

SECONDARY TRAUMATIC STRESS & EMERGENCY DEPARTMENT REGISTERED
NURSES IN ONTARIO: A CROSS-SECTIONAL STUDY

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Abstract

This thesis explores the prevalence of secondary traumatic stress (STS) among nurses working in Ontario emergency departments. Nurses can develop STS via exposure to traumatic events, such as death, injury, or critical illness (Badger, 2001). Emergency department (ED) nurses are especially susceptible to STS due to frequent exposure to traumatic events (Ratrouf & Hamdan-Mansour, 2017). This study aimed to (a) determine the prevalence of STS amongst registered nurses (RNs) working in Ontario emergency departments; and (b) to determine factors influencing STS development. Results showed 91.6% of ED nurses in this study experienced STS. Resilience and COVID-19 fear were both significantly associated with STS development in simple linear regression, though only resilience was a significant factor in multiple linear regression. This study provides insight regarding the prevalence of STS among Ontario ED nurses, which was previously unknown. Additionally, this study identified resilience as a significant protective factor against STS development.

Dedication

To Daryl, for your constant love, support, and encouragement throughout my thesis journey. You are my greatest supporter and have pushed me to achieve things I did not think were possible. I could not have accomplished this without you. And to Dexter, for your unconditional love and constant companionship as I completed this thesis. Thank you to my boys.

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List of Abbreviations

| | |
|-----------------|---|
| BO | Burnout |
| CD-RISC | Connor-Davidson Resilience Scale |
| CF | Compassion Fatigue |
| COVID-19 | Coronavirus Disease 2019 |
| CS | Compassion Satisfaction |
| DSM | Diagnostic and Statistical Manual of Mental Disorders |
| ED | Emergency Department |
| ENAO | Emergency Nurses Association of Ontario |
| FCV-19S | Fear of COVID-19 Scale |
| IES-R | Impact of Events Scale- Revised |
| ONA | Ontario Nurses' Association |
| PTSD | Post Traumatic Stress Disorder |
| ProQOL | Professional Quality of Life Scale |
| RN | Registered Nurse |
| SPOS | Scale of Perceived Organizational Support |
| STS | Secondary Traumatic Stress |
| STSD | Secondary Traumatic Stress Disorder |
| STSS | Secondary Traumatic Stress Scale |
| VT | Vicarious Traumatization |

Chapter 1: Introduction

Stress has been defined as “an exposure to a stimuli gauged as harmful, threatening, or challenging, that exceeds an individual’s capacity to cope” (Lazarus & Folkman, 1984, p. 19). The pervasiveness of stress amongst health care professionals has been well established (Mealer et al., 2017). Registered nurses (RNs) are especially vulnerable to stress, due to the highly stressful nature of the nursing profession (Gauthier et al., 2015). Stress amongst nurses is associated with increased attrition, lower patient satisfaction, and higher rates of patient mortality (Sansó et al., 2021). Secondary traumatic stress (STS), a term related to stress, is a relatively new concept that has not been extensively explored within the nursing profession (Morrison & Joy, 2016). Secondary traumatic stress is an emotional, physical, or psychological reaction that occurs due to indirect exposure to another individual’s trauma in a professional context (Dominguez-Gomez & Rutledge, 2009; Jacobs et al., 2019). The indirect trauma exposure that precipitates STS development involves witnessing the physical or emotional suffering of a patient or client in the context of a professional helping relationship (Kellogg, 2020). Secondary traumatic stress is characterized by the development of avoidance, intrusion, and arousal symptoms, which are also symptoms experienced with post-traumatic stress disorder (PTSD) (Arnold, 2020). Avoidance symptoms can include staying away from people, places, activities, or conversations that remind an individual of the traumatic event (Ariapooran, 2013). Intrusion symptoms that individuals can experience due to STS include recurrent memories or dreams about the traumatic event (Ariapooran, 2013). Arousal symptoms include irritability, sleep disturbances, and difficulty concentrating (Dominguez-Gomez & Rutledge, 2009; Jobe et al., 2021). STS can occur as a result of an exposure to a single traumatic event, or due to chronic exposure to various traumatic experiences (Badger, 2001). Previous research has shown that STS is common among healthcare

professionals (Robinson et al., 2022). Nurses are especially high risk for developing STS due to their close contact with patients, who are often critically ill, injured, or experiencing physical and/or emotional distress (Kellogg, 2020).

Clarification of STS & Related Concepts

In the existing literature, the term secondary traumatic stress is often used interchangeably with related concepts such as post-traumatic stress disorder (PTSD), compassion fatigue (CF), burnout (BO), and vicarious traumatization (VT). This inconsistent use of the term STS has led to a lack of conceptual clarity and has hindered further research into this concept (Arnold, 2020; Beck, 2011). A definition and explanation of each of these terms is included below, to provide clarity regarding the use of the term STS in this study. Further, secondary traumatic stress can be referred to as secondary traumatic stress disorder (STSD) in clinical literature, but the definitions are the same (Ogińska-Bulik et al., 2021; Rauvola et al., 2019). Therefore, in this study only the term secondary traumatic stress will be used.

Post-traumatic stress disorder (PTSD) is a psychological disorder caused by a stress response from experiencing a traumatic event (Meadors et al., 2009). In the literature, the main difference between PTSD and STS is related to how one is exposed to a traumatic event. Prior to 2013 a diagnosis of PTSD using the Diagnostic and Statistical Manual of Mental Disorders required an individual to have direct exposure to a traumatic situation (Meadors et al., 2009). In contrast, STS occurs due to indirect exposure to trauma in a work-related context, such as providing care to critically ill or injured patients (Missouridou, 2017). When the 5th edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-5) was released, it provided an expanded criterion of PTSD diagnosis, which included one indirectly “experiencing repeated or extreme exposure to aversive details of the traumatic event(s)” or “witnessing, in person, the

event as it occurred to others” (American Psychiatric Association [APA], 2013, p. 271). Though PTSD can now be diagnosed with direct or indirect exposure to a traumatic event, the definition of PTSD remains much more limited and specific than the definition of STS (Sprang et al., 2019). For example, secondary traumatic stress can occur without exposure to repeated or extreme details of a traumatic event and requires the indirect trauma exposure to occur within the context of a professional helping relationship (Kellogg, 2020; Sprang et al., 2019). Contrary to STS, PTSD does not require an individual to experience the traumatic event within the context of a professional caregiving relationship (Barré & Hooper, 2022). STS does not specify what constitutes a trauma event, and therefore is inclusive of any type of experience that an individual may deem as traumatic beyond the exposure to death, serious injury, or sexual violence required for a PTSD diagnosis (Sprang et al., 2019). Additionally, STS is specific to a work-related indirect exposure of a trauma, which differs from the criteria for PTSD (Erkin et al., 2021). Therefore, though STS and PTSD are similar concepts, fundamental differences exist in the definitions of these terms that prevents them from being interchangeable.

Compassion fatigue (CF) is the reduced capacity a caregiver has in regard to being empathetic towards an individual who is suffering (Meadors et al., 2009). CF is a progressive reduction in the ability to nurture patients and results in an individual becoming an ineffective caregiver (Kellogg, 2020). In order to have compassion fatigue, an individual must be exposed to a traumatized individual and have empathy for their patients (Meadors et al., 2009). In contrast, an individual can develop STS regardless of whether they feel empathetic towards the individual experiencing the traumatic event (Meadors et al., 2009). Additionally, CF occurs after prolonged and continuous exposure to patients and stress, while STS can occur without prolonged exposure to a stressor (Kellogg, 2020).

Burnout occurs due to prolonged exposure to a workplace that has high interpersonal demands and inadequate support for staff (Meadors et al., 2009). In contrast to STS and CF, the emotional distress caused by burnout is due to the organizational structure rather than exposure to traumatized individuals (Meadors et al., 2009). Further, burnout develops slowly over time, while secondary traumatic stress can occur suddenly as a result of exposure to a single traumatic incident (Kellogg, 2020). Additionally, the development of burnout does not require an individual to be providing care to a traumatized individual in a professional context, which is a requirement for STS development (Kellogg, 2020).

Vicarious traumatization is another term that is incorrectly used interchangeably with secondary traumatic stress (Tabor, 2011). VT is a term that was first used amongst psychotherapists and other mental health professionals (Kellogg, 2020; Tabor, 2011). VT refers to how an individual empathizes with their clients after listening to the client recount their experience with a traumatic event (Kellogg, 2020). The symptoms associated with VT are a permanent change in one's worldview, spiritual beliefs, self-identity, and emotional needs (Beck, 2011; Kellogg, 2020). VT differs from STS as it develops chronically as a result of listening to clients share details about traumatic experiences, while STS can occur acutely after indirectly experiencing a traumatic event (Sprang et al., 2019). Further, VT can result in countertransference, where the professional develops physical, emotional, and psychological symptoms that mirror the emotions experienced by the victim (Tabor, 2011).

Secondary Traumatic Stress & Nurses

For individuals working in a profession that requires direct contact with traumatized individuals, the development of STS can be an occupational hazard (Beck, 2011). In the nursing profession, STS can develop as a result of exposure to patients experiencing traumatic events,

such as death, physical or sexual assault, serious injury or disfigurement, or critical illness (Badger, 2001). Symptoms of STS can be categorized as physical, emotional, behavioural, and cognitive (Gates & Gillespie, 2008). These symptoms include difficulty concentrating, anxiety, depression, sleep disturbances, headaches, nausea, forgetfulness, and poor decision making (Arnold, 2020; Barleycorn, 2019). Secondary traumatic stress has been reported amongst a variety of nursing specialities, including pediatric nurses, hospice nurses, sexual assault nurse examiners, critical care nurses, and oncology nurses (Ariapooran, 2013; Beck, 2011, Erkin et al., 2021). A systematic review showed that the prevalence of STS amongst nurses can range from 25% to 78% (Beck, 2011). While the frequency of STS amongst nurses has varied in different practice settings, studies have consistently found the prevalence of STS to be higher amongst nurses working in the emergency department compared to nurses working on other units (Ariapooran, 2013; Ariapooran et al., 2022; Erkin et al., 2021).

Secondary Traumatic Stress & Emergency Department Nurses

Emergency department (ED) nurses in particular experience high levels of stress and burnout due to the fast-paced, unpredictable, and often overcrowded environment of emergency departments (Salvarani et al., 2019). Nurses working in the emergency department are exposed to a multitude of occupational stressors, which can lead to the development of STS (Jobe et al., 2021). Compared to nurses working on other units, ED nurses are more frequently exposed to traumatic events, such as death, workplace violence, and critically ill or injured adult and pediatric patients (Adriaenssens et al., 2012). As a result of this increased exposure to traumatic events, ED nurses have been found to be more susceptible to STS development than nurses working in other specialties (Ratrouf & Hamdan-Mansour, 2017). In previous studies, the prevalence of STS amongst emergency department nurses has often been found to be $\geq 70\%$

(Duffy et al., 2015; İlhan & Küpeli, 2022; Ratrouf & Hamdan-Mansour, 2020; Wolf et al., 2020). Emergency department nurses report that STS is associated with frequent exposure to death and patient resuscitation and exacerbated by stressors such as workplace violence, heavy workloads, and an unlimited number of patients in the ED (Morrison & Joy, 2016; Phillips et al., 2022). STS symptoms experienced by ED nurses include paranoia, irritability, nightmares, emotional numbing, and decreased engagement with work and family (Dominguez-Gomez & Rutledge, 2009; Wolf et al., 2020). STS has been found to impact the professional life of nurses, resulting in increased absenteeism and sick leaves, decreased job performance and quality of patient care, lower job satisfaction, more medication errors, and increased attrition from the nursing profession (Arnold, 2020; Ratrouf & Hamdan-Mansour, 2017; Ratrouf & Hamdan-Mansour, 2020; Robinson et al., 2022). Duffy et al. (2015) found a significant correlation between considering a change of career among ED nurses with STS. In addition, STS has been associated with increased rates of burnout, anxiety, and depression amongst ED nurses (Ariapooran et al., 2022; Bock et al., 2020; Erkin et al., 2021).

Importance of the Study

Despite the negative consequences associated with STS development and the frequent exposure of emergency department nurses to traumatic events, limited research has been conducting regarding STS and ED nurses (Morrison & Joy, 2016; Ratrouf & Hamdan-Mansour, 2017). The negative impact secondary traumatic stress has on nurses, such as decreased job satisfaction, and increased burnout and attrition from the nursing workforce, is particularly important due to the ongoing Coronavirus Disease 2019 (COVID-19) pandemic. The COVID-19 pandemic has negatively impacted the psychological well-being of nurses working in a variety of settings due to stressors such as fear of infection, high morbidity and mortality of patients, and

concerns about access to personal protective equipment (Said & El-Shafei, 2021). However, the COVID-19 pandemic has worsened the psychological well-being of ED nurses to a larger extent than nurses working in other areas (Said & El-Shafei, 2021). As ED nurses are the first point of contact for COVID-19 patients and often work with limited protective equipment, their chances of acquiring COVID-19 are increased (Ahorsu et al., 2022). As a result, studies have shown that during the COVID-19 pandemic the highest rates of burnout and stress were found amongst ED nurses (Ahorsu et al., 2022; Maunder et al., 2021). The prevalence of STS amongst ED nurses is an expected increase due to the ongoing COVID-19 pandemic, which has increased the workload of emergency department staff and worsened the mental health of nurses (İlhan & Küpeli, 2022; Kellogg, 2020). This was shown by İlhan and Küpeli (2022), who noted that prevalence of STS among ED nurses in their study was much higher than the prevalence of STS found in studies conducted pre-pandemic. As the COVID-19 pandemic will likely lead to an increased prevalence of STS amongst nurses, it is important to develop knowledge regarding STS prevalence and risk factors associated with STS development (Kellogg, 2020).

Additionally, generating knowledge regarding the prevalence and risk factors associated with STS development is critical due to the current nursing shortage. As of 2020, the World Health Organization (WHO) reported a global deficit of 5.9 million nurses, particularly in low and middle-income countries (WHO, 2020b). This is echoed in Canada, where a shortage of 11,000 RNs existed in 2007, which was projected to worsen to a deficit of 60,000 RNs by 2022 (Buchan et al., 2015). Future projections suggest that the Canadian nursing shortage could reach 117,600 by 2030 unless new policies are immediately implemented to increase retention and recruitment of nurses (Scheffler & Arnold, 2019). Though these pre-pandemic projections are concerning, the true extent of the Canadian nursing shortage is likely much more significant, as

the COVID-19 pandemic has led to significant increases in burnout, retirement, and job vacancies in the healthcare sector (Baumann & Crea-Arsenio, 2023). The nursing shortage is particularly dire in specialized units, such as emergency departments, where the nursing turnover rate is often very high (Gorman, 2019; McDermid et al., 2020). A recent study found the emergency department has the highest RN attrition rate among all specialities, with a 29.7% annual turnover rate (NSI, 2023). Unique factors impacting nursing retention in the emergency department include high rates of violence against staff, an unlimited number of patients, overcrowding, the increasing medical complexity of patients, and the wide range of disease processes encountered by ED nurses (Gorman, 2019; Sawatzky & Enns, 2012). A nursing shortage is associated with negative patient outcomes, such as increased mortality and morbidity, and higher likelihood of hospital-acquired infections (Bakker et al., 2010). Further, a nursing shortage has a negative impact on nurses in the workforce. Lower RN staffing is associated with decreased job satisfaction, increased burnout, and higher rates of absenteeism and job turnover (Lavoie-Tremblay et al., 2019). Von Rueden et al. (2010) stated that prevention of STS amongst nurses can help organizations increase recruitment and retention, which are critical to mitigating the nursing shortage. As a result, it is essential that research is conducted to gain an understanding of the prevalence and risk factors associated with STS, particularly in Canada where there is a nursing shortage as well as a lack of data regarding STS prevalence. Therefore, the purpose of this study is to (a) determine the prevalence of secondary traumatic stress among emergency department nurses in Ontario; and (b) to identify if any personal or organizational factors are associated with the presence of STS among ED nurses.

Chapter 2: Literature Review

A search of quantitative studies regarding secondary traumatic stress in emergency department nurses was conducted using the databases CINAHL, Embase, Proquest, Ovid Medline, and Google Scholar. The search terms used were ‘secondary traumatic stress’, ‘secondary traumatic stress disorder’, ‘emergency department nurse’, ‘emergency room nurse’, and ‘emergency nursing.’ No recommended Medical Subject Headings, such as compassion fatigue, post-traumatic stress disorder, burnout, or vicarious traumatization, were used in the search as these terms are not used interchangeably in this study. Articles were included if their sample population was exclusively ED nurses, and the prevalence of STS and/or factors related to STS were reported in the study. Articles were excluded if they were not published in English and if secondary traumatic stress was not directly investigated. A total of 131 studies were found using this search criteria, as well as snowball searches. The titles and abstracts of the articles were screened, and duplicates or irrelevant articles were excluded, leading to the inclusion of seven primary research articles in the literature review. After the initial literature review, an additional search was conducted that expanded the search criteria to include studies reporting the prevalence of STS and/or factors related to STS that included ED nurses in their sample population, though participants were not exclusively ED nurses. This second literature review led to the identification of an additional seven studies that reported the prevalence of STS and/or factors related to STS and included ED nurses as a sub-group of the greater study population. Overall, 14 primary research articles were identified and included in the literature review below.

Prevalence of Secondary Traumatic Stress Among ED Nurses

The first quantitative study on STS among ED nurses was conducted by Dominguez-Gomez and Rutledge (2009). The aim of this exploratory study was to determine the prevalence

of STS among a sample of 67 ED nurses working in Southern California. In this study, secondary traumatic stress was measured using the self-report Secondary Traumatic Stress Scale (STSS), which was created by Bride et al. (2004). Dominguez-Gomez and Rutledge (2009) used the PTSD diagnostic criteria, which requires participants to report at least one intrusion symptom, three avoidance symptoms, and two arousal symptoms, for participants to be classified as experiencing STS. Overall, Dominguez-Gomez and Rutledge (2009) found the prevalence of STS in their study was 32.8%. Dominguez-Gomez and Rutledge (2009) found that 60% of participants experienced intrusion symptoms, while arousal and avoidance symptoms were reported by 55% and 47% of participants, respectively. Additionally, 85% of participants experienced at least one STS symptom in the past week. This study is the first to investigate STS in ED nurses using the STSS, which is the only scale that specifically measures STS (Beck, 2011). This study found a high level of STS and STS symptoms amongst ED nurses, indicating the need for further research to validate these findings.

Duffy et al. (2015) conducted a cross-sectional study to determine the prevalence of STS among Irish emergency department nurses. All nurses working in three EDs in Western Ireland were invited to participate in the study, resulting in a sample size of 105 participants. Secondary traumatic stress was measured using the STSS. The presence of STS was determined using both the PTSD diagnostic criteria used by Dominguez-Gomez and Rutledge (2009) and using a cut-off score of ≥ 38 on the STSS, as recommended by Bride (2007). Duffy et al. (2015) found the prevalence of STS in the study to be 64% using the PTSD diagnostic criteria, and 70% using the STSS cut-off score criteria. The STS symptoms most commonly reported by participants were feeling discouraged about the future, irritability, and feeling emotionally numb (Duffy et al., 2015). The prevalence of STS found in the Duffy et al. (2015) study was almost twice as high

than the prevalence found by Dominguez-Gomez and Rutledge (2009) using the same measurement tool and diagnostic criteria, which may be due to differences between Irish and American healthcare systems.

Morrison and Joy (2016) conducted a mixed methods study to determine the prevalence of STS among Scottish ED nurses, as well as to investigate the experience of STS for these participants. A convenience sample of ED nurses from four different Scottish hospitals were recruited for this study, resulting in a sample size of 80 nurses. In this study, STS was measured using the STSS and the PTSD diagnostic criteria was used to determine STS prevalence. Overall, Morrison and Joy (2016) found that 39% of participants met the diagnostic criteria for STS and 75% of participants experienced at least one STS symptom in the last seven days. In addition, 71% of participants reported at least one intrusion symptom, and 54% of participants reported at least two arousal symptoms (Morrison & Joy, 2016). The most common STS symptoms reported by participants in this study were feeling irritable, intrusive thoughts about patients, and feeling discouraged about the future (Morrison & Joy, 2016). The STS prevalence in this study is similar to the prevalence reported by Dominguez-Gomez and Rutledge (2009), and lower than the prevalence reported by Duffy et al. (2015).

Wolf et al. (2020) conducted a mixed methods study to investigate the prevalence of STS in a sample of ED nurses, and the impact of STS on nursing practice and the workplace environment. Wolf et al. (2020) used convenience sampling to recruit ED nurses from a sample of nurses registered for an emergency nursing conference. Participants in the Wolf et al. (2020) study were geographically diverse, working in emergency departments across the United States of America. The STSS was used to measure STS in this study, and the presence of STS was determined based on a STSS score of ≥ 39 . A total of 125 nurses completed the STSS, and 53 of

those nurses attended a focus group session as well. The prevalence of STS in this study was only reported for the 53 nurses who attended the focus group. Wolf et al. (2020) reported no statistical differences in the STSS scores between focus group attendees and non-attendees. Overall, Wolf et al. (2020) found that 76% of the focus group attendees met the diagnostic criteria for STS, which was higher than the STS prevalence reported by Dominguez-Gomez and Rutledge (2009), Duffy et al. (2015), and Morrison and Joy (2016). Additionally, Wolf et al. (2020) used a cut-off score of ≥ 39 , which differs slightly from the recommended and validated STSS cut-off score of ≥ 38 (Bride, 2007). If Wolf et al. (2020) had used the recommended cut-off score, the STS prevalence in this study may have been even greater. However, as Wolf et al. (2020) did not report individual scores, it is not possible to calculate the STS prevalence using the recommended cut-off score.

Ratrout and Hamdan-Mansour (2020) conducted a cross-sectional descriptive correlational study to identify the prevalence, predictors, and consequences of secondary traumatic stress among nurses working in emergency departments. Convenience sampling was used to recruit ED nurses from eight emergency departments in Jordan. A total of 202 participants were included in this study and STS was measured using the STSS (Ratrout & Hamdan-Mansour, 2020). Ratrout and Hamdan-Mansour (2020) reported that 94% of participants had some level of STS, based on a STSS score of ≥ 28 . Additionally, Ratrout and Hamdan-Mansour (2020) reported that 74.5% of participants had a total STSS score of ≥ 38 , indicating the presence of moderate to severe STS. Ratrout and Hamdan-Mansour (2020) reported the highest STSS subscale score was for arousal symptoms, followed by avoidance and intrusion symptoms. A power analysis was used in this study to determine sample size, which strengthens study findings (Polit & Beck, 2021a). However, the STSS cut-off score used by

Ratrout and Hamdan-Mansour (2020) is much lower than the recommended and validated STSS cut-off score of ≥ 38 (Bride, 2007). Therefore, Ratrout and Hamdan-Mansour (2020) may be over-estimating the prevalence of STS in their study population.

Jobe et al. (2021) conducted a cross-sectional survey study to examine the relationship between STS and work productivity of emergency nurses who provide care to trauma patients in the United States of America. Jobe et al. (2021) sent a survey package to 3000 nurses across America who met the eligibility criteria and received completed survey responses from 255 participants. In this study, secondary traumatic stress was measured using the Impact of Events Scale- Revised (IES-R), a 22-item questionnaire that produces measures the three sub-categories of PTSD symptoms: intrusion, avoidance, and hyperarousal (Jobe et al., 2021). The IES-R can produce results ranging from 0 to 88. In this study, scores of <9 were categorized as low STS, scores 10-19 were categorized as moderate STS, and scores ≥ 20 were categorized as high STS (Jobe et al., 2021). Jobe et al. (2021) reported that 38% of participants met the criteria for high STS and the mean IES-R score was 19.1, indicating the average participant experienced a moderate level of STS. The study by Jobe et al. (2021) had a low response rate of 8.8%. This raises the concern of non-response bias, that may influence the reliability and validity study findings (Polit & Beck, 2021b). Further, a power analysis was used in this study to determine sample size, which strengthens study findings (Polit & Beck, 2021a). In addition, only ED nurses working in trauma centres were included in the study, so the results cannot be generalized to all RNs working in emergency departments, as not all hospitals are classified as trauma centres.

Finally, Lopez et al. (2022) conducted a descriptive observational study to assess burnout, secondary traumatic stress, and compassion satisfaction scores in emergency nurses working during the COVID-19 pandemic. Compassion satisfaction (CS) is a term used to

describe the sense of accomplishment or reward an individual experiences due to their ability to help patients or clients in a professional environment (Ratrouf & Hamdan-Mansour, 2017). High levels of secondary traumatic stress and burnout, and low levels of compassion satisfaction, suggest the presence of compassion fatigue among healthcare professionals (Lopez et al., 2022). In this study, 50 ED nurses were recruited from three emergency departments in Southern California. The Professional Quality of Life (ProQOL) scale was used to measure STS in this study. While no overall prevalence of STS was reported, Lopez et al. (2020) found the mean STS score in this study was 24.5, which correlates with a moderate level of STS using the ProQOL scale. Finally, the response rate for the Lopez et al. (2022) study was only 22.7%. It is recommended that researchers achieve a response rate of at least 60%, to minimize nonresponse bias and to help ensure the study population is representative of the population as a whole (Fincham, 2008). Therefore, the low response rate of participants in this study increases the risk of non-response bias (Polit & Beck, 2021b).

Prevalence of Secondary Traumatic Stress Among Subset of ED Nurses

In addition to primary studies discussed above, which exclusively had ED nurses as participants, an expanded literature search identified another seven articles that included ED nurses in their study population. The articles in the expanded literature search included nurses working on various units, as well ED nurses in the study population. These studies were published between 2013 and 2022 and were conducted in a variety of countries.

Firstly, Von Rueden et al. (2010) conducted a cross-sectional study to determine the prevalence of STS among nurses working at a trauma hospital in the United States of America. This study included a total of 128 nurses working on a variety of units including the critical care unit, operating room, and the trauma resuscitation area in the emergency department (Von

Rueden et al., 2010). The Penn Inventory was used in this study to measure secondary traumatic stress, which is a measurement tool typically used to diagnose PTSD based on the presence of PTSD symptoms (Hinderer et al., 2014; Von Rueden et al., 2010). The Penn Inventory is a 26-item survey, with scores ranging from 0 to 78 (Von Rueden et al., 2010). In this study, a Penn Inventory score of ≥ 35 was used to determine the presence of STS (Von Rueden et al., 2010). Overall, Von Rueden et al. (2010) found that 7% of participants met the diagnostic criteria for STS. This study was unable to determine any significant difference in STS prevalence between nursing units due to the low number of participants in each group. Emergency nurses represented only 14.7% of the total sample size in the Von Rueden et al. (2010) study. Additionally, all nurses in this study worked with trauma patients in a regional trauma centre. Due to the small proportion of ED nurses included in this study and exclusive sample of nurses working in a trauma centre, there is limited generalizability of these findings to a larger sample of ED nurses. Additionally, the Penn Inventory tool used in this study has not been validated for use within a nursing sample (Von Rueden et al., 2010). By not using a measurement tool that has been found valid for use in the nursing population, the quality of the data from this study may be reduced (Polit & Beck, 2021c).

Ariapooran (2013) conducted a study to determine the prevalence of secondary traumatic stress among Iranian nurses. A convenience sample of 200 nurses who worked at three hospitals were selected for inclusion in this study (Ariapooran, 2013). Ariapooran (2013) excluded participants who did not complete all survey questionnaires, leading to a sample size of 173. While the study included nurses from a variety of units within the three hospitals, more than half of participants (54.3%) were emergency nurses (Ariapooran, 2013). Ariapooran (2013) measured STS in this study using the STSS and used a cut-off score of ≥ 38 on the STSS to determine the

presence of STS among participants, as recommended by Bride (2007). Overall, Ariapooran (2013) found that 39.9% of participants met the diagnostic criteria for STS. Additionally, in this study the prevalence of STS was 41.5% for emergency nurses, which was higher than the STS prevalence for non-emergency nurses (Ariapooran, 2013). The findings for this study supported the belief that ED nurses experience higher rates of STS than nurses working on other units. However, as all participants in this study worked in a specific city in Iran, which limits the generalizability of these findings. Ariapooran (2013) notes that further research on STS prevalence should be conducted with nurses in different geographic areas to increase generalizability of results.

Erkin et al. (2021) conducted a study to determine the prevalence of STS among Turkish nurses who cared for suspected or confirmed COVID-19 patients. In this study, 205 registered nurses were recruited from different nursing units, including the emergency department, intensive care unit (ICU), and COVID-19 unit. Most participants in this study (53%) worked in the emergency department (Erkin et al., 2021). STS was measured in this study using the STSS, and the presence of STS was based on a cut-off score of ≥ 28 (Erkin et al., 2021). Overall, 96.6% of participants in the study experienced at least one STS symptom, as determined by a STSS score of ≥ 28 (Erkin et al., 2021). This study found 80.5% of participants experienced a moderate to high level of STS, based on a STSS score of ≥ 38 (Erkin et al., 2021). Erkin et al. (2021) noted that nurses working in the ED or ICU had higher STSS scores than nurses working in other units. In line with the Ariapooran (2013) study, the findings from this study indicate that ED nurses experience a higher rate of STS than nurses working in other areas (Erkin et al., 2021). Further, as this study was conducted in a single city in Turkey, the generalizability of results beyond this population is limited (Erkin et al., 2021).

Woo and Kim (2021) conducted a study to investigate the factors associated with STS among South Korean nurses. In total, 202 nurses who worked in three trauma centres across South Korea participated in this study (Woo & Kim, 2021). Participants in this study were either ED or ICU nurses, though only 29.6% of participants in this study worked in an emergency department setting (Woo & Kim, 2021). STS was measured in this study using the STSS, and a cut-off score of ≥ 38 on the STSS was used to determine the presence of STS (Woo & Kim, 2021). Overall, 84.4% of participants in the Woo & Kim (2021) met the diagnostic criteria for STS. Woo and Kim (2021) found there was no significant difference in the prevalence of STS between ED and ICU nurses. Similar to the Jobe et al. (2021) study, Woo and Kim (2021) only included participants working in trauma centres, therefore limiting the generalizability of the findings to ED nurses working in hospitals not deemed trauma centres.

Lykins et al. (2021) conducted a secondary analysis that aimed to identify the difference in compassion satisfaction, burnout, and secondary traumatic stress across different nursing specialities. The Professional Quality of Life (ProQOL) scale was used to measure STS in this study. This secondary analysis was based on a previous cross-sectional study that recruited nurses from an academic medical centre (Lykins et al., 2021). Overall, Lykins et al. (2021) analyzed the data from 350 registered nurses and advanced practice nurses, which was collected in a previous cross-sectional study conducted in an academic medical centre in the United States of America. A total of 14.3% of participants in the study worked in the emergency department, with most participants working in the ICU or a general medical unit (Lykins et al., 2021). Lykins et al. (2021) reported the mean STS score was 22.9, indicating a low level of STS among participants. However, the STS scores of nurses working in the ICU and ED were statistically significantly higher compared to nurses working on other units (Lykins et al., 2021). A major

limitation of secondary analyses is that data that was collected initially may not be focused on the study population or research question of interest in the secondary analysis (Cheng & Phillips, 2014). The primary research that Lykins et al. (2021) used for the secondary analysis investigated compassion fatigue and compassion satisfaction among healthcare workers, and therefore was not focused on secondary traumatic stress or nurses. As only 43% of participants in the primary research study used by the Lykins et al. (2021) were nursing staff, it is likely that the data set contained limited information for the population of interest, impacting the external validity of the study results (Dunn et al., 2015; Polit & Beck, 2021d).

Ariapooran et al. (2022) conducted a study on Iranian nurses to determine the prevalence of STS during COVID-19 pandemic. Secondary traumatic stress in this study was measured using the STSS, and a STSS score of ≥ 38 was used to determine the presence of STS. This study included 315 nurses working in various hospitals in Malayer, Iran. Overall, 34.92% of participants in this study were nurses working in the emergency department. Ariapooran et al. (2022) reported that 51.1% of participants in this study had STS symptoms. Additionally, the mean STS scores were significantly higher for nurses working in the emergency department compared to nurses working on general medical units (Ariapooran et al., 2022). Overall, the prevalence of STS was highest among nurses working in the emergency department (Ariapooran et al., 2022). Additionally, Ariapooran et al. (2022) found that nurses who had STS symptoms demonstrated higher levels of depression, anxiety, and suicidal ideation. The prevalence of STS in this study was 11.2% higher than the prevalence found in the study by Ariapooran (2013), which was conducted in the same geographical area with the same population of interest. The higher STS prevalence may be related to the COVID-19 pandemic, which was expected to negatively impact mental health of nurses and increase rates of STS among emergency

healthcare workers (Kellogg, 2020; Vagni et al., 2020b). However, Ariapooran et al. (2022) did not investigate factors related to COVID-19, such as fear of COVID-19, which can impact the STS prevalence. Therefore, Ariapooran et al. (2022) recommend future research should investigate factors related to COVID-19 and the impact on STS.

Finally, İlhan and Küpeli (2022) conducted a study to determine the STS prevalence and factors associated with mental health among emergency healthcare workers in Turkey. Secondary traumatic stress was measured in this study using the STSS, a STSS score of ≥ 38 was used to determine the presence of STS. This study included a total of 363 emergency healthcare workers, of which 69.4% were emergency nurses. İlhan and Küpeli (2022) reported that overall 71.6% of ED healthcare workers experienced STS, with a higher rate of 74.6% for ED nurses. İlhan and Küpeli (2022) conducted a post hoc power analysis, which was used to support their sample size and strengthen the validity of their results. However, the use of post hoc power calculations is often inappropriate, conceptually flawed, and provides analytically inaccurate and misleading results, and therefore is not a recommended method to validate research findings or sample size (Heckman et al., 2022; Heinsberg & Weeks, 2022; Zhang et al., 2019).

Reasons for Varying STS Prevalence in Current Literature

From this literature review, it is clear the reported prevalence of STS amongst ED nurses has varied in previous studies. One reason for the varying prevalence of STS in previous research may be related to the use of different tools to measure STS (Ratrouf & Hamdan-Mansour, 2017). Lopez et al. (2022) and Lykins et al. (2021) used the Professional Quality of Life (ProQOL) Scale to determine factors related to STS amongst ED nurses. The ProQOL scale indirectly assesses compassion fatigue risk through the measurement of three concepts that make up compassion fatigue: burnout, secondary traumatic stress, and compassion satisfaction (Lopez et

al., 2022; Sheppard, 2015). The ProQOL instrument suggests that burnout and secondary traumatic stress increase the risk of satisfaction fatigue, while compassion satisfaction reduces the risk (Wang et al., 2020). However, concerns have been raised regarding the validity of the STS subscale of the ProQOL instrument (Kellogg, 2020). A previous study investigating the psychometric properties of the ProQOL instrument in a sample of Canadian nurses found the convergent validity of the STS subscale was below the threshold to be considered acceptable (Hemsworth et al., 2018). Similarly, Heritage et al. (2018) found that the STS subscale of the ProQOL instrument does not demonstrate adequate construct validity in a sample of hospital nurses. Additionally, a construct analysis by Kellogg (2020) determined that STS is a unique phenomenon, and not simply a component of compassion fatigue. As a result, Kellogg (2020) does not recommend using the ProQOL instrument to measure STS prevalence amongst nurses.

Additionally, Jobe et al. (2021) used the Impact of Events Scale- Revised (IES-R). The IES-R is not used to measure STS directly, but instead is a tool that assesses the severity of the three subgroups of PTSD symptoms: avoidance, intrusion, and hyperarousal (Watts & Robertson, 2015). Similarly, Von Rueden et al. (2010) used the Penn Inventory, which is used to diagnose PTSD based on the presence, frequency, and severity of PTSD symptoms (Hammarberg, 1992). The use of PTSD assessment tools, such as the IES-R and the Penn Inventory, to determine STS prevalence is inappropriate, as these tools are not suitable for assessing the impact of indirect trauma and do not accurately measure STS (Watts & Robertson, 2015). Additionally, use of the Penn Inventory has not been well validated for use with nursing populations (Hinderer et al., 2014). Further, as PTSD has a much stricter diagnostic criteria than STS, use of PTSD assessment tools to identify STS can lead to an under-reporting of STS prevalence (Watts & Robertson, 2015).

On the other hand, the studies by Ariapooran (2013), Ariapooran et al. (2022), Dominguez-Gomez and Rutledge (2009), Duffy et al. (2015), Erkin et al. (2021), İlhan and Küpeli (2022), Morrison and Joy (2016), Ratrout and Hamdan-Mansour (2020), Wolf et al. (2020), and Woo and Kim (2021) used the Secondary Traumatic Stress Scale to measure STS. Currently, the STSS is the only scale that exclusively measures secondary traumatic stress and not related concepts, such as PTSD (Beck, 2011). In the STSS, the stressor of interest is indirect trauma due to exposure to patients, and the scale is worded to target this specific stressor (Bride et al., 2004). The STSS shown high consistency and reliability when utilized in nursing studies (Kellogg, 2020). Previous studies using the STSS in samples of pediatric nurses and neonatal intensive care nurses reported Cronbach alpha values of 0.92 and 0.94 respectively (Kellogg, 2020). The STSS has also been validated in studies using a sample of emergency nurses. In Dominguez-Gomez et al. (2009) study, the Cronbach alpha coefficients for each STSS subscale were 0.92, and the overall Cronbach alpha coefficient for the total STSS was 0.91, indicating excellent internal consistency. Additionally, the study by Woo and Kim (2021) used the STSS and reported an overall Cronbach alpha coefficient of 0.92, and Cronbach alpha coefficients of 0.79 for the intrusion and avoidance subscales and 0.81 for the arousal subscale. As a Cronbach alpha value of ≥ 0.70 indicates acceptable internal consistency, the use of the STSS has consistently demonstrated high consistency when used in a sample of ED nurses (Taber, 2018). The STSS accurately describes the characteristics of STS that occur in nurses and is the strongest and most appropriate tool for measuring STS in the nursing population (Barré & Hooper, 2023; Beck, 2011; Kellogg, 2020; Watts & Robertson, 2015). Not all studies in the current literature used the STSS; some authors chose to use scales that do not specifically measure STS, such as the ProQOL instrument, the IES-R, and the Penn Inventory. Therefore, the use of instruments

besides the STSS may have led to conflicting results regarding STS prevalence among ED nurses in the current literature.

Another possible cause of the variable prevalence of STS reported in the literature may be due to the use of different methods used to identify participants with STS using the STSS (Ratrout & Hamdan-Mansour, 2017). It is recommended that a cut-off score of ≥ 38 on the STSS is used to determine the presence of STS in a research study (Bride, 2007). Bride (2007) found a sensitivity of 0.93 and specificity with 0.91 in determining the presence of STS with a STSS cut-off score of ≥ 38 . Some studies have utilized this recommended and validated cut-off score of ≥ 38 on the STSS as the criterion to determine the presence of STS (Ariapooran, 2013; Ariapooran et al., 2022; Duffy et al., 2015; İlhan & Küpeli, 2022; Woo & Kim, 2021). However, some researchers used other STSS cut-off scores, such as ≥ 28 (Erkin et al., 2021; Ratrout & Hamdan-Mansour, 2020) and ≥ 39 (Wolf et al., 2020), which impacts the STS prevalence found in these studies. Other studies have used the diagnostic criteria for PTSD as the criterion to determine the incidence rate of STS in their study (Dominguez-Gomez & Rutledge, 2009; Morrison & Joy, 2016). To diagnose a patient with PTSD using the Diagnostic and Statistical Manual of Mental Disorders (DSM), an individual must experience one intrusive symptom (criterion B), three avoidance symptoms (criterion C), and two hyperarousal symptoms (criterion D) (Bride, 2007). The STSS contains three sub-scales referred to as intrusion, avoidance, and hyperarousal, which mimic the PTSD diagnostic criteria in the DSM (Bride et al., 2004). This method assumes that PTSD and STS can be diagnosed using the exact same criteria. However, while STS can cause symptoms similar to PTSD, determining the presence of STS is a much less stringent process than obtaining a formal PTSD diagnosis, and does not require the presence of a specific number of avoidance, intrusion, and hyperarousal symptoms (Barré & Hooper, 2023).

Therefore, determining STS presence using PTSD diagnostic criteria is often not suitable for healthcare professionals and may lead to an underreporting of STS prevalence (Watts & Robertson, 2015).

Finally, the differences in STS prevalence in the current literature may be due to differences in healthcare systems in the countries where studies were conducted (Ratrou & Hamdan-Mansour, 2017). This literature review consisted of six studies conducted in the United States of America (Dominguez-Gomez & Rutledge, 2009; Lopez et al., 2022; Lykins et al., 2021; Jobe et al., 2021; Von Rueden et al., 2010; Wolf et al., 2020), two Iranian studies (Ariapooran, 2013; Ariapooran et al., 2022), two Turkish studies (Erkin et al., 2021; İlhan & Küpeli, 2022), one Irish study (Duffy et al., 2015), one Jordanian study (Ratrou & Hamdan-Mansour, 2020), one Scottish study (Morrison & Joy, 2016), and one South Korean study (Woo & Kim, 2021). Despite an extensive search, no Canadian study measuring STS prevalence or risk factors associated with STS was found in the literature. The healthcare system in Canada is universal and publicly funded through taxes and administered through provincial and territorial health insurance plans (Martin et al., 2018). Similar to Canada, Scotland and South Korea provide universal public healthcare to their citizens through the National Health Service and National Health Insurance programs, respectively (Lee, 2003; Steel & Cylus, 2012). On the other hand, in the United States, Iran, Ireland, Turkey, and Jordan the healthcare systems include both public and private options (Doshmangir et al., 2021; Maunder et al., 2009; Nazer & Tuffaha, 2017; Tatar et al., 2011; Tikkanen et al., 2020). According to Schneider et al. (2021), each country has a unique healthcare system that is influenced by governmental policies, structure of healthcare delivery, and financing methods. As these studies were all conducted with nurses

working in different health care systems, the validity and generalizability of these findings to the Canadian nursing context is unclear.

For all the studies noted above, study limitations were present. Participants in all studies discussed in this literature review were recruited using non-probability sampling techniques. As a result, sampling bias or selection bias may have occurred and impacted findings of the studies (Polit & Beck, 2021b). Participants in the studies by Ariapooran (2013), Ariapooran et al. (2022), Dominguez-Gomez and Rutledge (2009), Duffy et al. (2015), Erkin et al. (2021), İlhan and Küpeli (2022), Lopez et al. (2022), Lykins et al. (2021), Morrison and Joy (2016), Ratrout and Hamdan-Mansour (2020), and Von Rueden et al. (2010) worked in a specific geographic area, which limits these findings from being generalized to a larger population. Additionally, participants in the studies by Ariapooran et al. (2022), Dominguez-Gomez and Rutledge (2009), Duffy et al. (2015), Erkin et al. (2021), İlhan and Küpeli (2022), Jobe et al. (2021), Lykins et al. (2021), Morrison and Joy (2016), Von Rueden et al. (2010), and Woo and Kim (2021) were predominantly female. In contrast, participants in the Ratrout and Hamdan-Mansour (2020) study were predominantly male, while Ariapooran (2013), Lopez et al. (2022), and Wolf et al. (2020) did not collect gender as a demographic variable in their studies. The unequal distribution of gender amongst participants in these studies may influence study results and limit the generalizability of study results. Additionally, Dominguez-Gomez and Rutledge (2009), Lopez et al. (2022), Morrison and Joy (2016), and Wolf et al. (2020) all determined STS prevalence with a sample size of less than 100 participants. A small sample size increases the risk of sampling errors and decreases the likelihood that the sample is representative of the larger population (Polit & Beck, 2021b). Additionally, only the studies by Ratrout and Hamdan-Mansour (2020), Jobe et al. (2021), and Woo and Kim (2021) included a power analysis to determine sample size,

which strengthens the validity of study results (Polit & Beck, 2021a). As the other studies in this literature review did not conduct a pre-study power analysis, they may be underpowered and at risk for the presence of type II errors, which may influence the study findings (Polit & Beck, 2021a).

Factors Associated with Secondary Traumatic Stress

Currently, there is no general consensus on which personal, demographic, or organizational factors contribute to the development of STS among ED nurses (Woo & Kim, 2021). Factors such as age, gender, educational level, years of nursing experience, resilience, and level of organizational support have been predicted to influence STS development amongst ED nurses (Ratrouf & Hamdan-Mansour, 2017; Robinson et al., 2022; Woo & Kim, 2021). The current evidence regarding the association between the various personal and organizational factors examined in this study and secondary traumatic stress is discussed below.

Personal Factors

Personal factors that have been previously examined in relation to STS development include age, gender, years of nursing experience, and educational level.

The relationship between age and development of STS amongst ED nurses has been contradicting in previous literature. Dominguez-Gomez and Rutledge (2009) found older ED nurses reported significantly more STS symptoms than younger ED nurses. However, Duffy et al. (2015), Erkin et al. (2021), İlhan and Küpeli (2022), Ratrouf and Hamdan-Mansour (2020), Von Rueden et al. (2010), and Woo and Kim (2021) found no relationship between age and STS. Morrison and Joy (2016) and Wolf et al. (2020) did not conduct any analyses to test the correlation between age and STS.

Dominguez-Gomez and Rutledge (2009) reported that male participants had lower mean STSS scores, but this finding was not statistically significant. Similarly, Ariapooran et al. (2022) found that the mean STS scores were significantly higher for female participants. Erkin et al. (2021), İlhan and Küpeli (2022), Ratrou and Hamdan-Mansour (2020), Von Rueden et al. (2010), and Woo and Kim (2021) found no relationship between gender and STS.

The relationship between years of nursing experience and STS has produced conflicting results in previous literature. This relationship has been investigated in terms of the years of ED nurse experience, as well as the overall years of nursing experience (Ratrou & Hamdan-Mansour, 2017). Von Rueden et al. (2010) found STS was statistically significantly correlated with less years of total nursing experience and less years of trauma nursing experience. Duffy et al. (2015) found no relationship between years of ED experience and STS scores in their study. Studies by Dominguez-Gomez and Rutledge (2009), İlhan and Küpeli (2022), and Ratrou and Hamdan-Mansour (2020) found no relationship between years of nursing experience and STS.

The studies by Dominguez-Gomez and Rutledge (2009), Erkin et al. (2021), Ratrou and Hamdan-Mansour (2020), Von Rueden et al. (2010), and Woo and Kim (2021) found no association was found between STSS scores and education level. However, Ariapooran et al. (2022) found that mean STS scores were significantly lower for nurses with a Master's degree compared to nurses with a Bachelor's degree.

The inconsistent findings regarding the relationship between personal factors and STS development noted in this literature review were supported by findings in an integrative review by Ratrou and Hamdan-Mansour (2017). This study found that the association between STS and personal factors including age, gender, education level, and years of experience was contradictory in various studies (Ratrou & Hamdan-Mansour (2017). Ratrou and Hamdan-

Mansour (2017) stated that the conflicting results reported in the literature prevented them making any definitive statements regarding the association between personal or organizational factors and the presence of STS in ED nurses. Additionally, Von Rueden et al. (2010) noted that a lack of research evidence exists regarding the relationship between personal factors and STS development. Therefore, further research on the association between personal factors and STS development among ED nurses is required in order to develop an understanding of this phenomenon and develop strategies to mitigate STS development among ED nurses (Ratrouf & Hamdan-Mansour, 2017; Von Rueden et al., 2010).

Resilience

Resilience refers to the individual strength and resources a person possesses that allows them to cope, adapt, and thrive despite adverse circumstances (Flarity et al., 2013; Ogińska-Bulik & Michalska, 2021; Schmidt & Haglund, 2017). In the existing literature, resilience has been consistently identified as a protective factor against the development of various forms of psychological distress amongst nurses, including post-traumatic stress disorder, burnout, and compassion fatigue (Mealer et al., 2012; Mealer et al., 2016; Schmidt & Haglund, 2017). In comparison, fewer studies have been conducted to determine if resilience has a similar protective role for the development of secondary traumatic stress (Ogińska-Bulik & Michalska, 2021). However, after an extensive search four research studies that investigated the association between resilience and STS were identified in the literature.

Tseng et al. (2018) conducted a study that examined Professional Quality of Life factors, including STS, amongst 88 Taiwanese nurses caring for burn victims following a mass casualty incident. Nurses in this study worked in plastic surgery, microsurgery, or a burn unit setting.

Tseng et al. (2018) conducted a regression analysis which found that resilience was a significant predictor of one's level of STS.

Ogińska-Bulik and Michalska (2021) conducted a study to determine the relationship between resilience and STS for 75 Polish nurses working in palliative care. A Pearson's correlation coefficient test was conducted, which found a statistically significant negative correlation between STS and resilience (Ogińska-Bulik & Michalska, 2021). As a result, Ogińska-Bulik and Michalska (2021) concluded that resilience may be an important protective factor preventing nurses from developing STS.

Abdolkarimi et al. (2022) conducted a cross-sectional study with a sample of 233 Iranian nurses working during the COVID-19 pandemic. The aim of this study was to determine the relationship between resilience and STS for nurses working in pandemic conditions. Participants were frontline nursing staff working in a single Iranian hospital, though the researchers did not report the nurse's unit of employment. Similar to the Ogińska-Bulik and Michalska (2021) study, a correlation analysis was conducted in this study, which found that resilience was negatively correlated with scores on the secondary traumatic stress scale (Abdolkarimi et al., 2022). This indicated that for nurses in this study a higher level of resilience was statistically significantly correlated with a lower level of STS (Abdolkarimi et al., 2022).

Finally, a study conducted by Tsouvelas et al. (2022) investigated STS among 222 Greek nurses working during the COVID-19 pandemic. This study included nurses working in hospital and community settings and did not report data regarding the nurse's unit of employment. Similar to Tseng et al. (2018), a regression analysis was conducted in this study, which found that resilience was a significant negative predictor of STS (Tsouvelas et al., 2022).

Overall, the results of these four studies provides some evidence for the effect resilience has on the development of STS among nurses. Additionally, the studies by Ogińska-Bulik and Michalska (2021), Abdolkarimi et al. (2022), and Tsouvelas et al. (2022) measured STS using the STSS, which is the gold standard measurement tool for this variable. However, Tseng et al. (2018) measured STS using the ProQOL instrument, which is not recommended as it indirectly measures STS through its relationship to the related variables of burnout and compassion satisfaction (Watts & Robertson, 2015). The nurses included in the studies by Tseng et al. (2018) and Ogińska-Bulik and Michalska (2021) worked in settings such as a burn unit, plastic surgery, and palliative care. Additionally, the studies by Abdolkarimi et al. (2022) and Tsouvelas et al. (2022) did not report data regarding the unit of employment of participating nurses. Therefore, the results of these studies may not be generalizable to nurses working on other units, such as the emergency department. Additionally, none of these studies were conducted within Canada, which may limit the generalizability of these results to nurses working in the Canadian healthcare environment.

Organizational Support

Organizational factors have been predicted to influence the development or prevention of STS among nurses (Ratrouf & Hamdan-Mansour, 2017). In fact, previous research findings suggest that organizational factors may have a more significant influence on the development of STS than personal factors (Dworkin et al., 2016). A specific organizational factor that has been examined in the literature is organizational support, which refers to the degree to which a workplace values the contributions of its employees and is concerned about the well-being of staff members (Kurtessis et al., 2017). Previous research has found that organizational support is a protective factor against the development of mental health symptoms for healthcare workers

(Karantikola et al., 2022). Among nurses, higher organizational support has been found to significantly reduce the risk of developing PTSD, burnout, depression, and anxiety (Cockerham et al., 2022; Labrague & De Los Santos, 2020; Luo et al., 2022; Sarabi et al., 2022; Yanbei et al., 2023; Zhou et al., 2021). Additionally, a positive perception of organizational support has been found to be associated with a lower level of STS among other caring professionals, such as child protective workers and mental health counsellors (Bride et al., 2007; Thompson et al., 2014). However, little research has been conducted to determine the relationship between organizational support and the development of STS among nurses (Ratrouf & Hamdan-Mansour, 2017).

The studies by Ratrouf and Hamdan-Mansour (2020), and Wolf et al. (2020), which were discussed earlier in the literature review, all examined the relationship between organizational support and STS. Ratrouf and Hamdan-Mansour (2020) found that STS was not correlated with organizational support but was correlated with sick leaves and absenteeism. However, Ratrouf and Hamdan-Mansour (2020) noted that this finding contradicted previous research and may indicate organizational support is influenced by sociocultural factors, resulting in varying results between studies. Wolf et al. (2020) investigated organizational support in the qualitative portion of their mixed methods study. ED nurses in the Wolf et al. (2020) study noted that lack of acknowledgement and support from management and administrators regarding exposure to traumatic events increased the trauma experienced by the nurses. As a result, the authors concluded that the presence of organizational and manager support is a mitigating factor for the development of STS among ED nurses (Wolf et al., 2020).

Further, three additional studies that examined the relationship between STS and organizational support among nurses were identified in the literature. Firstly, a study of organizational correlates of STS among sexual assault nurse examiners was conducted by

Townsend and Campbell (2009). Townsend and Campbell (2009) reported a positive association between organizational support and STS, whereas higher organizational support led to higher levels of STS. However, the authors noted their finding that high organizational support is correlated with high STS was unexpected (Townsend & Campbell, 2009). Secondly, Herrema et al. (2020) conducted a study to investigate the relationship between organizational support and STS among 278 nurses working in a pediatric hospital. Herrema et al. (2020) found that nurses who reported a higher level of organizational support following a traumatic event had significantly lower STS scores. The authors concluded that not only did higher organizational support lead to a reduction in the frequency of STS, but the nurses reported that organizational support also helped with coping after their exposure to a distressing event (Herrema et al., 2020). Finally, Xu et al. (2023) investigated the relationship between organizational support and professional quality of life among 2,200 Chinese nurses. A multiple stepwise regression was performed, which found that secondary traumatic stress was significantly correlated with organizational support (Xu et al., 2023). The authors concluded a higher level of organizational support can meet the emotional requirements of nurses, leading to reduced stress and increased nurse retention (Xu et al., 2023).

As outlined in this literature review the current evidence regarding the relationship between organizational factors and STS among nurses is both limited and conflicting. As a result, it has been stated that the relationship between secondary traumatic stress and organizational support remains unclear at this time (Ogińska-Bulik et al., 2021). The results from studies by Herrema et al. (2020), and Wolf et al. (2020) indicate that organizational support may be a protective factor against nurses developing STS, while Ratrou and Hamdan-Mansour (2020) did not identify a relationship between STS and organizational support. Due to the

minimal and contradicting findings in the current literature, the relationship between an organizational factor such as perceived organizational support on STS remains unclear (Ratrou & Hamdan-Mansour, 2017). Additionally, Herrema et al. (2020), Ratrou and Hamdan-Mansour (2020), Townsend and Campbell (2009), and Wolf et al. (2020) used the STSS to measure STS, which is the only STS tool that has experienced robust peer review in a nursing population (Watts & Robertson, 2015). However, Townsend and Campbell (2009) measured STS using the Compassion Fatigue Self-Test, which was later renamed the ProQOL scale (Watts & Robertson, 2015). Xu et al. (2023) also used the ProQOL instrument, which an appropriate tool to measure overall professional quality of life, but not to specifically measure STS (Barré & Hooper, 2023). Additionally, Ratrou and Hamdan-Mansour (2020) measured organizational support using the Scale of Perceived Organizational Support (SPOS), a measurement tool which has been previously validated in nursing samples (Latimer et al., 2023; Labrague & De Los Santos, 2020). The SPOS was the scale used to measure organizational support in this study. In comparison, Townsend and Campbell (2009) and Herrema et al. (2020) both created their own organizational support scales, which have not been previously validated. Further, Xu et al. (2023) used the Perception of Organizational Support Questionnaire, which has also not been validated in the literature. Finally, the studies by Ratrou and Hamdan-Mansour (2020) and Wolf et al. (2020) were the only studies identified in the literature that investigated the relationship between organizational support and STS among ED nurses, and these two studies had conflicting findings. As it has been reported that organizational factors are more important than personal factors in terms of development of STS, the lack of consensus regarding organizational factors associated with STS for ED nurses represents a knowledge gap that is important to address (Ratrou & Hamdan-Mansour, 2020). As Duffy et al. (2015) noted, methods to mitigate STS

development are not the sole responsibility of the nursing staff, but also requires organizational support. Identification of modifiable organizational factors, such as organizational support, as a protective factor against STS development is essential to develop policies and strategies to prevent or reduce STS symptoms among ED nurses (Duffy et al., 2015). While personal factors, such as resilience, may help an individual manage their emotions and grow from the secondary trauma experienced, the development of organizational structures that support and protect nurses may be even more important (Gee et al., 2022). Further, none of the studies reviewed investigating STS and organizational support included in this review were conducted in Canada. As Ratrou and Hamdan-Mansour, (2020) noted that sociocultural factors may impact on the relationship between STS and organizational support, it is important to examine these factors with a sample of Canadian nurses to obtain a clearer understanding of their association within the context of the Canadian healthcare system.

Fear of COVID-19

The COVID-19 pandemic has had a significant impact on the mental health of frontline nurses, due to stressors such as a lack of personal protective equipment, an increased number of critically ill patients, and exposure to frequent patient deaths (Gee et al., 2022; Yörük et al., 2022). A specific stressor experienced by many healthcare workers was COVID-19 fear, which was caused by their risk of exposure to the infectious agent, uncertainty regarding effective treatment for the disease, and concerns regarding transmission of the virus to their friends and family (Aslan & Dinç, 2022; Vagni et al., 2020a). However, fear of COVID-19 has the largest impact on the mental health of nurses compared to other frontline healthcare workers (Li et al., 2022). Previous studies found that fear of COVID-19 among nurses is associated with increased stress, emotional arousal, depression, anxiety, and secondary trauma (Ahorsu et al., 2022; Chura

et al., 2022; Karimi Khordeh et al., 2022; Khattak et al., 2021; Li et al., 2022). As fear of COVID-19 is a relatively new stressor caused by the novel SARS-CoV-2 virus, there is not a large body of evidence examining the relationship between fear of COVID-19 and STS. However, four studies were identified in the literature that examined the relationship between STS and fear of COVID-19 within the nursing population.

Khattak et al. (2021) investigated the impact of fear of COVID-19 on secondary trauma amongst 380 nurses in Pakistan. A regression analysis was performed, which found that fear of COVID-19 was significantly and positively associated with STS (Khattak et al., 2021). As a result, the authors concluded that a higher level of COVID-19 fear was associated with a higher prevalence of STS among nurses in their study (Khattak et al., 2021).

Moreno-Jiménez et al. (2021) explored the relationship between work requirements and STS among 221 healthcare workers in Spain. Though other healthcare professionals were included in this study, most participants were nurses. Moreno-Jiménez et al. (2021) conducted a hierarchical regression and determined that fear of COVID-19 was significantly associated with development of STS. Therefore, the authors concluded that fear of COVID-19 is a positive predictor for STS development among healthcare workers (Moreno-Jiménez et al., 2021).

A study by Li et al. (2022) examined the relationship between COVID-19 fear and STS among 243 nurses in Pakistan. Structural equation modeling was conducted, which found that fear of COVID-19 significantly and positively impacted STS development among nurses (Li et al., 2022). Li et al. (2022) concluded that COVID-19 fear is a stressor that significantly affects the mental and psychological health of nurses.

Finally, Yörük et al. (2022) investigated predictive factors of STS among a sample of 1416 Turkish healthcare workers. Though other healthcare professionals were included in the

sample, 61% of participants were nurses. A hierarchical regression analysis was conducted, which found that fear of COVID-19 was a statistically significantly associated with STS (Yörük et al., 2022). Therefore, in this study fear of COVID-19 was a significant predictor of STS development among healthcare workers (Yörük et al., 2022).

There is some evidence that fear of COVID-19 is positively associated with STS development among nurses. However, this evidence is limited as only four studies examining the relationship between fear of COVID-19 and STS among nurses were identified in the literature. Khattak et al. (2021), Moreno-Jiménez et al. (2021), Li et al. (2022), and Yörük et al. (2022) all used the STSS to measure STS in their studies, which is the strongest scale available to measure STS in a nursing sample (Barré & Hooper, 2023). However, the studies by Moreno-Jiménez et al. (2021) and Yörük et al. (2022) sampled a variety of healthcare workers and was not specific to nurses. Previous research has shown that nurses experience a higher level of COVID-19 fear than other healthcare professionals, which may occur as nurses often spend more time in closer contact with patients (Khanal et al., 2021; Labrague & De Los Santos, 2020). Therefore, the findings by Moreno-Jiménez et al. (2021) and Yörük et al. (2022) may not be truly representative of the nursing population. Further, none of these studies were conducted within Canada, which limits the generalizability of results to nurses working in the Canadian healthcare system. A scoping review found that prevalence of COVID-19 fear varied from a low of 18.1% to a high of 45.2% when comparing international studies (Quadros et al., 2021). The variation in COVID-19 fear may be due to differences in governmental policies implemented during the COVID-19 pandemic, as well as differences in governmental and media coverage of the pandemic (Lin et al., 2021). Therefore, it is important to examine the relationship between fear of COVID-19 and

STS amongst Canadian nurses, due to the influence federal policies may have on this association, and the current lack of research regarding these factors in a Canadian nursing population.

Overall, there is some evidence that demographic factors, organizational factors, resilience, and COVID-19 fear may influence STS development among nurses. However, the current evidence is limited regarding factors influencing STS development, and findings are often conflicting. In addition, despite an extensive search of the current literature no research was found that investigated the relationship between STS and resilience or COVID-19 fear in a sample of ED nurses. Additionally, only two studies that examined organizational support and STS among ED nurses were identified in the literature, but as these studies had conflicting results no clear understanding regarding the relationship between these variables could be reached. Previous research indicates that risk of STS increases with factors such as a lack of nursing staff, a shortage of nursing resources, frequent exposure to unpredictable and stressful workplace challenges, and caring for more severely ill patients (Jeong & Shin, 2023; Lee et al., 2021; Maiorano et al., 2020). Due to the risk of a high prevalence of STS among nurses due to the global nursing shortage and ongoing COVID-19 pandemic, the current lack of evidence regarding factors associated with STS is a significant knowledge gap and is important to address. The development of STS has a significant impact on the lives of ED nurses, as it can lead to physical symptoms such as headache and insomnia, psychological changes such as decreased concentration, depression, and anxiety, and influence them professionally by increasing nurse attrition and leading to decreased quality of patient care (Barleycorn, 2019; Wong et al., 2021). Due to the significant risk this poses to individual nurses and the nursing profession, further research is needed to develop an understanding of factors that mitigate or precipitate the development of STS (Duffy et al., 2015). Through increased knowledge, strategies can be

developed to prevent and reduce STS prevalence amongst ED nurses, which will positively impact nurses, patients, and healthcare organizations (Duffy et al., 2015; Robinson et al., 2022).

Research Aims

The varying prevalence of STS amongst ED nurses in previous studies may be related to differences in the structure and function of healthcare systems in different countries (Ratrouf & Hamdan-Mansour, 2017). This study will be conducted on ED nurses working in Ontario, Canada's most populous province and home to one-third of Canada's nursing workforce (CIHI, 2021). Despite an extensive search, no previous research on the prevalence of STS among RNs working in Ontario emergency departments was identified in the literature. Further, as previous research has produced inconsistent results, it is currently unclear what factors are associated with STS development in ED nurses (Ratrouf & Hamdan-Mansour, 2020). Therefore, further research is required to develop a clearer understanding of the prevalence and factors associated with STS among ED nurses (Ratrouf & Hamdan-Mansour, 2017). The primary objective of this study was to determine the prevalence of secondary traumatic stress among registered nurses working in Ontario emergency departments. The secondary objective of this study was to determine if personal and/or organizational factors are associated with the presence of STS among RNs working in Ontario emergency departments.

Chapter 3: Methodology

Research Design

This is a quantitative, cross-sectional, descriptive study. The aims of this study were to determine the prevalence of STS in ED nurses, and to determine the personal and/or organizational factors that are associated with the development of STS in ED nurses. The personal factors examined in relation to STS in this study are gender, age, years of nursing experience, education level, type of employment, population of city where emergency department is located, annual number of emergency department visits, level of COVID-19 fear, and resilience. The organizational factor examined in relation to STS in this study is organizational support. In this study data was collected using an online survey tool.

A descriptive research design was used as this method allows a researcher to describe the prevalence of the occurrence of a condition, such as STS, in a single sample and to describe the relationships amongst variables related to the condition of interest (Bloomfield & Fisher, 2019; Polit & Beck, 2021c). A quantitative descriptive study design does not involve any manipulation of variables by the researcher and is most useful when the goal is to determine the prevalence of a phenomenon, which is the primary aim of this study (Bloomfield & Fisher, 2019). This is also an appropriate study design to select when investigating a new topic about which little information is currently available (Bloomfield & Fisher, 2019). As there is very little research on this topic, and none in the Canadian context, a descriptive research study approach was chosen for this study. Quantitative descriptive studies are used to generate new hypotheses rather than test existing hypotheses, and as a result researchers report their study aims instead of a hypothesis (Siedlecki, 2020).

As this study was cross-sectional, data for each participant was captured at a single time point and all questionnaires were included in a single online survey. Cross-sectional designs are appropriate when the research aim is to determine the prevalence of an outcome or exposure (Setia, 2016). As the primary aim of this study was to determine the prevalence of STS among ED nurses, a cross-sectional design was suitable. Additionally, a cross-sectional study is useful for generating hypotheses and providing information that informs future research (Wang & Cheng, 2020). As this study is exploring a topic that has not been extensively researched, using a study design that assists with generating theories and informing future research is appropriate. In this study, data collection occurred anonymously by participants inputting responses to study questionnaires using the online survey program Qualtrics.

Sampling Frame & Strategy

Participants for this study were recruited using convenience sampling. Convenience sampling is the most widely used sampling method in clinical research, in which participants are enrolled in a study based on their accessibility or proximity to the research (Elfil & Negida, 2017; Jager et al., 2017). Registered nurses working in any emergency department in Ontario were recruited for this study through collaboration with the Emergency Nurses Association of Ontario (ENAO) and Ontario Nurses' Association (ONA). Participants were recruited through an invitational email (Appendix A) sent by ENAO and ONA to their members. The recruitment emails included study information, researcher contact information, a copy of the consent form (Appendix B). Additionally, participants could access the study using the direct link to the Qualtrics survey included in the invitational email. ONA sent out a recruitment email to members on March 15, 2023. ENAO sent out recruitment emails to members on April 12, 2023 and May 26, 2023. Additionally, a social media recruitment poster was created for this study,

which ONA and ENAO shared on their respective organizational Facebook groups (Appendix C). ONA posted the recruitment poster on their ONA members Facebook group on April 11, 2023. ENAO posted the social media recruitment poster on their Emergency Nurses Association of Ontario Facebook page on May 19, 2023. Additionally, ENAO posted the direct study link on their website on April 4, 2023, and kept the link posted on their website for the remainder of the study recruitment period.

To be eligible to participate in this study, participants were registered nurses, currently working in an Ontario emergency department providing direct patient care, able to read and write in English, and able to provide informed consent. The exclusion criterion was registered practical nurses, nurses who did not exclusively work in the emergency department (ex. float pool nurses), and emergency department managers or nurse educators. The Qualtrics survey included five inclusion/exclusion criteria questions, which required a response before participants could access the rest of the survey. Participants whose responses did not meet the study eligibility criteria received a message on the Qualtrics survey that stated: “Based on your responses to these questions, you are not eligible to participate in this study. Please exit the survey by closing the Qualtrics tab in your browser.” The rest of the survey, including the demographics questionnaire and all measurement scales, did not require a participant response to continue to progress through the survey. However, if a participant did not input a response to each question, they received a prompt at the top of the Qualtrics survey indicating that at least one question in this section was unanswered. In order to progress to the next survey section, participants had to indicate if they wanted to continue without answering the question or if they wanted to return to the survey section to answer the question. At the end of the survey participants had the option to provide their email address, which was entered into a draw for a \$40 electronic gift card. There

was a total of 25 gift cards included in the draw, and winners could choose if they wanted to receive a Tim Hortons, Starbucks, or Amazon gift card. The random gift card lottery was conducted after study recruitment had closed, and all electronic gift cards were subsequently emailed to participants by the lead investigator.

As this study used non-probability sampling, the necessary sample size could be determined using non-statistical methods, such as a sample size rule of thumb (Daniel, 2012). The data analysis for this study included a multiple linear regression, and as a result the sample-to-variable ratio rule was used to determine sample size (Memon et al., 2020). According to Memon et al. (2020), when completing a multiple linear regression analysis, the sample size should be 10 times larger than the number of variables. In this study, ten predictors will be used to produce a regression model to determine factors related to STS. Therefore, 100 participants were required for this study to achieve adequate power. Further, Hayat (2013) stated that when conducting multiple linear regression in a nursing study, a 10:1 ratio of subject per variable ratio is appropriate. A 10:1 subject per variable ratio ensures an accurate prediction of linear regression models and an adequate estimation of regression coefficients (Austin & Steyerberg, 2015). Additionally, using a 10:1 ratio helps prevent overfitting of the regression model, allowing generalization of findings beyond the included cohort (Grant et al., 2019). According to this rule of thumb, 10 participants are needed for each independent variable being tested (Hayat, 2013). As 10 independent variables were tested in this study, 100 participants were required to conduct an accurate multiple linear regression, which aligns with the sample size proposed by Memon et al. (2020). Therefore, a minimum sample size of 100 participants was required for this study.

In this study there are 10 independent variables included in the linear regression: nine personal factors and one organizational factor. The personal factors examined in this study were age, gender, years of nursing experience, educational level, employment status, number of annual ED visits, population of town where ED is located, resilience, and fear of COVID-19. The organizational variable examined in this study was perceived organizational support.

Data Collection Tools & Procedures

Data collection for this study occurred from March 15, 2023 to June 27, 2023. All self-report questionnaires in this study were distributed and completed using Qualtrics, an online survey program. As this study used an online survey to collect data, steps were taken to ensure data integrity was maintained (Griffin et al., 2022). Qualtrics survey protection settings were utilized, such as a tool to prevent ballot box stuffing and a Completely Automated Public Turing test to tell Computers and Humans Apart (CAPTCHA). The prevent ballot box stuffing setting on Qualtrics was utilized to prevent a single participant from submitting multiple survey entries. Additionally, a CAPTCHA was placed at the beginning of the survey, to reduce the likelihood of internet robots (“bots”) from submitting fraudulent responses (Teitcher et al., 2015). In order to progress to other sections of the survey and input response, the CAPTCHA must be passed by participants.

This study contains five measures: a demographics questionnaire, the Secondary Traumatic Stress Scale, the Connor-Davidson Resilience Scale, the Survey of Perceived Organizational Support, and the Fear of COVID-19 Scale. The demographics questionnaire asked participants their age, gender, years of nursing experience, type of employment, education level, the number of annual patient visits to the ED, and the size of the community where the ED is located (Appendix D). Data collection was anonymous as the demographics questionnaire did

not collect any identifying information from participants such as first or last name, birth date, home address, or hospital of employment.

Secondary traumatic stress was measured in this study using the Secondary Traumatic Stress Scale (STSS) (Appendix E). The STSS is a 17-item self-report instrument that specifically measures secondary traumatic stress among individuals working in helping professions (Bride et al., 2004). The STSS is the only instrument that specifically measures STS and not related concepts such as PTSD and CF (Beck, 2011). Therefore, the STS is the strongest instrument currently available for measuring STS among healthcare workers (Barré & Hooper, 2023). The STSS contains three subscales: avoidance, intrusion, and hyperarousal (Bride, 2007). The avoidance subscale is associated with items 1, 5, 7, 9, 12, 14, and 17 on the STSS (Bride, 2007). The intrusion subscale is associated with items 2, 3, 6, 10, and 13 on the STSS (Bride, 2007). The hyperarousal subscale is associated with items 4, 8, 11, 15, and 16 on the STSS (Bride, 2007). Respondents using the STSS indicated how often they experienced each item in the last seven days, with answers ranging from 1 to 5 (1=never, 2=rarely, 3=occasionally, 4=often, 5=very often) (Bride et al., 2004; Duffy et al., 2015). If a participant selected a response of “occasionally”, “often”, or “very often” on the STSS, it is considered a symptom experienced by the respondent (Bride, 2007). The STSS is scored by summing each response to generate a total score between 17 and 85 (Bride et al., 2004). Dominguez-Gomez and Rutledge (2009) found an overall Cronbach alpha coefficient of 0.91, and Cronbach alpha coefficients of 0.92 for each of three subscales when using the STSS in a sample of emergency department nurses, indicating this scale has excellent internal consistency for this study population. Similarly, Wolf et al. (2020) reported an overall Cronbach alpha coefficient of 0.93 when using the STSS in subsequent study of STS among ED nurses. Additionally, the STSS has shown high reliability,

and excellent convergent and discriminatory validity when used in the nursing population (Kellogg et al., 2018). Bride (2007) created categories using total STSS scores to determine the severity of STS experienced by an individual. A total STSS score of <28 indicates no/low STS, scores from 28-37 indicate mild STS, scores from 38-43 indicate moderate STS, scores from 44-48 indicate high STS, and scores ≥ 49 indicate severe STS. In this study, the primary aim is to use the STSS to determine the prevalence of STS among a sample of ED nurses. As recommended by Bride (2007), in this study a cut off score of ≥ 38 was used to determine the presence of STS. This cut off score is associated with a sensitivity of 0.93 and specificity of 0.91 (Bride, 2007).

An 8-item version of the Survey of Perceived Organizational Support (SPOS), which was developed by Eisenberger et al. (1986), was used to measure nurses' perceptions of the organizational support provided by their employer (Appendix F). The SPOS is a unidimensional self-report scale that uses a 7-point Likert scale ranging from 0 (strongly disagree) to 6 (strongly agree) to assess the degree of perceived organizational support (Maan et al., 2020). The 8-item SPOS is scored by adding the responses to each question, to produce a score that ranges from 0 to 48 (Robaee et al., 2018). A higher score on the SPOS is associated with a higher level of perceived organizational support (Peng et al., 2022). A total SPOS score can be interpreted as low (0-16), medium (17-32), and high (33-48) (El-Haddad et al., 2022). In previous studies, the 8-item SPOS has demonstrated good convergent and discriminant validity (Latimer et al., 2023). The 8-item SPOS has demonstrated good reliability, with a high internal consistency ($\alpha = 0.90$) in a reliability generalization study of 62 published studies (Khattak et al., 2021). Further, a high internal consistency has been reported when using this instrument in a sample of hospital nurses, as shown by a Cronbach alpha of 0.92 (Latimer et al., 2023), and Cronbach alpha of 0.87 (Labrague & De Los Santos, 2020).

In this study, resilience was measured using the Connor-Davidson Resilience Scale (CD-RISC) (Appendix G). While the CD-RISC was originally created as a 25-item scale, the factor structure of this version was found to be unstable across studies and cultural groups (Hébert et al., 2018). Therefore, a brief 10-item version of the CD-RISC was created by Campbell-Sills and Stein (2007), which is the CD-RISC instrument used in this study. The 10-item CD-RISC uses a 5-point Likert scale, in which responses range from not true at all (0) to true nearly all the time (4) (Mealer et al., 2016). The 10-item CD-RISC is scored by summing responses to each item, generating a score that ranges from 0 to 40, with a higher score indicating greater resilience (Aloba et al., 2016). After summing all 10 items, the level of resilience can be interpreted as low (0-29), moderate (30-36), or high (37-40) (Campbell-Sills et al., 2009; Davidson, 2022; Elkudssiah Ismail et al., 2022). As the CD-RISC been shown to have strong psychometric properties, including high construct validity and item-total correlations, it is one of the best measures of resilience (Hébert et al., 2018; Rogers et al., 2022). Finally, the 10-item CD-RISC has a high internal consistency in a sample of Canadian nurses ($\alpha= 0.89$) (Ang et al., 2018b) and in a sample of hospital nurses ($\alpha= 0.89$) (Ang et al., 2018a).

COVID-19 fear was measured in this study using the Fear of COVID-19 Scale (FCV-19S) (Appendix H). The FCV-19S is a unidimensional, 7-item Likert scale instrument that was created by Ahorsu et al. (2020). This scale measures the amount of fear an individual feels regarding COVID-19, with a higher score indicating a higher level of COVID-19 fear (Ahorsu et al., 2020). The FCV-19S is scored by summing the responses to each item to produce a score that ranges from 7 to 35 (Ahorsu et al., 2020). Then, the FCV-19S scores can be interpreted as mild fear (7-19), moderate fear (20-26), and severe fear (27-35) (Faro et al., 2022). The FCV-19S has been found to have excellent construct validity (Satici et al., 2022). In addition, the FCV-19S has

demonstrated high internal consistency in a sample of ED nurses ($\alpha=0.92$) (Ahorsu et al., 2022), and in a sample of Canadian nurses ($\alpha=0.92$)(Gélinas et al., 2021).

Ethics

This study received approval by York University's Research Ethics Board on November 25, 2022. At the beginning of the Qualtrics survey, a study information sheet and a consent form were provided. The consent form advised participants of aims of the study and potential risks and benefits, and that their consent must be informed, voluntary, and ongoing. Participants were informed that they could withdraw from the study at any time by closing the Qualtrics tab on their internet browser and not submitting their responses. The end of the consent form had a mandatory question asking participants for consent to participate in the study. Use of a signature to indicate informed consent was not used, to help maintain participant anonymity. Participants who did not consent to participate in the study were unable to continue in the survey and were advised to exit the survey by closing the Qualtrics tab in their internet browser. Qualtrics automatically generated a unique identification code for participant, which helped ensure participant confidentiality and anonymity. IP addresses and location data were not collected by the researcher in this study, to maintain the anonymity of participants. However, the informed consent form emphasized that as the host of the survey, Qualtrics may automatically collect participant information, though this information will not be used or saved by researchers. Additionally, the informed consent document emphasized that confidentiality and privacy of data cannot be guaranteed with internet surveys, due to the potential for access by third parties. Qualtrics uses Transport Layer Security (TLS) encryption for all transmitted data, which follows the Information and Privacy Commissioner of Ontario [IPCO] best practice guidelines for survey research (IPCO, 2015). The topic of secondary traumatic stress or answering questions about this

topic may bring up traumatic emotions or memories for participants. Therefore, the study information sheet included a list of mental health resources participants could access if they experienced psychological distress or discomfort. Further, a list of mental health resources was included in the consent form at the beginning of the survey and at the end of survey. At the end of the survey, participants who wanted to be entered into the gift card draw were directed to a Google forms page, where they entered their email address. Participants did not have to sign into a Google account to access the form, to protect anonymity and minimize the amount of personal data collected. The list of participant email addresses was downloaded from Google forms and stored in a password protected Word document. Study data was stored in password-protected hard drive and only the lead researcher and supervisor had access to this information. Data will be kept until May 2028; at which time it will be destroyed by reformatting the hard drive.

Statistical Analyses

All analyses for this study were conducted using SPSS version 29.0. Two-tailed testing and a 95% confidence interval was used for all statistical analyses conducted in this study. Statistical significance was achieved if the p-value was ≤ 0.05 . The data collection tools used in this study were the STSS, SPOS, CD-RISC, and FCV-19S, which are all ordinal instruments. However, as all these tools are Likert scale measures, there is a precedent for the results to be analyzed as ratio data (Polit & Beck, 2021a). In this study, individual scores from all four Likert scale tools were reported as the overall score obtained from the scale. Mean scores, standard deviations, percentages, and confidence intervals were calculated for each measurement tool.

The nominal demographic variables in this study were gender, education level, and employment status. The descriptive statistics used for the nominal independent variables were mode, percentages, and frequency distribution tables. The ratio demographic variables in this

study were age, years of nursing experience, annual number of ED visits, population of the community where the ED of employment was located, STS, resilience, perceived organizational support, and COVID-19 fear. The descriptive statistics used for the ratio variables were means and standard deviations.

Simple and multiple linear regression analyses were conducted to produce a predictive analysis of what factors were most reliable in predicting the presence of STS. In every regression model, STS was the dependent variable. The independent predictor variables for the linear regression were the personal and organizational factors discussed in the literature review, as well as the demographic variables collected in this study. Overall, the independent variables used in the regression model were age, gender, years of nursing experience, education level, employment status, annual ED visits, population of community where ED is located, resilience, organizational support, and fear of COVID-19. A total of ten simple linear regressions were conducted to determine the relationship between STS with each of the independent variables. In addition, one multiple linear regression was conducted to determine the association between STS and the ten independent predictor variables. The predictive strength of the multiple regression model was determined by analyzing the computed coefficient of determination and interpreting the regression coefficients for each independent variable. The unstandardized beta coefficients, 95% confidence intervals, and p-values were reported for the simple and multiple linear simple regression analyses.

Chapter 4: Results

Sample Demographics

The total sample size for this study was 119 participants. The Qualtrics survey was opened 325 times but only collected 119 responses, producing a response rate of 37%. Overall, 85.7% (n=102) of the participants were female. The age of participants ranged from 22 to 78 years, with an average age of 38.7 years (SD= 11.5). The employment status for most participants was full time (73.1%), followed by part time (17.6%), casual (7.6%), and other (1.7%). The other employment status was reported was a job share role for one participant, and not specified by the other participant. Overall, 70.6% of participants reported a bachelor's degree as their highest level of nursing education. The mean nursing experience was 13.6 years (SD= 12.0), with a range from 7 months to 59 years. Sample demographics are detailed in Table 1.

Table 1 - Demographic Characteristics of Emergency Department Nurses (n=119)

| | Mean (SD) | Frequency (%) | Range |
|-----------------------------------|---------------|---------------|-------------|
| Age (years) | 38.72 (12.12) | | 22.0 – 78.2 |
| Nursing experience (years) | 13.68 (12.04) | | 0.58 – 59.0 |
| Gender | | | |
| Male | | 16 (13.4) | |
| Female | | 102 (85.7) | |
| Non-binary/third gender | | 1 (0.8) | |
| Employment Status | | | |
| Full time | | 87 (73.1) | |
| Part time | | 21 (17.6) | |
| Casual | | 9 (7.6) | |
| Other | | 2 (1.7) | |
| Education Level | | | |
| Diploma | | 26 (21.8) | |
| Bachelor's Degree | | 84 (70.6) | |
| Master's Degree | | 9 (7.6) | |

The mean total STSS score in this study was 50.80 (SD= 10.97), with scores ranging from 17 to 76. The STSS produces individual scores that range from 17 to 85, where a higher score indicates a higher level of secondary traumatic stress. The mean STSS score in this study

of 50.80 falls within the category of severe STS, based on the Bride (2007) classification criteria. The mean score for organizational support in this study was 23.96, with a range from 0 to 31. The SPOS produces a total score that can range from 0 to 48, with a higher score indicating a higher level of perceived organizational support. A mean SPOS score of 23.96 can be categorized as moderate levels of organizational support (El-Haddad et al., 2022). In this study, 96.6% of participants reported moderate organizational support, and 3.4% reported low organizational support. Based on the SPOS scores, no participants reported high levels of organizational support. The mean score for resilience was 27.93, and responses ranged from 15 to 40. The CD-RISC produces total scores that range from 0 to 40, with a higher score indicating a higher level of self-reported resilience. A mean CD-RISC score of 27.93 can be interpreted as a low level of resilience (Campbell-Sills et al., 2009; Davidson, 2022; Elkudssiah Ismail et al., 2022; Notario-Pacheco et al., 2011). Overall, most participants in this study reported experiencing low resilience (60.5%). Less than half of participants reported moderate resilience (32.85%), and few reported high resilience (5.9%). The mean score for COVID-19 fear was 12.71, and scores ranged from 7 to 31. The FCV-19S produces total scores that range from 7 to 35, where a higher score indicates a higher level of COVID-19 fear. A mean FCV-19S score of 12.71 can be interpreted as low COVID-19 fear (Faro et al., 2022). Most participants in this study reported low COVID-19 fear (89.1%), while few reported moderate COVID-19 fear (9.2%), and high COVID-19 fear (1.7%). Results related to STS and the STSS are further discussed in the following sections. These results of these scales are further detailed in Table 2.

Table 2- *Personal & Organizational Factors of Emergency Department Nurses*

| | Mean (SD) | Minimum - Maximum |
|-----------------------------------|------------------|--------------------------|
| Secondary Traumatic Stress | 50.80 (10.97) | 17 - 76 |
| Organizational support | 23.96 (3.72) | 8-31 |
| Resilience | 27.93 (5.37) | 15-40 |
| COVID-19 Fear | 12.71 (5.25) | 7-31 |

Data Cleaning, Missing Data, & Multicollinearity

In this study, data was missing from six variables: SPOS (1.7%), CD-RISC (2.5%), age (2.5%), FCV-19S (3.4%), population of community where ED is located (15.1%), and annual number of ED visits (36.1%). There were no partially completed scales in this study, as the participants missing data for the SPOS, CD-RISC, and FCV-19S survey tools omitted responses to every item on the specific scale. For example, the two participants missing data for the SPOS did not input any responses to any of the 10-items for the SPOS. Overall, 57.98% of participants (n=69) fully completed the questionnaire, while 42.02% (n=50) were missing information for at least one variable. The variable with the highest percent of missing data was the annual number of ED visits, which was missing 36.1% of total data (n=43). When more than 10% of data for a variable is missing, the statistical analysis is likely to produce biased results (Bennett, 2001; Dong & Peng, 2013). Additionally, missing data can decrease the statistical power of a study and reduce generalizability of results (Kang, 2013). When the amount of missing data for a secondary variable is >10%, it is acceptable to exclude that variable from statistical analysis (Sainani, 2015). Further, it has been reported that any variable missing >15% of data should be dropped (Fox-Wasylyshyn & El-Masri, 2005). As the variables annual number of ED visits and population of community where ED is located were both missing >15% of case data and were secondary variables, both variables were dropped and not included in statistical analyses.

Before selecting a method to handle missing data, it is important to determine the pattern of missingness (Cismondi et al, 2013). To determine the pattern of missingness in this study, Little's MCAR test was completed. This test provides a single chi-square statistic to determine whether data is missing completely at random (MCAR) (Nicholson et al., 2016). This test has been found to be very stable with both large and small sample sizes and helps reduce type I

errors (Kim & Bentler, 2002; Little, 1988). When data is MCAR, there is less impact on statistical inferences and the data analysis remains unbiased (Dong & Peng, 2013; Kang, 2013). In Little's MCAR test, a significance level of >0.05 leads to acceptance of the null hypothesis that data is missing completely at random. The Little's MCAR test performed in this study produced a p-value 0.844. Therefore, the null hypothesis is accepted and data in this study are missing completely at random.

When the number of partial respondents in a study is $\geq 10\%$, use of maximum likelihood methods, such as expectation-maximization (EM), is recommended (Newman, 2014). As the number of partial respondents in this study was 42.02%, EM was used to handle missing data. EM uses maximum likelihood methods to generate summary estimates, which are imputed for missing variables and used for statistical analyses (Kang, 2013; Newman, 2014). This method is unbiased when data is MCAR (Enders & Peugh, 2004; Newman, 2014). EM produces results with substantially lower bias and error than methods such as listwise deletion, pairwise deletion, or mean substitution (Musil et al., 2002; Newman, 2014). The EM method is simple and robust tool that has been found to help maximize statistical power and produces accurate estimates of coefficient alpha (Do & Batzoglou, 2008; Enders & Peugh, 2004; Nicholson et al., 2016).

In this analysis, normality of variables was determined using the central limit theorem and the Kolmogorov–Smirnov test. According to the central limit theorem, a larger sample size results in sample means that are more normally distributed (Kwak & Kim, 2017). When a sample size is ≥ 30 , the central limit theorem is applied, and it is assumed that all variables are normally distributed (Kellar & Kelvin, 2013). As the sample size in this study was $n=119$, the central limit theorem is applicable, and normal distribution is assumed. Additionally, the Kolmogorov–Smirnov (K-S) test was used to assess the normality of each variable. The K–S test is the

preferred normality test when a study has a sample size of ≥ 50 (Mishra et al., 2019). As the null hypothesis for the K-S test is data is normally distributed, when a variable has a p-value of >0.05 , that variable is considered normally distributed (Mishra et al., 2019). Every variable had a p-value > 0.05 in the K-S test, therefore it is assumed that all study variables are normally distributed. Therefore, statistical analysis in this study was conducted using parametric tests.

Finally, a statistical analysis of the multicollinearity between independent variables in the multiple regression model was conducted using the Variance Inflation Factor. In the multiple regression model, the Variance Inflation Factor (VIF) was highest for age (VIF= 5.1) and years of nursing experience (VIF= 5.3) (Appendix I). The VIF for all other independent variables was below 2.0, with the VIF for COVID-19 fear reported as 1.1. When a VIF is >10 , the collinearity between variables is considered extremely high, leading to problematic and poorly estimated results (Aminu & Shariff, 2014; Ferré, 2009; Marcoulides & Raykov, 2019). Therefore, can be assumed that multicollinearity did not significantly impact the independent variables or the results of the multiple regression analysis.

Prevalence & Severity of STS in ED Nurses

The primary aim of this study was to determine the prevalence of STS from a sample of ED nurses working in Ontario. Overall, 91.6% (n= 109) of participants met the criteria for the presence of secondary traumatic stress, as determined by a total score of ≥ 38 on the STSS (Bride, 2007). Overall, only 10 participants had total STSS scores that did not indicate the presence of STS. More than half of the participants (60.5%) indicated they were experiencing a severe level of STS, as determined by a total STSS score of ≥ 49 . Only 2.5% of participants were experiencing little to no STS. As the entire STSS was completed by all participants, there was no missing data for this variable. The prevalence and severity of STS are further detailed in Table 3.

Table 3 – Prevalence & Severity of STS in ED Nurses

| | Frequency (n) | % |
|-------------------|---------------|------|
| Prevalence | | |
| STS Present | 109 | 91.6 |
| STS Absent | 10 | 8.4 |
| Severity | | |
| Little or no STS | 3 | 2.5 |
| Mild STS | 7 | 5.9 |
| Moderate STS | 19 | 16 |
| High STS | 18 | 15.1 |
| Severe STS | 72 | 60.5 |

Note: n= 119

STS Symptoms & ED Nurses

Overall, 98.3% (n=117) participants in this study reported experiencing at least one STS symptom in the past week. The STS symptoms most frequently experienced in this study were “I felt emotionally numb” and “I was easily annoyed”, with both reported by 84.9% of participants. Other frequently reported STS symptoms were “I thought about my work with patients when I didn’t intend to” (80.7%), and “I was less active than usual” (75.6%). The least common STS symptom in this study was “I avoided people, places, or things that reminded me of my work with patients”, which was reported by 46.2% of participants. Other infrequently endorsed STS symptoms were “I felt jumpy” (47.1%), “I noticed gaps in my memory about patient sessions” (47.1%), and “I had disturbing dreams about my work with patients” (49.6%). The most frequently experienced symptoms were associated with the arousal subscale, followed by the avoidance and intrusion subscales, respectively. Overall, 97.5% (n=116) of participants experienced at least one arousal symptom in the last seven days. Further, 96.6% (n=115) of participants experienced at least one avoidance symptom, and 91.6% (n=109) experienced at

least one intrusion symptoms in the last week. The most common arousal symptom in this study was “I felt easily annoyed” (84.9%), while “I felt jumpy” (47.1%) was the least reported symptom on the arousal subscale. The most common symptom on the avoidance subscale was “I feel emotionally numb” (84.9%), while the least endorsed avoidance symptom was “I avoided people, places, or things that reminded me of my work with patients” (46.2%). On the intrusion subscale, having intrusive thoughts about patients was the most common symptom (80.7%), while having disturbing dreams about patients was reported infrequently (49.6%). STS symptom frequency is further detailed in Table 4.

Table 4 - Frequency of STS Symptoms

| STSS Subscales (Item #) | n (%) |
|--|------------|
| <i>Intrusion (5 items)</i> | |
| My heart started pounding when I thought about my work with patients (2) | 70 (58.8) |
| It seemed as if I was reliving the trauma(s) experienced by my patient(s) (3) | 60 (52.1) |
| Reminders of my work with patients upset me (6) | 82 (68.9) |
| I thought about my work with patients when I didn't intend to (10) | 96 (80.7) |
| I had disturbing dreams about my work with patients (13) | 59 (49.6) |
| <i>Avoidance (7 items)</i> | |
| I felt emotionally numb (1) | 101 (84.9) |
| I felt discouraged about the future (5) | 88 (73.9) |
| I had little interest in being around others (7) | 89 (74.8) |
| I was less active than usual (9) | 90 (75.6) |
| I avoided people, places, or things that reminded me of my work with patients (12) | 55 (46.2) |
| I wanted to avoid working with some patients (14) | 88 (73.9) |
| I noticed gaps in my memory about patient sessions (17) | 56 (47.1) |
| <i>Arousal (5 items)</i> | |
| I had trouble sleeping (4) | 88 (73.9) |
| I felt jumpy (8) | 56 (47.1) |
| I had trouble concentrating (11) | 87 (73.1) |

| | |
|---|------------|
| I was easily annoyed (15) | 101 (84.9) |
| I expected something bad to happen (16) | 87 (73.1) |

Personal and Organizational Factors & STS

The secondary aim of this study was to determine if a relationship existed between personal and/or organizational factors and secondary traumatic stress. As a result, both simple linear regression and multiple linear regression analyses were conducted. In all regression models, STS was the dependent variable, while the demographic and organizational factors collected in the study were the independent variables. The eight independent variables included in these analyses were age, gender, years of nursing experience, employment status, education level, resilience, organizational support, and COVID-19 fear.

The simple linear regression analyses found that only resilience and COVID-19 fear were significant predictors of STS. Resilience was negatively associated with STS ($\beta = -0.83$, $p < 0.001$), as every 1 unit increase in resilience corresponded to a 0.83 unit decrease in STS. Resilience explained 16.6% of the variation in STS scores and was significant at the $p < 0.05$ level ($F = 23.28$, $p = < 0.001$). Fear of COVID-19 was positively associated with STS ($\beta = 0.39$, $p = 0.041$), as every 1 unit increase in COVID-19 fear produced a 0.39 unit increase in STS. Fear of COVID-19 explained 3.5% of the variation in STS scores and was significant at the $p < 0.05$ level ($F = 4.28$, $p = 0.041$). Both age and years of nursing experience were inversely related to STS, as both higher age or more years of experience were associated with a lower STS score. However, the association between STS and both age ($p = 0.328$) and years of nursing experience ($p = 0.233$) did not reach statistical significance. The STS scores among females was higher than males on average, though this was not statistically significant ($p = 0.730$). Further, nurses holding a Bachelor's or Master's degree had lower STS scores than diploma nurses on average, though this

relationship was not statistically significant ($p=0.384$). Nurses who worked full time had on average lower STS scores than nurses who worked casual or part time, though this association did not reach statistical significance ($p= 0.845$). Finally, organizational support was positively associated with STS, whereas higher perceived organizational support resulted in higher STS scores. However, the relationship between organizational support and STS was not statistically significant ($p= 0.685$). The results of the simple linear regression are detailed in Table 5.

Table 5- *Simple Linear Regression Analysis of STS Predictors*

| Independent Variable | Beta (SE) | R² | P-value | 95% CI |
|---|------------------|----------------------|-------------------|---------------|
| Age | - 0.082 (0.083) | 0.008 | 0.328 | -2.47 – 0.083 |
| Gender (female - yes/no) | 1.0 (2.885) | 0.01 | 0.730 | -4.71 – 6.71 |
| Years of Experience | -0.10 (0.084) | 0.012 | 0.233 | -2.66 – 0.065 |
| Education Level (diploma- yes/no) | -2.13 (2.437) | 0.006 | 0.384 | -6.95 – 2.70 |
| Employment Status (full time – yes/no) | -0.45 (2.278) | 0.00 | 0.845 | -4.96 – 4.06 |
| Resilience | -0.83 (0.172) | 0.166 | <0.001* | -1.17 – -0.49 |
| Organizational Support | 0.11 (0.272) | 0.001 | 0.685 | -0.43 – 0.65 |
| COVID-19 Fear | 0.39 (0.190) | 0.035 | 0.041* | 0.017 – 0.77 |

Note: * = P -value <0.05 ; dependent variable: total STS score

Additionally, a multiple linear regression analysis was run to examine the association between all eight predictor variables and secondary traumatic stress. The overall model predicted 23.4% of the variation in STS scores and was statistically significant at the $p <0.05$ level ($F= 4.21$, $p= <0.01$). As was found in the simple linear regression, in the multiple linear regression resilience had an inverse relationship to STS. In the multiple linear regression model for each 1 unit increase in resilience, the STS score was predicted to decrease by 0.88 units. This negative association between resilience and STS was statistically significant at the $p <0.05$ level ($F= 4.32$, $p <0.001$). However, while COVID-19 fear was significantly associated with STS in the simple linear regression model ($p= 0.041$), this variable failed to reach significance in the multiple linear

regression model ($p= 0.176$). Except for resilience, none of the independent variables included in the multiple regression model were statistically significantly associated with STS. The results of the multiple linear regression analysis are further detailed in Table 6.

Table 6- *Multiple Linear Regression Analysis of STS Predictors*

| Independent Variables | Beta (SE) | P-value | 95% CI |
|---|-------------------|-------------------|---------------|
| Age | -0.012 (0.171) | 0.944 | -0.35 – 0.33 |
| Gender (female - yes/no) | -0.27 (2.695) | 0.920 | -5.6 – 5.07 |
| Years of Experience | -1.65 (0.175) | 0.348 | -0.51 – 0.18 |
| Education Level (diploma- yes/no) | -4.17 (2.895) | 0.153 | -9.9 – 1.57 |
| Employment Status (full time – yes/no) | -1.80 (2.208) | 0.417 | -6.17 – 2.58 |
| Resilience | -0.88 (0.185) | <0.001* | -1.25 – -0.52 |
| Organizational Support | 0.33 (0.261) | 0.216 | -0.19 – 0.84 |
| COVID-19 Fear | 0.25 (0.182) | 0.176 | -0.13 – 0.61 |
| <i>Overall Model Results</i> | | | |
| F-test | 4.21 | | |
| Significance Level | <0.001* | | |
| R ² | 0.234 | | |

Note: * = P -value <0.05 ; dependent variable was total STS score; $n=119$

Chapter 5: Discussion

Secondary traumatic stress (STS) is an emotional, physical, or psychological reaction that can develop after an individual is indirectly exposed to a traumatized person or a traumatic event in a professional environment (Arnold, 2020). As exposure to traumatic events, such as patient morbidity and mortality, are significant risk factors for STS development, STS may be an occupational hazard for nurses (Adriaenssens et al., 2012; Beck, 2011). Nurses in the emergency department (ED) are especially susceptible to STS as their exposure to traumatized patients is often higher than nurses working in other units (Adriaenssens et al., 2012; Gates & Gillespie, 2008). Additionally, the ED is a stressful, fast-paced environment that is physically and psychologically taxing for nursing staff (Ratrouf & Hamdan-Mansour, 2017). However, to date no research has been published regarding STS prevalence and/or factors associated with STS development among Ontario ED nurses. Therefore, the purpose of this study was to determine the prevalence of STS among registered nurses working in Ontario EDs, and to determine if personal and/or organizational factors are associated with the presence of STS.

Summary of Key Findings

The findings indicate that an extremely high proportion of emergency department nurses working in Ontario are experiencing secondary traumatic stress. In this study, 91.6% of ED nurses were experiencing STS. Additionally, 75.6% of participants in this study reported their level of STS as either high or severe. Overall, almost every participant (98.3%) endorsed experiencing at least one STS symptom in the past seven days. The most commonly reported STS symptoms in this study were feeling emotionally numb and being easily annoyed, while the least reported STS was avoiding places or people that reminded one of work. The results of the simple linear regression found that age, gender, years of nursing experience, education level,

employment status, and organizational support were not associated with STS. However, fear of COVID-19 and resilience were both significantly associated with STS in the simple linear regression. Fear of COVID-19 was positively associated with STS, whereas a higher level of COVID-19 fear resulted in a significant increase in STS scores. On the other hand, resilience was negatively associated with STS, as participants reporting higher resilience had significantly lower STS scores. However, when the multiple linear regression was performed, resilience was the only factor that was statistically significant. Overall, the results of this study found that for ED nurses' resilience is significantly and inversely correlated with STS.

Discussion & Interpretation of Results

STS Prevalence & Severity

The results of this study suggest that an extremely high rate of ED nurses in Ontario are experiencing secondary traumatic stress, which was the primary study aim. In this study, the prevalence of STS among ED nurses was 91.6%, which is higher than the STS prevalence reported in previous studies. Previous studies that investigated STS prevalence among emergency department nurses found an STS prevalence of 70% to 76% (Duffy et al., 2015; Ratrouf & Hamdan-Mansour, 2020; Wolf et al., 2020). Additionally, previous studies that investigated the STS prevalence among hospital nurses, including ED nurses, reported STS prevalence rates of 80.5% (Erkin et al., 2021), 74.6% (İlhan & Küpeli, 2022), and 84.4% (Woo & Kim, 2021). The STS prevalence rate in the Erkin et al. (2021) and Woo and Kim (2021) studies was similar to the findings in this study and higher than the prevalence reported in the other previous studies. In the Erkin et al. (2021) study, more than half of participants (53%) were ED nurses. However, in the study by Woo and Kim (2020) 70% of participants worked in the ICU. Therefore, though Woo and Kim (2020) reported the closest STS prevalence to the rate in

this study using the same measurement tool and diagnostic criteria, most participants in their study worked in ICU, which differs from the practice setting of all participants in this study. Despite an extensive literature search, no previous studies reporting an STS prevalence of >90% for ED nurses and using the same measurement tool and diagnostic criteria was identified.

The results from this study suggest that the degree of STS experienced by ED nurses in Ontario is severe. Overall, 60.5% of ED nurses in this study were found to be experiencing a severe level of STS. The severity of STS among ED nurses in this study is higher than the 40% to 48% reported in previous studies of ED nurses (Ratrout & Hamdan-Mansour, 2020; Wolf et al., 2020). In the study of STS among hospital nurses, including ED nurses, by Erkin et al. (2021) the frequency of severe STS reported in studies of, was 56.6%, which was closer to the frequency found in this study.

The higher prevalence and severity of STS found in this study may be related to the increased stress and traumatization experienced by ED nurses due to the COVID-19 pandemic. Data collection for the studies of STS in ED nurses by Duffy et al. (2015), Ratrout and Hamdan-Mansour (2020), and Wolf et al. (2020) were all conducted before the COVID-19 pandemic was announced by the World Health Association (WHO) on March 11, 2020 (WHO, 2020a). Data collection for this study occurred between March and June 2023, while the study by Erkin et al. (2021), which reported a similar prevalence and severity of STS, collected study data from June to August 2020. Research on mental health outcomes of healthcare workers following Middle Eastern Respiratory Syndrome (MERS) and Severe Acute Respiratory Syndrome (SARS) demonstrated that the prevalence of STS among healthcare workers increased during an infectious disease outbreak (Khattak et al., 2021). Therefore, an increase in STS prevalence and severity due to COVID-19 was anticipated, due to the adverse impact of the pandemic on nurses'

mental health (Kellogg, 2020). Further, the pandemic has led to higher nurse-to-patient ratios and deteriorating working conditions for nurses (CFNU, 2021). Additionally, a survey by Statistics Canada (2021) noted that 96% of nurses reported their worsening mental health was caused by increased workplace demands during the COVID-19 pandemic. The COVID-19 pandemic put immense pressure on both the healthcare system and individual healthcare providers due to constantly changing organizational policies, a lack of resources, including face masks, and increased workloads, with nurse-to-patient ratios tripling in some settings (Connelly et al., 2023; ICN, 2021; Maiorano et al., 2020; Tomblin Murphy et al., 2022). Though this study and the study by Erkin et al. (2021) were both conducted during the COVID-19 pandemic, the STS prevalence found in this study was 11% higher. The reason for the higher STS prevalence in this study may be due to differences in the experience of the COVID-19 pandemic among the Canadian nurses in this study and Turkish nurses in the Erkin et al. (2021) study. Compared to Turkey, Canada had a higher case fatality rate and a higher rate of deaths per 100,000 of the population during the COVID-19 pandemic (Johns Hopkins, 2023). Previous studies have indicated that repetitive exposure to patient deaths may contribute to a higher risk of STS development (Adriaenssens et al., 2012; Vagni et al., 2020a). Therefore, it is possible the higher COVID-19 mortality rate in Canada contributed to the higher STS prevalence reported in this study of Canadian nurses compared to the findings by Erkin et al. (2021). Overall, the high prevalence and severity of STS identified in this study may be related to the more demanding work conditions and increased psychological caused by the COVID-19 pandemic.

Further, the increased prevalence and severity of STS reported in this study may be due to the inclusion of only ED staff nurses who provided direct, frontline care to patients. Previous research has found that risk factors for STS development includes direct patient contact and

being a frontline healthcare worker (De Brier et al., 2020). In addition, more exposure to and closeness with traumatized patients, such as required by a frontline nurse, is associated with higher rates of STS among nurses (Barleycorn, 2019; Orrù et al., 2021; Ratrout & Hamdan-Mansour, 2017; Vagni et al., 2020b). Previous studies of STS among ED nurses (Duffy et al., 2015; Wolf et al., 2020) which reported lower levels of STS included participants such as clinical nurse managers, clinical nurse educators, and nurse directors. Duffy et al. (2015) noted that the prevalence of STS was significantly higher among staff nurses was than clinical nurse managers. This finding was supported by Karanikola et al. (2022), who reported that nurses in leadership roles were significantly less vulnerable to STS than frontline nurses.

In particular, nurses working on the front lines, in particular ED nurses, have a higher risk of developing STS during the COVID-19 pandemic as they experienced continuous stress (Labrague & De Los Santos, 2021), high patient morbidity and mortality (Said & El-Shafei, 2021), a lack of personal protective equipment (Maiorano et al., 2020), and fear of becoming infected or infecting loved ones (Vagni et al., 2020a). Further, the prevalence of STS among all healthcare workers has increased during the COVID-19 pandemic (Orrù et al., 2021; Yörük et al., 2022). Therefore, the increased STS prevalence reported in this study is consistent with other studies conducted during the COVID-19 pandemic (Orrù et al., 2021; Yörük et al., 2022).

Symptoms Associated with STS

STS symptoms were extremely common among nurses working in the emergency department, as 98.3% of participants in this study experienced at least one STS symptom in the last week. The frequency of participants experiencing at least one STS symptom in the past week in this study was higher than was reported in studies of ED nurses prior to the COVID-19 pandemic. Dominguez-Gomez and Rutledge (2009) and Morrison and Joy (2015) previously

investigated the prevalence of STS among emergency department nurses, using the same measurement tool as was utilized in this study. In these studies, the reported frequency of nurses experiencing at least one STS symptom in the last week was 85% (Dominguez-Gomez & Rutledge, 2009) and 75% (Morrison & Joy, 2015). However, Erkin et al. (2021) found 96.6% of nurses reported at least one STS symptom in the previous week, similar to the rate to the 98.3% found in this study. The high frequency of STS symptomology noted in this study and by Erkin et al. (2021) is likely related to the COVID-19 pandemic. The COVID-19 pandemic has led to an increase in the trauma exposure of individuals in helping professions, resulting in a higher frequency of STS symptoms (Orrù et al., 2021; Whitt-Woosley et al., 2022). Similarly, other studies have reported that nurses have experienced increased psychological distress during the pandemic, due to their frequent exposure to traumatized patients, an increased workload, and higher job stress (İlhan & Küpeli, 2021; Labrague & De Los Santos, 2021; Lin et al., 2020; Moussa et al., 2021). Therefore, the higher prevalence of STS symptoms among ED nurses reported in this study was expected, as data collection occurred during the COVID-19 pandemic.

Though the frequency of STS symptoms was higher in this study than many previous studies, there were similarities in terms of which STS symptoms were most commonly reported by ED nurses. In both this study and Dominguez-Gomez and Rutledge (2009), the most commonly reported STS symptom by ED nurses was “I felt easily annoyed.” However, the rate at which this symptom was 30% higher in the current study compared to Dominguez-Gomez and Rutledge (2009). The frequency of other STS symptoms in this study was very similar to previous findings by Erkin et al. (2021), as both studies reported the same rate for the STS symptoms “I had little interest in being around others” and “I was less active than usual.” Overall, the frequency of all seventeen STS symptom in this study was higher than reported in

the studies by Dominguez-Gomez and Rutledge (2009), Morrison and Joy (2015). Further, the frequency of STS symptoms in this study was higher than the rate reported by Duffy et al. (2015) for all STS symptoms except one. As these studies were all conducted prior to 2020, it is possible the increased stress due to the COVID-19 pandemic has led to more ED nurses experiencing STS symptoms, leading to an increased STS symptom frequency in this study.

The STS symptoms reported in this study were further analyzed based on the three STSS subscales: avoidance, arousal, and intrusion. The results of this study are similar to the studies by Dominguez-Gomez and Rutledge (2009), Duffy et al. (2015), Morrison and Joy (2015), and Ratrou and Hamdan-Mansour (2020), which all found intrusive thoughts about patients as the most common symptom on the intrusion subscale reported by ED nurses. Additionally, Duffy et al. (2015), Morrison and Joy (2015), and Ratrou and Hamdan-Mansour (2020) all reported that having dreams about patients was the least frequent intrusion symptom, which was also found in this study. For the arousal subscale, the results from this study aligned with results by Dominguez-Gomez and Rutledge (2009) and Duffy et al. (2015). In these two studies, ED nurses reported being easily annoyed as the most common arousal symptom and feeling jumpy as the least common arousal symptom. For the avoidance subscale, the results from this study differed from the previous studies of ED nurses by Duffy et al. (2015), Morrison and Joy (2015) and Ratrou and Hamdan-Mansour (2020). In these previous studies, the most commonly avoidance symptom was feeling discouraged about the future. In this study the most frequently reported symptom on the avoidance subscale was feeling emotionally numb. However, in the studies by Duffy et al. (2015) and Morrison and Joy (2015) feeling emotionally numb was the second and third most frequently reported avoidance symptom among ED nurses, respectively. The increased reporting of the symptom "I felt emotionally numb" in this study may be related the

COVID-19 pandemic. The COVID-19 pandemic has led to an increase patient morbidity and mortality, which may cause psychological trauma for nurses (Alwesmi et al., 2022; Said & El-Shafei, 2021). The experience of high levels of psychological trauma in the context of depleted psychological reserves due to the pandemic can lead to emotional numbing (Alwesmi et al., 2022; Zhao et al., 2023). As a result, many studies conducted during the COVID-19 pandemic have found nurses frequently endorsing feeling emotionally numb (Foli et al., 2021; Ménard et al., 2023; Zhao et al., 2023). Overall, there were many similarities between the STS symptoms reported in this study and other studies conducted before and during the COVID-19 pandemic. This may suggest a global experience of STS among nurses, wherein the pattern of STS symptoms and reaction to traumatic experiences are similar, regardless of the cultural, organizational, or environmental context (Ratrouf & Hamdan-Mansour, 2020).

Personal and Organizational Factors & STS

The secondary aim of this study was to determine if personal and/or organizational factors are associated with the STS among ED nurses in Ontario. The factors examined in this study were demographic variables, resilience, COVID-19 fear, and organizational support. The findings of each variable will first be discussed and then the relationship of each variable and STS will be examined.

Sample Demographics

In this study, 85.7% of participants were female, and 13.7% of participants were male. Within the province of Ontario, females account for 91.4% of the RN workforce (CIHI, 2023). Though the proportion of female RNs in this study is slightly below the provincial rate, previous studies have found higher rates of male nurses working in high-acuity areas, including the emergency department (Shen et al., 2022; Zou et al., 2022). The median age of nurses in this

study was 38.72 years old. The median age of Ontario RNs is 44.3 years old, slightly higher than the mean age in this study (CIHI, 2023). However, this was expected as the age of emergency department nurses is often lower than the age of the general nursing population (Norful et al., 2023; Schumaker et al., 2019). Finally, 73.1% of participants in this study reported their employment status was full-time, which is similar to the provincial rate of 70.6% (CIHI, 2023).

Organizational Support, Resilience, and Fear of COVID-19

Overall, 96.6% of participants in this study reported a moderate level of organizational support in the emergency department. Further, the mean perceived organizational support scale (SPOS) score in this study was 23.96, which corresponds to a moderate level of perceived organizational support (El-Haddad et al., 2022). This mean organizational support score is similar to the results in studies by Ratrouf and Hamdan-Mansour (2020), El-Haddad et al. (2022), and Al-Hamdan and Bani Issa (2022). In all three of these nursing studies, on average nurses reported a moderate level of organizational support within their workplace. According to the Organizational Support Theory, one's perceived organizational support is based on the degree to which resources, encouragement, rewards, and communication are provided by the employer (Rhoades & Eisenberger, 2002). Rewards such as higher pay and more influence over organizational policies lead to higher perceived organizational support (Eisenberger et al., 1986). As a result of the COVID-19 pandemic, nurses experienced a lack of resources, including personal protective equipment, and poor communication and lack of information from hospitals regarding changing policies and procedures (Connelly et al., 2023; Sugg et al., 2023). However, encouragement was provided to Ontario nurses during the COVID-19 pandemic in the form of public support, such as banging pots and pans in the evenings to acknowledge healthcare workers. In addition, the Ontario government provided nurses with a temporary \$4 an hour wage

increase in 2020 due to the stress of the COVID-19 pandemic and a \$2,500 lump sum payment in 2022 as a retention incentive (Ontario, 2020; Ontario, 2022). Overall, the perceived organizational support reported in this study may be moderate as the positive impact of public support and salary increases may have been mitigated by the lack of resources and poor communication experienced during the COVID-19 pandemic. Previous research has indicated that perceived organizational support is lower amongst non-physician healthcare workers who are female and have less experience (Karanikola et al., 2022). As all participants were nurses and the majority were female, the moderate level of perceived organizational support reported in this study may be related to gender and/or employment as a nurse. Finally, perceived organizational support is strongly related to the degree to which an employee believes the actions and policies enacted by an organization are voluntary (Eisenberger et al., 1997). As Canada has a publicly funded healthcare system, many hospital policies and procedures are mandated by the Ontario Ministry of Health and Long-Term Care or external organizations, such as Public Health Ontario. For example, hospital infection control policies during the COVID-19 pandemic followed recommendations made by Public Health Ontario, and hospital funding in Ontario is decided by the provincial government. Further, as most Ontario hospitals are unionized, the wage grid for Ontario nurses is decided through a collective bargaining agreement between the Ontario Nurses Association and Ontario Hospitals Association. Therefore, many hospital policies in Ontario including hospital funding and nurse salaries are mandated by external organizations and not the individual hospital. As many policies are outside the control of an individual hospital, nurses believe these policies do not reflect whether a hospital's valuation of staff, leading to ambivalence regarding one's perceived organizational support (Shanock et al., 2019). Finally, in the context of a working environment the term perceived organizational support may be used to

refer to social support (Bonaiuto et al., 2022). However, social support consists of three unique dimensions: emotional support, practical support, and informational support (Greenglass et al., 1994). Emotional support refers to morale boosting and being a confidante, practical support refers to aiding with completion of a task; and informational support refers to offering facts or information (Greenglass et al., 1996). A study by Greenglass et al. (1996) found the three dimensions of social support each influenced different burnout outcomes. For example, emotional exhaustion was buffered by informational support, and not the emotional or practical support (Greenglass et al., 1996). As the dimensions of social support have been found to impact burnout outcomes in varying ways, it is possible the social support dimensions would have a unique influence on the three subscales of the STSS. Therefore, future research could investigate if an association exists between emotional support, practical support, and informational support and the three STS subgroups of avoidance, intrusion, and arousal. Finally, a moderate level of perceived organizational support was reported by the majority of participants in this study, which differed from the researcher's prediction of a low level of organizational support based on the challenging work environment of an emergency department. As the results from this study did not support the predicted finding, it is possible the SPOS is not capturing the actual impact of the organization on the STS of individual nurses working in the emergency department.

More than half (60.5%) of ED nurses in this study had a low level of resilience. This finding is similar to Grabbe et al. (2020), who reported 55% of nurses in their study had low resilience scores using the CD-RISC. This is similar to results by Haugland et al. (2023) and Petzel (2021), who both found the average ED nurse in their studies reported a low level of resilience. Therefore, based on the existing literature the low level of resilience among ED nurses in this study was anticipated. Baskin and Bartlett (2021) noted that the level of resilience among

nurses was lower during the COVID-19 pandemic than pre-pandemic levels. Further, a global meta-analysis by Janitra et al. (2023) reported the prevalence of low resilience was highest among frontline healthcare workers during the COVID-19 pandemic. This may be related to the reciprocal relationship between psychological stress and resilience, wherein higher stress causes decreases resilience, which further increases stress (Andersen et al., 2021). The COVID-19 pandemic resulted in a heavier workload, lack of supplies, and increased patient morbidity and mortality, which caused a higher level of psychological stress for nurses (Afshari et al., 2021; Lu et al., 2023). As a result of this increased stress, the level of nurse resilience has decreased (Afshari et al., 2021; Lu et al., 2023). Further, the prolonged duration of the COVID-19 pandemic and recurring surges of critically ill patients due to new COVID-19 variants may have contributed to reduced nurse resilience as well (Gee et al., 2022). A meta-analysis by reported the prevalence of low resilience among health care professionals increased as the duration of the COVID-19 pandemic has increased (Janitra et al., 2023). The accumulation of stressors associated with the COVID-19 pandemic over time may have overwhelmed normal coping mechanisms, leading to reduced resilience (Gee et al., 2022). Additionally, the nursing work environment has a significant impact on nurse resilience (Jung & Park, 2021; Park & Jang, 2022). For ED nurses, a positive association was found between resilience and the nursing environment (Jung & Park, 2021). An emergency department is a busy and complex environment due to environmental factors such as heavy patient volumes, high acuity patients, limited resources, high risk of violence, and long wait times (Hou et al., 2021; Rowe & Knox, 2023). The highly stressful and often overwhelming nature of the emergency department may be the reason ED nurses report a poorer work environment than nurses working in other units (Jung & Park, 2021). As a poor nursing work environment is associated with low resilience levels, the

difficult nature of the emergency department may be related to the low resilience reported by ED nurses in this study.

Finally, the majority of participants in this study (89.1%) reported their level of COVID-19 fear was low. The COVID-19 fear in this study was lower than the level reported in previous studies of ED nurses by Ahorsu et al. (2022) and Baysal et al. (2022), who found on average ED nurses experienced a moderate level of COVID-19 fear. However, data collection for both the studies by Ahorsu et al. (2022) and Baysal et al. (2022) occurred in fall 2020, within the first year of COVID-19 pandemic and before COVID-19 vaccines were widely available. On the other hand, data collection for this study occurred in spring 2023, during which time the World Health Organization declared COVID-19 was no longer a global health emergency (Wise, 2023). Further, a longitudinal study found COVID-19 fear decreased significantly between 2020 and 2021, suggesting that COVID-19 fear has gradually declined over time (Mertens et al., 2023). Additionally, COVID-19 vaccines became available to Ontario healthcare workers in December 2020 and mandatory COVID-19 vaccination policies were introduced in Ontario hospitals in 2021 (Ontario, 2021; PHO, 2023). Currently, 89.5% of adults living in Ontario have been vaccinated against COVID-19 (PHAC, 2023). Research has found receiving a COVID-19 vaccine led to a reduction in COVID-19 fear (Koltai et al., 2022; Seddig et al., 2022). Therefore, the high vaccination rate in Ontario and prolonged time between the pandemic onset and data collection may have contributed to the low rate of COVID-19 fear of ED nurses in this study.

Demographic Variables & Secondary Traumatic Stress

Overall, this study adds strength to the findings of many previous studies by indicating that demographic factors are not significant predictors of STS in ED nurses. In this study the demographic variables of age, gender, education level, employment status (full time/part

time/casual), years of nursing experience were not found to be predictors of STS for ED nurses in Ontario. These results align with previous research by Duffy et al. (2015), Erkin et al. (2021), İlhan and Küpeli (2022), Ratrout and Hamdan-Mansour (2020), and Woo and Kim (2021), who found that age is not significantly associated with STS among ED nurses. Previous studies of STS among ED nurses by Dominguez-Gomez and Rutledge (2009), Lopez et al. (2022), and Von Rueden et al. (2010) found no association between employment status and STS, which is supported by the findings in this study. Finally, the finding in this study that gender, education level, and years of nursing experience were not associated with STS in ED nurses is supported by many previous studies (Dominguez-Gomez & Rutledge, 2009; Duffy et al., 2015; Erkin et al., 2021; İlhan & Küpeli, 2022; Ratrout & Hamdan-Mansour, 2020; Woo & Kim, 2021).

Additionally, an integrative review of STS factors concluded that demographic variables cannot be definitively associated with STS development among ED nurses (Ratrout & Hamdan-Mansour, 2017).

Resilience & Secondary Traumatic Stress

In this study, resilience was the only significant predictor of STS among ED nurses in Ontario. The results from this study suggest that resilience may be a protective factor against the development of STS for nurses working in the emergency department. This supports previous nursing studies, which have found higher levels of resilience helps protect against STS development among nurses (Ogińska-Bulik & Michalska, 2021; Tseng et al., 2018; Tsouvelas et al., 2022). The simple and multiple linear regression analyses both demonstrated an inverse relationship between resilience and STS, wherein a higher level of resilience was associated with lower STSS scores. In both the simple and multiple linear regression analyses, every 1 unit increase in resilience led to corresponding 0.8 unit decrease in STS scores. This suggests that

strategies that increase resilience may be useful for mitigating STS development, as a higher resilience level was associated with a lower level of STS. Further, the simple linear regression conducted in this study found that resilience was the most significant predictor of STS, accounting for 16.6% of the variation in STS among ED nurses. This finding is similar to Alharbi et al. (2020), who found resilience was a significant predictor of STS among hospital and ED nurses in the simple linear regression and explained 15.4% of the variance in STS scores. The multiple linear regression was statistically significant, suggesting the regression model was a good fit of the data. Further, the multiple regression analysis predicted 23.4% of the variation in STS scores, and resilience was the only significant variable. This finding suggests a large proportion of STS scores could be influenced by the independent factors included in the model, specifically resilience. As resilience is a modifiable factor, the large impact resilience has on STS score variation presents an opportunity to implement resilience building strategies as a method of reducing STS development. The association between resilience and STS is supported extensively in previous studies of nurses (Alharbi et al., 2020; Abdolkarimi et al., 2022; Jeong & Shin, 2023; Ogińska-Bulik & Michalska, 2021; Tseng et al., 2018; Tsouvelas et al., 2022) and healthcare workers in the emergency department (Roden-Foreman et al., 2017; Wong et al., 2021). A significant, inverse association between STS and resilience among nurses was reported by Abdolkarimi et al. (2022), Jeong and Shin (2023), Ogińska-Bulik and Michalska (2021), Tseng et al., (2018), and Tsouvelas et al. (2022), indicating higher resilience may help mitigate STS in nurses. Additionally, studies of healthcare professionals in the emergency department have found greater resilience is a significant protective factor against STS development, which provides support for the findings in this study (Roden-Foreman et al., 2017; Wong et al., 2021). The

significant association between resilience and STS in this study highlights the importance of introducing strategies to increase resilience to help reduce STS prevalence among ED nurses.

COVID-19 Fear & Secondary Traumatic Stress

In this study, COVID-19 fear was found to be a predictor of STS in the simple linear regression analysis. The results of this regression analysis found that COVID-19 fear was directly associated with STS, wherein a higher level of COVID-19 fear produced a higher STS score. The finding that COVID-19 fear was positively associated with STS supports previous studies by Khattak et al. (2021) and Li et al. (2022), who used the same scales to measure STS and COVID-19 fear. Khattak et al. (2021) and Li et al. (2022) both found a significant association between STS and COVID-19 fear in a sample of hospital nurses. In addition, COVID-19 fear was found to be a predictor of STS for healthcare workers (Moreno-Jiménez et al., 2021; Yörük et al., 2022). However, in this study the positive association between COVID-19 fear and STS was not significant in the multiple linear regression model. As Feng et al. (2016) noted, a covariate may be significant in the simple linear regression but lose significance in the multiple linear regression analysis. The loss of a variable's significance from the simple linear regression to multiple linear regression may be due to correlations between covariates (Feng et al., 2016). As the VIF was <10 for all independent variables in this study, it can be concluded that multicollinearity did not significantly impact the independent variables or the results of the multiple regression analysis. Further, due to the more complex nature of multiple regression analyses, the effects of covariates are more difficult to define empirically in multiple regression analysis than in simple linear regression analyses (Morrissey & Ruxton, 2018). This may cause a covariate to be non-significant in the multiple linear regression that was significant in the simple linear regression (Morrissey & Ruxton, 2018). Overall, the simple linear regression analysis in

this study supports the existing evidence that COVID-19 fear is a significant, positive predictor of STS among nurses.

Organizational Support & Secondary Traumatic Stress

In this study, organizational support was not found to be a predictor of STS among ED nurses. This finding is similar to Ratrou and Hamdan-Mansour (2020), who reported perceived organizational support was not a predictor of STS among ED nurses. On the other hand, a study of sexual assault nurse examiners (SANE) by Townsend and Campbell (2009) reported a significant, positive association between organizational support and STS. As a result, Townsend and Campbell (2009) concluded that higher organizational support was associated with a higher level of STS among SANEs, though they noted this finding was unexpected. However, the findings in this study and the studies by Ratrou and Hamdan-Mansour (2020) and Townsend and Campbell (2009) are contradictory to other research, which has identified organizational support as a protective factor against STS development. In a study of pediatric nurses by Herrema et al. (2020), higher organizational support resulted in lower mean STSS scores and a decreased frequency in STS symptoms. Similarly, a study by Xu et al. (2023) reported that organizational support was a significant predictor of STS and enhanced the mental well-being of nurses. Overall, there is still a lack of clarity regarding the role, if any, that organizational support has in terms of STS development. Ratrou and Hamdan-Mansour (2020) suggested that the inconsistent findings regarding the relationship between organizational support and STS may be related to sociocultural factors that impact one's perception of organizational support. In the context of perceived organizational support, the actions that are considered supportive and rewarding to an employee are influenced by the national culture of the organization or employee (Shanock et al., 2019). While this study was conducted in Canada, these previous studies were

conducted in China (Xu et al., 2023), Jordan (Ratrou and Hamdan-Mansour, 2020), and the United States of America (Herrema et al., 2020; Townsend & Campbell, 2009). Perceived organizational support is based on concepts from the social exchange theory, wherein if an employee feels their employer is supportive, they will perform better to reciprocate the support (Akhtar et al., 2017). However, the degree of reciprocity between an employee and an organizational varies across cultures, leading to varying levels of perceived organizational support depending on societal norms (Rockstuhl et al., 2020). Further, the influence of regulatory, political, and economic institutions across societies may influence the level of perceived organizational support (Rockstuhl et al., 2020). The structure and organization of a healthcare system is influenced by political, economic, and regulatory bodies, and the universal healthcare system in Canada differs from the healthcare systems in China, Jordan, and the United States of America. Therefore, the inconsistent findings regarding the association of STS and perceived organizational support in the literature may be related to differences in institutional and cultural factors that impact organizational support between countries. Further, with the exception of the current study, Ratrou and Hamdan-Mansour (2020) was the only study identified in the literature to use the Scale of Perceived Organizational Support (SPOS) to examine the relationship between organizational support and STS among ED nurses. The SPOS has been used widely in nursing research to quantify organizational support and has been found to have high internal consistency in the nursing population (Cao et al., 2016; Filipova, 2023; Latimer et al., 2023; Labrague & De Los Santos, 2020; Robaee et al., 2018). Though Herrema et al. (2020) reported a significant association between STS and organizational support the authors created their own scale to measure organizational support, which does not have a validated internal consistency or test-retest reliability. Similarly, Xu et al. (2023) used the Perception of

Organizational Support Questionnaire, which has not been validated by other researchers and to date only been used in studies within China. Therefore, due to the lack of previous research utilizing a highly validated tool to measure organizational support, the relationship between STS and organizational support among ED nurses remains unclear.

Implications for Nursing Practice

This study provides important insight into the prevalence of STS among ED nurses in the Canadian context and is the first study of STS among emergency department nurses conducted in Ontario. The results of this study indicate the majority of ED nurses (91.6%) met the diagnostic criteria for STS, and more than half (60.5%) were categorized as experiencing a severe level of STS. The development of STS has an extremely detrimental impact on nurses, as it can cause increased psychological distress, physical symptoms, decreased job satisfaction, and higher rates of attrition and sick leave (Barleycorn, 2019; Dominguez-Gomez & Rutledge, 2009; Gates & Gillespie, 2008; Missouridou, 2017). The possible attrition of ED nurses due to high STS is even more concerning in the context of the Canadian nursing shortage. Current projections suggest that the Canadian nursing shortage could reach 117,600 by 2030 unless new policies are immediately implemented to increase retention and recruitment of nurses (Scheffler & Arnold, 2019). A nursing shortage is associated with lower RN staffing, which can cause decreased job satisfaction, increased burnout, and higher rates of absenteeism and job turnover (Lavoie-Tremblay et al., 2019). This produces a cyclical effect, where the lack of nurse staffing due to the nursing shortage causes increased stress and turnover for the remaining nurses, leading to further attrition from the nursing workforce. Additionally, the Registered Nurses' Association of Ontario carried out a survey during the pandemic, in which 16% of Ontario nurses reported they were likely or very likely to leave the nursing profession after the COVID-19 pandemic, a rate that is

3x higher than the attrition rate of Ontario RNs in 2020 (RNAO, 2021). Further, as frontline nurse costs a hospital an average of \$49,500 USD per RN, the increased rate of STS reported among ED nurses in Ontario could cause a large financial burden to provincial hospitals (Arnold, 2020). Therefore, the high prevalence and severity of STS in ED nurses in this study highlights the immediate need for hospital leadership to develop strategies to prevent or reduce STS amongst their staff to help mitigate the negative consequences of the nursing shortage. The prevention of STS is not merely the responsibility of the nurse but requires engagement from the entire organization as well (Wolf et al., 2020). An organizational strategy was implemented by Sprang et al. (2019), which involved increasing employee awareness of STS through a coaching program. The implementation of this program led to increased STS awareness and decreased STS scores among staff, which was maintained after completion of the program (Sprang et al., 2019). Another educational program was introduced by Grabbe et al. (2020) who implemented three-hour psychoeducation course that taught mindfulness and sensory awareness skills. Using a randomized control trial approach, this program amongst a group of hospital nurses and resulted in a decrease in STS and increase in resilience amongst the intervention group (Grabbe et al., 2020). The results of the Grabbe et al. (2020) study showed the benefit of introducing organizational programs that increase resilience as a method of mitigating STS amongst nurses. Finally, Robinson et al. (2022) introduced a five-week Accelerated Recovery Program to a group of ED nurses, which involved psychoeducation, mindfulness, and cognitive exercises. The STS scores of ED nurses were significantly lower after five weeks compared to baseline scores and the reduction in STS was maintained four months post-intervention (Robinson et al., 2022). The results of this study suggest the introduction of an Accelerated Recovery program to ED nurses could be an effective way to decrease STS both immediately, and for months after program

completion. The participation of management is essential to introduce STS mitigation programs successfully and effectively in the ED. In particular, the involvement of ED managers is critical as they can both enact organizational STS mitigation policies while simultaneously observing the impact of these policies on the frontline staff (Sprang et al., 2019). Currently there are no known strategies that prevent STS development among nurses (Kellogg, 2020). However, a two-tiered STS prevention strategy was suggested by a group of STS experts, which requires primary prevention at the organizational level to reduce risk factors and strengthen protective factors, and secondary prevention by providing support and clinical treatment for staff experiencing STS (Sprang et al., 2019). However, this framework was not specific to STS among nurses, but generalized to any helping professional. Further, increasing nurses' awareness and education regarding STS has been proposed as a preventative strategy against STS development among nurses (Gates & Gillespie, 2008). Overall, the high prevalence of STS among ED nurses in this study, given the increased attrition, lower quality patient care, and decreased job performance associated with STS, highlights the importance of introducing organizational strategies to mitigate STS (Arnold, 2020; Ratrout & Hamdan-Mansour, 2017; Ratrout & Hamdan-Mansour, 2020; Robinson et al., 2022).

Further, the findings from this study suggest the COVID-19 pandemic supports previous concerns that the COVID-19 pandemic would lead to an increase in STS among frontline nurses (Kellogg, 2020). During the COVID-19 pandemic, nurses have provided care for an increased number of critically ill patients and been exposed to a novel infectious disease, while experiencing increased workloads and intermittent shortages of personal protective equipment (Kellogg, 2020; Li et al., 2022). In a survey of registered nurses in Ontario, 95.7% reported their work had been affected by the COVID-19 pandemic (RNAO, 2021). The cumulative stressors

present when providing frontline nursing care during the COVID-19 pandemic has likely overwhelmed nurses' coping mechanisms, leading to an increased STS prevalence (Gee et al., 2022; Maiorano et al., 2020). Although many studies conducted during the COVID-19 pandemic focused on mental health outcomes of healthcare workers, there has been shortage of research on the impact of the pandemic on secondary traumatic stress (Kalaitzaki & Rovithis, 2021).

Therefore, there is an ongoing need to study the prevalence of STS in nurses as a result of the COVID-19 pandemic, and to investigate the potential long-term consequences of this pandemic on the mental health of frontline nursing staff (Orrù et al., 2021).

Finally, this study provides additional support regarding the protective role of resilience against STS development. In this study, ED nurses had a high prevalence and severity of STS and a low level of resilience. Resilience was found to be a significant protective factor against STS development in this study, wherein a higher level of resilience was associated with decreased STS scores for emergency nurses. The increased STS prevalence and low level of resilience identified in this study may be related to the high demand and workload currently experienced by emergency nurses due the COVID-19 pandemic (Henshall et al., 2020). Due to this occurring, and the protective role of resilience, it is essential that hospital and nursing leaders introduce strategies to increase nurse resilience and help mitigate STS development (Jobe et al., 2021; Lu et al., 2023; Yörük et al., 2022). Though resilience used to be considered a fixed trait, it is now considered a dynamic and modifiable attribute that can be developed with targeted intervention (Andersen et al., 2021; Schmidt & Haglund, 2017). Though individual strategies can help increase internal resilience, the complexity of nurse resilience requires organizational strategies as well to effectively manage workplace stress long-term (Cooper et al., 2021; Hart et al., 2014). The introduction of strategies to increase nurse resilience can help address

organizational challenges, such as retention and staff shortages, as well address individual issues, such as the development of secondary traumatic stress (Cooper et al., 2021). To successfully enhance resilience, strategies should be implemented at both an individual, team, managerial, and organizational level (Henshall et al., 2020). In particular, nursing leaders are foundational to the implementation of resilience enhancement strategies, and the development of a resilient nursing workforce (Wei et al., 2019). Some strategies found to effectively build resilience in the literature include self-care activities, mindfulness training, introduction of educational programs, and use of debriefing (Phillips et al., 2022). Self-care activities that help increase nurse resilience include self-reflection, prioritizing sleep, developing self-compassion, and utilizing peer support (Gee et al., 2022; Jobe et al., 2021). While individual approaches to building resilience through self-care can be effective, effective implementation also requires the consideration of organizational factors impacting STS and resilience (Sprang et al., 2019). The introduction of organizational strategies, such as formal mindfulness or meditation programs, has been found to enhance resilience for nurses working in the hospital setting (Joyce et al., 2018; Odom-Forren, 2020; van der Riet et al., 2018). Mindfulness practice improves coping skills by teaching an individual how to remain focused on the present, and respond to situations as they arise, while remaining relaxed and focused (Beddoe & Murphy, 2004; Penprase et al., 2015). Another strategy that organizations can utilize to increase nurse resilience is debriefing. Debriefing is a discussion that occurs after an experience, to allow for reflection and learning among individuals (Stafford et al., 2021). Conducting informal debriefings after traumatic events has been found to increase resilience among nurses (Kelly, 2020; Mealer et al., 2012). In addition, formal debriefing programs such as the Brigham Resilience in COVID-19-pandemic Emergency Forum (BRIEF) program and Personal Reflective Debrief have been utilized for nurses working

in the emergency department (Azizoddin et al., 2020; Schmidt & Haglund, 2017). Both programs involved structured reflection and pre-arranged debriefing sessions and led an increase in the resiliency of ED nurses (Azizoddin et al., 2020; Schmidt & Haglund, 2017). In the context of COVID-19, which has increased STS and decreased resilience, it is now critical to enhance the resilience of ED nurses to manage the increased burden of providing emergency care during a pandemic (Gee et al., 2022; Phillips et al., 2022; Whitt-Woosley et al., 2022).

Strengths & Limitations

Overall, there are many strengths associated with this study. This is the first study to investigate the prevalence and factors associated with STS among ED nurses in Ontario. The results of this study provide important new information regarding the prevalence of STS in the Canadian healthcare context and adds to the existing literature regarding higher rates of STS following the COVID-19 pandemic. Additionally, this study validates and strengthens previous evidence regarding the protective effect of resilience on the development of STS among ED nurses. As STS is associated with increased burnout and attrition among nurses, strategies that reduce STS development, such as increasing resilience, could help mitigate the ongoing Canadian nursing shortage (Duffy et al., 2015; Ratrouf & Hamdan-Mansour, 2017; Yörük et al., 2022). Further, the response rate for this online study was quite high. The overall response rate for this study was 37%, as the survey was accessed 325 times but only 119 responses were entered. This response rate is slightly higher than the typical online survey response rate of 25-30% (Menon & Muraleedharan, 2020). Wu et al. (2022) noted that for studies with less than 500 participants, a response rate of 20-25% is sufficient to produce reliable findings. As this study had a smaller sample size and larger response rate than discussed by Wu et al. (2022), one can be more confident in the reliability of the results.

Further, there are several limitations to consider when interpreting the results of this study. As this study utilized a quantitative descriptive design and cross-sectional data collection, the causality of STS in relation to the personal or organizational variables cannot be determined (Bloomfield & Fisher, 2019; Setia, 2019). However, the results from this study can be useful in identifying hypotheses that can be tested in future research (Bloomfield & Fisher, 2019). The generalizability of the results is limited as participants were all from Ontario and were not randomly selected, but instead sampling occurred through convenience sampling. In addition, while the CNO reported there were 7,975 RNs working in the emergency department in 2022, there is no formal database that collects demographic information for Ontario ED nurses (CNO, 2022). As a result, it is not possible to fully determine the representativeness of this study sample in comparison to the larger population of Ontario ED nurses. As the representativeness of this study sample cannot be fully understood, these findings may not be generalizable beyond this study (Martínez-Mesa et al., 2016). However, as noted previously, the demographics in this study sample were very similar to the demographics of Ontario RNs as a whole. Therefore, there may be some generalizability of findings, due to the similar demographics in this sample compared to the larger population of RNs in Ontario. Further, as data collection occurred using self-report scales, response bias is possible (Van de Mortel, 2008). Finally, this study was conducted using an online survey software, which generally produces lower response rates than other survey methods (Daikeler et al., 2020; Daikeler et al., 2022). There is no way to determine the motivation of individuals who chose to participate in this study, as it was conducted online using self-reporting tools. Therefore, non-response bias may have occurred wherein individuals who participated in this study may have been experiencing a higher level of STS than non-participants (Sedgwick, 2014).

Recommendations for Future Research

Overall, there is a lack of research regarding STS among emergency care professionals (Barleycorn, 2019). This was the first study to research the prevalence of STS and factors influencing STS development among Ontario ED nurses. Therefore, further research of STS prevalence among Canadian ED nurses is needed to strengthen the findings in this study. Additionally, most previous research into STS prevalence among ED nurses has used a cross-sectional study design. As a result, there is a lack of information regarding the long-term impact of STS on emergency department nurses (Barleycorn, 2019). A longitudinal study could help provide important knowledge regarding the process of STS symptom development, as well as provide further insight into the causality of resilience as a protective factor (Maiorano et al., 2020; Orrù et al, 2021). Additionally, the lack of clarity regarding the relationship between organizational support and STS is an area that requires further investigation. Perceived organizational support and STS were not found to be significantly associated in this study, which was anticipated. Therefore, it is possible that the Scale of Perceived Organizational Support is not capturing the actual impact of the hospital organization on STS, or that this scale was not the best tool to determine the relationship between organizational support and STS. In the future, the use of other scales, such as the Social Support Scale, may be more useful by assessing social support at the unit-level instead of an organizational-level. Further, to date there are no known interventions that directly address STS development amongst nurses (Kellogg, 2020). While previous studies by Grabbe et al., (2020) and Robinson et al. (2022) found psychoeducation and cognitive behavioural therapy programs were effective at reducing STS among nurses, these were single studies with relatively small sample sizes. Further research is needed to understand

the long-term impact of STS on nurses and to identify appropriate programs that effectively reduce STS development amongst nurses and (Kellogg, 2020).

Conclusion

This was a cross-sectional descriptive study that aimed to determine the prevalence of secondary traumatic stress (STS) amongst Ontario emergency department (ED) nurses, and to determine the personal and/or organizational factors that are associated with the development of STS in ED nurses. This was the first study conducted that investigated STS prevalence and associated factors among ED nurses in Ontario. The results of this study suggest that the prevalence of STS among Ontario ED nurses is extremely high, as 91.6% of nurses met the diagnostic criteria for STS. Additionally, almost every ED nurse (98.3%) in this study experienced at least one STS symptom in the last week. The severity of STS in this study was higher than previous findings, as 76.6% of Ontario ED nurses were categorized with a high or severe level of STS. It is suspected the increased severity and prevalence of STS identified in this study is related to the COVID-19 pandemic. Further, this study investigated the relationship between personal and organizational factors and STS development. Overall, resilience was the only factor in this study that was significantly associated with STS. In this study resilience and STS had a significant inverse relationship, wherein a higher level of resilience led to a lower STS level. However, more than half (60.5%) of ED nurses in this study reported a low level of resilience. This highlights the importance of the implementing of resilience building strategies to enhance nurse resilience and help mitigate STS development, especially in the context of the COVID-19 pandemic which has led to reduced nurse resilience and a higher prevalence of STS (Gee et al., 2022; Phillips et al., 2022; Whitt-Woosley et al., 2022). Therefore, it is essential to

implement strategies to maintain a robust, resilient emergency nursing workforce (Henshall et al., 2020; Sanzone et al., 2021).

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Appendix A

Study Invitation Email

Subject: Secondary Traumatic Stress & Emergency Department Registered Nurses in Ontario

Lead Researcher

Kelsey Fallis, RN, BScN, MScN (student)
kf09qo@yorku.ca

Supervisor

Dr. Claire Mallett, RN, PhD
cmallett@yorku.ca

Dear participant:

You are being invited to participate in a Masters of Nursing research study looking at secondary traumatic stress among registered nurses working in Ontario emergency departments.

Background & Purpose

Secondary traumatic stress (STS) refers to an emotional, physical, or psychological reaction that one experiences after being indirectly exposed to another person's trauma. Registered nurses (RNs) are at risk of developing STS due to exposure to the physical and/or emotional suffering of patients due to illness, injury, or death.

In particular, RNs working in the emergency department (ED) experience more traumatic events than nurses working on other units, and are more susceptible to developing STS. The development of STS among ED RNs leads to increased risk of burnout, anxiety, and staff leaving their positions in the ED. To date, no research has been conducted to determine the prevalence of STS among RNs working in the ED in Ontario.

The primary goal of this study is to determine the prevalence of secondary traumatic stress among Emergency Department nurses in Ontario. The secondary goal of this study is to determine if any personal or organizational factors are associated with development of STS.

Eligibility:

You are eligible to participate in this study if:

1. You are a registered nurse (RN)
2. You currently work in an emergency department in Ontario
3. In your role in the emergency department, you provide direct patient care

What You Will Be Asked to Do in the Research:

Participants who volunteer to participate in this study will be asked to complete an online survey using Qualtrics, an online survey software that can be completed using a computer, smart phone, or tablet. The survey will take approximately 30 minutes to complete, and must be completed in a single session.

At the end of the survey, participants have the option to provide their email address in order to be entered into a draw to win a \$40 e-gift card. A total of 25 gift cards will be awarded, and winners have the option to choose between a Tim Hortons, Starbucks, or Amazon gift card. In the event

that a participant chooses to withdraw from the study, they can still enter their name into the draw to win a gift card.

Confidentiality

No personal identifying information, such as name, address, or place of employment will be collected in this study. The email address you provide will be stored separately from the survey responses to ensure anonymity, and only the lead researcher will have access to participant email addresses.

Voluntary Participation and Withdrawal

Your participation in the study is completely voluntary and you may choose to stop participating at any time. Your decision not to volunteer, to stop participating, or to refuse to answer particular questions will not influence the nature of the ongoing relationship you may have with the researcher, York University, or your hospital of employment either now, or in the future. You can choose to withdraw from the study by closing the internet browser and not submitting your responses on Qualtrics.

If you have any questions, please contact the lead researcher Kelsey Fallis, RN, BScN, MScN by email at kf09qo@yorku.ca.

By clicking the following link, you will be directed to the survey.

Sincerely,

Kelsey Fallis, RN, BScN

This research has received ethics review and approval by the Delegated Ethics Review Committee, which is delegated authority to review research ethics protocols by the Human Participants Review Sub-Committee, York University's Ethics Review Board, and conforms to the standards of the Canadian Tri-Council Research Ethics guidelines. If you have any questions about this process, or about your rights as a participant in the study, please contact the Senior Manager & Policy Advisor for the Office of Research Ethics, 5th Floor, Kaneff Tower, York University (telephone 416-736-5914 or e-mail ore@yorku.ca).

Appendix B

Consent Form

Date: October 5, 2022

Study: Secondary Traumatic Stress & Emergency Department Registered Nurses in Ontario

Lead Investigator

Kelsey Fallis, RN, BScN, MScN (student)
York University
kf09qo@yorku.ca

Supervisor

Dr. Claire Mallette, RN, PhD
York University
cmallett@yorku.ca

Introduction

You are being invited to participate in a Masters of Science in Nursing research study looking at secondary traumatic stress among registered nurses working in Ontario emergency departments. Before deciding to participate in this study, please read and understand the information provided in this consent form. This consent form provides information about who can participate in this study, the purpose of the study, what you will be asked to do in the study, and the benefits and risks for participants. If you have any questions or concerns about participating in this study, please contact the lead researcher Kelsey Fallis (kf09qo@yorku.ca).

Purpose of the Research

Secondary traumatic stress (STS) refers to an emotional, physical, or psychological reaction that one experiences after being indirectly exposed to another person's trauma. Registered nurses (RNs) are at risk of developing STS due to exposure to the physical and/or emotional suffering of patients due to illness, injury, or death. In particular, RNs working in the emergency department (ED) experience more traumatic events than nurses working on other units, and are more susceptible to developing STS. The development of STS among ED RNs leads to increased risk of burnout, anxiety, and staff leaving their positions in the ED. To date, no research has been conducted to determine the prevalence of STS among RNs working in Ontario emergency departments. Therefore, this study is both timely and important due to the increased pressures and challenges emergency department RNs face due to the COVID-19 pandemic and the ongoing nursing shortage in Canada.

The aims of this study are to:

1. Determine the prevalence of secondary traumatic stress among Emergency Department nurses in Ontario
2. Determine if any personal or organizational factors are associated with development of STS

The data collected in this study will be presented in both written and oral forms as part of a master's thesis. In addition, an executive summary of study results will be shared with ENAO and ONA, and may be shared at conferences or published in a peer-review journal.

Eligibility

You are eligible to participate in this study if:

1. You are a registered nurse (RN)
2. You currently work in an emergency department in Ontario
3. In your role as a RN in the emergency department you provide direct patient care

What You Will Be Asked to Do in the Research

Participants who participate in this study will be asked to complete an online survey using Qualtrics, an online survey software that can be completed using a computer, smart phone, or tablet. The survey will take approximately 30 minutes to complete, and must be completed in a single session.

At the end of the survey, participants have the option to provide their email address in order to be entered into a draw to win a \$40 gift card. A total of 25 e-gift cards will be awarded, and winners have the option to choose between a Tim Hortons, Starbucks, or Amazon gift card. In the event that a participant chooses to withdraw from the study, they can still enter their name into the draw to win a gift card.

Following analysis of the data, if you provided an email address to put your name in the draw for a gift card, you will be emailed a summary of the results, with information to access the full study paper. 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.

Risks and Discomforts

The researchers do not intend any harm to participants to occur as part of this study. However, some of the survey questions may make you feel embarrassed, upset, or uneasy. You can stop, or skip questions, at any time if you feel uncomfortable. Participation in this study may bring up traumatic memories or emotions. If you are experiencing emotional distress, please utilize mental health support services. A list of no-cost mental health services is included below.

ConnexOntario Helpline

- Free 24/7 access to mental health support and information about Ontario mental health services and addiction services
- Toll free: 1-866-531-2600
- Text CONNEX to 247247 (standard data and messaging rates may apply)
- Online chat: <https://www.connexontario.ca/Chat>

Crisis Text Line

- Free 24/7 crisis counselling for healthcare professionals
- Text FRONTLINE to 741741

Hope for Wellness Hotline

- Free 24/7 mental health support for Indigenous people
- **Toll free: 1-855-242-3310**
- **Online chat: <https://www.hopeforwellness.ca/>**

Talk Suicide

- Free access to crisis supports if concerned about suicide or suicidal thoughts
- Toll free: 1-833-456-4566 (available 24/7)
- Text 45645 (available between 4 p.m. and midnight ET)

Benefits of the Research and Benefits to You

This study may not directly benefit you. However, to date no research has been conducted on STS among emergency department RNs in Ontario. Therefore, the information gained from this study may help increase awareness of the prevalence of STS among ED RNs in Ontario, and factors contributing to the development of STS. Through increased knowledge, there is the potential for strategies to be developed to prevent and reduce STS prevalence amongst ED nurses, which will benefit nurses, patients, and healthcare organizations.

Voluntary Participation and Withdrawal

Your participation in the study is completely voluntary and you may choose to stop participating at any time. Your decision not to volunteer, to stop participating, or to refuse to answer particular questions will not influence the nature of the ongoing relationship you may have with the researcher, York University, or your hospital of employment either now, or in the future. You may choose to withdraw from the study without penalty at any time by closing the internet browser without submitting your responses. However, once your responses have been submitted it is not possible to withdraw from the study, as no personal identifying information is associated with any of the responses. Therefore, please read this consent form and the survey questions carefully before submitting your responses.

If you stop participating, you will still be eligible to receive enter the draw for a \$40 gift card for agreeing to be in the project, even if you withdraw without completion of the research. In the event you withdraw from the study, all associated data collected will be immediately destroyed wherever possible.

Confidentiality

All study participation will occur via Qualtrics, an anonymous online survey software. No personal or identifying information such as name, address, or place of employment will be collected. All information you supply during the research will be held in confidence and your name will not appear in any report or publication of the research. Your data will be safely stored in password-protected hard drive and only the lead researcher and supervisor will have access to this information. Data will be kept until May 1, 2028, at which time it will be destroyed by reformatting the hard drive. Confidentiality will be provided to the fullest extent possible by law.

The researcher(s) acknowledge that the host of the online survey (Qualtrics) may automatically collect participant data without their knowledge (i.e., IP addresses.) Although this information may be provided or made accessible to the researchers, it will not be used or saved without participant's consent on the researcher's system. Further, because this project employs e-based collection techniques, data may be subject to access by third parties as a result of various security legislation now in place in many countries and thus *the confidentiality and privacy of data cannot be guaranteed during web-based transmission.*

Questions About the Research?

If you have questions about the research in general or about your role in the study, please feel free to contact the lead researcher Kelsey Fallis, RN, BScN, MScN student by email (kf09qo@yorku.ca). You may also contact Dr. Claire Mallette, RN, PhD, Graduate Student Supervisor (cmallett@yorku.ca) or the York University School of Nursing by phone (416-736-5271) or by email (nursing@yorku.ca).

This research has received ethics review and approval by the Delegated Ethics Review Committee, which is delegated authority to review research ethics protocols by the Human Participants Review Sub-Committee, York University's Ethics Review Board, and conforms to the standards of the Canadian Tri-Council Research Ethics guidelines. If you have any questions about this process, or about your rights as a participant in the study, please contact the Senior Manager & Policy Advisor for the Office of Research Ethics, 5th Floor, Kaneff Tower, York University (ore@yorku.ca).

Legal Rights and Signatures

I consent to participate in the study *Secondary Traumatic Stress & Emergency Department Registered Nurses in Ontario* conducted by Masters of Science in Nursing student Kelsey Fallis with supervision by Dr. Claire Mallette. I have understood the nature of this project and wish to participate. I am not waiving any of my legal rights by signing this form. I understand that I am free to withdraw consent and discontinue participation in this study at any time, without penalty. 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 by closing the internet browser.

Sincerely,

Kelsey Fallis, RN, BScN, MScN (student)

Appendix C

Social Media Recruitment Poster



Secondary Traumatic Stress & Emergency Department Registered Nurses in Ontario

Are you:

- **A registered nurse (RN)**
- **Currently working in an emergency department (ED) in Ontario**
- **Providing direct patient care**

If you answered yes to these questions, you are eligible to participate in this study.

You will be asked to complete an online survey using a smart phone, computer, laptop, or tablet. The survey will take approximately 30 minutes to complete.

Participants in this study will be entered in a draw to win a \$40 gift card

All responses in this study are anonymous. Participation in this study is voluntary, and participants have the right to withdraw consent for participation at any time.

If you have any questions about this study please contact:

Kelsey Fallis, RN, BScN, MScN student by email at kf09qo@yorku.ca

Caption:

You are being invited to participate in a research study looking at secondary traumatic stress among registered nurses working in Ontario emergency departments. For more information and to participate visit: https://yorkufoh.ca1.qualtrics.com/jfe/form/SV_207dEIG70QR5NKC

Appendix D

Demographic Form

1. What is your age? _____
2. What is your gender?
 - Male
 - Female
 - Transgender Man
 - Transgender Woman
 - Non-binary/third gender
 - Prefer not to say
3. What is the highest level of nursing education you have completed?
 - Diploma
 - Bachelor's Degree
 - Masters Degree
 - Doctoral Degree
4. How many years have you worked as a nurse? _____
5. What is your employment status within the emergency department?
 - Full time
 - Part time
 - Casual
 - Other (please specify)
6. What is the number of patient visits per year to the emergency department where you are employed? _____
7. What is the population of the city or town where your emergency department of employment is located? _____

Appendix E

Secondary Traumatic Stress Scale (STSS)

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 by choosing the number next to the statement.

| | Never | Rarely | Occasionally | Often | Very Often |
|--|-------|--------|--------------|-------|------------|
| 1. I felt emotionally numb. | 1 | 2 | 3 | 4 | 5 |
| 2. My heart started pounding when I thought about my work with patients. | 1 | 2 | 3 | 4 | 5 |
| 3. It seemed as if I was reliving the trauma(s) experienced by my patient(s). | 1 | 2 | 3 | 4 | 5 |
| 4. I had trouble sleeping. | 1 | 2 | 3 | 4 | 5 |
| 5. I felt discouraged about the future. | 1 | 2 | 3 | 4 | 5 |
| 6. Reminders of my work with patients upset me. | 1 | 2 | 3 | 4 | 5 |
| 7. I had little interest in being around others. | 1 | 2 | 3 | 4 | 5 |
| 8. I felt jumpy. | 1 | 2 | 3 | 4 | 5 |
| 9. I was less active than usual. | 1 | 2 | 3 | 4 | 5 |
| 10. I thought about my work with patients when I didn't intend to. | 1 | 2 | 3 | 4 | 5 |
| 11. I had trouble concentrating. | 1 | 2 | 3 | 4 | 5 |
| 12. I avoided people, places, or things that reminded me of my work with patients. | 1 | 2 | 3 | 4 | 5 |
| 13. I had disturbing dreams about my work with patients. | 1 | 2 | 3 | 4 | 5 |
| 14. I wanted to avoid working with some patients. | 1 | 2 | 3 | 4 | 5 |
| 15. I was easily annoyed. | 1 | 2 | 3 | 4 | 5 |
| 16. I expected something bad to happen. | 1 | 2 | 3 | 4 | 5 |
| 17. I noticed gaps in my memory about patient sessions. | 1 | 2 | 3 | 4 | 5 |

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Appendix F

8-Item Survey of Perceived Organizational Support

Listed below and on the next several pages are statements that represent possible opinions that you may have about working in your workplace. Please indicate the degree of your agreement or disagreement with each statement by selecting the answer that best represents your point of view about your workplace. Please choose from the following answers:

| | Strongly Disagree | Moderately Disagree | Slightly Disagree | Neither Agree or Disagree | Slightly Agree | Moderately Agree | Strongly Agree |
|--|------------------------------|--------------------------------|------------------------------|--|---------------------------|-----------------------------|---------------------------|
| 1. The organization values my contribution to its well-being. | 0 | 1 | 2 | 3 | 4 | 5 | 6 |
| 2. The organization fails to appreciate any extra effort from me. | 0 | 1 | 2 | 3 | 4 | 5 | 6 |
| 3. The organization would ignore any complaint from me. | 0 | 1 | 2 | 3 | 4 | 5 | 6 |
| 4. The organization really cares about my well-being. | 0 | 1 | 2 | 3 | 4 | 5 | 6 |
| 5. Even if I did the best job possible, the organization would fail to notice. | 0 | 1 | 2 | 3 | 4 | 5 | 6 |
| 6. The organization cares about my general satisfaction at work. | 0 | 1 | 2 | 3 | 4 | 5 | 6 |
| 7. The organization shows very little concern for me. | 0 | 1 | 2 | 3 | 4 | 5 | 6 |
| 8. The organization takes pride in my accomplishments at work. | 0 | 1 | 2 | 3 | 4 | 5 | 6 |

Copyright Eisenberger et al. (1986)

Appendix H

Fear of COVID-19 Scale

Please indicate your level of agreement to each of the following statements.

| | Strongly Disagree | Disagree | Neither Agree or Disagree | Agree | Strongly Agree |
|--|------------------------------|-----------------|--|--------------|---------------------------|
| 1. I am very afraid of COVID-19. | 1 | 2 | 3 | 4 | 5 |
| 2. It makes me uncomfortable to think about COVID-19. | 1 | 2 | 3 | 4 | 5 |
| 3. My hands become clammy when I think about COVID-19. | 1 | 2 | 3 | 4 | 5 |
| 4. I am afraid of losing my life because of COVID-19. | 1 | 2 | 3 | 4 | 5 |
| 5. When watching news and stories about COVID-19 on social media, I become nervous or anxious. | 1 | 2 | 3 | 4 | 5 |
| 6. I cannot sleep because I'm worrying about getting COVID-19. | 1 | 2 | 3 | 4 | 5 |
| 7. My heart races or palpitates when I think about getting COVID-19. | 1 | 2 | 3 | 4 | 5 |

Ahorsu et al. (2020)

Appendix I

Multiple Regression - Variance Inflation Factor (VIF) Analysis

| Variable | VIF |
|-----------------------------|------|
| Age | 5.10 |
| Gender | 1.07 |
| Education | 1.72 |
| Years of nursing experience | 5.28 |
| Employment status | 1.15 |
| Organizational support | 1.15 |
| Resilience | 1.18 |
| Fear of COVID-19 | 1.08 |