fatigue, burnout, and low compassion satisfaction (Dominguez-Gomez & Rutledge, 2009; Drury et al., 2014; Urbanetto et al., 2011; Von Rueden et al., 2010). Some interventions implemented were associated with lower incidence of secondary traumatic stress, burnout, compassion fatigue, or impaired compassion satisfaction (Flarity et al., 2013; Hevezi, 2016; Wei et al., 2017). These observed improvements suggest the implementation and evaluation of additional interventions with larger samples over longer time intervals are needed.

As research has identified those events which were most distressing to nurses include sudden death, children, or adolescents (Adriaenssens et al., 2012; Alzghoul, 2014; Healy & Tyrrell, 2011; Lavoie et al., 2016), future research among nurses affected by such events will further characterize these challenges and identify opportunities for intervention. While the rates of multiple-victim, school-associated shootings declined from July 1994 to June 2009, rates of incidence increased between July 2009 and June 2018 (Holland et al., 2019). As emergency and trauma nurses are closely involved in the care of children and adolescents after these events, it is appropriate to learn from their experiences to identify the psychosocial effects associated with providing nursing care to these patients as the prevalence of these events will unfortunately likely persist. This research can also clarify the benefits of coping strategies, resources, and interventions among these nurses to foster preparedness among nurses who may be tasked with caring for patients injured during future multiple-victim, school-associated shootings.

Limitations

This literature review was limited to a single reviewer and includes research published between 2010 and 2020. Further review into earlier studies may provide additional insight into the incidence of secondary traumatic stress, post-traumatic stress disorder, compassion fatigue, burnout, and impaired compassion satisfaction among emergency and trauma nurses. The identified studies used varying measurement scales, had varying response rates, and primarily made use of cross-sectional convenience samples. These limitations may limit generalizability of findings to the worldwide populations of emergency and trauma nurses. The research performed by Flarity reported outcome measurements which were completed between three to four weeks (Flarity et al., 2013) and the study by Wei et al. was limited to six months (2017). Longer periods

of time between the interventions and outcome measurements may more effectively evaluate the long-term efficacy of the interventions.

Implications for Emergency and Trauma Nursing Practice

Kovner et al. reported that 17.4% of new nurses will leave their first position within a year of entering the workforce (Kovner et al., 2014). While there are efforts to increase nurse training and education to meet the projected workforce demands, promoting nurse welfare and resilience may abate staffing challenges and reduce overtime and staff turnover costs. Efforts to increase awareness, prevention, and treatment of secondary traumatic stress, post-traumatic stress disorder, and compassion fatigue among emergency and trauma nurses may improve welfare, decrease burnout, and improve compassion satisfaction. Increased symptom awareness, promotion of coping strategies, and implementation of active interventions by nursing managers and leaders may abate secondary traumatic stress, compassion fatigue, and burnout. These actions and efforts may improve compassion satisfaction and retention among nurses, which may ultimately alleviate staffing challenges, improve patient outcomes, and decrease overtime and orientation costs.

Conclusions

Further research into the incidence of secondary traumatic stress, compassion fatigue, burnout, and impaired compassion satisfaction among nurses of varying genders, races, clinical settings, average patient acuity levels, and duration of clinical experience are needed. Studies that examine the presence and severity of secondary traumatic stress symptoms among nurses who practice in community emergency departments versus those who practice in tertiary care or trauma center emergency departments or trauma specialty care areas may further the

understanding of how patient acuity and populations may predict the development of symptoms among these nurses.

In addition, assessment of emergency and trauma nurses who provide care to victims of particularly stressful incidents, such as school shootings, workplace violence, natural disasters, or acts of terrorism, may further the understanding of associated psychosocial effects. Studies that evaluate the efficacy of interventions aimed at mitigating secondary traumatic stress through prevention, coping, or resilience promotion activities over the long term are needed. With the highest incidence of secondary traumatic stress most often being detected among junior nurses, interventions to promote resilience and self-care are indicated for this population and may support nurse wellness, retention, and resilience. As Ludick and Figley (2017) describe with the theory of secondary traumatic stress that "qualitative data offers targeted information and specific insights that unearth valuable, unique information and opens new lines of research" (p. 118), exploring the experiences of nurses who provide care to patients from traumatic events perceived as being particularly stressful for nurses may yield valuable research that will support nurse wellness and resilience. The use of case study methodologies, such as those described by Yin (2018), would describe these experiences and provide themes that translate to practices that may improve patient outcomes, nurse welfare, and processes in emergency and trauma care areas.

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Supplementary Appendix

Table 1. Literature matrix

Citation	Location/ Setting of Study	Research Design and Data Collection Method	STS or Related Symptomatology Measurement Tool	Study *N* (Number of Emergency or Trauma Nurse Participants)	Mean Score ± S.D.	Range of Scores	Significant Findings	Quality of Evidence
Adriaenssens et al. (2012).	Fifteen Flemish (Belgian) general hospitals	Quantitative methods. Cross-sectional. Self-administered structured survey.	IES Dutch version of the BSI Sleep questions from DSM-IV criteria	*N*=248 (248)	11.90 ± 13.09	Not provided	28.7% to 37.2% exceeded sub-clinical levels for psychological distress and somatic complaints. 8.5% met clinical levels for PTSD.	80.5% response rate. Data responses may be affected by 58% of participants also functioning in prehospital role and 60% serving also as rescue team member.

Table 1 continued.

Citation	Location/ Setting of Study	Research Design and Data Collection Method	STS or Related Symptomatology Measurement Tool	Study *N* (Number of Emergency or Trauma Nurse Participants)	Mean Score ± S.D.	Range of Scores	Significant Findings	Quality of Evidence
Alzghoul. (2014).	Emergency department in northeast Scotland	Qualitative methods. Face-to-face interviews.	Semi-structured interview technique. Analysis performed using Miles and Huberman model.	*N*=23 (23)	NA	NA	Themes included "picturing trauma patients," "experiences with patient responses to trauma," "trauma care as a specialized job," "experiencing the emotional challenge," and "surviving the trauma work."	Data saturation following interview of 23 nurses. Included nurses in all departments who care for trauma patients.

Table 1 continued.

Citation	Location/ Setting of Study	Research Design and Data Collection Method	STS or Related Symptomatology Measurement Tool	Study *N* (Number of Emergency or Trauma Nurse Participants)	Mean Score ± S.D.	Range of Scores	Significant Findings	Quality of Evidence
Berg et al. (2016).	Focus group from trauma team members in Wichita, Kansas	Qualitative methods. Survey and focus group methodologies.	ProQOL Holmes-Rahe Life and Stress Inventory	*N*=12 (6)	Not provided	Not provided	75% had moderate or high scores for STS 58.3% in moderate or high range for BO. Identified themes that included "positive aspects of job," "stress triggers," "stress symptoms," and "coping with stress."	Utilized a small focus group that was half emergency nurses.

Table 1 continued.

Citation	Location/ Setting of Study	Research Design and Data Collection Method	STS or Related Symptomatology Measurement Tool	Study *N* (Number of Emergency or Trauma Nurse Participants)	Mean Score ± S.D.	Range of Scores	Significant Findings	Quality of Evidence
Carmassi et al. (2016).	University hospital in Italy	Quantitative methods. Cross-sectional. Survey.	TLSS WSAS	*N*=83 (51)	Total WSAS 7.02 ± 7.16 in nurses group	Not provided	15.7% of the emergency nursing participants reported symptoms of PTSD.	75.5% complete response rate. Limited sample size may limit generalizability.
Carmassi et al. (2018).	University Hospital in Italy.	Quantitative methods.	TALS-SR, WSAS.	*N=42* (32)	(TALS-SR) 45.50 ± 2.93. (WSAS) 7.06 ± 6.94	Not provided	21.4% of the sample reported DSM-V PTSD. Higher scores among health care assistants, women, older, and non-graduated operators.	Small sample size.

Table 1 continued.

Citation	Location/ Setting of Study	Research Design and Data Collection Method	STS or Related Symptomatology Measurement Tool	Study *N* (Number of Emergency or Trauma Nurse Participants)	Mean Score ± S.D.	Range of Scores	Significant Findings	Quality of Evidence
Dominguez-Gomez & Rutledge. (2009).	Three general community hospitals in rural southern California	Quantitative methods. Exploratory comparative study. Survey packets.	STSS	*N*=67 (67)	37.4 ± 11	17 to 74	32.8% reported they experienced all three symptoms of STS.	60.3% response rate. Small sample size.
Drury et al. (2014).	Tertiary hospital in western Australia.	Qualitative methods. Reported as a phase of a mixed-method study. Semi-structured interviews and a focus group.	Data analysis using Braun and Clarke's thematic analysis method	N=10 (10)	NA	NA	Identified themes of "social networks and support," "infrastructure and support," "environment and lifestyle," "learning," "leadership," "stress," and "suggestions for building psychological wellness in nurses."	

Table 1 continued.

Citation	Location/ Setting of Study	Research Design and Data Collection Method	STS or Related Symptomatology Measurement Tool	Study *N* (Number of Emergency or Trauma Nurse Participants)	Mean Score ± S.D.	Range of Scores	Significant Findings	Quality of Evidence
Duffy et al. (2015).	Three teaching hospitals in Western Ireland	Quantitative methods. Cross-sectional. Questionnaire.	STSS	*N*=105 (105)	45.98 ± 14.1	17 to 80	82% of staff nurse participants at or above diagnostic score of 38.	90% response rate.
Flarity et al. (2013).	2 emergency departments in Colorado Springs, Colorado	Quantitative methods. Intervention study. Convenience sample of voluntary emergency nurses. Pre- and post-tests.	ProQOL	*N*=73 (73)	Initial STS 23.5 ± 5.3 Initial CS 40.3 ± 5.6 Initial BO 23.9 ± 5.1	Initial STS 14 to 42 Initial CS 21 to 49 Initial BO 15 to 42	60% of emergency nurses had moderate to high levels of STS.	Longitudinal study that did not use control group methodology. Short duration of intervention. 59 post-tests were returned.

Table 1 continued.

Citation	Location/ Setting of Study	Research Design and Data Collection Method	STS or Related Symptomatology Measurement Tool	Study *N* (Number of Emergency or Trauma Nurse Participants)	Mean Score ± S.D.	Range of Scores	Significant Findings	Quality of Evidence
Hamdan & Hamra. (2017).	Fourteen emergency departments in Palestine	Quantitative methods. Cross-sectional. Self-administered questionnaire.	MBI	*N*=444 (161)	Not reported	Not reported	69.8% of nurse participants reported high levels of emotional exhaustion. 48.8% reported high levels of depersonalization. 32.1% reported low personal accomplishment	Response rate of 80.1% among nurses. Self-reporting by participant may result in reporting bias.

Table 1 continued.

Citation	Location/ Setting of Study	Research Design and Data Collection Method	STS or Related Symptomatology Measurement Tool	Study *N* (Number of Emergency or Trauma Nurse Participants)	Mean Score ± S.D.	Range of Scores	Significant Findings	Quality of Evidence
Healy & Tyrrell. (2011).	Three emergency departments in Ireland	Quantitative methods. Descriptive survey. Non-probability convenience survey.	Custom questionnaire	*N*=103 (90)	Not reported	Not reported	51% reported experiencing stress at work frequently or very frequently. 74% reported receiving no employer assistance. Younger and less experienced nurses experienced more stress from caring for critically ill patients.	69% response rate. Used questionnaire that has not been evaluated.

Table 1 continued.

Citation	Location/ Setting of Study	Research Design and Data Collection Method	STS or Related Symptomatology Measurement Tool	Study *N* (Number of Emergency or Trauma Nurse Participants)	Mean Score ± S.D.	Range of Scores	Significant Findings	Quality of Evidence
Hinderer et al. (2014).	Urban trauma center in eastern United States	Quantitative methods. Cross-sectional descriptive. Voluntary survey.	ProQOL Penn	*N*=128 (30 from "trauma resuscitation unit" or "shock trauma acute care unit.")	Penn Inventory 18.5 ± 10.24 BO 20.56 ± 6.34 CF 13.94 ± 7.19 CS 37.96 ± 7.62	Penn Inventory 1 to 54 BO 2 to 38 CF 1 to 39 CS 9 to 50	7% reported Penn scores indicative of STS. 35.9% of scores indicative of BO. 27.3% reported symptoms of CF.	48.9% response rate. Participants from varied units in trauma system.

Table 1 continued.

Citation	Location/ Setting of Study	Research Design and Data Collection Method	STS or Related Symptomatology Measurement Tool	Study *N* (Number of Emergency or Trauma Nurse Participants)	Mean Score ± S.D.	Range of Scores	Significant Findings	Quality of Evidence
Hooper et al. (2010)	Level II trauma center in southeastern United States	Quantitative methods. Cross-sectional. Voluntary survey.	ProQOL: CS and Fatigue Subscales, R-IV	*N*=109 (29)	Not provided	Not provided	82% of emergency nurses had moderate to high levels of BO. 86% had moderate to high levels of CF.	82% adjusted survey return rate. Small sample size. Limited generalizability.
Hunsaker et al. (2015).	Emergency department nurses across the United States.	Quantitative.	ProQOL and demographic survey.	*N*=278	Not provided.	CS 39.77 ± 6.32, CF 21.57 ± 5.44, BO 23.66 ± 5.87.	56.8% of participants with average level of CS, 65.9% with low level of CF, 54.1% with average BO level.	28% response rate. Sample primarily White, married women.

Table 1 continued.

Citation	Location/ Setting of Study	Research Design and Data Collection Method	STS or Related Symptomatology Measurement Tool	Study *N* (Number of Emergency or Trauma Nurse Participants)	Mean Score ± S.D.	Range of Scores	Significant Findings	Quality of Evidence
Lavoie et al. (2011).	Two emergency departments in Quebec	Qualitative methods. Purposive sampling.	Semi-structured interviews and focus group. Guba and Lincoln's fourth-generation evaluation model. Miles and Huberman's data analysis framework.	*N*=12 (12)	NA	NA	Identified "exposure as a witness," "exposure as a victim," and "contextual exposure" as causing PTSD symptoms. The frequency of PTSD symptoms decreased with age.	

Table 1 continued.

Citation	Location/ Setting of Study	Research Design and Data Collection Method	STS or Related Symptomatology Measurement Tool	Study *N* (Number of Emergency or Trauma Nurse Participants)	Mean Score ± S.D.	Range of Scores	Significant Findings	Quality of Evidence
Lavoie et al. (2016).	Emergency department in Quebec	Quantitative methods. Cross-sectional descriptive correlational design. Self-administered questionnaires	CEQ IES– Revised questionnaire	*N*=35 (35)	PTSD symptoms/Total 16 ± 23	Not provided	14.3% of the participants had scores >33, which were indicative of PTSD.	Response rate of 35%. Recall bias for preceding 12 months. Small sample size.
McAleese et al. (2016).	Two Accident and Emergency Departments and 12 ambulance bases in Northern Ireland	Quantitative methods. Cross-sectional. Questionnaire packet.	STSS	*N*=107 (21)	42.05 ± 13.313	Not reported	Highest elevations of STS symptomatology seen in nursing and junior medical staff	Small sample size.

Table 1 continued.

Citation	Location/ Setting of Study	Research Design and Data Collection Method	STS or Related Symptomatology Measurement Tool	Study *N* (Number of Emergency or Trauma Nurse Participants)	Mean Score ± S.D.	Range of Scores	Significant Findings	Quality of Evidence
McCall. (2020).	One emergency department in the Southeastern United States.	Qualitative case series.	Semi-structured interviews. Framework analysis methodology.	N=7 (7)	NA	NA	Identified themes and findings of "preparation and preparedness," "coping and support mechanisms," and "reflections and closure."	Small sample size limited ability to confirm saturation. Single case series and single event.
Morrison & Joy. (2016).	Four emergency departments in Western Scotland	Mixed methods design. Convenience sample. Mailed questionnaire. Focus group randomly selected.	STSS	*N*=80 (10 in focus group) (80 in quantitative phase, n=10 in qualitative phase)	37.4 ± 17	17 to 80	39% of emergency nurses met the full diagnostic criteria for STS. Themes included "acute stressors" and "nursing culture."	Performed pilot of questionnaire. 53.3% response rate. 20 returned focus group invitations with 10 stratified and randomly selected.

Table 1 continued.

Citation	Location/ Setting of Study	Research Design and Data Collection Method	STS or Related Symptomatology Measurement Tool	Study *N* (Number of Emergency or Trauma Nurse Participants)	Mean Score ± S.D.	Range of Scores	Significant Findings	Quality of Evidence
Ratrout & Hamdan-Mansour. (2020).	Eight emergency departments in Jordan	Quantitative Methods. Convenience Sampling. Cross-sectional descriptive correlational design.	STSS, Life Events Checklist, Toronto Empathy Questionnaire, Scale of Perceived Organizational Support, Multidimensional Scale of Perceived Social Support, Coping Inventory Scale, Demographics.	*N*=202 (202)	46 ± 12.45	Not reported	40% of participants reported STSS scores consistent with severe STS. 12.3% reported high level. 22.2% reported moderate level. Nurses with lower empathy and greater coping capacity reported higher STS scores.	67% response rate.

Table 1 continued.

Citation	Location/ Setting of Study	Research Design and Data Collection Method	STS or Related Symptomatology Measurement Tool	Study *N* (Number of Emergency or Trauma Nurse Participants)	Mean Score ± S.D.	Range of Scores	Significant Findings	Quality of Evidence
Schooley et al. (2016).	Two public urban hospitals in Turkey	Primarily quantitative methods. Cross-sectional survey. Face-to-face interview method for demographic and employment information. Questionnaire.	MBI	*N*=250 (89)	Not reported	Not reported	66.29% of nurses reported high levels of emotional exhaustion. 79.77% reported high depersonalization. 65.16% reported low personal accomplishment.	100% response rate. No exclusion criteria were applied.

Table 1 continued.

Citation	Location/ Setting of Study	Research Design and Data Collection Method	STS or Related Symptomatology Measurement Tool	Study *N* (Number of Emergency or Trauma Nurse Participants)	Mean Score ± S.D.	Range of Scores	Significant Findings	Quality of Evidence
Urbanetto et al. (2011).	Hospital emergency service in southern Brazil	Quantitative methods. Cross-sectional. Non-probabilistic convenience sample. Interviews questionnaires.	Job Stress Scale	*N*=388 (88 nurses, nursing technician, and auxiliaries)	Not reported	Not reported	21.4% reported high strain. 37.9% reported high psychological demand. 57.0% reported low control over their job. Low social support was associated with high strain.	92.2% response rate.

Table 1 continued.

Citation	Location/ Setting of Study	Research Design and Data Collection Method	STS or Related Symptomatology Measurement Tool	Study *N* (Number of Emergency or Trauma Nurse Participants)	Mean Score ± S.D.	Range of Scores	Significant Findings	Quality of Evidence
Wang et al. (2020).	Nurses in 11 tertiary hospitals in China.	Quantitative.	ProQOL, demographic, work-related information, and lifestyle questionnaire.	*N*=1044 (58)		CS 32.22 ± 6.60, BO 28.32 ± 4.74, STS 27.88 ± 4.62	Poor sleep quality, low job satisfaction, more work hours, and second-hand smoke exposure related to STS.	5.55% of nurses from emergency department. Highest *n* from departments of psychiatry and surgical.

Table 1 continued.

Citation	Location/ Setting of Study	Research Design and Data Collection Method	STS or Related Symptomatology Measurement Tool	Study *N* (Number of Emergency or Trauma Nurse Participants)	Mean Score ± S.D.	Range of Scores	Significant Findings	Quality of Evidence
Wei et al. (2017).	Three high-level hospitals in Jinan, China	Quantitative methods. Intervention study. Randomly selected. Randomized to intervention and control groups. Pre- and post-intervention period questionnaires	MBI-General Survey	*N*=102 (102)	Pre-intervention: Emotional Exhaustion 15.75 ± 4.61 Depersonalization 11.91 ± 4.60 Personal Achievement 24.1 ± 4.90	Not reported	All of the nurses were found to be experiencing burnout. Participants in the active intervention group reported improved mean scores for emotional exhaustion and depersonalization.	Six month randomized intervention study. Only assessed burnout scores.

Note: BO, burnout; BSI, Brief Symptom Inventory; CEQ, Clinical Events Questionnaire; CF, compassion fatigue; CS, compassion satisfaction; DSM-IV, Diagnostic and Statistical Manual of Mental Disorders IV; IES, Impact of Event Scale; MBI, Maslach Burnout Inventory; NA, Not Applicable; Penn, Penn Inventory; ProQOL, Professional Quality of Life Scale; PTGI, Post-traumatic Growth Inventory; PTSD, Post-traumatic stress disorder; RN, Registered Nurse; STS, secondary traumatic stress; STSS, Secondary Traumatic Stress Scale; TLSS, Trauma and Loss Spectrum Self-report; TSS, Traumatic Stress Schedule; WSAS, Work and Social Adjustment Scale.

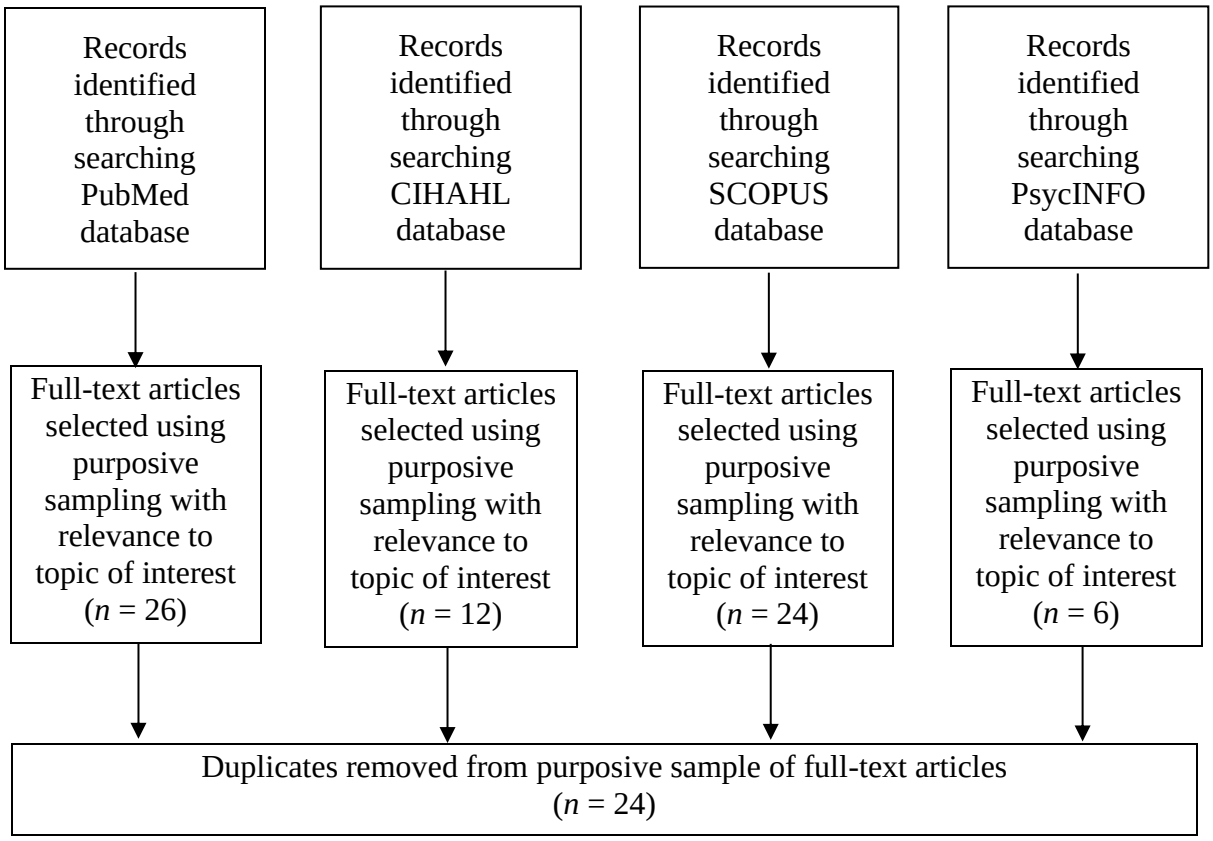

Figure 1. PRISMA Flow Diagram

Chapter III: Caring for Patients from a School Shooting:

A Qualitative Case Series in Emergency Nursing

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Abstract

Introduction: Emergency nurses are at risk for secondary traumatic stress, compassion fatigue, and burnout as a result of witnessing the trauma and suffering of patients. The traumatic events perceived as being most stressful for emergency nurses involve sudden death, children, and adolescents. Multi-casualty, school associated shooting events are, therefore, likely to affect emergency nurses, and recent reports indicate an increase in multi-casualty, school associated shootings. This research is necessary to learn of emergency nurses' experiences of caring for patients from a school shooting event in an effort to benefit future preparedness, response, and recovery. This manuscript describes these experiences and provides opportunities for nurses, peers, and leaders to promote mental health and resilience among emergency nurses who may provide care to patients after such events.

Methods: A qualitative case series approach, a theory of secondary traumatic stress, and the compassion fatigue resilience model guided the research. The emergency nurses who provided care to patients who were injured during a 2018 multi-casualty, school associated shooting in the Southeastern United States were invited to participate.

Results: The themes identified by this research with seven participants were preparation and preparedness, coping and support mechanisms, and reflections and closure.

Discussion: The results identified through this research may be translated to policies and practice to improve emergency nurse welfare, coping, resilience, and retention. Patient outcomes may also be improved through planning and preparedness.

Keywords: school shooting; mass shooting; mass casualty; secondary traumatic stress; stress; emotional stress.

Contributions to Emergency Nursing Practice

- The current literature on secondary traumatic stress indicates that emergency nurses may be affected by experiences with providing care to critically ill or injured patients. The situations that have been described as most distressing are those involving sudden death, children, or adolescents.
- This article contributes to the scientific knowledge of secondary traumatic stress among emergency nurses through the examination of experiences with providing emergency nursing care to patients from a multi-casualty, school-associated shooting event.
- Key implications for emergency nursing practice found in this article are that self-care routines, peer support activities, and subsequent optional formal debriefs may support emergency nurse welfare to promote coping and recovery following multi-casualty, school-associated shooting events.

Caring for Patients from a School Shooting:

A Qualitative Case Series in Emergency Nursing

Introduction

Secondary traumatic stress is the incidence of thought intrusions, heightened arousal, situational avoidance, and/or emotional numbing in those who witness traumatic events or provide care to critically ill or injured patients.[1] It is often associated with the development of compassion fatigue, defined as a clinician's impairment in their ability to care for others effectively.[2] The presence of secondary traumatic stress among emergency nurses can negatively impact their resilience,[3] which may ultimately contribute to burnout and departure from the nursing profession.[4]

Emergency nurses are frequently exposed to traumatic events through the delivery of care to injured patients. The types of events that have been identified as being most distressing to nurses are those involving sudden death, children, or adolescents.[5–8] Therefore, providing care to patients who are injured during school shooting events is likely to be particularly stressful for emergency nurses. Although the rates of multi-casualty, school associated shootings declined from July 1994 to June 2009, the incidence rates increased between July 2009 and June 2018.[9] The study defined "multiple-victim" as including more than a single victim and reported that 38 of these events resulted in 121 youth homicides between July 1994 and June 2016.[9]

A recent study exploring nurses' suicide rates in the United States identified that rates among female and male nurse subpopulations were significantly higher than those in the general female and male populations, respectively.[10] Additional research to identify risk factors and effective interventions is needed to improve mental health and combat the prevalence of suicide among nurses. Moreover, nurse burnout and departure from the profession may exacerbate

nursing shortages and staffing challenges, which may directly affect emergency departments. Therefore, research is indicated to identify how health care professionals who are tasked with providing medical care to the victims of school shooting events are affected mentally and emotionally. Benefits of this research include improved understanding of how these events may affect emergency nurses and identification of factors that may promote welfare, coping, resilience, and retention. The purpose of this study was to learn how emergency nurses describe their experiences to identify themes and findings that may translate to practices for improving the mental health and wellness of emergency nurses who care for patients from a multi-casualty, school shooting incident.

Methods

A qualitative case series methodology using data collection and analysis methods described by Yin,[11] which includes steps of plan, design, prepare, collect, analyze, and share, was used to guide this research. The study was performed after approval was received by the Vanderbilt University Institutional Review Board (IRB #190980).

These methods include the use of structured interviews and reliance on theoretical propositions in the analysis.[11] The interviews were conducted approximately 18 months after the adult emergency department of a Level 1 trauma center received five patients by helicopter emergency medical transport from the scene of a school shooting event. The emergency nurses who participated in the trauma resuscitations or assisted with the transition of these patients from the receiving helipad to the emergency department were eligible to participate. Ten registered nurses were identified by review of the ED daily assignment sheet, and their patient care roles were confirmed from patient electronic medical records. These nurses were invited to participate by email distribution of a recruitment flyer. The processes and flow of the receiving emergency

department were known to the researcher, who had more than three years of experience as a clinician in this department. The researcher did not have any personal experience with providing care to patients from a school shooting event.

A list of available support services was provided to each participant at the time of their interview. Semi-structured interview questions and analysis of the data were informed by a theory of secondary traumatic stress and the compassion fatigue resilience model,[12] as well as the professional quality of life model.[13] The conceptual variables identified in the compassion fatigue resilience model (Figure) and an examination of how those concepts related to the experiences described by these nurses benefitted the development of the interview questions (Supplementary Appendix) and interpretation of the data.

The professional quality of life model defines professional quality of life as incorporating aspects of compassion satisfaction and compassion fatigue. Although compassion satisfaction reflects positivity in helping others, compassion fatigue consists of the concepts of burnout and secondary trauma.[13] Burnout includes symptoms such as exhaustion and depression while secondary traumatic stress represents negative symptoms that result from trauma experienced through work activities.[13]

The interviews were recorded with an audio recorder and transcribed verbatim by the researcher or a transcriptionist who had signed a confidentiality agreement. Field notes were recorded by the researcher at the end of the interview and reviewed before coding activities. Each transcript was reviewed by the researcher for accuracy. The framework method was used in the analysis of the data. This method uses stages of transcription, familiarization, coding, analytical framework development, analytical framework application, data charting into framework matrix, and data interpretation.[14] Key phrases and meaning units from the

transcriptions were identified and coded by the researcher using NVivo 12 software (QSR International).[15] The categorization of codes generated themes that represented what the participants shared.

Results

Seven nurses agreed to enroll and completed an informed consent. There was no verbal or written response from the three eligible participants who did not enroll. The participants' ages ranged from 30 to 41 years, and six were female. Two of the participants shared that they were parents. The researcher was known to four of the participants before the interviews. It was anticipated that the interviews would last between 30 to 60 minutes and the median length was 37.7. The associate nursing officer for emergency services agreed to pay the five participants who remained actively employed by the health care institution for their interview time. Two participants had resigned from their positions and were compensated with a gift card at the expense of the researcher. A single interview with each of the participants were collected over a period of nearly four weeks. The interviews were conducted in private without the presence of non-participants. The interviews were conducted at a location identified by the participant, and three were performed by video conference owing to distance or participant availability. Although the participation of seven eligible nurses limited the ability to ensure saturation, identified themes and findings were consistent through the interviews.

PREPARATION AND PREPAREDNESS

The emergency nurses often reported being in "nurse mode" and described taking immediate actions to promote readiness of the receiving trauma bays.

> *Focusing on tasks allows you to kind of push the sadness and the trauma to the side so that you can complete your tasks successfully and give the best chance at living, or keeping their arm, or anything like that.*

We had to compartmentalize that […] these were actually children and just focus on the job we knew we needed to do.

The nurses described placing signage indicating the air ambulance service and unit number as well as age and known injuries for each corresponding patient on the door of each resuscitation room during the planning stage prior to the arrival of the patients. This planning was described as beneficial in that it allowed the emergency nurses to gather supplies and equipment needed to effectively care for the patients.

If my room is better prepared, I can take care of the patient better.

The participants described the importance of being proficient in providing care to trauma patients. Although these patients were all transported to the receiving trauma center by helicopter, the limitations in air medical resources such as weather restrictions or ambulance availability could necessitate the stabilization of patients from multi-casualty school shooting events in community departments where resources are likely to be more limited. These limitations may include bed capacity, number of available providers and staff, supplies and equipment, blood product availability, and access to support services. One participant indicated that nurses in community settings who may face such a mass casualty should maintain trauma nursing certification to promote proficiency in trauma care.

Nurses that even work in those community hospitals…my advice is to become TNCC [Trauma Nursing Core Course] certified.

One nurse expressed concern regarding the frequency of these events, which underscored the need to maintain high levels of readiness.

I don't think it's gonna get any better with time. I think it's gonna get worse. I don't think that we're gonna be able to stop it.

Another participant predicted that community or critical access emergency departments receiving patients from a multi-casualty school shooting may experience even greater emotional

challenges, since these departments are more likely to have staff who may personally know the victims or their families.

Compounding variables may create unique challenges for teams and individuals who are providing care to these patients. These factors or limitations may include personal matters, interpersonal challenges, multiple simultaneous traumatic events, high patient censuses, and staffing or equipment constraints. For instance, one nurse recalled tension with a staff member from another department who was encountered during transition to the emergency department. Comprehensive trauma centers routinely experience high censuses and preparing to accommodate the influx of patients from a mass casualty can be daunting. Underlying personal or departmental issues may also compound the stresses associated with caring for these patients. Recognizing existing factors or limitations, and taking action to control these effects, may mitigate the stresses associated with potential external variables.

Some emergency nurses described an increased presence of uninvolved staff coming to the department during the care of the patients.

> *Everybody who was anybody, administratively… whether they had anything to do with what we were actually doing there, was there.*

Two of the emergency nurses reported their disapproval of individuals who were not directly involved in patient care being present for the resuscitation efforts. One of the emergency nurses described the attendance of some individuals as their "just [wanting] to be enmeshed in that story, in that drama."

Another participant reflected on:

> *…the feeling of having people there who were just there to kind of watch this terrible thing and just kind of live…vicariously through us.*

In addition, this emergency nurse further described that when observers are present in a resuscitation that he or she perceives as difficult, it may result in increased emotional or psychosocial challenges.

> *When it's really bad or it affects you personally, and there's someone in there looking at you, it's very hard, at least for me, to not feel just angry, or just disgusted by the whole thing.*

Some nurses found the attendance by individuals who were not participating in the care of the patient to be unhelpful and one described it as "inappropriate."

COPING AND SUPPORT MECHANISMS

Most participating emergency nurses described the importance of maintaining a self-care routine to foster personal well-being and promote emotional recovery after such events. Coping and self-care strategies or routines that were described by the emergency nurses included cooking, exercising, walking, hiking, kayaking, humor, or talking with peers. One participant did admit that her common mechanism after witnessing such trauma was to "bury it," but she found some benefit to participating in activities in the outdoors when needing to cope with a situation. The participants who offered that their significant other or spouse worked in a health care role identified benefits of gaining their support after challenging patient situations. However, another shared prior challenges with discussing stressful work situations with a significant other who did not work in health care. None of the nurses discussed negative coping strategies or mentioned avoiding work or certain patient assignments after caring for these patients.

A formal debriefing event, taking place after these patients were transitioned from the emergency department to receiving operating rooms or units, was recalled by most participants. The emergency nurses offered varied perceptions of the formal debrief and some questioned its effectiveness in promoting coping and recovery of the emergency nurses in attendance. Some

participants indicated that the debrief focused on clinical assessment of the resuscitations rather than on the emotional components of being involved in the patients' care.

[They] talked about things that went well, and things that didn't go well.

Some of the nurses discussed being unfamiliar with those who came to the department to lead the debriefing session. Some participants also reported limited perceived efficacy of the session. Reasons for this perceived limited efficacy included a lack of rapport with the debriefing session lead. One of the nurses admitted that she would not have voiced a perceived need for formal support during the debrief because she didn't "feel comfortable." Another nurse admitted being reluctant to share emotions in a group of people, many of whom she did not know, during the formal debrief after the resuscitations.

It was all these people, most of whom I had never seen before.

One of the emergency nurses valued the availability of an employee assistance program but described that its resources would be most appropriate to provide to nurses after the acute phase of the incident.

> *I do think there's a benefit to having someone who's…objective and has been trained on how to be…an emotional mediator. And reflect things back at you…I do think that has its place. I think maybe it's in the moment…that it, it really doesn't fit.*

Therefore, the presence of employee assistance professionals in the affected emergency department may be most appropriate during the days or weeks following the mass-casualty event to coordinate any desired individual appointments for counseling or resources.

One nurse shared:

> *I think if you want to safeguard the staff's emotions you should keep [it] in the family.*

The emergency nurses identified that peer-to-peer interactions after the event were beneficial for coping and recovery but indicated some reluctance in making immediate use of

formal resources provided by individuals who had not participated in the care of these patients. They reported the perceived benefits of participating in peer-led activities to promote discussion and closure after caring for these patients.

They offered me services, but I feel like I got the most help from my coworkers.

Some of the participating nurses expressed that they would have preferred peer-support sessions and informal conversations to the debriefing that occurred following the emergency department resuscitations.

I feel like the most effective way to have dealt with that, for me, would have been for us to have a conversation. Like the people involved.

REFLECTIONS AND CLOSURE

Despite the passage of 18 months between the event and the nurses' participation in the research interviews, each participant provided recollections of these patients and their interactions. Most admitted that having such vivid recollections of a patient after such a length of time was not common.

Every time I hear about a school shooting in the news, anything like that, I just remember [my patient] in my bay.

The participating emergency nurses often described reflecting on the patients while they were away from work. One nurse admitted to thinking about the patients for months after the event. Another participant described nightmares she experienced in the week following the event.

I did have a few nightmares that I was actually at the school and I was trying to save some kids through a gym and going behind the stairs.

Media coverage of the school shooting event was described as providing a context for the incident but heightened thought intrusions.

It was all over the news that day…I was just looking at news reports to see what had been reported.

Social media and the frequent sharing or posting of media information limited the ability to separate from the event after the shift.

> *You can't escape, you may not be [seeking out] the articles of things, but…you're reading people posting the articles and…they inevitably [add] their own commentary on it.*

The emergency nurses described a lack of closure because hospital policy prevented access to medical records after a patient's departure from the emergency department.

> *If they're not in the ER, we're not supposed to access them.*

> *I think about them often when I hear of school shootings and wondering how they are. We didn't get really good follow-up on them, actually, which I think might have been helpful.*

Two participants also expressed a curiosity related to how these patients had recovered from the emotional trauma of the event.

The emergency nurses described the development of heightened situational awareness of potential acts of violence against themselves, family members, or friends as a result of being involved in the care of victims of acts of violence. Those nurses who identified themselves as parents described having increased thoughts of such situational awareness and acknowledged a concern for potential risks to their own children.

> *I was pretty emotional because I just thought of [my kids].*

This nurse later transitioned her children to home school following the incident.

> *I don't have to worry about someone coming in and shooting my kids at school.*

Another participant who did not identify as being a parent added:

> *I can't imagine having kids that are at that age and having to work something like that.*

The identified themes of preparation and preparedness, coping and support mechanisms, and reflections and closure were identified through an analysis of interviews with the emergency

nurses. Within these themes were findings that may be translated to implications for emergency nursing (Table 1).

Discussion

This study was conducted to examine the psychosocial effects of providing emergency nursing care to patients who were injured in a multi-casualty, school associated shooting event. In a discussion of the theory of secondary traumatic stress, Ludick and Figley identified "qualitative data offers targeted information and specific insights that unearth valuable, unique information and opens new lines of research" (p. 118).[12] Because the events perceived as being most distressing to nurses involve sudden death, children, or adolescents,[5–8] qualitative research among emergency nurses who provided care to patients from a multi-casualty, school-associated shooting may provide opportunities to learn how to best support nurse welfare and resilience among emergency nurses. The themes identified by this study include preparation and preparedness, coping and support mechanisms, and reflections and closure. These themes parallel the theoretical sectors and variables of empathic response, empathic concern, other life demands, self-care, detachment, social support, traumatic memories, sense of satisfaction, and secondary traumatic stress.[12]

This research aligns with literature that has identified the prevalence of secondary traumatic stress among emergency nurses.[16–20] The symptoms identified among nurses who participated in this study included the presence of vivid recollections 18 months after providing care to the patients from the multiple-victim, school associated shooting. Some participating emergency nurses also discussed the presence of thought intrusions when not in the work setting. Although none of the participants reported avoidance of patient care situations in their clinical

roles, some reported having increased situational awareness of the potential for violent acts which could directly affect them, family members, or friends.

Qualitative research studies among emergency nurses also provided themes consistent with those identified through this study. The importance of supportive relationships, which was described by participants performed by Alzghoul,[6] was also identified in this study. Findings also agree with results suggesting the importance of having protective mechanisms for coping with working with trauma patients and that experience and proficiency is essential for trauma nursing.[6] The importance of having strategies to mitigate stress, such as talking with peers, was identified by Drury et al.[21] The participants from the study performed by Drury et al.[21] also discussed being less likely to use external counseling services than pastoral or peer support resources.

Positive emotions, as described by Alzghoul,[6] include the reward of seeing patients improve and may not be experienced by emergency nurses who care for these patients for only a short duration and are unable to learn of their outcomes. Differing opinions related to formal debriefs were also discussed by Morrison and Joy.[20] Experiences with "poly-stressor effect"[20] mirrors the discussion of compounding variables which may affect the nurses' ability to cope with such traumatic events. The themes and findings from this study and review of the available literature yield implications for emergency nursing that may mitigate the negative psychosocial effects of providing care to patients from multiple-victim, school associated shootings.

Expanded research to include professionals from various health care disciplines and specialties is indicated to examine further the effects of caring for these patients and to identify those clinicians who are most at risk for secondary traumatic stress. The research efforts may also be broadened to include other clinical specialties in the emergency department such as

emergency medicine physicians, trauma surgeons, paramedics, respiratory therapists, or social workers. Further research may expand beyond the emergency department and could include clinicians from the responding prehospital agencies, air medical transport services, operating rooms, trauma and surgical intensive care units, step-down units, mental health services, and rehabilitation facilities. Gathering data from community emergency departments that have received patients from multi-casualty, school-associated shooting events is likely to further the understanding of how clinicians and departments without the vast resources of a trauma center are affected by these events and what unique challenges were experienced. Continued research efforts are also indicated to evaluate the effectiveness of interventions aimed at alleviating the symptoms associated with secondary traumatic stress, compassion fatigue, and burnout.

Implications for Emergency Nurses

The implications for emergency nursing are applicable to the preplanning, response, and recovery phases associated with providing care to these patients. Emergency nurses, nurse leaders, and nurse educators should encourage positive coping skills and self-care routines to mitigate the incidence of secondary traumatic stress and related symptoms. These skills and routines may support effective recovery after the provision of care to patients from multi-casualty, school-associated shooting events. Peer-focused sessions, which encourage open discussion and reflections, are likely to promote coping and recovery after caring for patients from these events. This aligns with research that identified debriefing with peers as being more effective and recommending the facilitation of debriefings by a nurse.[22]

Actively promoting the use of employee assistance professionals may be essential to helping affected clinicians cope after such an event; however, these services should complement, rather than supplant, peer-to-peer support that occurs immediately following patient care. Nurse

managers and hospital administration may consider providing paid administrative leave for clinicians immediately following patient resuscitations and dispositions to facilitate participation in peer conversations to promote coping and recovery. In addition to the implementation of peer support mechanisms immediately following the event, comprehensive employee assistance services, which include counseling or formal support services, may be appropriate to support clinicians involved in the care of these patients. Available resources that may mitigate secondary traumatic stress and promote mental health among health care professionals are provided in Table 2.

The restriction of non-essential staff in resuscitation rooms is likely a best practice to promote patient privacy and confidentiality while alleviating some of the emotions described by these emergency nurses. Likewise, as the participating emergency nurses indicated that not learning how the patients had recovered prevented their gaining closure after the event, notification of patient outcomes in compliance with state and federal laws and regulations is likely to benefit clinicians involved in the care of these patients. Although patient confidentiality is critical, individually sharing patient outcomes with the nurses, providers, and staff who were involved in the emergency care of these patients would likely prove beneficial and may be facilitated by gaining consent from parents or guardians. For those departments from which patients are transferred to other facilities for definitive care, the receiving facilities should perform outreach to the referring clinicians and their departments to inform them of patient outcomes to promote closure after the event.

Because research has identified barriers to obtaining trauma education among rural clinicians,[23] education and outreach by trauma centers to community facilities can improve clinical preparedness for mass and multiple casualty events while promoting wellness and self-

care resources to lessen secondary traumatic stress. Such education and outreach efforts may include trauma nursing curricula, assistance with event simulations, provision of training with patient care scenarios, and facilitation of patient transfers through the creation of autoacceptance agreements. Assistance with mass casualty drills that include mock patients who may be pediatric are also likely to support preparedness for such events.

Limitations

The study participants were emergency nurses who received these patients at a Level 1 comprehensive trauma center with vast resources, capacity, and personnel. The emergency nurses who participated in this study have access to employee assistance professionals, full-time social workers in their department, and clinical resources that include surgeons, surgical capacity, supplies, equipment, and blood products. Emergency departments and facilities with more limited resources are likely to experience greater challenges with accommodating the volume of patients from a multi-casualty, school-associated shooting event.

The participating nurses were from a single medical center and provided care to patients from one school shooting event. There may be some limitations in the transferability of these results to community emergency department settings with fewer specialty resources. In addition, the participating emergency nurses from the Level 1 comprehensive trauma center are likely to have more experience caring for patients injured by gun violence. This experience is likely to afford clinical and emotional benefits that supported these nurses' abilities to cope during and following their roles in the care of the victims from this event.

Conclusions

Emergency departments are typically the front line of hospital-based medical care. Multi-casualty school shooting events often occur without warning and bring unique challenges to the

clinicians and departments who are tasked with receiving and caring for these patients. Learning from emergency department nurses who care for patients from a multi-casualty, school-associated shooting event may promote personal and departmental preparedness and improve coping and recovery among involved clinicians. The identification of themes and the findings from this study translate to implications for emergency nursing that may improve patient outcomes through planning and preparedness while benefitting the welfare, resilience, and retention of emergency nurses who are likely to be emotionally affected by their roles caring for the victims of multi-casualty school shootings. Further research is indicated to explore the experiences of nurses after caring for patients from other school shooting events to better understand the psychosocial effects and define the most effective support methods.

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Supplementary Appendix

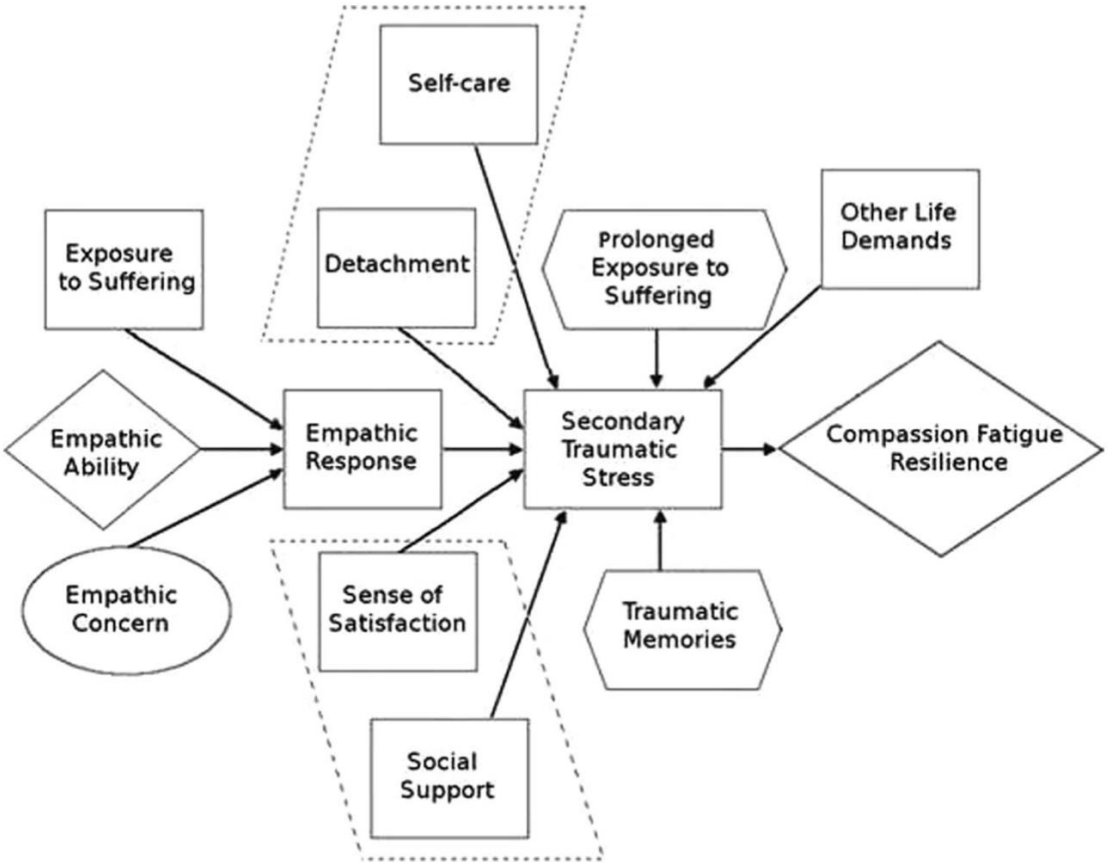

Figure 2. Compassion fatigue resilience model.[12]

Tables

Table 2. Identified Themes and Findings

Preparation and preparedness
Nurses felt that preparation, planning, and trauma nursing proficiency are essential.
Nurses stressed the importance of removing of non-essential staff and unfamiliar contributors.
Compounding variables from professional and personal lives may worsen associated stress.
Coping and support mechanisms
The use of self-care routines fosters underlying nurse welfare.
Nurses shared varied perceptions and opinions related to the formal debrief.
Nurses discussed the benefit of peer activities to promote wellness and healing.
Reflections and closure
Nurses shared vivid recollections of the patients even after 18 months.
Nurses often described reflecting on the patients while away from work. One participant described nightmares experienced in the following week.
There was a lack of achieving closure as patient outcomes were often unknown.
Extensive media coverage and social media provided context for the incident but increased thought intrusions.
Heightened situational awareness was evident, particularly among those nurses who are parents.

Table 3. Internet links for secondary traumatic stress and mental health resources for health care professionals.

URL
https://www.nimh.nih.gov/health/topics/coping-with-traumatic-events/index.shtml
https://safespace.org/secondary-traumatic-stress/
https://www.samhsa.gov
https://www.traumagroup.org
https://www.headspace.com/health-covid-19
https://www.calm.com/blog/health

Appendix A

INTERVIEW QUESTIONS

Do you recall what your thoughts were when you learned that your department was going to be receiving victims from a school shooting?

Do you recall your feelings while you were preparing to receive these patients, providing care to them, or reflecting on your role as part of the involved healthcare team?

What was it like for you as you cared for these patients?

Do you recall if you experienced any increased stress while preparing for the patients' arrivals?

Do you recall reflecting on or thinking about those patients in the days, weeks, or months after the incident?

Where there family members, peers, or managers who you talked with about this incident?

Were any services provided by the medical center to help the emergency department team after this incident?

Did you feel that these services were sufficient and/or helpful?

Did you find yourself seeking more information from the media about the event?

Do you think that these patients affected you any differently than those trauma patients who you routinely care for?

Did you find yourself avoiding situations or patient care assignments where you may encounter similar patients?

Did you experience any disruptions in your normal routines, such as difficulty sleeping or concentrating on other tasks, due to thinking about those patients?

Do you think that you were "jumpy" or more aware of the potential for violent incidents which could affect you, a family member, or a friend?

Were there any activities that you found to be helpful as a coping mechanism after the incident?

If you have left your position at this medical center, do you feel that this event had an effect on your decision to leave?

Is there anything else that you would like to add that would help me understand the challenges that you experienced as a result of caring for these patients?

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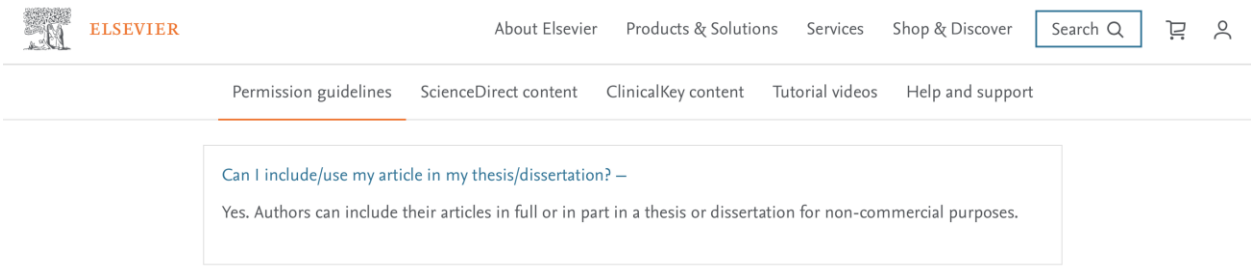

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Chapter IV: “It was Definitely Different Because They Were Kids:” Providing Trauma Nursing Care to Patients from a School Shooting.

This manuscript (Scholarly Paper #3) has been prepared for submission to the *Journal of Trauma Nursing*. The required citation format for this journal is that of American Psychological Association, 7th Edition.

Abstract

Background: Trauma nurses may experience secondary traumatic stress, compassion fatigue, and burnout as their clinical roles routinely expose them to patients with traumatic injuries. As those traumatic events described as being most stressful for nurses involve sudden death, children, and adolescents, multi-casualty, school-associated shooting events are likely to be particularly stressful for clinicians who care for the affected patients.

Objective: This research was performed to examine the psychosocial effects of caring for these patients in an inpatient trauma unit and to identify strategies for promoting mental health among trauma nurses.

Methods: A qualitative case series approach, a theory of secondary traumatic stress, and the compassion fatigue resilience model guided this research. Registered nurses who provided care in the trauma unit of a Level 1 trauma center to patients who were injured during a 2018 multi-casualty, school-associated shooting in the Southeastern United States were invited to participate.

Results: The themes identified by this research were trajectory of increased emotions, processing emotional stressors, and innocence of the patients. Nurses reported benefits of peer support and provided recommendations to increase the efficacy of formal debriefing sessions.

Conclusions: The themes and findings identified through this research translate to implications for staff nurses, nurse educators, nurse leaders, and legislators of public policy. Self-care routines and activities benefit nurse welfare. Nurses recognize benefits of peer support after such events. The use of employee assistance services should be encouraged among trauma nurses. Strategies aimed at promoting nurse welfare should be introduced in academic and institutional educational curricula.

Key words: Secondary Traumatic Stress; Stress; School shooting; Mass shooting; Mass casualty.

"It was Definitely Different Because They Were Kids:"

Providing Trauma Nursing Care to Patients from a School Shooting

Background

Secondary traumatic stress is defined as the presence of symptoms consistent with post-traumatic stress disorder that a professional develops as a result of witnessing or experiencing trauma that is affecting another individual (Figley, 1999). These symptoms include intrusive thoughts, avoidance of situations or locations that the individual may associate with the traumatic event, and hyperarousal and result from exposure to the suffering of a patient or client (Mealer & Jones, 2013). Nurses who provide care to patients who have suffered traumatic injuries are at risk of developing symptoms of secondary traumatic stress (Berg et al., 2016; Dominguez-Gomez & Rutledge, 2009; Duffy et al., 2015; Flarity et al., 2013; Hinderer et al., 2014; McAleese et al., 2016; Morrison & Joy, 2016; Ratrout & Hamdan-Mansour, 2020; Wang et al., 2020). The majority of research assessing the prevalence of secondary traumatic stress among nurses who provide care to trauma patients has focused on those who practice in emergency department settings (Alzghoul, 2014; Dominguez-Gomez & Rutledge, 2009; Duffy et al., 2015; Flarity et al., 2013; Lavoie et al., 2011; Morrison & Joy, 2016; Ratrout & Hamdan-Mansour, 2020).

Compassion fatigue has been defined as a physical, emotional, and spiritual decline that results from chronic exposure to increased stress, chronic exposure to the suffering of others, and personal experience in the context of a professional role (Peters, 2018). As described by the Professional Quality of Life Model (Stamm, 2010), compassion fatigue opposes compassion satisfaction, which includes positive characteristics nurses may experience in their clinical roles (Sacco & Copel, 2018). While the terms secondary traumatic stress and compassion fatigue have

been used interchangeably (Coetzee & Klopper, 2010), secondary traumatic stress has been clarified through concept analysis as differing from compassion fatigue (Arnold, 2020). This analysis described secondary traumatic stress as a condition similar to post-traumatic stress disorder "that results from empathetic engagement with others who are undergoing traumatic experiences" (Arnold, 2020, p. 152).

Another sequela of secondary traumatic stress is burnout, which is defined as a negative response to stress that results in emotional exhaustion, decreased feelings of work or personal accomplishment, impairment in professional compassion, and depersonalization (Hinderer et al., 2014). As burnout scores have been found to be higher among those who also score higher for secondary traumatic stress (Hinderer et al., 2014), burnout may be alleviated through interventions that seek to alleviate secondary traumatic stress. Because burnout is associated with lower patient satisfaction and quality of care, increased employee absenteeism and turnover, and increased institutional costs associated with staffing limitations (Hamdan & Hamra, 2017), patients and health care organizations may benefit from research that mitigates burnout among nurses.

Critically ill or injured patients are likely to have improved outcomes from the receipt of quality nursing care from experienced nurses. Tenured nurses also serve as essential resources and mentors for novice nurses entering the trauma nursing specialty. Nursing workforce shortages and turnover, which may be exacerbated by burnout and the subsequent departure of nurses from stressful specialty care areas, bring increased expenses associated with overtime and training costs. As patients, nurses, and health care communities may benefit from nurse welfare and retention (Kellogg et al., 2018), there are advantages to mitigating secondary traumatic stress and the related sequelae of compassion fatigue and burnout.

When discussing their theory of secondary traumatic stress, Ludick and Figley (2017) identified benefits of performing research that explores secondary traumatic stress among populations of professionals. As those incidents identified as being most distressing to nurses involve sudden death, children, and adolescents (Adriaenssens et al., 2012; Alzghoul, 2014; Healy & Tyrrell, 2011; Lavoie et al., 2016), multi-casualty, school-associated shooting incidents provide an appropriate context to further understand how nurses are effected by their roles in the care of trauma patients. Such school-associated shooting events occurred with increased frequency between July 2009 and June 2018 (Holland et al., 2019). As the incidence of school shooting events has increased in the recent past and nurses' roles in the care of these patients would be expected to be particularly stressful, the current research is viewed as providing a context to further define how nurses are affected by these events. Additionally, given the available literature examining secondary traumatic stress among nurses who practice in inpatient, trauma-focused care areas is limited, the current research is needed to further understand this phenomenon among trauma nurses.

Objectives

With the theory of secondary traumatic stress, Ludick and Figley (2017) identified the benefit of conducting research among groups of professionals to better define secondary traumatic stress. The current research is also appropriate to identify the psychosocial effects of providing nursing care in a trauma unit to patients who were injured in a multi-casualty, school-associated shooting event. Examination of these experiences may also support the implementation of practices and interventions that intend to mitigate the negative sequelae associated with providing care to patients injured during such events.

As research among clinicians who provide care to trauma patients has focused primarily on the experiences of nurses in emergency department settings, the current research offers differing perspectives from nurses who provided care in an inpatient trauma specialty unit. The current research may also further clarify the efficacy of nursing practices and activities in alleviating or mitigating secondary traumatic stress and the related sequelae of compassion fatigue and burnout. Through examination of the characteristics of participant nurses and their shared experiences, the current research may also help identify those nurses who may be at highest risk for secondary traumatic stress.

Methods

Qualitative methodologies using a case series study design were employed to conduct the current research. As defined by El-Gilany (2018), case series design is a study type "in which researchers describe the experience of a small group of people" (p. 10). For the current study, participants were professionals identified as having been involved in the care of a group of patients from a mass casualty incident that would be perceived as particularly stressful. Participants were registered nurses who provided nursing care in the trauma unit to one or more of five patients who were received at an academic, urban, Level 1 trauma center for treatment of injuries sustained during a multi-casualty, school-associated shooting event. Approval for this research was obtained from the institutional review boards at Vanderbilt University Medical Center (#190980) and the University of Tennessee (#20-06174-XP).

The theory of secondary stress and compassion fatigue resilience model benefitted the study design by facilitating the development of semi-structured interview questions and supporting the interpretation of the data. The compassion fatigue resilience model identifies variables that may predict the presence and level of compassion fatigue resilience. The model

supported the interpretation of the data through the assessment of how the nurses' discussion of their experiences related to these variables. Variables of exposure to suffering, empathic concern, empathic ability, and empathic response are identified as comprising an empathic stance within which workers in a caring profession are exposed to the suffering of others (Ludick & Figley, 2017). The secondary traumatic stress sector of the model, which includes those variables related to the negative impacts of exposure to trauma, is identified as consisting of traumatic memories and other life demands. The compassion fatigue resilience sector is provided as opposing the effects of secondary traumatic stress and represents "the emotional hardiness reached by trauma exposed individuals through the positive pathways of the [compassion fatigue resilience] model " (Ludick & Figley, 2017, p. 116). The variables included in this sector include self-care, detachment, sense of satisfaction, and social support.

The primary researcher performed three observational shifts on the trauma unit where the five patients were admitted for treatment of their injuries. These shifts were conducted to promote the primary researcher's ability to interview participants, better comprehend the content of the interviews, and facilitate the analysis of the interview data. The total observational time of these shifts was nearly 30 hours and allowed the researcher to learn the physical layout and nursing processes of the trauma unit. None of the participants were on shift during the researcher's presence on the trauma unit.

Eligible nurses from the trauma unit were identified from review of the patients' electronic medical records and recollections of the manager and nursing staff from the trauma unit. Review of the electronic medical records confirmed those nurses who had completed documentation on one or more of these patients. This allowed for the identification of potential participants as well as confirmation of the eligibility of nurses identified using recollection.

Review of the electronic medical records and remembrances of the unit manager and nurse participants identified 40 potential participants from the trauma unit.

Contact information for 20 of the eligible trauma nurses was obtained through the directory of the medical center and in consultation with two former trauma nurses who remained in contact with these nurses. No contact information for the other potential participants was able to be obtained. An introductory email was sent to the 20 nurses and responses were received from ten eligible participants. One potential participant responded and indicated she had no recollection of being involved in the care of these patients and felt her invitation to participate was an error. Informed consent was obtained from each participant after the primary researcher answered all of the nurses' questions.

Semi-structured interviews were performed using questions developed by the researcher and one of the collaborating researchers. These questions were approved by the institutional review boards (Appendix B). A list of available support services was provided to each participant at the time of their interview. Interviews were conducted via a HIPAA-compliant Zoom session, during which only audio was recorded. At the conclusion of each interview, a $25 electronic gift card was provided to the participants at the expense of the primary researcher. Audio files were recorded using the Zoom platform and an electronic audio recorder as a backup. The Zoom audio files were saved to a secure OneDrive folder maintained by the University of Tennessee. The interviews were transcribed verbatim by the primary researcher and saved to the secure OneDrive folder. These transcription activities benefitted the primary researcher's ability to be immersed in the data (Gale et al., 2013). The identities of the participants and clinicians mentioned during these interviews were removed from the transcripts to promote anonymity.

Analysis of the data was performed using the framework analysis method (Gale et al., 2013). The stages for analysis using the framework method consist of transcription, familiarization with the interview, coding, development of a working analytical framework, application of the analytical framework, charting data into the framework matrix, and interpretation of the data (Gale et al., 2013). The first three transcripts to be completed and transcribed were analyzed by both the primary researcher and collaborating researchers from the primary researcher's dissertation committee to confirm interrater reliability. Two of the transcripts were analyzed by more than one of the collaborating researchers to further confirm the reliability and accuracy of the analyses.

The interview transcripts were imported into NVivo (QSR International Pty Ltd., 2018) for analysis. The analyses completed by the primary and collaborating researchers were compared and interrater reliability of the analyses confirmed. A working analytical framework was developed from the analysis of the first three transcripts. The remaining transcripts were analyzed independently by the primary researcher and the analytical framework was applied for the analysis. Further development of the analytical framework was performed after the analysis of each transcript to enhance the data analysis. Data were charted into a framework analysis to support the identified themes and findings.

Results

Seven registered nurses identified as having provided care to one or more of the five patients who were admitted to the trauma unit after being injured during the multi-casualty, school-associated shooting event were enrolled in the study. Two eligible nurses who expressed initial interest in participating did not enroll in the study. Six of the participants were female. One of the participants identified as being a parent. Six of the participants were working the day

shift in the trauma unit on the day of the event. Only one of the participants continued to practice on a full-time basis in the trauma unit at the time of the interview. The total interview time was 348 minutes and the seven interviews averaged 49 minutes and 44 seconds.

Despite three years having elapsed since the multi-casualty, school-associated shooting event, the participating trauma nurses provided vivid recollections of their experiences providing care to one or more of these patients. Three themes were identified during the analysis: innocence of the patients, trajectory of increased emotions, and processing emotional stressors. These themes were returned to the participants by email for comment. Three nurses responded and validated the accuracy of the identified themes.

Innocence of the patients

The innocence of the patients injured during the school-associated shooting event was described as increasing the emotional burden of providing nursing care to the victims. One nurse described:

> *I think that factor in itself, knowing that these people…were not doing anything wrong, 'cause sometimes the patients, it's like, you can kind of brush it off as like "well they didn't make a very good decision and put them in this situation." Obviously not the case in this event. And that makes it a lot harder to cope with because I think that that's sometimes an outlook that people would have to make it a little bit easier to process some of the situations that we could be in. And in this one, obviously, it's someone completely innocent and just in a really bad situation* (RN3).

The trauma nurses reported that while they commonly provided care to patients who suffered injuries from acts of violence, the age of these patients and the circumstance of suffering injuries

during a school shooting compounded the associated emotional burden. One nurse described "It wasn't my first time by any means taking care of patients with gunshot wounds. But it's different whenever you hear it's from, like, a school shooting. You know, things that you only hear about in the news" (RN4). Another nurse shared "Someone went into a school and did this. This felt way more malicious than if it were to have just been one person. Especially with kids" (RN6).

This innocence increased the severity of the emotional stressors described by the trauma nurses and compounded what one nurse described as "my normal emotions just felt heightened" (RN4) prior to, during, and following the admission of these patients to the trauma unit. The innocence of the patients also heightened one nurse's awareness of the potential of becoming a victim of violence: "This could happen anywhere to any of…us and the fact that it happened to these young innocent kids made it even harder to process" (RN3).

Trajectory of increased emotions

Merriam-Webster (n.d.) defines trajectory as "a path, progression, or line of development." Research has used trajectory as a way to describe emotions as individuals move through time (Kirkland & Cunningham, 2012). The nurses described a trajectory of emotions that commenced with anxiety when they received notification by pager alert that the facility was receiving patients from a school shooting event. This anxiety was also accompanied by emotions of fear as the conditions of these patients were unknown at the time of the notifications. After the arrival of the patients, the nurses described experiencing anger as they witnessed the physical and emotional effects of this event on the patients. Following the death of one of the patients, the nurses reported experiencing sadness that affected them individually and across the whole trauma unit. The realization of the psychological effects this event would have on the mental health of the patients was also identified as causing sadness among the nurses. Despite the death

of the patient, there were emotions of joy in the following shifts as the conditions of the remaining patients improved and they were eventually able to be discharged home from the trauma unit. The anger the trauma nurses experienced from their exposure to patients who were injured during the school shooting often translated to the recognition of the need for public policy and societal changes.

Participants identified routine challenges associated with working as a nurse in the trauma unit of a Level 1 trauma center. One of the nurses shared: "This unit is heavy and very demanding physically and emotionally in a lot of ways" (RN3). These routine challenges trauma nurses reported experiencing included stress associated with the acuity of the patients and the incidence of verbal and physical abuse against nurses. One nurse summarized this abuse as: "We were being cussed out, hit, kicked, spit on, threatened on an almost daily basis" (RN6).

The day of the multi-casualty, school-associated shooting, when the five patients were admitted to the trauma service, was described by another nurse as being one of the most stressful of her professional career:

> *I would say a very stressful [unit] most days but extra stressful on, like, I can probably count on one hand the amount of days that I left just being like "Oh my gosh, that was terrible." And that was one of them* (RN3).

The increased emotions described by the trauma nurses included anxiety, fear, anger, sadness, and joy. The heightened emotions of anxiety and fear were described as being present when they became aware they would be receiving an unknown number of patients from a multi-casualty, school-associated shooting event. During the preparation and anticipation of receiving these patients, the nurses were not aware of the specific conditions and associated injuries of the patients. In preparing for the arrival of the patients, the nurses described efforts to transition

patients off the trauma unit to be able to accommodate an unknown number of patients from the shooting event.

Participants described experiencing anger during the provision of nursing care for these patients and in the time following the event. One nurse described this emotion as:

> *I just remember thinking this something that [will] scar them for the rest of their lives and it's something that he'll never be able to forget. And I just remember thinking "what a horrible legacy to have to be the survivor of." I just remember feeling really angry for them at the injustice of it all* (RN1).

The anger was related to the perception that the patients injured during the school shooting event were innocent in the situation that led to their injuries. This anger often translated to report of advocacy for change to decrease the incidence of mass shootings and gun violence in the United States. The nurses also expressed concern for the psychological well-being of those directly or indirectly affected by this event, which also compounded the sadness and anger felt by the participants. One nurse described this concern for the emotional impact of the event on the affected students. "The emotional component that is gonna come with that for years down the road is sad" (RN3).

The sadness participants described was most commonly associated with the loss of life from the event. Despite this sadness, the participants also described the joy they experienced when the conditions of the survivors improved. One nurse described this in the following way:

> *I was so, so glad when he, he was able to move all of the extremities. And, you know, other than his [anatomical region] injury, he was fine. And that was great. And I was so glad. Because it could have been way worse and with getting shot in the [anatomical region], it's a high real estate area so, so many awful things can*

> *happen. And I remember being, like, yeah, really, really glad he opened his eyes and could move all of his extremities, and everything was gonna be fine. But, you know, most of it was, very sad day* (RN2).

One of the nurses described the conflicting emotions of joy and sadness that occur on the trauma unit, particularly with the experience of providing care to the school shooting victims:

> *Just having multiple scenarios happening at one time. You know, gratitude for the folks that did okay. And then extreme sadness for the ones that didn't. And lots of, you know, emotional roller coasters of grieving the loss and then celebrating the recovery. Kind of a strange dynamic* (RN3).

Another nurse described a sense of satisfaction among trauma nurses who witness the recovery of patients:

> *Those are definitely the things that got me through and just knowing that, you know, the good, nice thing about trauma is it is very rewarding to see your patients get better. Obviously not everyone gets better and those cases are really hard. But a lot of your patients come in really, really, really sick and have really amazing recoveries, and it's awesome* (RN3).

The proximity to patients from the event provided a firsthand account of the profound effects of mass shootings and gun violence. The innocence of the patients and direct involvement in the care of victims who were injured during a multi-casualty, school-associated shooting event compounded the realization of the impacts of mass shooting events and the need to advocate for change. One nurse shared:

> *I remember school shootings were getting, were very common. Obviously not now because of the worldwide pandemic but I just remember thinking "are you kidding me,*

another shooting." Like what, what are we doing that, that we can't stop this. I remember being super upset with…the political administration, political climate that we are in at the moment (RN1).

Several of the nurses described how the prevalence of mass shooting events, and the related psychosocial effects of these incidents, became more apparent and personal after providing care to the patients who were injured during this event. One nurse described how providing care to patients from a nearby multi-casualty, shooting-associated shooting event heightened the actuality of these events:

Something like that just felt, like, so far away. You know, whether it was, like, Sandy Hook or even, like, Las Vegas. Like, whenever that happened it just all feels so far away, you know, but it really is different whenever it's so close and you know that school or you're familiar with where it's at or you have family there. It's definitely different (RN4).

One of the nurses described:

I've seen on the news plenty of times other school shootings or, you know, Aurora, or Orlando. Like, plenty, Sandy Hook. I remember all of those but it didn't feel real, really. Like, you still kind of feel like you're more so watching a show, for lack of better terminology. You know, it doesn't feel personal. It doesn't feel real. And so that was when I was like, people are really going to die. We know it. More than likely people are going to die from this and I'm going to have a direct relationship to this event in some way or another. And for some reason, knowing that I was going to have a connection to such a, like, travesty of an event just, it felt more personal than, you know, not having been a part of it (RN6).

Similarly, another nurse shared:

Devastating events in some other place where you have literally no connection to versus an event where you took indirect part in it. Somehow or another, makes it, it kind of sheds light on the reality that this stuff does happen to people, to anyone, anywhere, any time (RN6).

One of the nurses described the need for public policy change and offered the suggestion of increasing mental health screenings among those who purchase and possess firearms to alleviate the incidence of gun violence:

Certainly makes you think that some things are out of your control and gun violence is certainly in our society and it has taken a lot of innocent lives…it makes me definitely want to have more mental health screenings and things like that with people that have guns and, you know, unfortunately in our society I don't think that it, guns are going to be a thing but gun violence can, I think, be reduced if there's some mental health screenings in place. And I hope for that and seeing this instance first-hand makes you hope for that too because these are innocent lives that didn't need to be lost…It certainly makes me think about my life and my loved ones' lives and we're all, unfortunately in today's world could happen to anyone at any time (RN3).

Another nurse described how providing care to these patients illuminated the effects of shooting events and cultivated their motivation to advocate for change:

I didn't even really grasp how bad it was…gun control didn't become the thing I care as much about until I actually saw the results of it. But I definitely feel like, having the second-hand trauma of it has made me much more politically motivated, made me much more aware of how horrible it is and how much I don't want it to happen again (RN2).

The nurse further described taking action to advocate for public policy change after providing care to the patients who were injured during this multi-casualty, school-associated shooting event:

> *I was really angry when I got home. I ended up emailing [Congressman] about trying to get gun legislation. You know, he never ended up responding….Gun control is really big for me. Because I don't think that kids should have to deal with this, and we have a huge firearm problem in America* (RN2).

Processing emotional stressors

Having less nursing experience and tenure in the trauma unit was associated with experiencing increased emotional stress. The current research suggests that having underdeveloped coping strategies, such as peer relationships with work colleagues and the ability to compartmentalize emotions while providing direct patient care, correlate with greater emotional stress. A nurse who identified as being a novice nurse on the trauma unit described that having limited coping skills was detrimental: "I just had no ability to cope. It was just horrible and I brought it home with me" (RN1).

There was a perceived benefit among more tenured nurses of having confidence in one's nursing skills and trust in capabilities and skill of the trauma team. Nurses with more experience also described a protective ability to compartmentalize emotional stressors while providing care for these patients. The ability to compartmentalize emotional aspects of patient care on the trauma unit was described as a learned mechanism to combat the stress nurses experience on the trauma unit. Another nurse with more experience and longer tenure on the trauma unit shared the following thoughts related to compartmentalizing:

In the moment you just have to power through it, and you're so focused on keeping your patients alive that you don't really have time to process the gravity of the situation (RN3).

A lot of the trauma cases that I got I, like I said, and this is just me personally, how I would cope with stuff, is put the blinders and do the tasks at hand and, you know, just stay really focused on providing care and not really thinking about the gravity and sadness of the whole scenario because there's a lot of dark situations and I felt like if I really, like emotionally tied, or to some of the back stories, it's too much (RN3).

Another nurse who was more tenured on the trauma unit described compartmentalizing to a significant extent as "I felt kind of dissociated from myself" (RN6).

As nurses reported value in peer support from nursing colleagues in the trauma unit, being newer to the trauma unit was a risk factor for having less collegial support to promote coping. A nurse who identified as being newer to the unit at the time of the shooting event reported reluctance to talk with peers:

I very much kept it to myself. I was new. I didn't know a lot of people. So, I didn't feel like I could, I didn't feel like I really had a safe space to talk to any of my peers about it (RN1).

Those participants with the closest exposure to the critical patients received in the trauma unit also reported experiencing more emotional stress. One nurse offered:

I think really just the fact that I literally can remember every patient. I at least remember their first names. I remember what bed we admitted them to. I remember what, like, where they were shot and what they needed. And how they did. The fact that I remember

all of that so vividly, but I can't recall a lot of things about most patients that I've cared for in the past. I really think that speaks to just the heightened emotional level that everyone kind of felt that day (RN4).

Another nurse reported being in a supportive clinical role with the nurses on the trauma unit, but not in an assignment that put her in consistent close proximity to the patients. The nurse reported decreased recollections of the patients:

You know, I don't remember their faces. I don't remember the families' faces. I don't even remember some of the people that were there that day (RN6).

So, I don't know if maybe it was because I wasn't as "in it" as other people were. Like, I was kind of more on the outskirts of the situation. So that might have just been it. Like, it wasn't, I don't know, maybe it wasn't hitting me as hard (RN6).

The one participating nurse who provided patient care during the night shift reported her perception that the day shift nurses who received the patients on the day of the event were more likely to be affected by their role in the care of the patients: "I think probably some of the day shift nurses, you know, probably got a lot more involvement in it" (RN7).

Social support was identified as being essential to processing the emotional stressors that trauma nurses experienced while providing care to the patients who were injured during the multi-casualty, school-associated shooting event. Those nurses with greater tenure on the trauma unit were more likely to have a peer support network that supported an ability to cope with the emotional stress of this event.

I kinda like to say that I've never found a ground of people at work like the ones I worked with on trauma because you kind of go through like a war on trauma. And they become like your battle buddies if that makes sense (RN1).

Another nurse shared:

> *I really like to do peer stuff. I like to be around people who have, who you know have been through it and you don't even have to talk about it. Like just being around somebody who knows, like, what you're going through helps a million to me* (RN5).

Nurses also reported that talking with peers about experiences and feelings was without fear of punitive action for violating patient confidentiality. The need to maintain patient confidentiality in accordance with patient privacy and protection laws limited the ability to discuss patient care experiences, particularly with friends or family members.

Coping strategies discussed by trauma nurses included journaling, exercise, therapy, and debriefing. One of the nurses described the following experience with improved mental health as a result of therapy: "I've really tried to become more healthy mentally, so I'm seeing a therapist now. Really specifically for COVID PTSD. So, the punches don't stop coming, but therapy, I feel, really helps" (RN1). Another nurse offered: "Therapy really helped. And kind of helped me reflect on some of the stuff and let go of some of the baggage that I had accumulated" (RN2).

The physical activities identified as beneficial to promote coping among the participants included running, kickboxing, and physical strength training. Maintaining a self-care regimen to combat the stresses experienced at work was described as being helpful. One of the nurses shared:

> *I think, I, at the time was doing those things to take care of myself outside of work and during work. It was stressful but I knew that I had my twelve hours and was going to work as hard as I could, and then do the things that I needed to do to take care of myself after. And, you know, I am glad that I did that because I think*

otherwise it would be really hard to come to work the next day, you know, if you are constantly having disruptions outside of work (RN3).

A debriefing that occurred after the five patients were admitted to the trauma unit was described by the participants who were on the day shift on the day of the event. However, the participants often reported that the timing of the debriefing inhibited their active participation. One nurse described the debriefing as not beneficial and admitted a lack of personal readiness to benefit from such a session:

We tried to do a debrief at the end of the day. One of our attendings tried to do it. I don't feel like it was incredibly helpful. But I don't know it I was in the best headspace for it at the moment (RN2).

Another nurse shared that the mental burden of the situation and timing of the debriefing limited the perceived benefit of the session:

I don't really remember much about the debriefing other than, you know, "we did our best, we moved like a team," things like that. Just the typical uplifting stuff, but it just seemed to go in one ear and out the other, at least for me. Just because it was, like, no matter what you say we couldn't save this kid (RN6).

But I feel like I, at least speaking for me, felt the weight of everything that had just happened was just now hitting. And so, I was just kind of absorbing all of that. And that kind of took precedence of whatever they were saying (RN6).

Those nurses who were in a direct patient care assignment expressed their priority was to continue providing care to their patients, which prevented their ability to actively participate in the debriefing and discuss their feelings and emotions. The trauma nurses admitted they likely

would have found the debriefing to be more beneficial if other clinicians had been available to assist with the immediate care needs of these patients. One of the nurses shared:

> *But, you know, it's just hard because there wasn't any staff brought in to relieve us. So, you know, they tried to have this debrief during the shift, but, like, I still had patients to take care of. Like, I still had labs to be drawn and meds to be given. And, you know, all the quality stuff that they want us to do. So, it's like, the debrief, maybe the debrief wasn't helpful because, like, you know, I couldn't really sit back and think about it because I was still on the clock doing my job* (RN2).

Another nurse also described that patient care was prioritized over participation in the debriefing session: "They did do a debriefing but we, the nurses that were actually providing care, didn't get to be a part of it" (RN5). As care of the patients was their priority, these nurses indicated the timing of the debriefing could have facilitated nurse involvement if the session had been held following the conclusion of the work shift.

Some of the trauma nurses, while aware of employee assistance services available from the medical center, described being unlikely to seek these services due to a culture that hinders their use. One nurse described use of employee assistance services as "under encouraged" (RN3) and described a cultural barrier to seeking employee assistance services on the trauma unit:

> *It wasn't a norm to go, you know, seek an employee assistance program or anything like that. Um, in fact I feel like the, some of the culture on that unit is a little bit of…the chip on your shoulder kind of macho* (RN3).

Discussion

As research has identified that situations involving sudden death, children, and adolescents are particularly challenging for nurses (Adriaenssens et al., 2012; Alzghoul, 2014; Healy & Tyrrell, 2011; Lavoie et al., 2016), the innocence of the patients identified by participants compounded the psychosocial effects of this event. The participants described reflecting on these patients following the event. They also described how providing care to these patients increased awareness of the prevalence and severity of such events. These intrusive thoughts and heightened arousal are consistent with symptoms of secondary traumatic stress, which has been identified as being present among nurses who provide care to patients with traumatic injuries (Adriaenssens et al., 2012; Berg et al., 2016; Dominguez-Gomez & Rutledge, 2009; Duffy et al., 2015; Flarity et al., 2013; Hinderer et al., 2014; McAleese et al., 2016; Morrison & Joy, 2016; Ratrout & Hamdan-Mansour, 2020; Von Rueden et al., 2010). As a participant who identified as being more novice to the nursing profession reported experiencing heightened emotions and having fewer coping mechanisms, this finding agrees with research that identified increased risk of secondary traumatic stress among more junior nurses (Kelly et al., 2015; Von Rueden et al., 2010).

The themes and findings from the current research correlate with variables provided in the compassion fatigue resilience model (Ludick & Figley, 2017). The model variables of exposure to suffering, empathic ability, and empathic concern were represented by the nurses' roles of providing care to these patients. Self-care, social support, the ability to compartmentalize emotions while providing care, and a resulting sense of satisfaction were described by the nurses as beneficial for processing emotional stressors. The traumatic memories associated with providing care to the patients injured during the multi-casualty, school-associated shooting event

and frequent exposure to suffering in the delivery of nursing care to trauma patients were seen as contributive towards the prevalence of secondary traumatic stress. Compassion fatigue resilience, which supports nurse wellness and retention, may be promoted through the promotion of positive coping mechanisms and strategies that may alleviate secondary traumatic stress.

The current research has implications for nurses, nurse peers, nurse leaders, administrators, and political officials. Nurses may benefit from maintaining a self-care regimen to improve wellness, which can mitigate the incidence of secondary traumatic stress. As mindfulness interventions among nursing students have been identified as assisting with management of stress (Chen et al., 2021; Marthiensen et al., 2019), the inclusion of such activities in nursing curricula may ultimately improve the welfare of nurses transitioning to practice. While encouraging self-care activities, services offered by health care organizations may further advance nurse welfare. Promoting a culture among nurses that supports the use of employee assistance services (Healy & Tyrrell, 2011; Kornhaber & Wilson, 2011) is likely to aid in alleviating the negative sequelae of compassion fatigue and burnout after stressful patient care situations. Advocating for peer support activities (Jarden et al., 2019; Lavoie et al., 2011; Peterson et al., 2008; Wahl et al., 2018) to support nursing colleagues who experience emotionally challenging situations, such as mass shootings, pediatric traumas, or unexpected patient deaths, may benefit nurses who care for the affected patients.

Formal debriefing activities have been identified as beneficial for clinicians after providing care for trauma patients (Morrison & Joy, 2016). Research has indicated that emergency department debriefings "should occur before the end of the shift or within 12 to 24 hours of the incident" (Clark et al., 2019, p. 403). Within the inpatient trauma unit setting, current research suggests that formal critical incident stress debriefing activities should occur

following the patient care shift to facilitate nurse participation when the priority of providing care to the patients has been transitioned to other nurses. In addition to promoting the use of employee assistance services (Healy & Tyrrell, 2011; Kornhaber & Wilson, 2011) and peer support activities among nurses (Jarden et al., 2019; Lavoie et al., 2011; Peterson et al., 2008; Wahl et al., 2018), nurse leaders and administrators may mitigate the incidence of secondary traumatic stress, compassion fatigue, and burnout by advocating for education to increase awareness of secondary traumatic stress (Kellogg et al., 2018; Morrison & Joy, 2016), fostering supportive relationships among clinicians with varying experience (Jarden et al., 2019), and implementing and evaluating interventions aimed at improving nurse welfare (Hamama et al., 2019; Kleis & Kellogg, 2020; McDermid et al., 2019; Ratrout & Hamdan-Mansour, 2020).

Multi-casualty, school-associated shooting events have an impact on more than the victims, family members, and members of affected communities. Health care clinicians who provide care to the patients from these events are affected by their clinical experiences with these patients. Nurses are well-positioned to advocate for policy and social changes aimed at alleviating the incidence of mass shootings. Through the promotion of prevention strategies that seek to prevent mass shootings, improve awareness of secondary traumatic stress, detect negative impacts of nurses' roles in challenging situations, implement self- and peer-care interventions, and increase availability and use of employee assistance services, nurse welfare, resilience, and retention may be improved.

Limitations

This study included registered nurses involved in the care of patients from a single multi-casualty, school-associated shooting event who were received at one Level 1 trauma center. As such tertiary trauma centers have comprehensive medical and surgical specialties and resources

to care for critically ill or injured patients, increased services would also typically be available to benefit clinicians who provide for these patients. Nurses who care for similar patients at health care facilities with more limited resources may be more adversely affected by their experiences. Multi-casualty, school-associated shooting events during which fewer or greater numbers of patients are injured may also be associated with differing experiences among the involved clinicians. As the innocence of the patients was an identified theme, school shooting events during which younger children are injured may be associated with increased emotional stress.

Data collection was conducted three years after the incident, which could have created recall bias. Despite the time that had elapsed since providing care to these patients, each of the participating nurses shared vivid recollections of their patient interactions, experiences, and nursing roles. The number of enrolled participants was limited by challenges associated with obtaining contact information. Despite these enrollment challenges, the data and associated analyses revealed common themes and findings. All but one of the participants were nurses who were on shift when the patients were received in the trauma specialty care area and likely experienced more stress than those nurses who provided care to these patients in the days following their initial admission.

Conclusions

The findings of the present research agree with research supporting critical incident stress debriefings, but differ from the recommendation that such sessions be held before the end of the patient care shift (Clark et al., 2019). This is due to the nurses reporting that patient care was their priority during the shift and their being unable to actively participate in the debriefing while needing to tend to the needs of their patients. We identified benefits of social support among peers involved in the care of these patients. As interventions using peer support have been

recognized as beneficial for the promotion of compassion satisfaction (Wahl et al., 2018) and prevention of stress and burnout (Peterson et al., 2008), our findings of this research support that such interventions may also combat secondary traumatic stress.

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The researchers have no conflicts of interest to report.

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Key Points

- The psychosocial impacts of multi-casualty, school-associated shooting events extend beyond the affected students, their family members, and the affected communities to those clinicians whose roles involve the provision of care to these patients.
- Trauma nursing is stressful and the provision of care for patients who are victims of multi-casualty, school-associated shooting events is associated with increased emotional burden.
- Active peer support, particularly for nurses new to the trauma specialty or unit, is a valuable coping mechanism for processing emotional stressors.
- Employee assistance services should be available and promoted as a valued tool to support nurses who work in challenging specialties and care areas.
- Debriefing sessions among affected nurses in inpatient care areas should be conducted at the conclusion of the patient care shift and encourage active participation among peers.

Supplementary Appendix

Appendix B

Interview Questions

What were your thoughts when you learned that you would be providing care to patients who were injured in a multi-casualty, school-associated shooting event?

What was it like for you as you cared for these patients?

In what ways did your experiences with caring for these patients compare with those that you commonly face as a trauma nurse?

What emotions did you experience as you were preparing to provide nursing care for these patients?

Did these emotions differ from those that you routinely experience in your role as a trauma nurse?

How would you describe your feelings as you were providing nursing care to these patients?

Did the amount of stress that you experienced with caring for these patients differ from that which you experience with those patients who you routinely care for?

What services were provided by the medical center to help the trauma team after this incident?

What were your perceptions of these services?

Were these services helpful or unhelpful?

What activities did you find to be helpful to promote your ability to cope with stressful situations at work?

Where there family members, peers, or managers who you talked with regarding your feelings or experiences with providing care to these patients?

Without providing any protected patient information, how would you describe your recollections about the clinical outcomes of these patients?

What sort of reflections or thoughts about those patients did you experience after the incident?

What disruptions in your normal routines did you experience due to thinking about those patients?

Did your experiences with caring for these patients make you more aware of the potential for events or situations which could affect you, a family member, or a friend?

What sources of information did you seek out or visit to learn any more about this school shooting event?

If you have left your position at this medical center, did your experiences with these patients influence your decision to leave?

Chapter V: Conclusion

Secondary traumatic stress, characterized as a condition like post-traumatic stress disorder, may result from an empathic relationship with individuals experiencing trauma (Arnold, 2020). Recognized in helping relationships as a "cost of caring" (Figley, 1999, p. 11), secondary traumatic stress describes symptoms of intrusions, avoidance, and hyperarousal that professionals may experience as a result of witnessing trauma experienced by others (Mealer & Jones, 2013). The first manuscript of this dissertation provides an integrative review of the literature performed to examine the current state of the science related to secondary traumatic stress among nurses who provide care to patient with traumatic injuries. The review of the literature synthesized qualitative and quantitative research that identified that emergency and trauma nurses experience secondary traumatic stress and related sequelae of compassion fatigue and burnout as a result of their professional roles. The review identified the need for further research to explore secondary traumatic stress among emergency and trauma nurses through the examination of experiences with providing care for patients with traumatic injuries to clarify the psychosocial effects of providing care to such patients, to identify those nurses most at risk for secondary traumatic stress, and to learn strategies and interventions that may be effective in mitigating secondary traumatic stress.

The researchers who provided the theory of secondary traumatic stress and the compassion fatigue resilience model support the use of qualitative research in examining secondary traumatic stress as it "offers targeted information and specific insights that unearth valuable, unique information and opens new lines of research" (Ludick & Figley, 2017, p. 118). The second manuscript of this dissertation used qualitative case series methods to examine the experiences of emergency nurses who provided nursing care to patients injured during a multi-casualty, school-associated shooting event. As such incidents would be expected to be

particularly stressful for nurses who provided care to these patients, this research provided information that benefits nurses, nurse leaders, hospital administrators, and legislators. The themes of preparation and preparedness, coping and support mechanisms, and reflections and closure relate to findings that support the development of self- and peer-care routines as well as interventions and strategies that may be provided by health care organizations to combat secondary traumatic stress among nurses who are at risk.

The third manuscript also used qualitative case series methods to examine the experiences of trauma nurses who provided care to the patients injured during the same multi-casualty, school-associated shooting event. The integrative review of the literature identified that the majority of research examining secondary traumatic stress among nurses who provided care to patients with traumatic injuries focused on emergency nurses. As trauma nurses would provide care for longer duration in inpatient settings, they would be expected to have longer exposure to the patients, be aware of patient outcomes, and have increased interaction with the family members of these patients. This research was performed to gain additional knowledge related to the incidence of secondary traumatic stress among trauma specialty nurses through the examination of experiences with providing care to the victims of the school shooting event. The themes identified by this research include innocence of the patients, trajectory of increased emotions, and processing emotional stressors. Findings of this research also supported the implementation of self- and peer-care interventions and recommendations to promote increased benefits of debriefing sessions.

Theoretical Foundations

The nurses from the emergency department and trauma unit provided vivid recollections of their experiences with providing care for these patients. They described reflecting on these

patients after the work shifts during which they had provided nursing care to the victims of the event. The emergency and trauma nurses, particularly those who identified as being parents, experienced heightened awareness of the potential for injury to themselves or family members. Nurses who were newer to patient care roles that brought them in contact with the victims of the multi-casualty, school-associated shooting event described some resulting avoidance behaviors. These anecdotal descriptions of experiences associated with caring for these patients suggest these nurses experienced secondary traumatic stress.

Themes and findings from qualitative research among emergency and trauma nurses who provided nursing care to patients injured during a multi-casualty, school-associated shooting event correlate with variables of the compassion fatigue resilience model and theory of secondary traumatic stress (Ludick & Figley, 2017). Nurses who provide care to critically ill or injured patients experience the empathic response, which the compassion fatigue resilience model identifies as including variables of exposure to suffering, empathic ability, and empathic concern. Emergency and trauma nurses, through their professional roles, experience the prolonged exposure to suffering that is a variable in the model associated with secondary traumatic stress. The nurses who provided care in the emergency department and trauma unit to these patients often described traumatic memories associated with secondary traumatic stress in the compassion fatigue resilience model.

Social support, specifically in the form of peers who were also involved in the care of the patients from this event, is identified in the model and was found as an important variable to mitigate secondary traumatic stress. Self-care, another mitigating variable from the model, was also described by emergency and trauma nurses who recognized benefit of routines and activities perceived as helpful in alleviating work-related stress. The variable of detachment, which was

described by the trauma nurses as the ability to compartmentalize emotions during the provision of care, was more effectively performed by more tenured nurses. However, despite the ability to compartmentalize during the provision of nursing care, increased emotions were experienced following the work shift. A sense of satisfaction, another variable in the compassion fatigue resilience model that influences secondary traumatic stress, was experienced by the trauma nurses who were more aware of the outcomes of most of the affected patients admitted to their specialty care area. The emergency nurses more commonly shared experiences relevant to the model variable of other life demands in recognition that extraneous factors may compound the stress associated with such patient care situations.

Prevention Strategies

While gaining insight into the effects of providing nursing care to these patients, this research also clarifies how the effects of multi-casualty, school-associated incidents extend beyond the injured patients, their family members, and the members of the affected communities. Primary prevention strategies target prevention of injuries or illnesses while tertiary prevention strategies seek to deliver quality treatment and care to those who or sick or injured and support the recovery of those who are affected by injury or illness (Kisling & Das, 2020). The effects of these events, combined with the prevalence of mass shootings, require the implementation of education and interventions aimed at promoting awareness of secondary traumatic stress and mitigating the effects that such events have on clinicians.

Primary, secondary, and tertiary prevention strategies in health care target stages of disease to prevent and minimize illness and associated complications (Kisling & Das, 2020). Primary prevention targets individuals and populations at risk for a disease and aims to prevent disease. Secondary prevention strategies seek to promote early detection of disease while tertiary

prevention strategies are aimed at minimizing the severity of disease and reducing related sequelae (Kisling & Das, 2020). In the context of secondary traumatic stress among nurses, primary and tertiary prevention focus on the prevention of symptoms, alleviating secondary traumatic stress when it occurs, and recovering from the effects and mitigating the development of compassion fatigue and burnout. Secondary prevention, which focus on early detection of an illness, is also applicable to nurses as education may increase awareness of secondary traumatic stress (Kisling & Das, 2020).

Strategies implemented to mitigate secondary traumatic stress may be identified as primary prevention strategies. Such strategies would target underlying nurse welfare through encouragement of self- and peer-care routines. The promotion of such routines should be introduced in nurse education and within health care organizations. Public policy and social change strategies that target the prevention of traumatic events such as mass shootings are another form of primary prevention that may prevent secondary traumatic stress among clinicians who care for trauma patients. Secondary and tertiary prevention strategies may also be implemented to alleviate the severity of secondary traumatic stress and lessen the prevalence of compassion fatigue and burnout.

It is alarming that research has identified suicide rates among male and female nurses are higher than the suicide rates among males and females in the general United States population (Davidson et al., 2019). With the identification of concerning nurse suicide rates, the increased occupational stress associated with providing nursing care necessitates increased efforts to promote nurse welfare. Increased awareness of the need to mitigate stress among nurses may increase research efforts through heightened interest in promoting mental health and increased funding opportunities to support further investigation of strategies and interventions.

The current research identified implications for nursing practice, nursing education, public policy, social change, and health care research. Nursing practice implications are applicable to nurses, nurse leaders, and hospital administrators. The introduction of secondary traumatic stress and mitigating interventions in nursing education may promote nurse wellness and welfare. Additional research that evaluates secondary traumatic stress among professionals from differing health care specialties may further define the psychosocial effects resulting from involvement in response and patient care related to mass shooting events. Research evaluating the feasibility and efficacy of interventions aimed at mitigating secondary traumatic stress and related sequelae of compassion fatigue and burnout is also necessary to improve nurse welfare, resilience, and retention. Recognition of the psychosocial effects of mass shooting events that extend beyond the patients, their family members, and their community members can promote the development of public policy and social change to prevent these events while supporting those clinicians involved in these devastating incidents.

Implications for Nursing Practice

Within nursing practice, self-care routines are indicated to mitigate the negative effects nurses may experience as a result of the challenges they may encounter. The Institute for Healthcare Improvement identifies the need for individual and leadership actions aimed at promoting mental health among health care clinicians (Institute for Healthcare Improvement, 2020). Self-care routines foster resilience and retention as a result of combatting secondary traumatic stress, compassion fatigue, and burnout. The compassion fatigue resilience model identifies self-care as a variable that can mitigate secondary traumatic stress. Activities and hobbies aimed at promoting positive coping mechanisms are likely to be beneficial for those health care clinicians who practice in areas where there is frequent exposure to the suffering of

patients and their family members. Benefits of peer support in combatting secondary traumatic stress were identified by the current research. Collegial support within patient care areas provided obvious benefits to promoting coping among nurses who may be affected by secondary traumatic stress.

Health care institutions that offer debriefing sessions to support nurses who may be affected by their roles during stressful events such as mass shootings should promote active participation of clinicians by conducting these sessions at a time when participants are not actively involved in patient care. In those care areas where patients receive treatment for short duration prior to disposition to another facility or patient care area for specialty services or procedures, administration may consider administrative leave to allow opportunities for peer-focused debriefing sessions as patient care situations are likely to change quickly with rapid patient turnover and high census. For those nurses who provide care to patients for longer durations, such as those who work in intensive care or specialty inpatient care areas, debriefing sessions should occur following transition of patient care due to work shift conclusion to promote focus and participation of the affected nurses.

As nurses from the trauma unit reported feelings of sadness with the loss of life, they also found joy witnessing improvement in the conditions of other affected patients. This validates the indication for notification of patient outcomes, while respecting patient privacy, to those emergency departments where patients injured during such events receive stabilizing treatments prior to their disposition to a specialty care area or transfer to a different facility. Such notification of patient outcomes may offer a feeling of accomplishment as described by the variable of a sense of satisfaction from the compassion fatigue resilience model.

Implications for Nursing Education

There is a need to stress the importance of self- and peer-care (Lavoie et al., 2011; Peterson et al., 2008) and to introduce strategies and interventions aimed at mitigating secondary traumatic stress in nursing education curricula. Identification of the risks of secondary traumatic stress and related symptoms of compassion fatigue and burnout could prove valuable for primary and secondary prevention techniques as such education may prevent secondary traumatic stress as well as promote recognition of symptoms that require assistance. Tertiary prevention techniques, which would aim to promote recovery after onset of secondary traumatic stress, may alleviate the associated symptoms and prevent the development of compassion fatigue and burnout.

Secondary prevention strategies that may be included in nursing curricula should seek to promote awareness and recognition of symptoms (Kellogg et al., 2018) associated with secondary traumatic stress and identify those situations likely to negatively impact nurses. Education that promotes emotional intelligence (Enns et al., 2018; Lewis et al., 2017) is likely to promote nurses' recognition of symptoms in themselves and their peers. This recognition may be beneficial for seeking professional employee assistance services as well as providing support to peers in whom these symptoms may be identified. Such early detection of symptoms following stressful events or situations may benefit those nurses who may be experiencing secondary traumatic stress and would benefit from support and services.

Education curricula that introduce the importance of wellness routines for nurses may combat the psychosocial effects encountered in the nursing profession (Kellogg et al., 2018). These self-care practices may include activities such as exercise routines (Neville & Cole, 2013), enjoyable tasks (Neville & Cole, 2013), or mindfulness exercises (Ameli et al., 2020; Westphal

et al., 2015). Inclusion of self- and peer-care material on nursing board and clinical specialty examinations would encourage the introduction of topics in education that mitigate the incidence of secondary traumatic stress, compassion fatigue, and burnout. Consideration of "Psychological PPE," as described and recommended by Institute for Healthcare Improvement (Institute for Healthcare Improvement, 2020), may be introduced within nursing curricula to promote wellness among individuals and health care leaders.

Implications for Public Policy

The current research supports the development of public policy aimed at preventing mass shootings, providing resources and education to support readiness and response, and supporting those responders and clinicians involved in these events through their professional role. Primary prevention strategies may include the institution of school safety measures aimed at preventing multi-casualty, school-associated shooting events, funding campaigns that target the securement of firearms that may be used during such events, and early detection of impaired mental health among individuals who may exhibit or develop intent to cause harm to others in schools.

Tertiary prevention strategies may benefit the victims of multi-casualty, school-associated shooting events as well as their family members, friends, or the residents of affected communities. Such strategies may also be beneficial for those professionals and clinicians who respond and provide medical care for the victims. The appropriation of resources and training for responders and clinicians may improve readiness and improve the ability of emergency departments and trauma centers to accommodate the patients from mass shootings. Increased availability of training and resources to improve psychological readiness and promote mental health among those responders and clinicians who may provide care to patients from such events may mitigate secondary traumatic stress.

Following events such as multi-casualty, school-associated shootings, first responders and hospital-based clinicians would benefit from opportunities to give to and receive support from peers involved in the care of the victims. Employee assistance services that include encouragement of peer support activities should be actively provided to those clinicians involved in the care of those patients who are injured during such events. To promote the availability of employee assistance services and create of culture that promotes its use, medical facilities who participate in reimbursement through the Centers for Medicare and Medicaid Services should be mandated to include such services for their employees. While there are associated costs with the provision of these resources, health care systems may ultimately benefit from reduced clinician burnout and turnover as training and overtime costs are likely to be controlled.

Implications for Social Change

The current research provides recognition that mass shootings, particularly those that occur in schools, affect not only victims, family members, and members of the affected communities, but also members of those agencies and organizations who respond to the scenes and provide medical care to the victims. Social change may be more broadly supported through the recognition of how such events affect those who provide care to the victims of these events. As nursing is consistently viewed as the most trusted profession (Gaines, 2021), the impact of these events on emergency and trauma nurses may offer a foundational basis for the adoption of social change that deemphasizes the importance of weapon availability and possession while promoting safe securement of firearms.

Implications for Research

Further research is needed to evaluate the effectiveness of interventions to address secondary traumatic stress to yield evidence to support the implementation of these strategies in

nursing practice and education. As the current research identified the value of peer support, focused evaluation of the efficacy of peer support programs offering social support among health care clinicians is necessary to validate the efficacy of such interventions. Future research is also needed to identify barriers to the use of employee assistance services among nurses as such resources may alleviate secondary traumatic stress and ultimately mitigate compassion fatigue and burnout.

Additional research is also indicated to identify how clinicians from other specialties or professions are affected by their roles with emotionally challenging situations such as multi-casualty, school-associated shooting events. The continuum of patient care originates with prehospital clinicians who are first responders to the scene, progresses through transport to the receiving emergency departments, results with disposition to specialty trauma and surgical care areas, and includes further care in outpatient settings for clinical follow-up and focused mental health services. This continuum of care in various settings with differing types of health care professionals and specialties identifies the breadth to which the psychosocial effects of mass shootings extend beyond the affected victims, their family members, and the communities.

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Vita

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While working in the emergency department, Mr. McCall earned his bachelor's degree in Nursing from the University of Alabama in Huntsville. He earned a master's degree in Nursing in 2013 from Vanderbilt University in the focus of the Emergency Nurse Practitioner curriculum. In 2011, Mr. McCall transitioned to the role of flight nurse with Vanderbilt LifeFlight. He has completed more than 1000 patient transports with this air medical transport program. In 2014, Mr. McCall began a role as a *pro re nata* nurse practitioner in three rural emergency departments. In 2015, he received an appointment as adjunct instructor in nursing at Vanderbilt University, where he continues making contributions to the education of nurse practitioner students.

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