

**CROSS-SECTIONAL STUDY:
SECONDARY TRAUMATIC STRESS IN EMERGENCY
DEPARTMENT NURSES IN ALBERTA**

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DEDICATION

To all the nurses who participated in this study. Your participation has highlighted just how pervasive the traumatic environment of the emergency department can be, and without you, this thesis would not exist. I admire so much how you continue to show up and care.

To the late Rick Suggit “Sluggo”, you were the one who sparked my interest in graduate school, with the idea that I “could do more”. Two sentences are not enough to say the impact you have permanently had on my life, but your passion in everything that you ever did has been a constant motivator for me as I’ve worked through this project.

Then finally to my husband Mitchell, who has borne the brunt of a lot of my stress and given me nothing but encouragement. You are a remarkable partner that has made this whole process so much more enjoyable and fulfilling with your unwavering support and love in my abilities. We did it!

ABSTRACT

Death, trauma, violence, and heavy workloads are regular occurrences that contribute to the stressful emergency department (ED). Repeated exposure to these stressors may result in secondary traumatic stress (STS). This thesis includes a literature review on the current evidence on traumatic stress in ED nurses, a study (1) measuring prevalence of STS in ED nurses in Alberta and associated factors, and a study (2) that validates the secondary traumatic stress scale (STSS) as a screening tool among ED nurses. Limited research exists in Canada on STS, with inconsistent findings of factors associated with STS (literature review). ED nurses in Alberta are experiencing significant STS, with support and hours worked being associated with STS (study 1). The STSS when used appropriately is a valuable tool for use among ED nurses (study 2). These findings all highlight the occupational hazard that STS is and will inform future research, nurses, and organizations.

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LIST OF ABBREVIATIONS

ED	Emergency Department
RN	Registered Nurse
STS	Secondary Traumatic Stress
PTSD	Posttraumatic Stress Disorder
DSM-4-TR	Diagnostic and Statistical Manual of Mental Disorders – 4 th edition – text revised
DSM-5	Diagnostic and Statistical Manual of Mental Disorders – 5 th edition
STSS	Secondary Traumatic Stress Scale
MOS	Medical Outcomes Study Social Support Survey
CARNA	College and Association of Registered Nurses of Alberta

CHAPTER ONE

INTRODUCTION

Emergency department (ED) nurses routinely treat victims of severe injuries, death, and suffering, often times dealing with one traumatic event after another with little time for recovery (Adriaenssens, de Gucht, & Maes, 2012; Dominguez-Gomez & Rutledge, 2009; Ratrouf & Hamdan-Mansour, 2017). When compared to other areas of nursing, ED nurses are confronted with more acute and traumatic stressors, with hardly predictable work conditions (Adriaenssens, De Gucht, & Maes, 2015). A potential outcome of working with traumatized individuals is secondary traumatic stress (STS) (Bride, 2007), and it can have lasting effects on an individual's health and well-being. To date STS has not been researched extensively within the ED nursing population. The purpose of this thesis was to measure the prevalence of STS in ED nurses in Alberta, expand the current understanding of potential risk or protective factors associated with STS, and to validate the STS screening tool among ED nurses.

Secondary Traumatic Stress

STS is defined as the stress that care-givers experience after gaining knowledge of a traumatizing event experienced by another, and then the consequential emotions or behaviors that occur from caring for that individual (Hinderer et al., 2014; Watts & Robertson, 2015). Both posttraumatic stress disorder (PTSD) and STS identify symptom sub-groupings of intrusion, avoidance, and arousal (Mordeno, Go, & Yangson-Serondo, 2017). In versions of the *Diagnostic and Statistical Manual of Mental Disorders* prior to the *fifth edition* (DSM-5), an individual required direct exposure to trauma to be diagnosed with PTSD, which inherently did not allow people who had indirect exposure (care-worker) to meet the criteria for PTSD. As this

requirement failed to recognize the potential of indirect trauma, the construct of STS was established to acknowledge the possibility of STS. However, the DSM-5 was revised in 2013 to include indirect exposure or witnessing of trauma as a potential criterion for developing PTSD. Although identification of secondary traumatization as a possible criteria for PTSD is now included, the failure to recognize the empathetic nature of the relationship between primary and secondary traumatized victims remains a notable gap in this diagnostic category (Mordeno et al., 2017); therefore STS remains a current term used by those conceptualizing secondary traumatization in care-workers.

Statement of Problem

Research pertaining to STS has used a variety of tools to assess symptoms, as well as inconsistent rationale for choosing certain variables as predictors of STS (Ratrou & Hamdan-Mansour, 2017). This has made it difficult to compare or synthesize results. Varying geographic regions where research has occurred, and different healthcare systems have also contributed to this inconsistency (Ratrou & Hamdan-Mansour, 2017). To date there is limited research on STS in ED nurses in Canada (Lavoie et al., 2016), and none on ED nurses in Alberta. If not managed, STS can have a significant effect on a nurses worldview, along with their long-term health (Mealer & Jones, 2013). It also can hinder their ability to provide optimal patient care (Morrison & Joy, 2016). Until it is established that this is an occupational hazard for ED nurses in Alberta, it also makes it difficult for individual nurses, supervisors, or organizations to proactively prevent this traumatic stress, or manage it when it arises.

Conceptual Framework

For the purpose of this study the traumatic stress-coping model was applied, which theoretically emphasizes that an event becomes traumatic based on an individual's interpretation

of that event. Furthermore, individual characteristics such as personality, past experiences, social support, and coping strategies may influence an individual's ability to cope with traumatic stress (Lavoie et al., 2016). The traumatic stress-coping model groups these characteristics into intrinsic and extrinsic factors, resulting in different interpretations of traumatic events, making a trauma event unique to each individual's experience. The intrinsic factors assessed in this thesis were age, marital status, gender, ethnicity, and education. The extrinsic factors were ED work experience, size of hospital, hours worked per week, type of shifts worked, professional support, and support outside of work.

The experience of trauma may cause deep psychological injury that happens at an unconscious level and can result in a loss of control, language, power, and self (Missouridou, 2017). I assert that individuals enter the nursing profession because of an innate desire to help those in need. However, it is easy for traumatic and stressful environments, such as the ED, to become normalized and accepted as a personal burden for these nurses to carry. For those working in trauma-related professions, significant care-related stress is known to exist to the extent that it is an expected occupational outcome (Berg, Harshbarger, Ahlers-Schmidt, & Lippoldt, 2016), yet nurses have consistently felt a lack of support at the individual level, interpersonal level and organizational level (Duffy, Avalos, & Dowling, 2015; Lavoie et al., 2016; Ratrout & Hamdan-Mansour, 2017). When dealing with the complexities of trauma, a nurse's natural human responses are too often dismissed, and poorly supported as normal response to traumatic experiences.

Due to the complexity of psychological trauma, it is realistic to always question the ability of science to truly know a reality with certainty. In order for traumatized individuals to move forward in life though, they must find language and symbols to express their feelings of

frustration, helplessness, disempowerment, and humiliation (Missouridou, 2017). Prior to trying to understand what this reality is like for traumatized individuals, it is of upmost importance to establish clear evidence that traumatic stress exists in ED nurses in Alberta.

THESIS OVERVIEW

This thesis was written in a paper format. Chapter two, three and four include their own introductions, methods, results, and discussion. The same data was used for chapter three and chapter four. Chapter five is a general discussion and summary of my findings, including a post-hoc analysis.

Chapter Two

The purpose of this chapter was to understand the state of the existing research on STS/PTSD in the ED nursing population by doing a literature review. The inclusion criteria included: published English language literature; ED nursing populations; studies that measured STS, and PTSD; and, scoping/ integrative reviews on STS or PTSD in ED nurses. A comprehensive search process was used. All academic citations were imported into Endnote citation manager. This literature search was completed in October 2018, and 138 titles and abstracts were obtained. 10 articles met the inclusion criteria and were included in this literature review.

Chapter Three

The purpose of this chapter was to understand how STS is affecting ED nurses in Alberta and examine associations between certain factors and STS. Specifically, the following three research questions were examined:

1. How common is STS among a sample of ED nurses in Alberta?

2. What are demographic and professional factors associated with STS among ED nurses in Alberta?
3. What are potentially contributing personal factors associated with STS in ED nurses in Alberta?

Data for chapter three of this thesis was obtained from a convenience sample of ED nurses in Alberta from May 29th, 2020 to July 29th, 2020 using a single survey that was distributed by the primary investigator, Brittany Dirk. The project received ethics approval from the Research Ethics Board at the University of Alberta (Pro00096173). Registered nurses (RN) who currently worked in any ED in Alberta were recruited using a recruitment email sent out to a general listserv provided by the *College and Association of Registered Nurses of Alberta*, and a recruitment poster was posted on various social media platforms. If interested, nurses could simply click on a link provided within the recruitment email or on the poster.

Data were collected anonymously using Qualtrics. Consent was obtained by all participants prior to completing the survey by clicking a box. As the topic of STS could potentially be upsetting to participants, each were provided information for psychological support if needed and were encouraged to use it if they were experiencing any symptoms of distress or discomfort. Three participants were randomly selected and given a \$20 gift card to Starbucks as an incentive to participate. All data were stored on a password protected computer.

Measurements

The secondary traumatic stress scale (STSS) was used to assess STS in participants. This scale was originally developed to test for STS as a construct of PTSD among social workers (Bride, Robinson, Yegidis, & Figley, 2004). This scale was developed to measure the three subgroups that correspond with criterion B, C, and D of the *Diagnostic and Statistical Manual of*

Mental Disorders, fourth edition – text revision (DSM-4-TR) necessary for a PTSD diagnosis (Bride, 2007). Criterion A (traumatic exposure) is assumed to be present as the wording of instructions and the stems of stressor-specific items were designed such that the traumatic stressor was identified as the patient (Bride et al., 2004). Criterion A was also assumed due to the nature of the environment of the ED. It is a 17-item questionnaire that uses a five-point Likert scale ranging from never (1) - very often (5), asking participants how often they experienced each symptom in the previous seven days.

Demographic's (age, gender, marital status, ethnicity), professional factors (education, hours worked per week and per shift, type of shift, work experience, size of hospital) and support were all measured, and correlation/associations were examined related to STS. Professionally, participants were asked how supported they felt when dealing with stressors from work from their colleagues, direct supervisor, and the organization they worked for. Participants answered using a five-point Likert scale of strongly agree (1) – strongly disagree (5). Support outside of work was measured using the medical outcomes study social support survey (MOS social support survey) (Sherbourne & Stewart, 1991). It is a 19-item questionnaire that uses a five-point Likert scale with scores ranging from 19 to 100, with higher scores indication better support. A logistic regression was also done as a predictive analysis for STS. Predictors were support, and hours works per shift and per week. All participants were RN's currently working in an ED in Alberta for a minimum of six months. Analysis was done using IBM SPSS Statistical Software version 26.0.

Chapter Four

The purpose of this chapter was to validate the STSS as a screening tool for PTSD among ED nurses against the *Diagnostic and Statistical Manual of Mental disorders – fifth edition* (DSM-5) PTSD criteria. The follow research question's were explored:

1. What is the validity of the secondary traumatic stress scale using the *Diagnostic and Statistical Manual of Mental Disorders – fifth edition* PTSD criteria as the reference-standard?
2. What is the best evidence-informed cut-off score to be used for the STSS to identify PTSD based on the DSM-5?

Data used for this chapter was the same data used in chapter three. The rationale for completing this chapter was to evaluate the STSS against the most up to date recommendations from the *American Psychiatric Association*. Compared to the DSM-4-TR which the STSS was developed from, the DSM-5 increased the number of symptom subgroups from three to four, and the number of symptoms from 17 to 20. Most notable the DSM-5 separated the avoidance and numbing symptoms into different groups, with the avoidance symptoms (two items) remaining a part of the subgroup avoidance (C) and the numbing symptoms now being apart of cognition and mood symptoms in subgroup D. With this change in items included in subgroups, based on the DSM-5, it is now a requirement for an individual to be experiencing at least one symptom of avoidance to meet the diagnostic criteria for PTSD, in contrast to the DSM-4-TR which permitted a PTSD diagnosis with no avoidance symptoms (Pai, Suris, & North, 2017).

Diagnostic accuracy is an indicator of the utility of a test, and the degree to which a screening tool correctly identifies the presence or absence of a condition based off of a gold-standard test (McDonald & Calhoun, 2010). As diagnostic interviews are considered the gold-

standard-test in mental health disorders, due to this method not being feasible, instead the DSM-5 PTSD criteria was chosen and referred to as the 'reference-standard'. Using specific formulae, efficiency, sensitivity, specificity, positive predictive power, negative predictive power, prevalence, and estimated population prevalence was calculated. The analysis was done using IBM SPSS Statistical Software version 26.0 and manual calculations.

Chapter Five

The final chapter of this thesis will be a general discussion and summary on the findings from chapter three and four, with a post-hoc analysis of factors associated with traumatic stress using the DSM-5 PTSD criteria. The construct of traumatic stress within the ED nursing population will be explored based on these findings, and recommendations for future research, and clinically implications will be discussed.

Significance of the Study

The findings of these studies have highlighted that ED nurses in Alberta are experiencing a significant amount of traumatic stress. By establishing that it exists, ideally this will give individual nurses and organizations the evidence to re-examine their approach to supporting and managing this occupational hazard. These findings have also brought awareness to a topic that is often met with shame or embarrassment for those working in trauma related professions. The findings have also highlighted both risk factors and protective factors that are associated with STS. Most concerning is nurses perception that they are not experiencing these symptoms, and the increase in traumatic stress when a lack of support is felt. Due to the nature of this study design, a causal relationship cannot be determined between STS and factors, but this study has the potential to inform future more robust analytical studies in this area.

The validity of the STSS against the DSM-5 PTSD criteria was also established, which could be beneficial to future researchers and clinicians depending on how the tool is used. If used thoughtfully, it can be a valuable tool to screen for traumatic stress among the ED nursing population. I plan to disseminate the findings of these studies through publication in relevant nursing journals, and magazines and newsletters that are distributed to frontline nurses through the *College and Association of Registered Nurses of Alberta* and the *National Emergency Nursing Association*.

Limitations of the Study

Cross-sectional designs can be limited in assessing STS because it is done at a single point in time, and it is possible that the individual's assessment of their perceptions could change over time (Adriaenssens et al., 2012; Hunsaker, Chen, Maughan, & Heaston, 2015). Symptoms assessed could be due to a number of causes, not related to work. Symptoms could also be due to the violence and aggression that ED nurses are known to experience while at work (Adriaenssens et al., 2015). By using this design, the direction of the relationship between the variables cannot be determined. In the future, prospective cohort studies would inform clearer perspectives on STS incidence and temporal sequence in which the variables relate to each other (Dominguez-Gomez & Rutledge, 2009; Ratrouf & Hamdan-Mansour, 2017).

CHAPTER TWO: LITERATURE REVIEW

ABSTRACT

Introduction: Death, trauma, violence, and heavy workloads are regular occurrences that contribute to the stressful environment experienced by nurses in the emergency department. Repeated exposure to these stressors may result in secondary traumatic stress. The aim of this literature review was to understand what evidence exists on secondary traumatic stress among emergency department nurses.

Methods: A comprehensive search process was conducted to retrieve relevant studies that have been conducted related to secondary traumatic stress in emergency department nurses. The term posttraumatic stress disorder was also included in the search as the symptomatology subgroupings of intrusion, avoidance, and arousal, are the same as secondary traumatic stress.

Results: Ten articles were selected for applicability and review, ranging in publication dates from 2003 to 2017 in varying international geographical areas. Documented prevalence of secondary traumatic stress ranged from seven to sixty-four percent, and a variety of tools were used to measure this.

Conclusion: It is evident that emergency department nurses are highly affected by the exposure to traumatic events they encounter in their daily practice, which can adversely affect their well-being, organizational outcomes, and quality of patient care provided. More research is needed in varying geographical areas with validated reliable measurement tools, with strong rationale for variables selected as potential factors associated with secondary traumatic stress.

INTRODUCTION

An emerging body of research has found that the traumatic and stressful environment of the emergency department (ED) has consequences for those who are privy to these experiences. The psychological effects of direct exposure to traumatic events have been well documented; however, the effects of indirect exposure to traumatic events has not yet been researched extensively within the nursing population (Duffy et al., 2015). Secondary traumatic stress (STS) is defined as the consequential behaviors and emotions resulting from knowledge about a traumatizing event experienced by another, with stress resulting from helping or wanting to help a traumatized or suffering person (Hinderer et al., 2014; Watts & Robertson, 2015). To date there have been limited studies done in Canada to explore how STS is affecting ED nurses. There is also a need to further the current understanding of factors associated with STS in ED nurses.

Background

When compared to other areas of nursing, ED nurses are confronted with more acute and traumatic stressors, with overwhelming, and often unpredictable work conditions (Adriaenssens et al., 2015). ED nurses routinely treat victims of severe injuries, death, suicide and suffering, with little time for recovery between patients (Adriaenssens et al., 2012; Dominguez-Gomez & Rutledge, 2009; Ratrout & Hamdan-Mansour, 2017). A potential outcome for nurses working in this highly stressful and traumatic environment is STS.

Secondary traumatic stress

STS symptomatology is very similar to posttraumatic stress symptomatology, which can have lasting effects on a person's well-being and ability to manage stress (Ratrout & Hamdan-Mansour, 2017). Both post-traumatic stress disorder (PTSD) and STS identify symptom sub-groupings of intrusion, avoidance, and arousal (Mordeno et al., 2017). In versions of the

Diagnostic and Statistical Manual of Mental Disorders prior to the *fifth edition* (DSM-5), an individual required direct exposure to trauma to be diagnosed with PTSD, which inherently did not allow people who had indirect exposure to meet the criteria for PTSD. In 2013 the DSM-5 was revised to include indirect exposure or witnessing trauma as potential criteria for developing PTSD. Although identification of secondary traumatization as a possible criteria for PTSD is included, the failure to recognize the empathetic nature of the relationship between primary and secondary traumatized victims is a notable gap (Mordeno et al., 2017); therefore STS remains a current term used by those conceptualizing secondary traumatization in care-workers.

If not managed appropriately, STS can represent a significant barrier to the mental health of nurses and their ability to provide optimal care (Morrison & Joy, 2016). For persons who provide direct patient care to traumatized victims, STS is a significant potential occupational hazard (Beck, 2011), with the consequences of STS manifesting at a personal, interpersonal, and organizational level (Ratrouf & Hamdan-Mansour, 2017). Individual nurses with STS have been shown to have higher rates of alcohol use as a coping mechanism (Duffy et al., 2015), and it has been linked to job dissatisfaction, poor job retention, burnout and a tendency to leave nursing altogether (Ratrouf & Hamdan-Mansour, 2017). Nurse's well-being is instrumental in ensuring that their patients receive appropriate empathetic care (Forsgarde, From Attebring, & Elmqvist, 2016); therefore, attending to the health and well-being of nurses is of utmost importance.

METHODS

A comprehensive search process was conducted to retrieve relevant studies that have been conducted related to STS. The inclusion criteria included: published English language literature; ED nursing populations; studies that measured STS, and PTSD; and, scoping/integrative reviews on STS or PTSD in ED nurses. PTSD was included as the symptomatology

subgroupings of intrusion, avoidance, and arousal, are the same as STS. The search was conducted using the following online databases: Cumulative Index to Nursing and Allied Health Literature (CINAHL), PubMed, and Google Scholar. Databases were searched using the following search terms, secondary traumatic stress, compassion fatigue, vicarious trauma, post-traumatic stress disorder, secondary trauma, nurses, emergency room nurses. In order to narrow down and focus the results, Boolean operators (AND, OR) were applied separately and in combination with the keywords/subject terms to expand, combine, or exclude keywords/subject terms in a search.

The literature search was completed in October 2018, and 138 titles and abstracts pertaining to STS and PTSD in ED nurses were reviewed. Many of these articles were excluded due to duplication across databases. Following electronic searching, selected references were manually checked, and citations were searched in order to find articles that may have been missed, not indexed in the targeted databases, or because of inconsistent terminology. All references were imported and stored using Endnote reference manager. Only articles published in English were included; therefore, relevant literature in other languages may have been missed. From this process 10 research articles (*Table 2.1*) were selected for applicability and review. Publication dates ranged from 2003 to 2017. The studies focused on traumatic stress in ED nursing populations in a variety of geographical regions including Belgium, United States of America, the United Kingdom, and two studies from in Canada.

Table 2.1. Results of Literature Review of STS in ED Nurses

Author	Year	Design	Sample	Screening Tool
(Laposa, Alden, & Fullerton)	2003	Cross-sectional Study	N = 51	Posttraumatic Stress Diagnostic Scale
(Dominguez-Gomez & Rutledge)	2009	Cross-sectional Study	N = 67	Secondary Traumatic Stress Scale

(Von Rueden et al.)	2010	Cross-sectional Study	N = 128	Penn Inventory Score
(Adriaenssens et al.)	2012	Cross-sectional Study	N = 248	The Impact of Events Scale
(Hinderer et al.)	2014	Cross-sectional Study	N = 128	Penn Inventory Score
(Duffy et al.)	2015	Cross-sectional Study	N = 105	Secondary Traumatic Stress Scale
(Berg et al.)	2016	Qualitative Study	N = 12	Professional Quality of Life Scale (ProQOL)
(Morrison & Joy)	2016	Mixed-Method Study	N = 80	Secondary Traumatic Stress Scale
(Lavoie et al.)	2016	Cross-Sectional Study	N = 35	Impact of Events Scale
(Ratrou & Hamdan-Mansour)	2017	Integrative Review	9 articles	Whittemore and Knaf's framework of integrative review process

RESULTS

Research pertaining to STS among ED nurses has demonstrated that STS symptomatology is variable and high (Ratrou & Hamdan-Mansour, 2017). Different theoretical frameworks have been used to theorize traumatic stress development, and varying factors and consequences have been found to be associated with it (*Table 2.2*).

Table 2.2. Major Themes of Literature Review

Prevalence of STS	Theoretical Frameworks	Factors Associated with STS	Consequences of STS
<ul style="list-style-type: none"> • Reported prevalence • Factors affecting variation of prevalence 	<ul style="list-style-type: none"> • The Trauma Transmission Model • Dutton and Rubenstein's theory for STS • Traumatic Stress-Coping Model 	<ul style="list-style-type: none"> • Experience of Nurses • Type of Traumatic Stressors • Support • Protective factors 	<ul style="list-style-type: none"> • Individual level • Interpersonally • Organizationally

Prevalence of STS in ED Nurses

Adriaenssens et al. (2012) measured the prevalence of PTSD among Belgian ED nurses which found that 24.3% of participants met subclinical diagnostic levels of PTSD, and 8.5% of the participants reached clinical diagnostic levels of PTSD. Dominguez-Gomez and Rutledge (2009) in California found that 32.8% of all participants met the full criteria for STS, with 60% of participants experiencing at least one symptom, and 56% experiencing at least two symptoms in the previous week. A study done on the prevalence of STS among Irish ED nurses by Duffy et al. (2015) found that 64% of the participants met the full criteria for STS. Berg et al. (2016) in a study in the Midwestern United States of trauma nurses found that most (75%) scored at risk, either with high (25%) or moderate (50%) levels of STS. Data collected on trauma nurses by Von Rueden et al. (2010) and Hinderer et al. (2014) in the United states found that 7% of participants reflected significant scores of STS. In Canada, Lavoie et al. (2016) found that 14.3% of participants had clinical levels of PTSD, and Laposa et al. (2003) reported 12%. Finally a study done in Scotland by Morrison and Joy (2016) found that 75% of a sample of ED nurses reported at least one symptom of STS in the previous week and 39% met the full criteria for STS.

Factors Affecting Variation of Prevalence

Previous studies done in a variety of countries and regions have reported inconsistent prevalence rates of STS, which could be related to cultural differences, and different healthcare systems where these studies were done (Ratrouf & Hamdan-Mansour, 2017). Researcher's analysis strategy could also be a factor.

Another factor that could be affecting the variation in reported prevalence of traumatic stress is the diversity of tools used to measure it. The secondary traumatic stress scale (STSS) has been reported as the only scale that exclusively measures STS among nurses (Beck, 2011; Watts & Robertson, 2015). Although the STSS was often used (Dominguez-Gomez & Rutledge, 2009; Duffy et al., 2015; Morrison & Joy, 2016), other scales such as the impact of event scale (Adriaenssens et al., 2012; Lavoie et al., 2016), professional quality of life scale (Berg et al., 2016), the Penn inventory (Hinderer et al., 2014; Von Rueden et al., 2010), and the posttraumatic stress diagnostic scale (Laposa et al., 2003) were also used to measure STS/PTSD. Interestingly the studies using the impact of event scale (Adriaenssens et al., 2012; Lavoie et al., 2016) the Penn inventory (Hinderer et al., 2014; Von Rueden et al., 2010), and the posttraumatic stress diagnostic scale (Laposa et al., 2003) had much lower reported rates of STS/PTSD.

Factors Associated with STS

Many of the studies on STS explored different factors associated with STS. While one study reported higher levels of avoidance, intrusion, and arousal symptomatology in more senior trauma workers (Lavoie et al., 2016), others reported higher levels of STS/PTSD in trauma workers with less experience (Dominguez-Gomez & Rutledge, 2009; Von Rueden et al., 2010). Due to inconsistent screening tools and variability in questions related to demographic and professional characteristics across studies, it is difficult to know what is considered “more” or “less” experienced. Absence of normality in the distribution of experience among participants could also have contributed to the variability of these findings.

Morrison and Joy (2016) found that acute stressors such as traffic accidents, or sudden death of a child were recognized as significant factors associated with the development of STS symptomatology among the majority of ED nurses. These acute stressors were then exacerbated

by a nursing culture of not providing an opportunity to process or debrief an experience, combined with an unspoken expectation to move onto the next task (Morrison & Joy, 2016). Acute stressors such as traffic accidents, or sudden death of a child would be considered “large scale” disasters. Interestingly, when ED nurses who have experienced “large scale” disasters were compared to ED nurses who were repetitively confronted with “small scale” disasters on a daily basis, no difference was found in incidence of anxiety, depression or traumatic stress responses (Adriaenssens et al., 2012). These findings are significant as it would imply that all ED nurses, regardless of the traumatic events they are exposed to, are at significant risk of STS development based on being in the busy ED environment.

The support that nurses felt from their managers/colleagues and hospital administration was also found to be a factor that affected nurses’ ability to manage symptoms related to this traumatic stress (Adriaenssens et al., 2012; Laposa et al., 2003). Specifically, Laposa et al. (2003) found that ED personnel were able to manage the work, but that it was the interpersonal environment that was more relevant as a predictor of PTSD.

Protective Factors

Empathy. Empathy is a core therapeutic technique used by nurses when providing care to their patients. Although the empathetic relationship has been found to be a predictor of STS symptomatology and distress, it also has been known to be a protective factor to STS symptomatology development. The empathetic relationship between nurses and the traumatized individual can provide nurses with a positive feeling of their ability to help others, resulting in compassion satisfaction (Ratrouf & Hamdan-Mansour, 2017). However, numerous studies in trauma-related disciplines, aside of ED nursing, have documented the salient role of the empathetic relationship in the development of STS (Arnedo & Casellas-Grau, 2016; Avieli, Ben-

David, & Levy, 2016; Choi, 2017; Gil & Weinberg, 2015; Mehus & Becher, 2016; Rzeszutek, Partyka, & Gołab, 2015). The role of the empathetic relationship in moderating the risk of developing STS remains unclear based on the current nursing literature, necessitating the need for further study.

Organizational support. An organizational support network, either from colleagues or management, has also been found to be a strong protective factor on the development of STS or PTSD symptomatology (Adriaenssens et al., 2012; Lavoie et al., 2016). Interestingly, nurses who adopted a pro-active or anticipatory coping style were also shown to have more resilient behaviors, and reported lower levels of depression, which is an outcome often related to STS (Adriaenssens et al., 2012). Formal debriefing was also identified as a protective factor, but was reported as not routinely practiced (Morrison & Joy, 2016). This further highlights the need for more research on STS/PTSD, so that both individual nurses and organizations have the appropriate knowledge related to the suitability of adopting these pro-active coping styles.

Consequences of STS

While the consequences of STS vary, there are notable themes in the current literature. At the individual level, Duffy et al. (2015) found that alcohol was used to cope by 61% of nurses experiencing STS compared to 26% of nurses who were not experiencing STS. Prescription and non-prescription drugs have also been found to be used as a coping mechanism for traumatic stress (Von Rueden et al., 2010). Although it is important that individuals have coping mechanisms in place, use of substances as a way to cope could result in further distress to an individual. Nurses experiencing STS were also at risk for experiencing burnout, which can have long term implications (Dominguez-Gomez & Rutledge, 2009; Hinderer et al., 2014). At the interpersonal level, hyperarousal symptoms sometimes caused nurses to perceive colleagues and

patients as a threat, resulting in potentially violent and non-professional relationships (Ratrouf & Hamdan-Mansour, 2017).

Organizationally, consequences that have been associated with nurses who experience traumatic stress symptoms include: more sick days; reduced work performance and job satisfaction; greater staff turnover; and lower quality of patient care (Adriaenssens et al., 2012; Lavoie et al., 2016). In Canada, it has been reported that nurses miss an average of 14.5 work days per year, with 11.6% of those being due to psychological reasons (Lavoie et al., 2016). There is limited research on the effects of STS among ED nurses and the quality of patient care (Morrison & Joy, 2016).

Theoretical Frameworks

The trauma transmission model (Ratrouf & Hamdan-Mansour, 2017) is one of the early models used to explain the process by which the effects of trauma is transmitted from the victim to helper. This model indicates that the trauma worker, who shares empathy with a traumatized victim, may experience compassion stress, which if prolonged, may result in STS (Ratrouf & Hamdan-Mansour, 2017).

Dutton and Rubenstein's theory for STS was originally developed to assess social workers psychological responses to caring for trauma victims but was later adapted for use with trauma nurses (Hinderer et al., 2014). It conceptualizes the development of STS in nurses as a function of four key elements: personal/environment characteristics, coping strategies, exposure to traumatic events, and the reaction of the nurses to the stress of trauma.

Another theoretical model is the traumatic stress-coping model, which proposes that PTSD symptomatology develops in a person who has been exposed to a traumatic event, based on the person's interpretation of that event (Lavoie et al., 2016). A person's immediate reaction

to the traumatic event, personal characteristics, personality, past experiences, social support, and coping strategies all have influence on the persons interpretation of that event. These factors are each grouped into intrinsic and extrinsic variables (Lavoie et al., 2016).

Conceptual Clarity

Research on the nature and extent of secondary trauma is often hampered by poorly defined concepts, and lack of psychometrically tested tools (Watts & Robertson, 2015) . In particular, there has been a lack of conceptual clarity about the concept of STS among researchers, which has likely contributed to some of the inconsistencies in the literature (Ratrou & Hamdan-Mansour, 2017). For example, some literature on compassion fatigue (CF) has also used the term STS to describe symptomatology. CF has been described as emotional exhaustion, which can result in depression, sleeplessness, and general anxiety, and sometimes a lack of capacity to nurture (Berg et al., 2016). Although CF is deeply intertwined with the symptomatology of STS, it is important that congruent definitions, concepts, and terms are used to describe these disorders and symptoms in order to develop a clear understanding of the nature of them. Precisely identifying the symptom subgroupings related to STS of intrusion, avoidance, and arousal may contribute to the development of more appropriate interventions and support their implementation.

Furthermore, there is a need to understand sub-concepts related to STS, including risk factors, symptoms, potential coping strategies and organizational interventions (Dominguez-Gomez & Rutledge, 2009). Although researchers have repeatedly measured variables that have been conceptualized as predictors for STS , the rationale underpinning the selection of these variables has not always been clear since these studies were generally focused on screening for STS rather than establishing scientific merit or theoretical explanation (Ratrou & Hamdan-

Mansour, 2017). Limited literature exists to assist individual nurses and managers in identifying factors influencing STS/PTSD development, which is critical to early recognition of symptoms, and foundational to developing and implementing relevant interventions to prevent and treat the negative effects of traumatic stress (Adriaenssens et al., 2012; Hinderer et al., 2014; Morrison & Joy, 2016; Ratrou & Hamdan-Mansour, 2017).

DISCUSSION

The results of this literature review have identified gaps in the current understand of STS/PTSD among ED nurses. Due to the lack of consistent tools used to measure STS/PTSD, it is difficult to draw any firm conclusions of the prevalence of this health outcome among ED nurses. There is a need for the use of consistent reliable tools when screening for STS/PTSD in order to form clearer perspectives, and compare results between nursing populations.

It is important that the concept of STS has a clear definition so that individuals, and organizations can recognize and develop appropriate tools to support nurses. More research is needed in specific geographical regions and varying healthcare systems to understand how STS/PTSD is affecting ED nurses. To date there is also limited research that identifies proactive factors that could be used to help prevent or mitigate traumatic stress among ED nurses. This is important as traumatic stress has been identified as an occupational hazard of working with traumatized individuals (Beck, 2011).

Factors potentially associated with STS/PTSD such as coping styles, traumatic stressors, support, and various professional factors have been measured using inconsistent tools. This makes it difficult to compare results from different studies to form clearer perspectives. When measuring these factors, it is also important that researchers provide good rationale for the

inclusion of these factors and explain how these factors were measured in order to facilitate their consistent use in research. Currently cross-sectional studies have been the most common method used to research STS/PTSD, and more robust analytic studies, such as prospective cohort studies, are needed to develop a better understanding of the causal chain of STS.

Limitations

Selection bias must be considered when examining studies concerning the effects of trauma, because avoidance of stimuli associated with trauma is a symptom of PTSD (Lavoie et al., 2016). Controversially, nurses who complete the survey may have agreed to do so because of their perceived belief that they were experiencing traumatic stress (Duffy et al., 2015). The study design, must also be considered as a potential limitation of existing studies. Cross-sectional study designs using self-administered surveys have been the most common method used to study STS among ED nurses (Adriaenssens et al., 2012; Dominguez-Gomez & Rutledge, 2009; Duffy et al., 2015; Hinderer et al., 2014; Laposa et al., 2003; Lavoie et al., 2016; Morrison & Joy, 2016; Von Rueden et al., 2010). However, cross-sectional designs can be limiting as they only measure an individual's perception at a single point in time, and it is possible that the individual's assessment of their perceptions could change over time (Adriaenssens et al., 2012; Dominguez-Gomez & Rutledge, 2009; Duffy et al., 2015).

Although researchers have attempted to assess the level of trauma that ED nurses experience using a single self-reported survey, significant recall bias must be accounted for (Adriaenssens et al., 2012; Lavoie et al., 2016). To avoid this bias, often the exposure to trauma working in the ED is assumed, but not actually measured, making it difficult to generalize results to a larger population (Dominguez-Gomez & Rutledge, 2009; Duffy et al., 2015; Hinderer et al.,

2014; Von Rueden et al., 2010). Low response rates may also be a limitation, as significant symptoms may have been missed in non-participants (Dominguez-Gomez & Rutledge, 2009; Lavoie et al., 2016; Morrison & Joy, 2016).

CONCLUSION

It is evident that ED nurses are highly affected by their exposure to traumatic events they encounter in their daily practice, which can adversely affect their well-being, organizational outcomes, and quality of care provided (Ratrouf & Hamdan-Mansour, 2017). Although this has been documented previously, it is unclear how STS is affecting ED nurses in Alberta due to the lack of research in this geographical area. In addition, a more thorough understanding of the factors associated with STS will further enhance the understanding of STS among ED nurses. By developing a greater understanding of STS, nurses and organizational leaders can be more apt to recognize the symptoms of STS and offer interventions to prevent and treat the negative effects of STS (Adriaenssens et al., 2012; Hinderer et al., 2014; Morrison & Joy, 2016).

CHAPTER THREE: STS IN ED NURSES

ABSTRACT

Introduction: Emergency department (ED) nurses are confronted with repetitive and unpredictable acute traumatic stressors. A potential outcome of this environment is secondary traumatic stress (STS), which exhibits symptom subgroups of intrusion, avoidance, and arousal. Limited research exists in Canada on STS in ED nurses. The purpose of this study was to measure prevalence of STS among ED nurses in Alberta and assess potential professional and personal factors associated with STS.

Methods: Data for this cross-sectional study design was collected from a convenience sample of ($n = 260$) registered nurses currently working in an ED in Alberta. Survey instruments included the medical outcomes study social support survey and the secondary traumatic stress scale. Correlations and a logistic regression model were used for analysis.

Results: 91% of the sample experienced at least one symptom of STS in the previous week. 56% of the sample met the full criteria for STS. The number of hours that nurses worked per week and per shift were associated with STS. The support nurses felt professionally and outside of work was a significant association. Of particular concern was nurse's perception that they were not experiencing these symptoms.

Conclusion: ED nurses in Alberta are highly affected by the stressful and traumatic environment of the ED as is evident by the prevalence of STS in this sample. More qualitative research is needed to understand what would make nurses feel more supported to recognize and manage this traumatic stress, and prospective longitudinal studies would inform more clear perspectives on how certain factors are influencing STS.

INTRODUCTION

An emerging body of research has found that the traumatic and stressful environment of the emergency department (ED) has consequences for those who are privy to these experiences. The psychological effects of direct exposure to traumatic events have been well documented, however, the effects of indirect exposure to traumatic events has not yet been researched extensively within the nursing population (Duffy et al., 2015). A potential occupational outcome of this traumatic environment is secondary traumatic stress (STS) (Dominguez-Gomez & Rutledge, 2009; Morrison & Joy, 2016). STS is defined as the consequential behaviors and emotions resulting from knowledge about a traumatizing event experienced by another, with stress resulting from the empathetic engagement with the traumatized or suffering person (Figley, 1995; Hinderer et al., 2014; Watts & Robertson, 2015). Symptoms of STS are akin to posttraumatic stress disorder (PTSD) symptoms, involving symptom subgroupings of intrusion, avoidance, and arousal (Beck, 2011; Mordeno et al., 2017). To date there is limited research in Canada on these trauma related symptoms and how they are affecting ED nurses (Lavoie et al., 2016), and a lack of understanding of factors associated with it (Ratrou & Hamdan-Mansour, 2017).

Background and Significance

Compared to other areas of nursing, ED nurses are confronted with more acute and traumatic stressors (Adriaenssens et al., 2015). ED nurses routinely treat victims of severe injuries, death, and suffering, often times dealing with one traumatic event after another, with little time for recovery (Adriaenssens et al., 2012; Dominguez-Gomez & Rutledge, 2009; Ratrou & Hamdan-Mansour, 2017). An integrative literature review completed in 2017 showed that a potential occupational outcome of working in this environment is STS, with symptoms being

present to varying degrees (Ratrou & Hamdan-Mansour, 2017). Although the symptom construct of STS and PTSD are similar; with PTSD, the empathetic relationship between a caregiver and the traumatized or suffering persons is not emphasized (Mordeno et al., 2017). STS is also used to describe this phenomenon that is occurring within trauma professionals, as it does not require the rigor needed to meet a PTSD diagnosis (Watts & Robertson, 2015). For these reasons, the term and construct of STS will be used to understand the traumatic stress that is occurring in ED nurses in Alberta.

Studies conducted between 2009-2017 in varying international geographical areas have documented prevalence rates ranging from 7% - 64% (Adriaenssens et al., 2012; Berg et al., 2016; Dominguez-Gomez & Rutledge, 2009; Duffy et al., 2015; Hinderer et al., 2014; Lavoie et al., 2016; Mordeno et al., 2017; Morrison & Joy, 2016; Von Rueden et al., 2010). Difference in healthcare systems, cultures, and tools used to measure STS have contributed to this variability in prevalence (Beck, 2011; Ratrou & Hamdan-Mansour, 2017).

When not managed, STS has been associated with poor job retention, increased sick days, job dissatisfaction and higher alcohol consumption (Duffy et al., 2015; Ratrou & Hamdan-Mansour, 2017). This negative impact on the mental health of nurses limits their ability to provide optimal patient care (Morrison & Joy, 2016). Nurses are instrumental to the care that patients receive, which makes their health and well-being very important (Forsgarde et al., 2016).

Study Rationale

I became interested in the topic of STS through my experience working in the ED as a nurse. I have experienced, and observed in my co-workers, the impact of working in this environment. Current evidence supports these anecdotal experiences, suggesting that traumatic

stress is common among ED nurses (Adriaenssens et al., 2012; Dominguez-Gomez & Rutledge, 2009; Duffy et al., 2015; Morrison & Joy, 2016). Given scant research has been conducted in Canada, it is unclear the extent to which STS is affecting ED nurses (Lavoie et al., 2016). Studies in this area are beneficial by promoting awareness and discussion on a topic that is often met with silence and shame in trauma-related professions (Bercier & Maynard, 2015). It would be impractical to develop analytical studies before first understanding whether the prevalence of STS represents an occupational problem for ED nurses in Alberta. The aim of this study is to *measure the prevalence of STS among a convenience sample of ED nurses, and to examine correlations of potential factors associated with it.*

Research Questions

By assessing STS among ED nurses across Alberta, the results of this study will contribute to the understanding of how STS affects ED nurses in this specific geographical area. These results will be disseminated to improve awareness of STS as an occupational hazard, as well as inform future interventions and research in this area of study. The following research questions were explored:

- How common is STS among a sample of ED nurses in Alberta?
- What are demographic and professional factors associated with STS among ED nurses in Alberta?
- What are potential personal factors associated with STS in ED nurses in Alberta?

METHODS

Study Design

Data for this cross-sectional study (Appendix A) were collected from ED nurses currently working in Alberta. This project received ethical approval from the Research Ethics Board at the

University of Alberta (Pro00096173). Data collection occurred from May 29th, 2020 to July 29th, 2020. Registered nurses currently working in any ED in Alberta were recruited. Recruitment strategies involved advertising via emails sent out to a general listserv obtained from the *College of Alberta Registered Nurses Association* (Appendix B), and an anonymous link posted on various social media sites (Appendix C). Due to this recruitment approach, it was not possible to calculate an accurate response rate. Consent was obtained from all participants (Appendix D) prior to beginning the survey.

Two-hundred and seventy-five surveys were initiated online via Qualtrics ($N = 275$). On average the survey took approximately 10 minutes for participants to complete as per the Qualtrics metrics. Inclusion criteria were that participants must be a registered nurse, and currently providing direct patient care in an ED in Alberta for a minimum of 6 months. Nurse managers and licensed practical nurses were excluded. Thirteen ($n = 13$) of the surveys initiated were not included in the analysis because they did not meet the eligibility criteria done at the beginning of the survey: eligibility criteria not completed ($n = 1$), did not provide direct patient care ($n = 6$), were not a registered nurse ($n = 1$), were currently a nurse manager ($n = 5$). Another two surveys were removed for analysis as participants had only completed the inclusion criteria and nothing else. This left 260 ($n = 260$) participant responses for analysis. Data were analyzed using IBM SPSS 26.

Theoretical Framework

Various theoretical frameworks described in the existing literature have been used to describe how secondary exposure to trauma results in STS. In this study the traumatic stress-coping model was applied, which emphasizes that an event becomes traumatic based on an individual's interpretation of an event, and is influenced by individual characteristics such as

personality, past experiences, social support, and coping strategies (Lavoie et al., 2016). The traumatic stress-coping model groups these characteristics into intrinsic and extrinsic factors, resulting in different interpretations of traumatic events, making psychological trauma unique to each individual. The intrinsic factors assessed as part of this study were age, marital status, gender, ethnicity, and education. The extrinsic factors were ED work experience, size of hospital based on patient beds, type of shifts worked, professional support, and support outside of work.

The experience of trauma may cause deep psychological injury that happens at an unconscious level and can result in loss of control, language, power, and self (Missouridou, 2017). I assert that individuals enter the nursing profession drawn by an innate desire to help those in need. However, it is common for a working environment that is traumatic and stressful, such as the ED, to become normalized and accepted as a personal burden that these nurses carry. For those working in trauma-related professions, significant care-related stress is known to exist to the extent that it is an expected occupational outcome (Berg et al., 2016), yet nurses have consistently felt a lack of support at the individual level, interpersonal level and organizational level (Duffy et al., 2015; Lavoie et al., 2016; Ratrouf & Hamdan-Mansour, 2017). When dealing with the complexities of trauma, an individual's natural emotional responses are too often dismissed, and poorly supported as a normal response to secondary trauma.

Due to the complexity of psychological trauma responses, it is realistic to always question the ability of science to truly know a reality with certainty. In order for traumatized individuals to move forward in life though, they must find language and symbols to express their feelings of frustration, helplessness, disempowerment, and humiliation (Missouridou, 2017). Prior to trying to understand what this reality is like for traumatized individuals, it is of utmost importance to establish clear evidence that STS is affecting ED nurses in Alberta.

Analysis Strategy

Measuring Prevalence of STS

The secondary traumatic stress scale (STSS) was used to measure STS. Based on existing research, the STSS has been validated as the only tool that exclusively measures STS among nurses (Beck, 2011; Watts & Robertson, 2015). It is a 17-item questionnaire that uses a Likert scale ranging from “never” (1) to “very often” (5), asking participants how often they experienced each symptom in the previous seven days. This scale was developed to measure the three subgroups that correspond with criterion B, C, and D of the *Diagnostic and Statistical Manual of Mental Disorders, fourth edition – text revision (DSM-4-TR)* necessary for a PTSD diagnosis (Bride, 2007). Criterion A (exposure) is assumed to be present as the wording of instructions and the stems of stressor-specific items were designed such that the traumatic stressor was identified as the patient (Bride et al., 2004). For this study criterion A was also assumed due to the traumatic nature of the environment of the ED.

Based on the PTSD domain, Bride (2007) formulated an algorithm to identify cases of PTSD based on the 17 STSS items. As per this algorithm, when a participant reported that a symptom was experienced “occasionally (3),” “often (4),” “very often (5),” this symptom was interpreted as present. Participants who reported at least one intrusion symptom, three avoidance symptoms, and two arousal symptoms met diagnostics levels for PTSD (Bride, 2007). These parameters were followed when reporting individual symptoms.

When calculating symptom severity Bride (2007) recommends that the total STSS score be calculated by summing the response value for each item, with the lowest possible score being 17 and the highest being 85 (*Table 3.1*). A cut-off score of 38 will designate STS as present as

per these guidelines (Bride et al., 2004). This cut-off score was used in all correlation and regression analyses.

The only adaptation made to the original questionnaire was replacing the word client with patient throughout. In this sample the Cronbach’s alpha was excellent at .93 for the total scale, and good for all subgroups: intrusion .78, avoidance .86, and arousal .83. Based on this the STSS had good internal consistency and reliability in the current sample.

Table 3.1. Symptom Subscales and Calculating the STSS score

Symptom Category	Question on STSS	Total
Intrusion subscale	add items 2, 3, 6, 10, 13	/25
Avoidance subscale	add items 1, 5, 7, 9, 12, 14, 17	/35
Arousal subscale	add items 4, 8, 11, 15, 16	/25
TOTAL	add intrusion, arousal, avoidance scores	/85

Demographic and Professional factors

Using a cut-off score of 38 on the STSS to represent the presence or absence of STS, correlation tests were run to test if there were associations between STS, demographics, and professional factors. Frequencies, crosstabs and cramer’s V correlations were used to examine the correlations and associations of STS with demographic (i.e., ethnicity, gender, age, marital status) and professional factors (i.e., education, type of shift, total hours worked in ED, size of hospital, FTE, length of shift).

Personal Factors

Participants perception of STS symptoms they may or may not be experiencing, as well as how supported they felt professionally and outside of work were assessed as personal factors. To assess participants’ perceived experience, participants were asked “Do you currently think

you are experiencing symptoms of PTSD (i.e., intrusion, avoidance, arousal)” and could answer no (0) or yes (1). A cramer’s V correlation test was then done to examine nurses perception of traumatic symptoms and its association to STS.

To assess professional support, participants were asked how supported they felt when dealing with traumatic stressors from work by colleagues, their direct supervisor, and the organization they worked for. For each of these questions, the participants answered using a five-point Likert scale of; strongly agree (1), agree (2), neither agree nor disagree (3), disagree (4), strongly disagree (5). A Kendall tau b test was used to measure the correlation and associations of professional support to STS

To measure participant’s support outside of work, the medical outcomes study (MOS) social support survey was used (Sherbourne & Stewart, 1991). It is a 19-item questionnaire that uses a five-point Likert scale to assess multiple dimensions of social support being informational support, positive social interaction, emotional support, tangible support and affectionate support (Sherbourne & Stewart, 1991). Scores potentially ranged from 19 to 100, with higher scores indicating better support. The Cronbach’s alpha was excellent for the total MOS social support survey at .97. A Pearson’s r test was used to measure the correlations and associations between support outside of work and STS.

Finally, a logistic regression was used as a predictive analysis for which variables most reliable predicted the presence or absence of STS. The dependent variable was STS. The predictor variables were support outside of work (MOS social support survey), length of shift, hours worked per week, and professional support (colleagues, direct supervisor, organization).

RESULTS

Sample Description

Overall, 92.7% ($n = 241$) of the total 260 participants who participated in this study identified as female, with 7.3% ($n = 19$) identifying as male. This is a slightly higher gender spread compared to the general nursing population in Canada which in 2019 approximately 91% of regulated nurses were female (Canadian Nursing Association, 2021). The average age of participants was 38 years old, which is slightly less than the average nursing age in Canada of 43 years (Canadian Nursing Association, 2021). The majority of the sample identified as Caucasian at 90.8% ($n = 236$), and 58.8% ($n = 153$) were married. Professionally, 85.4% ($n = 222$) had their bachelor's degree, and 61.2% ($n = 159$) worked at a major tertiary hospital. Participants of this study on average worked 29.75 hours per week, equivalent to a 0.78 FTE, and had worked on average for 18.28 years in the ED. Detailed information on demographic's and professional factors can be seen below (*Table 3.2*).

Table 3.2. Demographics and Professional Factors

<i>Demographics</i>	<i>n</i>	<i>%</i>
Gender		
Female	241	92.7
Male	19	7.3
Ethnicity		
Caucasian	236	90.8
Indigenous	4	1.5
Asian	13	5.0
Other	7	2.8
Marital Status		
Married	153	58.8
Common-law	25	9.5
Divorced	16	6.1
Single	30	11.4
Other	36	13.6
Highest Education		
Diploma	30	11.4
Bachelor's Degree	222	85.4
Master's Degree	8	3.1

Professional Factors

Size of Hospital		
Major Tertiary ED (Calgary, Edmonton)	160	60.8
Regional ED (Lethbridge, Red Deer, Medicine Hat, Grand Prairie)	55	20.9
Rural Hospital ED	46	17.5
FTE		
Part-time (0.3 - 0.9)	170	65.4
Full-time (0.91 – 1.0)	90	34.6
Type of Hours worked		
Day Hours (0700 - 1900)	185	71.2
Evening Hours (1200 - 0000)	76	29.2
Night Hours (1900 - 0700)	163	62.2
Approximate Total Hours worked in ED		
0 – 5000 hours	53	20.2
5000 - 10,000 hours	72	27.7
10, 000 + hours	135	51.9
Length of Shifts		
12 hours	162	62.3
Less than 12 hours	98	37.7

Prevalence of STS in ED Nurses

The average score on the total STSS was 40.7 ($n = 260$, $SD = 12.67$) with 56.5% ($n = 147$) of the total sample meeting the criteria for STS as per the recommended cut-off score of 38 (Bride, 2007). The lowest reported score was 17 and the highest was 81. Details of each item response can be seen in *Table 3.3*. Little’s MCAR test was done to assess the type of missing data and the results were $\chi^2(159, n = 253) 180.9, p = .113$. Based on this we fail to reject the null hypothesis and therefore the data is missing completely at random for the STSS. Mean substitution was used as the imputation technique for the seven cases, or two percent of data that were missing.

Table 3.3. Reported STS Symptoms

Criterion (Item No.)	Never (1) [n (%)]	Rarely (2) [n (%)]	Occasionally (3) [n (%)]	Often (4) [n (%)]	Very	Mean	SD
					Often (5) [n (%)]		
Criterion B - Intrusion symptoms						11.0	3.62
Intrusive thoughts about clients (10)	34 (13.1)	67 (25.8)	90 (28.5)	54 (20.8)	15 (5.8)	2.80	1.10
Disturbing Dreams about clients (13)	106 (40.8)	84 (32.3)	56 (21.5)	8 (3.1)	6 (2.3)	1.94	.977
Sense of reliving client's trauma (3)	112 (43.1)	91 (36.0)	43 (16.5)	10 (3.8)	2 (0.8)	1.83	.891
Cued psychological distress (6)	57 (21.9)	98 (37.7)	80 (30.8)	16 (6.2)	9 (3.5)	2.32	.993
Cued physiological reaction (2)	74 (28.5)	96 (36.9)	74 (28.5)	10 (3.8)	6 (2.3)	2.15	.955
Criterion C: Avoidance symptoms						16.8	5.78
Avoidance of clients (14)	58 (22.3)	59 (22.7)	96 (36.9)	31 (11.9)	16 (6.2)	2.56	1.14
Avoidance of people, places, and things (12)	106 (40.8)	68 (26.2)	44 (16.9)	27 (10.4)	7 (2.7)	2.05	1.12
Inability to recall client information (17)	101 (38.8)	71 (27.3)	60 (23.1)	20 (7.7)	8 (3.1)	2.09	1.10
Diminished activity level (9)	59 (22.7)	81 (31.2)	70 (26.9)	40 (15.4)	10 (3.8)	2.48	1.12
Detached from others (7)	64 (24.6)	74 (28.5)	70 (26.9)	39 (15)	13 (5.0)	2.49	1.16
Emotional numbing (1)	45 (17.3)	69 (26.3)	102 (39.3)	33 (12.7)	11 (4.2)	2.59	1.05
Foreshortened future (5)	60 (22.9)	69 (26.3)	66 (25.2)	40 (15.3)	18 (6.9)	2.55	1.21
Criterion D: Arousal symptoms						13.0	4.23
Difficulty sleeping (4)	35 (13.4)	65 (24.8)	79 (30.2)	44 (16.8)	29 (11.1)	2.87	1.19
Irritability (15)	15 (5.7)	65 (24.8)	84 (32.1)	62 (23.7)	26 (9.9)	3.08	1.06
Difficulty concentrating (11)	43 (16.4)	85 (32.4)	76 (29)	40 (15.3)	9 (3.4)	2.55	1.05
Hypervigilance (16)	62 (23.7)	59 (22.5)	79 (30.2)	39 (14.9)	13 (5)	2.53	1.16
Easily startled (8)	107 (40.8)	77 (29.4)	43 (16.4)	17 (6.5)	8 (3.1)	1.98	1.06

- **Bolded** numbers are the mean score of each subcategory

Symptom Subgroups

Based on the PTSD domain (Bride et al., 2004) 73.8% ($n = 192$) reported one symptom of intrusion, 56.2% ($n = 146$) reported at least three symptoms of avoidance, and 71.5% ($n = 186$) reported at least one symptom of arousal in the previous seven days. 91% of the sample reported experiencing at least one symptom of STS in the previous week. The most frequent reported symptom for intrusion was intrusive thoughts about patients, with 55% ($n = 159$) reporting they thought about their work with patients when they did not intend to do so. The most frequently reported symptom of avoidance was emotional numbing with 57% ($n = 146$) reporting that they felt emotionally numb, but avoidance of patients was also highly reported, with 55% ($n = 143$) reporting that they wanted to avoid working with certain patients. The most frequently reported symptom of arousal was irritability at 66% ($n = 172$), with difficulty sleeping being very high as well at 58% ($n = 152$).

It is important to note that although the STSS does not screen for criterion A (exposure) as it is assumed participants meet this criteria, participants in this study were specifically screened on the survey using the DSM-5 (American Psychiatric Association, 2013) PTSD criteria, of which, 100% of the sample met the diagnostic criteria for criterion A.

One of the most concerning findings was participants' perception of whether they were currently experiencing symptoms of PTSD (*Table 3.4*). Participants were asked "Do you think you are currently suffering from symptoms of PTSD? (ie: avoidance, intrusion, arousal)". Possible participant responses were, no (0) or yes (1). Based on this question, only 35.3% of participants who were experiencing STS thought they were experiencing symptoms of PTSD, and only 61.9% of the participants correctly identified whether they were or were not experiencing these symptoms.

Table 3.4. Correlations of Perceived PTSD symptoms

	Do you think you are currently experiencing PTSD symptoms?		Correlation Coefficient ϕ	Total ($n = 260$)	Classification Accuracy
	Yes	No			
STS			.384***		61.9%
Met criteria	52	95		147	
Did not meet criteria	4	109		113	

Note. *** p-value < 0.001

Demographic and Professional Factors Associated with STS

Correlation statistics reporting the association between demographics and professional factors and STS are presented in *Table 3.5*. A cramer's V test was conducted to evaluate the strength of the relationship between STS and participants' demographic and professional factors. Professionally, participants working full-time were more likely to experience STS than those working part-time ($\phi = .203, p = .001$), and participants who worked 12-hour shifts were more likely to experience STS compared to those working less than 12 hours ($\phi = .171, p = .006$). When asked about type of hours worked, nurses were asked what time of day the majority of their hours worked fell into and could choose any or all of the options available being day (0700-1900), evening (1200-0000), or night (1900-0700). Of the participants who worked day shift ($n = 185$), 54% met the criteria for STS, 55% who worked evening shift ($n = 76$) met the criteria for STS, and 56% of participants working nights shift ($n = 163$) met the criteria for STS. No statistically significant correlation was found between participants who worked a combination of these shifts together and STS.

Table 3.5. Demographic and Professional Factors Correlations to STS

<i>Demographics</i>	STS Cut-off		Correlation Coefficient	Total
	Absence of STS (<i>n</i> = 113)	Presence of STS (<i>n</i> = 147)		
Gender			.082	
Male	11	8		19
Female	102	139		241
Ethnicity			.167	
Caucasian	105	131		236
Indigenous (First Nations, Metis, Inuit)	1	3		4
Other	7	13		20
Marital Status			.156	
Married	72	81		153
Common-law	13	12		25
Divorced	5	11		16
Single	12	18		30
Other	11	25		36
Age			.104	
21-30yrs	25	46		71
31-40yrs	47	56		103
>41yrs	41	45		86
<i>Professional Factors</i>				
Level of Education			.024	
Diploma	13	17		30
Bachelor's Degree	96	126		222
Master's Degree	4	4		8
Size of Hospital			.034	
Major tertiary hospital ED	67	92		159
Regional hospital ED	25	30		55
Rural hospital ED	21	25		46
Current FTE			.165**	
Part-time	84	86		170
Full-time	29	61		90
Length of Shift			.167**	
12 hours	60	102		162
<12 hours	53	45		98
Total Hours worked in ED			.091	
0 -5000 hours	20	33		53
5000-10,000 hours	29	43		72

>10,000 hours	64	71	135
Years' work in ED			.063
1-10 years	59	86	145
11-20 years	30	34	64
>21 years	24	27	51

• *Note.* **p < 0.01

Support and STS

To evaluate associations between STS and support, the existence of both professional support and personal support (outside of work) were measured. Professionally, participants were asked if they felt supported when dealing with trauma-related stressors at work (this included support received from colleagues, their direct supervisor, and more broadly, organizational support). For each of these questions' participants answered on a Likert scale. As shown in Figure 1, 80% ($n = 208$) of participants felt supported by their colleagues compared to only 21% ($n = 54$) who felt supported by the organization that they worked for. Participants felt slightly more supported (45%, $n = 118$) than unsupported (33%, $n = 85$) by their direct supervisor, and 54% ($n = 140$) felt unsupported by the organization that they worked for.

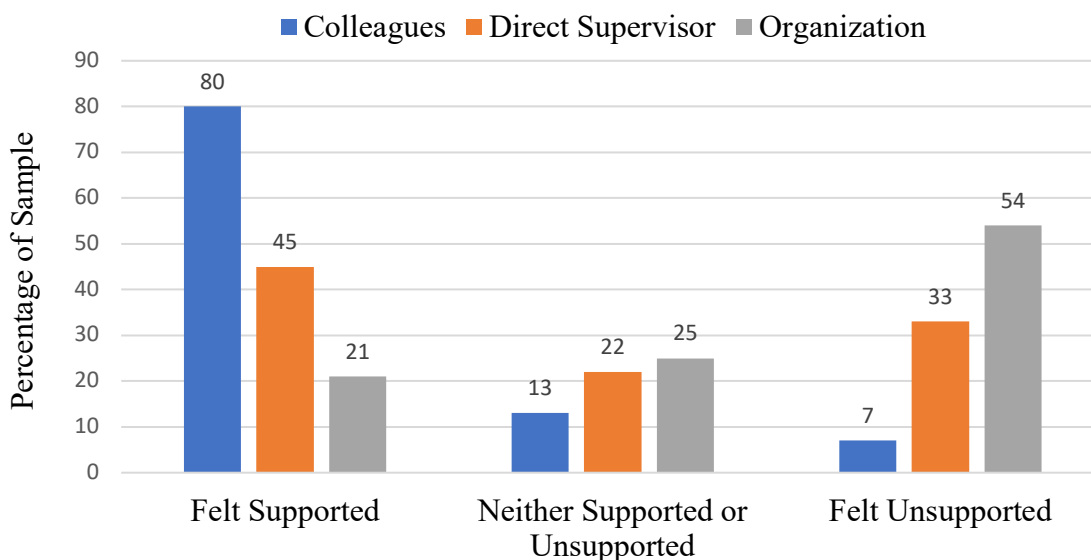


Figure 1. Support when dealing with trauma-related stressors

A Kendall tau b correlation was applied to examine the strength of the relationship between how supported a participant felt at work, and their score on the STSS ($M = 40.7$, $SD = 12.7$). A significant positive correlation was obtained for each category of professional support. The results were support from colleagues $\tau_b = .204$, $p > .001$ (2-tailed), support from direct supervisor $\tau_b = .196$, $p > .001$ (2-tailed), and support from the organization participants worked for $\tau_b = .291$, $p > .001$ (2-tailed). This indicates that the less supported a participant felt in any of these areas, there was a moderate association with higher scores on the STSS.

To measure participant's support outside of work, the MOS social support survey was used, with scores that ranged from 19 - 100 with higher scores indicating better support. Based on Little's MCAR test, $\chi^2(126, n = 250) = 51.1$, $p = 1.0$, we fail to reject the null hypothesis and therefore the data was missing completely at random for the MOS social support survey. Mean substitution was used as the imputation technique for the seven cases or two percent of data that were missing.

A Pearson's r correlation was applied to examine the strength of the relationship between a participant's support outside of work ($M = 73.3$, $SD = 16.4$) and their score on the STSS ($M = 40.7$, $SD = 12.7$). A significant negative correlation was obtained, $r = -.423$, $p > .001$ (2-tailed), indicating that the higher a participant scored on the MOS social support survey (more supported they felt), the lower they scored on the STSS. A subsequent analysis using a Kendall tau b test was done to examine each subscale (emotional/informational support, positive social interaction, tangible support, affectionate support) within the MOS social support survey. Based on these results (*Table 3.6*), participants scored slightly higher on affection support and positive interaction, but overall, each subscale association was very similar.

Table 3.6. Correlations of MOS Social Support Survey Subscales to STS

	Mean Score on Likert	Correlation Coefficient (τ)
Emotional/Information Support	3.68	-.265***
Tangible Support	3.89	-.240***
Affectionate Support	4.09	-.255***
Positive Social Interaction	4.10	-.278***

Note. *** $p < 0.001$

Support in a Regression Model

A logistic regression was used to investigate characteristic's differentiating participants who met the criteria for STS and those who did not based on the cut-off score of 38. Six predictor variables were used: support outside of work (MOS social support survey), length of shift, hours worked per week, and professional support (colleagues, direct supervisor, organization). Predictors were chosen based on gaining more understanding on how support correlates to STS, previous research, as well as present associations. Each categorical variable for professional support was dummy coded with 'disagree' being the reference group. Entry of the variable's into the equation was simultaneous. Data from $n = 260$ participants was available for analysis: 147 participants who met the criteria for STS and 113 participants who did not meet the criteria.

Table 3.7. Logistic Regression of Characteristics of STS

Variable	Regression Coefficient (B)	Wald Statistics	Odds Ratios	95% C.I. for Odds Ratio	
				Lower	Upper
MOS social support survey	-.046	18.8***	.955	.935	.975
Length of Shift	.300	.358	1.35	.712	2.56
Fulltime vs. parttime	.247	.506	1.28	.648	2.53
Colleagues Support	.419	.322	1.52	.358	.647

Direct Supervisor Support	.083	.044	.834	.500	2.36
Organizational Support	1.16	7.90***	3.18	1.42	7.13
Constant	2.84	9.377	17.1		

Note. *** $p < .001$

A test of the full model with all six predictors against a constant-only model was statistically significant, $\chi^2(9, n = 260) = 60.39, p < .001$, indicating that the six predictors, as a set, reliably distinguished between participants experiencing STS and those who were not. The variance accounted for was modest, with a Nagelkerke R squared = 27.8%. Overall prediction success was also modest at 71.9%, with 76.9% of participants experiencing STS classified correctly, and 65.5% of those not experiencing STS classified correctly. *Table 3.7* shows regression coefficients, Wald statistics, and odds ratios (OR) for each of the six predictors. 95% confidence intervals were used. According to the Wald criterion, only the lack of organizational support reliably predicted the presence of STS, while support outside of work as measured by the MOS social support survey was a protective factor against STS. Although the OR indicated that support outside of work was a protective factor, if a person had good social support outside of work, there was only a 4.45% decrease in the odds of STS. However, if participants reported that they felt unsupported by their organization, these participants were approximately three times more likely to be experiencing STS.

DISCUSSION

Prevalence of STS

Based on these results it is evident that ED nurses in Alberta are experiencing frequent traumatic stress. Of note, 91% of the nurse's sampled experienced at least one symptom of STS in the previous week, with 56.5% meeting the cut-off for STS. This is higher than Dominguez-Gomez and Rutledge (2009), who reported 32.8% in ED nurses in California, and Morrison and

Joy (2016) who reported 39% in ED nurses in Scotland. However, this result is slightly less than Duffy et al. (2015) who reported 64% in ED nurses in Ireland. Each of these studies used the STSS to screen for STS, using Bride (2007) recommendations for analysis. For symptom severity using a cut-off score of 38, the average score in the present study was 40.7 which was slightly higher than Morrison and Joy (2016) and Dominguez-Gomez and Rutledge (2009), but lower than Duffy et al. (2015). These symptoms are much higher than other studies that used the impact of event scale (Adriaenssens et al., 2012; Lavoie et al., 2016) and Penn inventory (Hinderer et al., 2014; Von Rueden et al., 2010) to measure PTSD like symptoms. It is also a much higher prevalence than Laposa et al. (2003) who reported 12% of nurses meeting diagnostic levels of PTSD in British Columbia (neighboring province) using the posttraumatic stress diagnostic scale.

From this study the most commonly reported symptom of intrusion was of having intrusive thoughts about patients, which is similar to other studies that used the STSS (Dominguez-Gomez & Rutledge, 2009; Duffy et al., 2015; Morrison & Joy, 2016). For the subgroup avoidance, avoiding patients was the most commonly reported symptom which was similar to findings from Dominguez-Gomez and Rutledge (2009). Conversely, Duffy et al. (2015), and Morrison and Joy (2016) reported foreshortened future as the most common symptom. Then finally the most commonly reported symptom of arousal was irritability which is congruent with other studies (Dominguez-Gomez & Rutledge, 2009; Duffy et al., 2015; Morrison & Joy, 2016). To date this is the first study in Canada to measure STS in the ED nursing population using the STSS which supports previous findings from other geographical areas and different healthcare systems, but also highlights difference, resulting in a clearer perspective of how STS is occurring among ED nurses.

Demographic and Professional Factors and STS

There were no significant correlations found between gender, ethnicity, age, marital status, level of education, experience in the ED, and shiftwork. These findings support earlier studies conducted on traumatic stress in ED nurses (Adriaenssens et al., 2012; Dominguez-Gomez & Rutledge, 2009; Duffy et al., 2015; Lavoie et al., 2016; Von Rueden et al., 2010).

There was however, moderate association between nurses who worked full-time versus part-time (Adriaenssens et al. (2012). This differs from other studies that found no association between STS and how much a nurse worked (Dominguez-Gomez & Rutledge, 2009; Laposa et al., 2003; Von Rueden et al., 2010). Nurses who worked 12-hour shifts were moderately associated with STS compared to those who worked less than 12-hour shifts, which differed from Von Rueden et al. (2010) study that found no association. Notable, when these two variables were entered into a logistic regression, they were no longer statistically significant, which perhaps suggests that their effect on STS may be linked to the perception of organizational support among full-time nurses working 12-hour shifts. Conceivably, because these nurses are at work more, this may result in more frustration with the organization's response to their needs. However, additional exploration of these relationships is warranted.

It is also possible that although hours worked per shift and per week had a low association with STS, it is actually the fatigue accumulated from the varying hours worked that is associated with STS. More research is needed on professional factors that contribute to fatigue (hours work per week and per shift), to understand its effect on STS. It is recommended that future researchers use a validated tool that measures fatigue to better understand its association with STS among ED nurses.

Support and STS

Support that nurses feel professionally from colleagues, supervisors and organizations has been tested regularly, but using various methods which makes it difficult to come to any solid conclusions of how this is affecting nurses. For the current study the nurses were asked how supported they felt when dealing with traumatic stressors from work from their colleagues, direct supervisor, and the organization they worked for.

Lack of support in any of these areas was found to be a risk factor for STS. Von Rueden et al. (2010) made similar conclusions that nurses who reported a positive relationship with their co-workers, experienced less STS, and Adriaenssens et al. (2012) perceived better support from supervisor to be associated with less traumatic stress. Laposa et al. (2003) found that nurses consistently felt they had inadequate support from hospital administration when dealing with traumatic stressors, and that it wasn't the work itself that caused distress or symptoms of PTSD, but the jobs interpersonal environment. In the current study, nurses who did not feel supported by the organization they worked for were three times more likely to be experiencing STS, which provides a potential area for quality improvement councils and policies makers to address.

Support outside of work had a strong association with STS as a protective factor in the current study. This was measured using the MOS social support survey (Sherbourne & Stewart, 1991), a valid and reliable tool. These findings highlight how important nurse's relationships are outside of work. It also provides rationale of the complexity of different areas of support (tangible, emotional/informational, affection, positive social interaction) all needed for an individual to feel supported. These finding suggests that individual nurses, who invest and

maintain their relationships and community in their personal life outside of work, may avoid the potential negative consequence of STS.

Recommendations

It is clear from the findings of this study, that there is a significant proportion of ED nurses experiencing STS in Alberta. Care-related stress has been identified as a profound occupational hazard for those working in trauma-related professions (Berg et al., 2016), and the results of this study support just how pervasive STS, a form of care-related stress, is among ED nurses. These findings contribute to the small but growing body of research that had similar findings. The negative impact that STS has on the mental health of nurses limits their ability to provide optimal patient care (Morrison & Joy, 2016), and nurses are instrumental to the care that patients receive hence (Forsgarde et al., 2016), their health and well-being is critical. Knowing that ED nurses are experiencing STS is the first step to organizations and individuals taking a more proactive approach to preventing it, but also a better approach to supporting nurses who are experiencing it. Arguably because of the integral part that nurses play in the care that patients receive, a “nurse focused” approach by organizations could potentially mitigate STS, as well as poorer patient care.

It is vital that nurses understand that STS is a very serious potential health outcome of working in the ED and they must be hypervigilant in recognizing these symptoms. It is concerning that nurses do not perceive that they are experiencing STS when the results of this and previous studies (Dominguez-Gomez & Rutledge, 2009; Duffy et al., 2015; Morrison & Joy, 2016) clearly indicate prevalence among ED nurses. Future research is needed to understand why ED nurses do not perceive symptoms of intrusive thoughts about patients, sleep disturbances, irritability, hypervigilance, and foreshortened future as abnormal and unhealthy symptoms that

they are experiencing. Dissemination of these findings is critical to assist individual nurses with the awareness of the occupational hazard of STS.

The current study shows a disproportionate number of nurses who feel a lack of support from the organization that they work for, which has been a consistent theme in the current literature (Adriaenssens et al., 2012; Laposa et al., 2003; Von Rueden et al., 2010). Future research needs to seek to understand what it is that nurses need in order to feel more supported. Although the term “support” has been used repetitively by researchers (Adriaenssens et al., 2012; Laposa et al., 2003; Von Rueden et al., 2010), this term needs to be clearly defined when used in the future to understand more specifically what nurses feel is lacking. Qualitative research would also enhance understanding of what nurses need to deal with the complexity of STS and how it develops from working in the ED. Prospective longitudinal studies would help to establish the casual relationships between STS and factors like hours worked per week or per shift, and the support that nurses feel.

Limitations

Cross-sectional designs can be limited in assessing STS because it is measured at a single point in time, and it is possible that the individual’s assessment of their perceptions could change over time (Adriaenssens et al., 2012; Hunsaker et al., 2015). Symptoms assessed could be due to a number of causes, not related to work. They could also be from the aggression and violence that ED nurses are known to experience personally while at work (Adriaenssens et al., 2015). Although there were strong associations found between certain variables and STS, due to this design, no causation can be established between these variables and the outcome of STS. It is also possible that nurses may have been more likely to participate as they believed they were experiencing STS.

CONCLUSION

STS is a significant occupational outcome of working in the ED in Alberta. It still remains unclear as to why ED nurses do not feel like they are experiencing these symptoms. The support ED nurses require, is an important factor to consider when developing appropriate interventions to proactively and reactively benefit nurses who are experiencing STS. While the results of this study cannot establish causation, it has established scientific merit to inform future research on STS, and increase awareness among individual nurses, supervisors and organizations of this occupational health outcome. More prospective and qualitative research is needed to build understanding of the construct of STS among ED nurses. The results from this study support the notion that policy makers and quality improvement groups should consider STS a significant consequence of working in the ED environment which can affect the nurse's ability to provide optimal patient care.

CHAPTER FOUR: VALIDATING THE STSS IN ED NURSES

ABSTRACT

Introduction: The secondary traumatic stress scale (STSS) was originally made for social workers on the premise that its symptoms mirrored PTSD. It was developed based on the DSM-4-text revised PTSD criteria. The DSM-5 was published in 2013, with some changes made to the PTSD diagnostic criteria. The purpose of this study was to reexamine the STSS's validity within the ED nursing population based on the DSM-5 PTSD criteria.

Methods: A cross-sectional study design with a sample of ($n = 260$) Registered nurses currently working in an ED in Alberta was used. The STSS was the screening tool, and the DSM-5 PTSD criteria was the reference-standard. Efficiency, sensitivity, specificity, positive predictive power, negative predictive power, prevalence and estimated population prevalence were calculated.

Results: Using either the STSS or the DSM-5 PTSD criteria it is evident that ED nurses in Alberta are experiencing significant amounts of traumatic stress. For the total scale based on currently recommendations, the STSS estimated a higher prevalence than the DSM-5 PTSD criteria. When the cut-off score was adjusted to 49, prevalence was similar to the DSM-5 prevalence, and specificity was significantly higher.

Conclusion: If used thoughtfully the STSS is a valuable tool when screening ED nurses for PTSD. It is an easy concise assessment tool which can make it appealing to busy ED nurses. Using consistent tools such as the STSS can allow researchers to compare results from varying areas, and between different nursing specialties. It is recommended that depending on what the STSS is being used for that an adjusted cut-off score from the current recommendations be used to represent PTSD.

INTRODUCTION

For those working in trauma-related professions, significant care-related stress is known to exist to the extent that it is an expected occupational outcome (Berg et al., 2016). For nurses working in the emergency department (ED), listening to and witnessing patients suffering, pains and trauma are regular occurrences (Mordeno et al., 2017). A term that has been used to describe this occupational outcome is secondary traumatic stress (STS), which is the stress resulting from helping or wanting to help a traumatized individual (Figley, 1995). When conceptualizing STS, the symptomatology of STS closely resembles that of posttraumatic stress disorder (PTSD) symptomatology. To date the secondary traumatic stress scale (STSS) has been validated as the only tool that exclusively measures STS among nurses (Beck, 2011; Watts & Robertson, 2015). The purpose of this study was to test the validity of the STSS as a screening tool for PTSD with the *Diagnostic and Statistical Manual of Mental disorders – fifth edition* (DSM-5) PTSD criteria as the reference-standard.

Background and Significance

The STSS was originally developed for use among social workers, based on the premise that STS symptomatology resembles PTSD symptomatology (Beck, 2011; Bride et al., 2004; Dominguez-Gomez & Rutledge, 2009). This scale was developed to measure the three subgroups that correspond with criterion B (intrusion), C (avoidance), and D (arousal) of the *Diagnostic and Statistical Manual of Mental Disorders, fourth edition – text revision (DSM-4-TR)* (American Psychiatric Association, 2000), which are necessary for a PTSD diagnosis. In versions of the DSM prior to the *fifth edition*, an individual required direct exposure to trauma to be diagnosed with PTSD, which inherently did not allow people who had indirect exposure (caregivers) to meet the criteria for PTSD. In 2013 though, the DSM-5 was revised to include indirect exposure

or witnessing of trauma as a caregiver to be a potential criteria for developing PTSD (American Psychiatric Association, 2013). A study done by Mordeno et al. (2017) on nurses in the Philippines examining the latent factor structure of the STSS using the DSM-5 PTSD nomenclature, concluded that STS symptoms mirrored PTSD symptoms. They also concluded that although identification of secondary traumatization as a possible criteria for PTSD is included in the DSM-5, failure to recognize the empathetic nature of the relationship between primary and secondary traumatized victim is a notable gap (Mordeno et al., 2017); therefore the construct of STS is still used in the current literature by those conceptualizing secondary traumatization in care-workers. With the changes to the PTSD symptom criteria in the DSM-5 (American Psychiatric Association, 2013), it is important to reexamine the STSS's validity within the ED nursing population.

Research Questions

Using the data collected from a convenient sample of ED nurses in Alberta, the following research questions were examined:

- What is the validity of the secondary traumatic stress scale using the *Diagnostic and Statistical Manual of Mental Disorders – fifth edition* PTSD criteria as the reference-standard?
- What is the best evidence-informed cut-off score to be used for the STSS to identify PTSD based on the DSM-5?

METHODS

Study Design

Data for this cross-sectional study was collected from ED nurses currently working in Alberta. This project received ethical approval from the Research Ethics Board at the University of Alberta (Pro00096173). Data collection (Appendix A) occurred from May 2020 to July 2020. Registered Nurses currently working in any ED in Alberta were recruited. Recruitment strategies involved advertising via emails sent out to a general listserv obtained from the *College of Alberta Registered Nurses Association* (Appendix B), and an anonymous link posted on various social media sites (Appendix C). Due to this recruitment approach, it was not possible to calculate an accurate response rate. Consent was obtained from all participants (Appendix D) prior to beginning the survey.

Two-hundred and seventy-five online surveys were completed via Qualtrics ($N = 275$). Inclusion criteria was that the participant must be a registered nurse, currently providing direct patient care in an ED in Alberta for a minimum of six months. The rationale for participants needing to have worked minimum six months was based on the assumption that this would be enough experience and time to have had repeated exposure to traumatic events which are commonplace in the ED. Nurse managers were excluded as their daily tasks would be different than those providing direct patient care, and licensed practical nurses were excluded for greater homogeneity in the sample, although it is completely reasonable that they would be at just as much risk of developing traumatic stress.

Thirteen ($n = 13$) of the surveys completed were not included in the analysis because they did not meet the inclusion criteria. Another two surveys were removed as these participants had only

completed partial demographic information and nothing else. The remaining 260 ($n = 260$) surveys were included in the analysis. As per the Qualtrics's metrics, the survey took approximately ten minutes for participants to complete in totality, which included questions on demographics, professional characteristics, DSM-5 PTSD symptoms, the STSS, and the medical outcomes study social support scale. Data were analyzed using IBM SPSS 26 and manual calculations

Screening Tool - STSS

The STSS is a 17-item questionnaire that uses a Likert scale asking participants how often they experienced a symptom in the previous seven days: “Never (1)”, “rarely (2)”, “occasionally (3)”, “often (4)”, “very often (5)”. This scale was developed based on the DSM-4-TR criteria for PTSD, measuring subgroup intrusion (B), avoidance (C), arousal (D), and was intended to be used as a screening tool for populations that are likely exposed to traumatic stressors (Bride, 2007). Criterion A (traumatic exposure) is assumed to be present as the wording of instructions and the stems of stressor-specific items were designed such that the traumatic stressor was identified as the patient (Bride et al., 2004).

Based on the PTSD domain, Bride (2007) formulated an algorithm to identify cases of PTSD based on the 17 STSS items in two different ways. As per this algorithm, when a participant reported that a symptom was experienced “occasionally (3),” “often (4),” “very often (5),” this symptom was interpreted as present. Participants who reported at least one intrusion symptom, three avoidance symptoms, and two arousal symptoms met diagnostic levels for PTSD (Bride, 2007). The second way Bride (2007) recommends, is to use the total STSS score by summing each response value for each item, with the lowest possible score being 17 and the highest being 85 (*Table 4.1*), and a cut-off score of 38 designating PTSD.

Table 4.1. Symptom Subgroups and Calculating the STSS score

Symptom Category	Question on STSS	Total
Intrusion subscale	add items 2, 3, 6, 10, 13	/25
Avoidance subscale	add items 1, 5, 7, 9, 12, 14, 17	/35
Arousal subscale	add items 4, 8, 11, 15, 16	/25
TOTAL	add intrusion, arousal, avoidance scores	/85

The only adaptation made to the original questionnaire was replacing the word client with patient throughout. In previous studies The Cronbach's alpha has been reported as .91 for the total scale, and high for all subgroups ranging from .80 to .93 (Bride et al., 2004; Dominguez-Gomez & Rutledge, 2009). In this sample the Cronbach's alpha was excellent at .93 for the total scale, and good for all subgroups: intrusion .78, avoidance .86, and arousal .83. Based on this the STSS had good internal consistency and reliability.

Reference-Standard – DSM-5 PTSD Criteria

As there is no lab test for the majority of mental disorders, the most valid approach for a diagnosis of a mental disorder is a standardized interview (McDonald & Calhoun, 2010). Due to the immensity of performing interviews to this standard, the DSM-5 PTSD criteria was chosen as the reference-standard test as it is the most up to date diagnostic criteria as recommended by the *American Psychiatric Association*. The DSM-5 identifies symptom subgroups of intrusion (B), avoidance (C), negative alterations in cognition and mood (D), and alterations in arousal and reactivity (E) (American Psychiatric Association, 2013). Compared to the DSM-4-TR, which the STSS was developed from, the DSM-5 increased the number of symptom subgroups from three to four, and the number of symptoms from 17 to 20. For each of these subgroups (*Table 4.2*), symptoms needed to begin after the traumatic event(s) occurred and be lasting more than one month.

Table 4.2. DSM-5 PTSD Criteria

Symptom Subgroups	Number of items in each subgroup	Number of items needed to meet full criteria
Intrusion (B)	5	1
Avoidance (C)	2	1
Negative alterations in cognition and mood (D)	7	2
Alterations in arousal (E)	6	2

Compared to the DSM-4-TR, the DSM-5 separated the avoidance and numbing symptoms into different groups, with the avoidance symptoms (two items) remaining a part of the subgroup avoidance (C) and the numbing symptoms were assigned to the subgroup cognition and mood (D). With this change of items included in subgroups, based on the DSM-5, it is now a requirement for an individual to experience at least one symptom of avoidance to meet the diagnostic criteria for PTSD, in contrast to the DSM-4-TR which permitted a PTSD diagnosis with no avoidance symptoms (Pai et al., 2017).

For the purpose of this study, since screening for symptoms was the intent, participants were not asked when symptoms began or for how long they have been lasting. Due to the nature of the design (cross-sectional), this also could have potentially produced significant recall bias if these questions were asked.

Analysis Strategy

Diagnostic accuracy is an indicator of the utility of a test, and the degree to which a screening test correctly identifies the presence or absence of a condition based off of a gold-standard test (McDonald & Calhoun, 2010), or in this instance reference-standard. Using specific formulae (*Table 4.3*), efficiency, sensitivity, specificity, positive predictive power, negative

predictive power, prevalence, and estimated population prevalence was calculated using the STSS as the screen, and the DSM-5 as the reference-standard.

Table 4.3. Definitions and Formulae for Common Diagnostic Accuracy Statistics

Statistic	Description	Formula
Efficiency	Overall hit rate	$(\text{True positive} + \text{true negative})/\text{total}$
Sensitivity	Proportion of those with the disorder who are correctly identified by the test	$\text{True positive}/(\text{true positive} + \text{false negative})$
Specificity	Proportion of those without the disorder who are correctly identified by the test	$\text{True negative}/(\text{true negative} + \text{false positive})$
Positive predictive power (PPP)	Proportion of those screening positive who have the condition	$\text{True positive}/(\text{true positive} + \text{false positive})$
Negative predictive power (NPP)	Proportion of those screening negative who do not have the condition	$\text{True negative}/(\text{true negative} + \text{false negative})$
Prevalence in sample	Proportion of those in the sample who have the condition	$(\text{true positive} + \text{false negative})/\text{total}$
Estimated population prevalence	Proportion of those in the population who are estimated to have the condition	$(\text{true positive} + \text{false positive})/\text{total}$

Note. Table adapted from McDonald and Calhoun (2010).

Diagnostic levels of PTSD

Using the DSM-5 criteria, the presence, or absence of PTSD was analysed. Based on the items in *Table 4.2*, participants must experience one symptom in criterion B and C, and two symptoms in criterion D and E. If participants met the criteria for each of these subgroups, as well as criterion A which is the traumatic stressor, then they would meet the full diagnostic criteria for PTSD.

To assess the presence or absence of PTSD based on the STSS, two methods based on Bride (2007) recommendations were used. Due to the nature of mental disorders, they generally are not natural dichotomies and are often measured using a continuous scale, with a particular

cut-off score to indicate a positive screen (McDonald & Calhoun, 2010). As recommended by Bride (2007), a cut-off score of 38 was used based on the add-item total of the 17 items on the STSS. A cut-off score of 49 was also used in the analysis to assess a potential change in the diagnostic accuracy of the STSS. Diagnostic accuracy tests were run for each cut-off score between 38 and 49 and based on these results 49 was deemed most appropriate as efficiency, specificity, and PPP each improved. The estimated population prevalence was also closest to the DSM-5 prevalence. A cut-off that produces a high specificity was of interest so that those who do not have PTSD are correctly identified, avoiding excessive further testing which could be costly and time consuming, particularly in the context of research.

The diagnostic accuracy was also calculated for the STSS based the PTSD domain that Bride (2007) recommends. As per this domain, when a participant reported that a symptom was experienced “occasionally (3),” “often (4),” “very often (5),” this symptom was interpreted as present (Bride, 2007). For a participant to meet the criteria for the subgroups, the participant needed to be experiencing one symptom of intrusion (B), three symptoms of avoidance (C) and two arousal (D) symptoms. To have diagnostic levels of PTSD based on this PTSD domain that (Bride, 2007) recommends, the participant would have to meet the full criteria for each of these subgroups. These symptoms were also modified and assessed using only “often (4),” “very often (5),” as interpreting a symptom as present to assess whether a change of what constitutes a symptom could affect the diagnostic accuracy.

RESULTS

Overall, 92.7% ($n = 241$) of the total participants data ($n = 260$) used in the analysis identified themselves as female, with 7.3% ($n = 19$) identifying as male. The average age of these participants were 38 years old, the majority at 90.8% ($n = 236$) identified as Caucasian, and

58.8% ($n = 153$) were married. Professionally, 85.4% ($n = 222$) had their bachelor's degree, and 61.2% ($n = 159$) worked at a major tertiary hospital. On average the participants worked 29.75 hours per week, equivalent to a 0.78 FTE, and had worked on average 18.28 years in the ED. See *Table 4.4* for detailed information on demographic's and professional factors.

Table 4.4. Sample Description

<i>Demographics</i>	<i>n</i>	<i>%</i>
Gender		
Female	241	92.7
Male	19	7.3
Ethnicity		
Caucasian	236	90.8
Indigenous	4	1.5
Asian	13	5.0
Other	7	2.8
Marital Status		
Married	153	58.8
Common-law	25	9.5
Divorced	16	6.1
Single	30	11.4
Other	36	13.6
Highest Education		
Diploma	30	11.4
Bachelor's Degree	222	85.4
Master's Degree	8	3.1
<i>Professional Factors</i>		
Size of Hospital		
Major Tertiary ED	160	60.8
Regional ED	55	20.9
Rural Hospital ED	46	17.5
FTE		
Part-time (0.3 – 0.9)	170	65.4
Full-time (0.91 – 1.0)	90	34.6
Type of Hours worked		
Day Hours (0700 – 1900)	185	71.2
Evening Hours (1200 – 0000)	76	29.2
Night Hours (1900 – 0700)	163	62.2
Approximate Total Hours worked in ED		
0 – 5000 hours	53	20.2
5000 – 10,000 hours	72	27.7
10, 000 + hours	135	51.9
Length of Shifts		

12 hours	162	62.3
Less than 12 hours	98	37.7

Prevalence of PTSD

The average score on the total STSS was 40.7 ($n = 260$, $SD = 12.67$) with 56.5% ($n = 147$) of the total sample meeting the criteria for PTSD as per the recommended cut-off score of 38. When Bride’s (2007) PTSD domain recommendations for a PTSD diagnosis were applied 50.8% ($n = 132$) of the sample met the full criteria for PTSD. When these symptoms were modified and assessed using only “often (4),” “very often (5),” as interpreting a symptom as present, only 12% ($n = 31$) met the criteria for PTSD, and these later findings are identified as the “modified PTSD domain” hereafter. Using the DSM-5 PTSD criteria 30.8% ($n = 80$) met the full criteria for PTSD and was used in the correlation analysis (*Table 4.5*), with 100% of the sample meeting criterion A (traumatic stressor) for PTSD.

Table 4.5. Prevalence of PTSD using STSS, and Correlations to the DSM-5

Diagnostic levels of PTSD	STSS [n (%)]	Correlation Coefficient (ϕ)
Recommended PTSD domain	132 (50.1)	.306***
Based on a cut-off score of 38	147 (56.5)	.332***
Based on modified PTSD domain	22 (11.9)	.320***
Based on cut-off score of 49	49 (28.8)	.477***

Note. *** p-value < 0.001

Diagnostic Accuracy

Using the STSS as the screening tool and the DSM-5 PTSD criteria as the reference-standard, the diagnostic accuracy of the STSS was analyzed. Initially efficiency, sensitivity and specificity were analysed using various diagnostic methods (*Table 4.6*). Efficiency is the number

of times that a screen accurately identifies those with a disease (true positive) and those without (true negative). For diagnostic levels of PTSD, using the current recommendations, efficiency was just over 60% using both the PTSD domain and a cut-off score of 38. With the modified PTSD domain and cut-off score of 49, efficiency significantly improved, being able to correctly identify approximately 75% of participants who did and did not have diagnostic levels of PTSD.

Table 4.6. Efficiency, Sensitivity and Specificity of the STSS

PTSD Diagnosis	Efficiency	Sensitivity	Specificity
PTSD domain	.64	.74	.59
Modified PTSD domain	.74	.28	.95
Cut-off 38	.63	.81	.54
Cut-off 49	.78	.61	.86

Sensitivity is the degree to which a screen accurately identifies the proportion of individuals who do have a disease, and specificity is the degree to which a screen accurately identifies those without a disease correctly (McDonald & Calhoun, 2010). Using the recommended PTSD domain, 74% of the time the STSS correctly identified those who had PTSD, and 59% of the time correctly identified those who did not have PTSD. With the modified cut-off score of 49, the STSS correctly identified those with PTSD 61% of the time, and correctly identified those without PTSD 86% of the time. It is important to note that although the modified PTSD domain efficiency was similar to the cut-off score of 49, the sensitivity of the modified PTSD domain significantly decreased to only 28%, which would mean a large number of participants experiencing PTSD would be missed if used.

Positive predictive power (PPP), negative predictive power (NPP), prevalence and estimated population prevalence were analyzed next (*Table 4.7*). PPP is the proportion of those who screened positive, who actually have the condition, and NPP is the proportion of those who

screened negative who do not actually have the condition (McDonald & Calhoun, 2010). Using any of the diagnostic criteria for PTSD, they each were fairly consistent, screening those who did not have PTSD approximately 70% to 80% as not actually having it. However, the modified PTSD domain and cut-off score had much higher percentages for correctly identifying those who screened positive who actually had PTSD.

Table 4.7. Predictive Power, Prevalence, and Estimated Prevalence of the STSS

PTSD Diagnosis	PPP	NPP	Prevalence	Estimated Population Prevalence
PTSD domain	.45	.84	.31	.51
Modified PTSD domain	.71	.75	.31	.12
Cut-off 38	.44	.87	.31	.57
Cut-off 49	.65	.83	.31	.29

Prevalence is the proportion of those in the sample who have a condition, and estimated population prevalence is the proportion of those in the population who are estimated to have a condition based on a screening tool (McDonald & Calhoun, 2010). Using the recommendations of the PTSD domain and cut-off of 38, the STSS overestimated the prevalence of PTSD by approximately 20%. Using the cut-off of 49, this slightly underestimated the prevalence of PTSD by just 2%. The modified PTSD domain significantly underestimated the prevalence of PTSD in this sample.

DISCUSSION

Based on the prevalence of PTSD using either the DSM-5 criteria or the STSS, it is evident that ED nurses in Alberta are experiencing significant amounts of PTSD symptoms. To date this is the first study to use the STSS to measure PTSD in ED nurses in Canada, and the first to validate the STSS using the DSM-5 PTSD criteria within the ED nursing population. When considerations are made for future research in validating the STSS using the DSM-5 criteria,

sensitivity and specificity are considered “fixed properties”, indicating they should not change as long as a screening tool is being used within similar groups of people (Streiner, 2003).

Using the current recommendations for the STSS to designate diagnostic levels of PTSD (Bride, 2007), when compared to the DSM-5 the STSS overestimated the prevalence of PTSD consistently. In other research that has compared the DSM-4-TR and the DSM-5 symptom checklists for PTSD, a decreased identification of PTSD cases was found when using the DSM-5 criteria (Hoge, Riviere, Wilk, Herrell, & Weathers, 2014). Although the present study didn't directly compare these symptoms, the STSS was developed from the DSM-4-TR, and arguably had similar findings.

When thoughtfully used, with the current recommendations, the STSS could be a valuable screening tool within the ED nursing population. It is a quick assessment tool, which makes it appealing and user friendly for busy ED nurses who may have low incentive to complete yet another task. Criterion A is assumed when using the STSS, and that assumption is validated by these findings as 100% of ED nurses in this sample met this criterion based on the DSM-5. It could be used by individual nurses as a quick assessment to evaluate if they are in fact experiencing PTSD symptoms. By completing the STSS, this alone could give nurses the awareness that they are experiencing symptoms of PTSD, which could prompt them to seek support to manage these symptoms. Specifically, it could be incorporated into debriefing strategies as a long-term follow-up tool to evaluate if nurses may need more exact assessment such as an interview by a registered psychologist or psychiatrist. If the later example were to be employed, it is recommended that based on these findings a cut-off score of 49 be used to represent clinical levels of PTSD. If it is important that those who are not experiencing PTSD are correctly identified, using the modified PTSD domain would be valuable.

Recommendations for Research

To date the effects of indirect exposure to traumatic events has not been researched extensively within the ED nursing population (Duffy et al., 2015; Ratrout & Hamdan-Mansour, 2017). Within this limited body of knowledge, the STSS has been used a number of times to assess empathic traumatic stress among ED nurses (Dominguez-Gomez & Rutledge, 2009; Duffy et al., 2015; Morrison & Joy, 2016). To inform greater understanding of this phenomena, it is important that researchers use consistent screening tools. Using the current recommendations (Bride, 2007) this will allow researchers to draw associations among ED nurses from varying geographical areas and healthcare systems, and relationships between different nursing specialties (i.e., pediatric, labor and delivery, intensive care). Further research on STS would serve to promote awareness and discussion on a topic that is often met with silence and shame (Bercier & Maynard, 2015), which makes the STSS a beneficial tool in spite of a tendency to overestimate the prevalence of PTSD based on the DSM-5. If the STSS is used in future research to screen participants for a diagnostic interview, it is recommended that a cut-off score that produces a high sensitivity and a reasonable specificity (for resources available to accommodate the false positives) to be used.

Limitations

Procedurally, cross-sectional designs can be limiting because data is collected at a single point in time, and it is possible that the individual's assessment of their perceptions could change over time (Adriaenssens et al., 2012; Hunsaker et al., 2015). Symptoms assessed within the context of this study could be attributed to a number of causes, not related to work in the ED. Screening tests are advantageous tools to gather data on a specific outcome, as it would be difficult to conduct large studies using interview methods due to potential costs and time

constraints. Some disadvantages of this approach may be that it can result in some potentially misleading cases, and overestimates of PTSD in a population (McDonald & Calhoun, 2010).

Another limitation of the current study is that the DSM-5 criterion F “duration of the disturbance (criteria B, C, D, and E) is more than one month” was not assessed. Had this measurement been done, this could have affected the overall prevalence measured within this ED nursing sample. Although the STSS only accounts for symptoms experienced in the week prior, recall bias could also have affected participant responses.

CONCLUSION

Overall, the findings of this study contribute to the small but growing area of research on symptoms of traumatic stress among ED nurses. This is the first study conducted in Canada using the STSS to measure PTSD among ED nurses, and to assess validity of the STSS using the DSM-5 PTSD criteria. Although the STSS tends to overestimate the prevalence of PTSD based on its current recommendations, depending on how it is used, there are still benefits to its use among ED nurses for research and clinical application.

CHAPTER FIVE: DISCUSSION AND RECOMMENDATIONS

INTRODUCTION

In this paper-based format dissertation I have reviewed the current literature on STS and PTSD in the ED nursing population and establish evidence that ED nurses in Alberta are experiencing a significant amount of traumatic stress. I also was able to find associations of risk factors, and protective factors associated with STS. I also validated the secondary traumatic stress scale (STSS) using the DSM-5 PTSD criteria as a screening tool within ED nurses. The purpose of this chapter is to summarize themes and findings from this research project, a post-hoc analysis on factors associated with traumatic stress, and a general discussion on implications of this research clinically and for future research.

My intent with this project was to bring awareness to these symptoms that are occurring among ED nurses, as limited research in this area exists here in Canada. I also wanted to produce evidence to inform future research in this area. Ideally, this research would be more robust analytical studies that form clearer perspectives on why ED nurses are experiencing these traumatic symptoms, resulting in more proactive approaches to manage the influence of the traumatic environment of the ED on individual nurse's well-being.

Constructs of Traumatic Stress

Based on the findings of this project, and similar to other studies who used the STSS in different geographical areas, it is evident that ED nurses experience a significant degree and frequency of traumatic stress. This was clear when using either the STSS, or the DSM-5 PTSD criteria. STS is a construct developed to understand what is occurring among trauma workers, partially due to limitations of the construct of PTSD as per the DSM-5 in how traumatic stress

occurs and is experienced among trauma professionals. Both constructs include similar symptomatology (Mordeno et al., 2017). The purpose of this research project was to understand what traumatic symptoms were experienced by ED nurses in this sample.

STS is defined as the stress that occurs after an individual *hears* of a traumatic experience, followed by the consequential emotions or behaviors resulting from caring for the traumatized individual (Hinderer et al., 2014; Watts & Robertson, 2015). Although ED nurses hear of events, they also witness a significant occurrence of suffering related to death, severe injuries, and suicide, all while experiencing a certain level of violence and aggression from patients while at work (Adriaenssens et al., 2015). These experiences alone are traumatic and challenge the idea of whether the symptoms that ED nurses are experiencing are STS or PTSD based on the definitions of these constructs. STS does not require the level of rigor needed to meet a PTSD diagnosis (Watts & Robertson, 2015), hence, the construct of STS is beneficial; giving voice to the symptoms that nurses are experiencing.

Based on the findings from these studies, it is evident that whether measured via the construct of STS or PTSD, ED nurses experience a significant degree of avoidance, intrusion, and arousal symptoms. It is important that symptoms related to sleep disturbances, hypervigilance, intrusive thoughts about patients, foreshortened future, and avoidance of certain patients be recognized as unhealthy symptoms exhibited by the ED nurse. In the current study nurses generally did not perceive themselves as experiencing these symptoms. Until nurses recognize that they are experiencing these symptoms, it seems reasonable to assume that steps to healing will not occur. Based on these interpretations of these constructs, and the findings from this research project it is vital that emphasis is placed on the symptoms experienced, prior to understanding the nuances of how these symptoms develop in ED nurses.

Post-Hoc Analysis of Factors Associated with Traumatic Stress

After completing the analysis for chapters three and four, a post-hoc analysis was conducted on potential factors associated with traumatic stress using the DSM-5 PTSD criteria rather than the STSS cut-off score of 38. Cramer's V and Kendall tau b statistical tests were used for this analysis. The findings were similar to the results reported in chapter three: the hours worked per shift and per week, professional support, and social support outside of work, were all found to be associated with the presence of traumatic stress (*Table 5.1*). Nurses' perception of symptoms of PTSD (i.e.: intrusion, avoidance, arousal), were also associated with traumatic stress.

Table 5. 1. Post-hoc Analysis of Factors Associated with Traumatic Stress

<i>Professional Factors</i>	Correlation Coefficient
Fulltime vs Parttime	.163**
12-hour shift vs less than 12-hour shift	.140*
Support from colleagues	.211**
Support from direct supervisor	.136*
Support from organization	.176**
<i>Personal Factors</i>	
Support outside of work (MOS social support survey)	- .148**
Perception of PTSD symptoms	.421***

Note. *p-value <.05, **p-value < .01, *** p-value < 0.001

These findings are similar to the risk factors and protective factors found to be associated with traumatic stress in this research project. The strength of the associations differed slightly, but given the rigor required to meet a PTSD diagnosis, it does add more validity and strength to the findings of this research project. What remains so concerning, is that of the nurses identified as having PTSD as per the DSM-5 ($n = 80$), 47.5% ($n = 38$) did not think that they were experiencing any symptoms of PTSD.

Clinical Implications

The findings from this research project have provided evidence for individual nurses and organizations to take action to address and mitigate symptoms of traumatic stress. It is important for individual nurses to maintain and invest in their personal relationships and community outside of work that represents their social support network as this type of support was found to be a protective factor to traumatic stress in the current study. For nurses who work full-time or 12-hour shifts it is important that the nurses and management proactively acknowledge that these nurses may be at greater risk of traumatic stress and should be hypervigilant at recognizing the symptoms as they begin to occur. As far as professional support when dealing with traumatic stressors, feeling a lack of support from colleagues, direct supervisors, or the organization by and large, was also associated with traumatic stress.

The majority of the nurses in this sample felt supported by their colleagues, but over 50% felt unsupported by the organization that they worked for when dealing with traumatic stressors from work. Most concerning is that nurses in the current study who did not feel supported by the organization they worked for were three times more likely to be experiencing traumatic stress. A lack of organizational support has been a common theme in the literature on traumatic stress in ED nurses (Adriaenssens et al., 2012; Laposa et al., 2003; Von Rueden et al., 2010), calling for policy development and quality improvement strategies to address this need. The STSS, is a user-friendly quick assessment tool, that could be used as a self-assessment tool to help nurses recognize and evaluate if they are in fact experiencing traumatic stress symptoms. Institutions could also incorporate this tool into psychological debriefing strategies as a long-term follow-up tool to evaluate if nurses need more exact assessment such as seeing a registered psychologist or

psychiatrist. If diagnostic interviews are going to be used, based on the findings of this research project, a cut-off score of 49 to represent clinical levels of PTSD is recommended.

Implications for Research

Continued research in this area is important to bring awareness and a voice to a topic that is often met with silence and shame among trauma workers (Bercier & Maynard, 2015). Based on the findings from this research project, it is recommended that researchers explore professional factors that contribute to fatigue in order to better understand its associations with traumatic stress. Qualitative research would enhance understanding on why nurses do not feel supported when dealing with traumatic stressors. This could also be hypothesis building for additional analytical studies to inform institutions and policies makers of what is needed to help nurses manage the significant occupational threat that traumatic stress poses.

If, in the future, the STSS is used to measure traumatic stress in ED nurses for research, the current recommendations will allow researchers to draw associations among ED nurses from varying geographical areas and healthcare systems, and relationships between different nursing specialties. If researchers are using this screening tool to screen nurses for a more thorough diagnostic interview, the findings from this research project have established 49 as a cut-off score that more appropriately represents clinically levels of PTSD. More importantly though, it is recommended that a cut-off score that produces a high sensitivity and reasonable specificity be used to account for false positives.

CONCLUSION

The findings of this research, while unable to predict causation, has indeed established scientific merit for action to be taken by individual nurses and institutions to manage the occupationally hazardous effects of traumatic stress among ED nurses. These findings also have

the potential to inform future research in this area, and contribute to the limited, but growing body of research in this area. Nurses are critical to the quality of care that patients receive; (Forsgarde et al., 2016) hence, their health and wellbeing is of utmost importance.

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APPENDIX A

Qualtrics Survey

Secondary Traumatic Stress in Emergency Department Nurses in Alberta

Start of Block: Inclusion/Exclusion

In your role in the Emergency Department (ED) do you provide direct ED patient care?

Yes (1)

No (2)

Are you a Registered Nurse?

Yes (1)

No (2)

Are you currently a Nurse Manager?

Yes (1)

No (2)

Have you worked in the ED providing direct patient care for a minimum of 6 months?

- Yes (1)
- No (2)

End of Block: Inclusion/Exclusion

Start of Block: Demographics

Ethnic origin: Please specify your ethnicity.

- Indigenous (First Nations, Metis, Inuit) (1)
 - Asian (3)
 - Black, or African descent (4)
 - Hispanic, Latino, or Spanish origin (5)
 - Middle Eastern (6)
 - Caucasian (7)
 - Prefer not to answer (8)
 - Not listed (please specify) (9)
-
-

Marital Status: What is your marital status?

- Married (1)
 - Common-law (3)
 - Dating (4)
 - Divorced (5)
 - Single (6)
 - Prefer not to answer (8)
 - Not listed (please specify) (7)
-

Age: What is your age in years?

Gender: What is your gender?

- Man (1)
 - Woman (2)
 - Transman (3)
 - Transwoman (4)
 - Prefer not to answer (6)
 - Not listed (please specify) (5)
-

End of Block: Demographics

Start of Block: Professional Factors

Education: What is the highest degree or level of education you have completed? (*If currently enrolled, highest degree received*)

- Diploma (1)
- Bachelor's Degree (2)
- Master's Degree (3)
- Doctoral Degree (4)

Please check all that you have completed at any time. *(If currently enrolled, only check ones that have been completed)*

- Advanced Cardio Life Support (ACLS) (1)
 - Pediatric Advanced Life Support (PALS) (2)
 - Trauma Nursing Core Course (TNCC) (3)
 - Neonatal Resuscitation Program (NRP) (4)
 - Canadian Emergency Nursing Certification Exam (5)
 - Emergency Nursing Pediatric Course (ENPC) (6)
 - The Canadian Triage & Acuity Scale (CTAS) (7)
 - Advance Studies in Critical Care Nursing (ACCN) (8)
 - Emergency, Practice, Interventions, and Care – Canada (EPICC) (9)
 - Have you taken any additional training not listed (Please specify) (10)
-



What is your current FTE in the ED where you are employed?

- 0.2-.03 (1)
 - 0.31-0.4 (2)
 - 0.41-.05 (3)
 - 0.51-0.6 (4)
 - 0.61-0.7 (5)
 - 0.71-0.8 (6)
 - 0.81-0.9 (7)
 - 0.91-1.0 (8)
 - Casual (9)
-

How many hours per week on average do you provide direct ED patient care?

- Specific hours worked (2) _____
-



Primarily, what is the length of your shifts in the ED?

- 4 hours (1)
- 6 hours (2)
- 8 hours (3)
- 10 hours (4)
- 12 hours (5)

Primarily, where do the majority of your hours worked in the ED fall? *(please check all that apply. e.g., if you are in a day/night rotation then you will check 2 boxes "Day Hours" and "Night Hours")*

- Day Hours (0700-1900) (1)
- Evening Hours (1200-0000) (2)
- Night Hours (1900-0700) (3)
-

How long have you worked in the ED? *(please use decimal for months. e.g., 6 months equals 0.5, 1 year 6 months equals 1.5)*

Years worked in the ED (1) _____

Approximately how many hours total have you worked in the ED? *(e.g., 1 year of full-time work is approximately 1700 hours)*

- 0-1000 hours (1)
- 1000-5000 hours (2)
- 5000-10,000 hours (3)
- 10,000 + hours (4)
-

What size of a hospital do you work primarily in?

- Major tertiary hospital ED (Calgary, Edmonton) (1)
- Regional hospital ED (Lethbridge, Red Deer, Medicine Hat, Grande Prairie) (2)
- Rural Hospital ED (3)

End of Block: Professional Factors

Start of Block: Personal Factors

Please answer the next 3 questions based on the statement provided:

"I feel very supported by my colleagues when dealing with stressors from work."

- Strongly agree (1)
- Agree (2)
- Neither agree nor disagree (3)
- Disagree (4)
- Strongly disagree (5)

"I feel very supported by my direct supervisor/manager when dealing with stressors from work."

- Strongly agree (1)
 - Agree (2)
 - Neither agree nor disagree (3)
 - Disagree (4)
 - Strongly disagree (5)
-

"I feel like the organization I work for provides adequate support to deal with the stressors of working in the ED."

- Strongly agree (1)
- Agree (2)
- Neither agree nor disagree (3)
- Disagree (4)
- Strongly disagree (5)

End of Block: Personal Factors

Start of Block: PTSD Screening

Have you experienced or witnessed a traumatic event(s) such as threatened death, serious injury, or sexual violence?

- Yes (1)
 - No (2)
-

Has a traumatic event(s) occurred to a close family member or close friend?

- Yes (1)
- No (2)

Have you experienced repeated or extreme exposure to aversive details of a traumatic event(s)?

- Yes (1)
- No (2)

Skip To: DSM avoid psychologi If Have you experienced repeated or extreme exposure to aversive details of a traumatic event(s)? = No

Does your exposure to aversive details of traumatic events occur primarily within your work as an emergency department nurse?

Yes (1)

No (2)

Do you persistently try to avoid distressing memories, thoughts, or feelings about the traumatic event(s)?

Yes (1)

No (2)

Do you persistently try to avoid reminders about the traumatic event(s)?

Yes (1)

No (2)

Check off any of the following that occurred after you experienced or were exposed to a traumatic event(s):

- recurrent, involuntary, and intrusive distressing memories of the traumatic event(s). (1)
- recurrent distressing dreams in which the dream was related to the traumatic event(s). (2)
- flashbacks or feelings as if the traumatic event was recurring. (3)
- intense or prolonged psychological distress when exposed to reminders of the traumatic event(s). (4)
- physiological reactions (e.g., racing heart, sweating) when exposed to reminders of the traumatic event(s). (5)

Check off any of the following thoughts or feelings that began after, or were worsened by, the traumatic event(s):

- unable to remember important aspects of the traumatic event(s). (1)
- negative beliefs or expectations about yourself, others, or the world. (2)
- blaming yourself or others for the traumatic event(s) who were not at fault. (3)
- persistent negative emotional state (i.e. fear, anger, shame). (4)
- decreased interest or participation in significant activities. (5)
- feelings of detachment or estrangement from others. (6)
- inability to experience positive emotions (e.g., happiness, satisfaction, loving feelings). (7)

Check off any of the following reactions that began after, or were worsened by, the traumatic event(s):

- irritability and angry outbursts with little or no provocation. (1)
 - reckless or self-destructive behavior. (2)
 - heightened sensitivity to potential threats (hypervigilance). (3)
 - exaggerated startle response. (4)
 - trouble concentrating. (5)
 - difficulty sleeping. (6)
-

Have you ever been diagnosed with Post-Traumatic Stress Disorder (PTSD) by a qualified healthcare provider?

- Yes (1)
- No (2)

Skip To: Do you think PTSD? If Have you ever been diagnosed with Post-Traumatic Stress Disorder (PTSD) by a qualified healthcare... = No

Were you diagnosed with PTSD by a qualified healthcare provider prior to working in the ED?

- Yes (1)
 - No (2)
-

Do you think that you are currently suffering from symptoms of PTSD? (ie: avoidance, intrusion, hyperarousal)

Yes (1)

No (2)

End of Block: PTSD Screening

Start of Block: Secondary Traumatic Stress Scale

The following is a list of statements made by persons who have been impacted by their work with traumatized patients. Read each statement then indicate how frequently the statement was true for you in the past seven (7) days.

	Never (1)	Rarely (2)	Occasionally (3)	Often (4)	Very Often (5)
1. I felt emotionally numb. (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2. My heart started pounding when I thought about my work with patients. (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3. It seemed as if I was reliving the trauma(s) experienced by my patient(s). (3)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4. I had trouble sleeping. (4)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
5. I felt discouraged about the future. (5)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
6. Reminders of my work with patients upset me. (6)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
7. I had little interest in being around others. (7)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
8. I felt jumpy. (8)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
9. I was less active than usual. (9)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
10. I thought about my work with patients when I didn't intend to. (10)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
11. I had trouble concentrating. (11)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
12. I avoid people, places, or things that remind me of my work with patients. (12)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
13. I had disturbing dreams about my work with patients. (13)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
14. I wanted to avoid working with some patients. (14)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
15. I was easily annoyed. (15)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

16. I expected something bad to happen.
(16)

17. I noticed gaps in my memory about
patient interactions. (17)

End of Block: Secondary Traumatic Stress Scale

Start of Block: Medical Outcomes Social Support Survey

People sometimes look to others for companionship, assistance, or other types of support. How often is each of the following kinds of support available to you if you need it?

	None of the time (1)	A little of the time (2)	Some of the time (3)	Most of the time (4)	All of the time (5)
1. Someone you can count on to listen to you when you need to talk. (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2. Someone to give you information to help you understand a situation. (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3. Someone to give you good advice about a crisis. (3)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4. Someone to confide in or talk to about yourself or your problems. (4)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
5. Someone whose advice you really want. (5)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
6. Someone to share your most private worries and fears with. (6)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
7. Someone to turn to for suggestions about how to deal with a personal problem. (7)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
8. Someone who understands your problems. (8)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
9. Someone to help you if you were confined to bed. (9)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
10. Someone to take you to the doctor if you needed it. (10)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
11. Someone to prepare your meals if you were unable to do it yourself. (11)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
12. Someone to help with daily chores if you were sick. (12)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
13. Someone who shows you love and affection. (13)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
14. Someone to love and make you feel wanted. (14)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

- | | | | | | |
|---|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| 15. Someone who hugs you. (15) | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 16. Someone to have a good time with. (16) | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 17. Someone to get together with for relaxation. (17) | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 18. Someone to do something enjoyable with. (18) | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 19. Someone to go to things with to help you get your mind off things. (19) | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

End of Block: Medical Outcomes Social Support Survey

Start of Block: COVID-19

Which of the following best describes your status for the COVID-19 infection?

- I do not have COVID-19. (1)
- I suspect that I may have COVID-19 but have not been tested. (2)
- I am awaiting test results for COVID-19. (3)
- I currently have COVID-19, as confirmed with testing. (4)
- I previously had COVID-19, but have since recovered. (5)



Have you provided direct patient care to a COVID-19 positive patient?

- Yes (1)
- No (2)



Do you feel like you have had an increased amount of stress due to the COVID-19 pandemic?

Yes (1)

No (2)

Skip To: End of Block If Do you feel like you have had an increased amount of stress due to the COVID-19 pandemic? = No

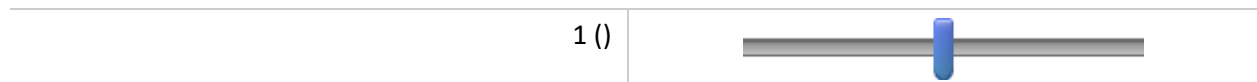
How would you rate the amount of stress in your life related to COVID-19 at work? (from 0 for "no stress" to 100 for "extreme stress").

0 10 20 30 40 50 60 70 80 90 100



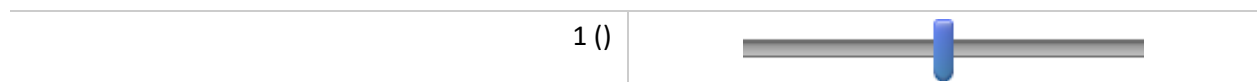
How would you rate the amount of stress in your life related to COVID-19 outside of work? (from 0 for "no stress" to 100 for "extreme stress").

0 10 20 30 40 50 60 70 80 90 100



How would you rate the amount of fear/worry about your own health and the health of your partner (or loved ones) as a result of COVID-19? (from 0 for "no fear/worry" to 100 for "extreme fear/worry").

0 10 20 30 40 50 60 70 80 90 100



End of Block: COVID-19

APPENDIX B

Invitational email sent to listserv

Subject: *Secondary Traumatic Stress in Emergency Nurses*

Research Investigator:

NAME: Brittany Orr

ADDRESS

Faculty of Health Sciences

4401 University Drive W

Lethbridge, AB, T1K 3C4

EMAIL: brittany.orr2@uleth.ca

Supervisor

Professor Supervisor: Dr. Tracy Oosterbroek

ADDRESS

Faculty of Health Sciences

4401 University Drive W

Lethbridge, AB, T1K 3C4

EMAIL: tracy.oosterbroek@uleth.ca

Dear participant:

Date: _____

You are invited to participate in a Master of Nursing Research Study that seeks to measure Secondary Traumatic Stress in Emergency Department (ED) nurses in Alberta.

Background and Purpose

Secondary traumatic stress (STS) is defined as the consequential behaviors and emotions resulting from knowledge about a traumatizing event experienced by another, with stress resulting from helping or wanting to help a traumatized or suffering person. STS symptomatology is very similar to PTSD symptomatology, which can have lasting effects on a person's well-being and ability to manage stress.

Having worked in the ED for quite some time, I appreciate that trying to define what is traumatic to each individual is difficult to do, as these experiences are both unique and pervasive. I have experienced first-hand the impact of acute stressors such as car accidents, or sudden death of a child, and the omnipresent culture in the ED of not having the time to think or talk about an experience because you are expected to move onto the next task. To date there is limited research in Canada of how STS symptomatology is affecting ED nurses, therefore my study aims to further the current understanding of such.

A Cross-Sectional Survey is the research method that will be used for the study. You will be required to complete a 10-minute survey that will take place at your own convenience using Qualtrics, which is an online survey that is accessible using a smart phone, tablet, computer, or laptop. Once completing the survey you will have a chance to have your name put in a draw for 1 of 3 \$20 Starbuck's gift cards.

Confidentiality

Confidentiality of participants will be ensured as no identifying information will be collected in the survey such as name, address, or place of employment. The email you provide will be stored separately from your responses and will not be able to be linked in order to maintain anonymity, with only the primary researcher having access to this.

Voluntary Participation and Freedom to Withdraw

Your participation in the study would be greatly appreciated and is entirely voluntary. If you choose to withdraw from the study after commencement, this is easily done by closing your survey browser.

If you have any questions at any time, please contact me at the above information.

By clicking here you will be directed to the survey

Sincerely,

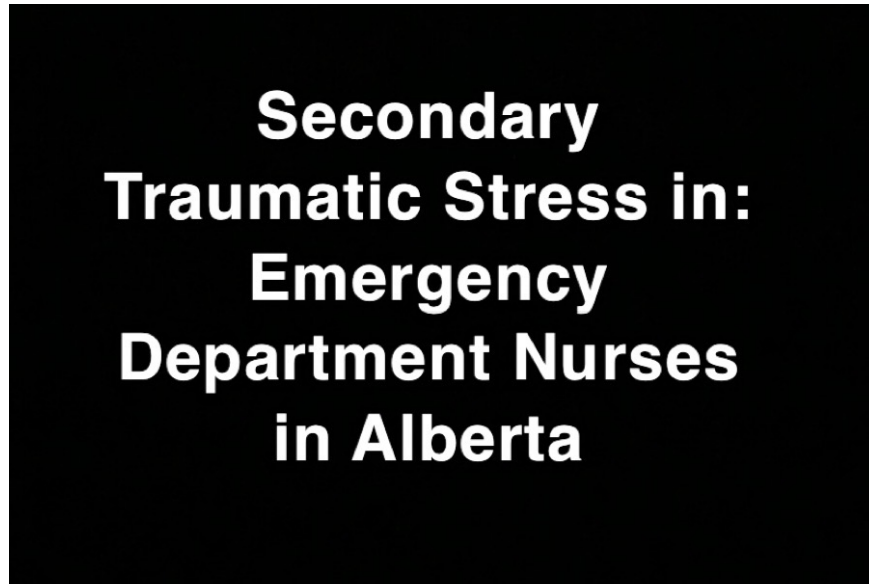
Brittany Orr, RN BN

The plan for this study has been reviewed for its adherence to the ethical guidelines by a Research Ethics Board at the University of Alberta (Pro00096173). For questions regarding participants rights and ethical conduct of research, contact the Research Ethics Office at (780) 492-2615.

APPENDIX C

Advertising for Social Media

Picture posted:



Caption that appeared under photo:

DEATH, TRAUMA, VIOLENCE, AND HEAVY WORKLOADS ARE REGULAR OCCURRENCES THAT CONTRIBUTE TO THE STRESSFUL ENVIRONMENT EXPERIENCED BY NURSES IN THE ED. REPEATED EXPOSURE TO THESE STRESSORS MAY RESULT IN SECONDARY TRAUMATIC STRESS.

Having worked in the ED I appreciate how pervasive these experiences can be and want to further the understanding of how secondary traumatic stress is affecting ED RN's throughout Alberta. I am currently looking for participants to volunteer their time and complete a 10-minute online survey that can be done on a computer, laptop, tablet, or smart phone. To access more information, and the survey, please use the following link: https://uleth.qualtrics.com/jfe/form/SV_e5NKKBOpAdYHSzX

All responses will be ANONYMOUS with no personal information being collected. Participation in this study is completely voluntary and confidential. This study has been reviewed and approved by a Research Ethics Board at the University of Alberta (Pro000096173). If you have any questions, please contact:

Primary Investigator: Brittany Orr
Graduate Student
Master of Nursing, University of Lethbridge
Email: Brittany.orr2@uleth.ca

APPENDIX D

Invitation to participate and consent found at beginning of survey

Research Investigator:

NAME: Brittany Orr

ADDRESS

Faculty of Health Sciences
4401 University Drive W
Lethbridge, AB, T1K 3C4
EMAIL: brittany.orr2@uleth.ca

Supervisor

Professor Supervisor: Dr. Tracy Oosterbroek

ADDRESS

Faculty of Health Sciences
4401 University Drive W
Lethbridge, AB, T1K 3C4
EMAIL: tracy.oosterbroek@uleth.ca

Dear participant:

You are invited to participate in a Master of Nursing Research Study that seeks to measure *Secondary Traumatic Stress in Emergency Department (ED) Registered Nurses in Alberta*.

Background and Purpose

Secondary traumatic stress (STS) is defined as the consequential behaviors and emotions resulting from knowledge about a traumatizing event experienced by another, with stress resulting from helping or wanting to help a traumatized or suffering person. STS symptomatology is very similar to PTSD symptomatology, which can have lasting effects on a person's well-being and ability to manage stress.

Having worked in the ED for quite some time, I appreciate that trying to define what is traumatic to each individual is difficult to do, as these experiences are both unique and pervasive. I have experienced first-hand the impact of acute stressors such as car accidents, or sudden death of a child, and the omnipresent culture in the ED of not having the time to think or talk about an experience because you are expected to move onto the next task. To date there is limited research in Canada of how STS symptomatology is affecting ED nurses, therefore my study aims to further the current understanding of such.

A Cross-Sectional Survey is the research method that will be used for the study. You will be asked to complete a 10-minute survey that will take place at your own convenience using Qualtrics, which is an online survey that is accessible using a smart phone, tablet, computer, or laptop.

Your participation in the proposed study will include:

1. Approximately 10 minutes of your time to complete the online survey through Qualtrics, that can be completed on your own time.
2. At the end of the survey, you will have the option to have your name submitted into a draw for a \$20 gift card to Starbucks, of which 3 names will be drawn. Based on the proposed sample size, you will have a 3 in 125 chance of winning one of these gift cards.
3. Following analysis of the data, if you provided an email to put your name in the draw for the Starbucks gift card, you will be emailed a summary of the results, with information to

access the full article. If you did not provide an email, due to anonymity, study findings will only be available in respective publications. You also can contact the primary investigator directly for these findings.

Study Procedures

1. After you have voluntarily provided your electronic consent to participate, you will be directed to the online survey in Qualtrics. It will be the expectation that the you as the participant will have a personal smart phone, tablet, lap top, or computer to complete the survey. The survey will take approximately 10 minutes.
2. Once you have begun the survey, it will be required that you complete the survey at that time. You may withdraw from the survey at any time without penalty by simply closing the browser before you submit your responses. If you choose to withdraw after you have submitted your responses, it will not be possible to withdraw them because they will not have personal identifying information linked to them.
3. At the end of the survey, you will have the option to provide your email to have your name submitted in a draw for 1 of the 3 possible Starbuck's gift cards. This identifying information will be stored separately from your responses and will not be linked to your responses in order to maintain anonymity.

Benefits

Although the results of the proposed study are unlikely to immediately influence your current practice environment, the knowledge gained from the proposed study has the potential to highlight the occupational hazard of STS symptomatology that ED nurses in Alberta are experiencing. This then has the potential to inform future research, as well as enhance supports that are in place for frontline ED nurses.

Risks

I am conscious of how the topic of STS could affect individual nurses. Participation in this study could potentially bring up memories or emotions related to traumatic stress that any individual nurse could knowingly, or unknowingly be experiencing. Although I have significant knowledge on STS symptomatology, I am in the role of primary researcher, and do not have the skill set to appropriately treat nurses who are potentially experiencing the physical and mental effects of secondary trauma. Alberta Health Services provides free and confidential counselling services through the *Shepell-FGI Employee and Family Assistance Program*. If at any time throughout the research process you are experiencing distress or are unsure of feelings you are having, please access this service or reach out to someone for support.

Confidentiality

Confidentiality of participants will be ensured as no identifying information will be collected in the survey such as name, address, or place of employment. The email you voluntarily provide will be stored separately from your responses and will not be able to be linked in order to maintain anonymity, with only the primary researcher having access to this. Upon completion of the study, all data will be stored on an encrypted hard drive at the University of Lethbridge for a minimum five years according to institutional requirements of the University of Lethbridge. Study findings will be disseminated in the form of peer-reviewed publications and oral

presentations at a national and international level that are relevant to emergency department nursing research.

Voluntary Participation and Freedom to Withdraw

Your participation in the study would be greatly appreciated and is entirely voluntary. If you choose to withdraw from the study after commencement, this is easily done by closing your survey browser. If you have any questions at any time, please do not hesitate to contact me.

The plan for this study has been reviewed for its adherence to the ethical guidelines by a Research Ethics Board at the University of Alberta (Pro00096173). For questions regarding participants rights and ethical conduct of research, contact the Research Ethics Office at (780) 492-2615.

I have been satisfactorily informed of the above-described procedures, risk, and benefits with regards to the study entitled ***Secondary Traumatic Stress in Emergency Nurses***. I consent to participation in this study. I know that *Brittany Orr* (primary researcher) will be available to answer any questions I may have at any time. I understand that I am free to withdraw this consent and discontinue participation in this survey at any time. By checking the box below, I confirm that I understand and agree to the above conditions. If I do not wish to participate, I can exit the survey now by closing the browser.

I greatly appreciate your participation,

Brittany Orr, RN BN