Secondary traumatic stress, job satisfaction, anxiety, depression and coping among pediatric perioperative nurses exposed to trauma: a descriptive correlational study

by

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Abstract

Background: Nurses caring for individuals affected by a traumatic event may experience secondary traumatic stress (STS), which has negative downstream implications such as decreased mental well-being and job satisfaction. While STS has been described among some nursing specialties, little is known about the experiences of STS among pediatric perioperative nurses.

Purpose: As guided by the Transactional Model of Stress and Coping, the primary objectives of this exploratory study were to: 1) describe the prevalence of STS in pediatric perioperative nurses who were exposed to trauma, 2) examine proposed antecedent correlates of STS (trauma exposure, years of service, and coping), and 3) examine proposed outcome correlates (anxiety, depression, and job satisfaction) among pediatric perioperative nurses.

Methods. In this descriptive correlational study, a pan Canadian internet survey was conducted with 33 pediatric perioperative nurses between January to March 2024. Participants completed six online questionnaires.

Data Analysis Plan. Descriptive statistics of sample characteristics and study variables were conducted. Inferential statistics were employed to conduct correlational analyses to address this study's research questions.

Main Results. The main finding was that 61percent of participants reported STS levels of moderate or greater, and the mean number of trauma exposure was 9.06 weekly exposures. There was a significant correlation found between STS and avoidant coping ($r(31) = .467$ ($p = .006$). Participants identified workplace relationships as one of the top indicators of job satisfaction. Other significant correlations were found between antecedent and outcome variables for nurse STS.

Conclusion. The high prevalence of weekly exposures to direct and indirect trauma and avoidant coping, and their linkage to pediatric perioperative nurse STS levels have practice and research implications. Attention is called for better workplace supports and healthy work environments that thwart the harmful impact of STS on nurse job satisfaction, anxiety, and depression when nurses face trauma in the workplace.

Keywords: secondary traumatic stress, pediatric nursing, perioperative nursing, coping, job satisfaction, anxiety

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Chapter One – Introduction

Statement of the Problem

Caring (Adams, 2016; Bloomfield & Pegram, 2015; Leininger, 1988; Watson, 1988), compassion (Bloomfield & Pegram, 2015) and empathy (Olsen, 1991) are considered the primary identifying values that embody the nursing profession. Nurses care for patients in various and increasingly complex environments (Lykins et al., 2021). The act of caring itself can carry an innate source of stress (Kellogg, 2021), which in turn has been described as one of the occupational hazards of nursing (Clegg, 2001; McVicar, 2003). While empathy is related to optimal care and positive patient-care provider relationships (Bunin et al., 2021), it is considered a risk factor for developing secondary traumatic stress (STS), which may occur after a nurse's direct exposure to or hearing about a patient who has undergone a traumatic event (Wakefield, 2018), or a nurse's direct exposure to or hearing about bullying in the workplace (Aristidou et al., 2020; Galanis et al., 2024). STS is defined as the 'acute' emotional duress that results from an individual hearing about or witnessing firsthand another's physical and/or emotional traumatic experiences (Figley, 1995; Kellogg, 2021; Lykins et al., 2021; Peebles-Klieger, 2000;

The National Child Traumatic Stress Network, 2023). Nurses often work with individuals who have experienced traumatic events, and the nursing profession is one in which caring, empathy and the response to other's stress converge in a unique way to form and impact work-related stress (Clegg, 2001).

Empathy-based stress embodies the human nature of nursing, or that of empathic engagement with another's experience (Figley, 1995, 2002) and may result in second-hand traumatization (Sprang et al., 2019). It is important to note that the contemporary understanding of empathy-based stress includes similar constructs of compassion fatigue and vicarious trauma to STS (Rauvola, Vega & Lavigne, 2019). Compassion fatigue, vicarious trauma, and STS are all empathy-based stress constructs that may result from exposure to second-hand trauma and empathic engagement of the nurse with a patient who has undergone a trauma (Rauvola, Vega & Lavigne, 2019). It is important to clarify differences that exist among the three empathy-based stress constructs. Compassion fatigue refers to a 'progressive' (Zhang et al., 2018) and 'cumulative effect' of prolonged exposure to sick and traumatized patients (Figley, 1995; Kelly et al., 2015; Melvin, 2015; Sabo, 2006) which can result in emotional exhaustion (Alharbi et al., 2019; Gelsema et al., 2006) and is understood as a final product of accumulated stress (Adams et al., 2006; Bride et al., 2007; Figley, 1995; Figley, 2002; Pearlman & Saakvitne, 1995). Vicarious trauma is defined as a 'generalized' negative experience or outcome of working with individuals (Figley, 2003; Pearlman & Saakvitne, 1995) who have undergone primary trauma. STS differs from compassion fatigue and vicarious trauma in that it is the acute effect of having experienced a more immediate exposure to trauma in the workplace (Figley, 1995; Kellogg, 2021; Lykins et al., 2021; Peebles-Klieger, 2000; The National Child Traumatic Stress Network, 2023). Nonetheless,

compassion fatigue, STS and vicarious trauma have been described as occupational hazards within caring professions (Aiken et al., 2002; Clegg, 2001; Pearlman & Saakvitne, 1995). Health care personnel may be more prone to empathy-based stress than other professions (Crumpei & Dafinoui, 2012; Lykins et al., 2021; Oginska-Bulik et al., 2021), with acute care nurses working in pediatric care being more impacted than in other areas of care (Kellogg et al., 2018b).

STS in nurses is of particular concern as it may affect the individual's well-being, job satisfaction, and retention of nurses in a given specialty (Duffy et al., 2015; Meyer et al., 2015; Sheppard, 2015; Sorenson, 2017), and may negatively impact quality of care provided to the patient (Meyer et al., 2015; Sabery et al., 2017; Sorenson et al., 2017). The shortage of nurses is a current global concern (Drennan & Ross, 2019; Marc et al., 2019; Murray, 2002), and stressful work environments may contribute to this shortage (Duvall & Andrews, 2010; Fox & Abrahamson, 2009). The retention of highly educated nurses who are extensively prepared to provide safe and competent care to pediatric patients with complex needs and in highly stressful specialty care environments, such as perioperative care (Turris et al., 2007), is vital (Gillespie & Hamlin, 2009).

Increased levels of stress impact nurses' job satisfaction (Golbasi et al., 2008; Healy &McKay, 2000). Within the nursing profession, stress may influence the retention of staff in specialized care environments (Van Osch et al., 2018), their commitment to or intentions of leaving their profession (Arnold, 2020), and is related to increasing rates of stress-related burnout (Hayes et al., 2015; Lim et al., 2010; McConnell, 1982; Oganowski, 1983; WaddillGoad, 2016). Numerous studies have described the effects of stress in specialized care areas

(DeLongis et al., 1988; Monat & Lazarus, 1985; Holroyd & Lazarus, 1982; Oganawski, 1983; Salmond et al.; Schernhammer et al., 2004; Schulz et al., 2011). The organizational consequences of unaddressed STS include increased absenteeism, decreased morale and deterioration in team functioning (Seys et al., 2013). Studying the effects of stress can better assist organizations in promoting healthy work environments for nurses who work in specialized care areas (Meadors & Lamson, 2008; Maloney, 2012; Noblet & Lamontagne, 2006; Sorenson et al., 2017; Van Den Tooren, & De Jonge, 2008), such as pediatric perioperative care.

Prevalence of Anxiety and Depression

Several studies have examined anxiety and depression among nurses in Canada. One study reported that nurses experience depressive symptoms at a rate twice as high as other professionals (Letvak et al., 2012). One Canadian study found that 22.7 percent of nurses reported symptoms of anxiety, while 19.3 percent of nurse participants reported symptoms of depression (Boucher et al., 2023). Another large study that examined the rates of mental disorders in Canadian nurses found that 36 percent of participants screened positive for major depressive disorder, while 26 percent screened positive for generalized anxiety disorder (Stelnicki et al., 2020)

In British Columbia, a province in Canada, researchers employed the Patient Health Questionnaire (PHQ-8) to measure depression symptoms and the Generalized Anxiety Disorder Scale (GAD-7) to measure anxiety symptoms in a province-wide sample of nurses. The authors report that 31% of respondents met the clinical cut-off for moderate to severe depression symptoms, and just under 29% met the cut-off for moderate to severe anxiety symptoms (Havaei et al., 2021).

In yet another study, the Hospital Anxiety and Depression Scale (HADS) was employed to measure anxiety and depression (as co-morbidities of post-traumatic stress disorder) in a

sample of pediatric acute care nurses. These authors reported that among nurses reporting posttraumatic stress disorder (PTSD) symptoms, 16% of the nurses sampled reported anxiety, while 10% reported symptoms of depression (Czaja et al., 2012). Despite this large body of literature on anxiety and depressive symptoms and disorders among nurses, no study has investigated the relationship between STS and affective disorders among pediatric perioperative nurses.

Based on the results of an extensive search of the literature, this study was the first to specifically examine the experiences of pediatric perioperative nurses' experiences of STS and its relationship to psychological well-being, measured by reported levels of anxiety and depression symptoms.

Purpose of the Study

The purpose of this exploratory study was to: 1) describe the prevalence of STS in pediatric perioperative nurses who were exposed to direct and indirect trauma, 2) examine proposed antecedent correlates of STS (trauma exposure, years of service, and coping), and 3) examine proposed outcome correlates (anxiety, depression, and job satisfaction) among pediatric perioperative nurses.

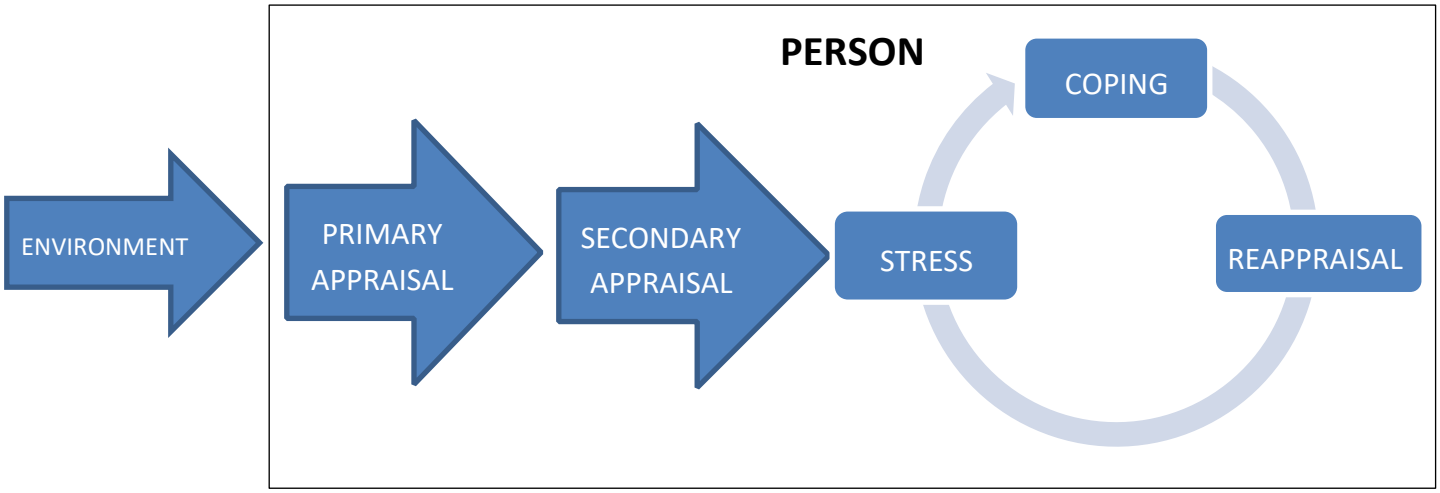
Theoretical Perspective

In order to understand the pediatric perioperative nurse's experience of STS, it is beneficial to review literature and theory on the broader concept of stress. Richard Lazarus and Susan Folkman spent over 40 years studying and describing the phenomenon of stress and coping, and how these constructs interact with one another to mediate and reformulate an individual's stress response. Lazarus and Folkman (1984) developed a comprehensive theoretical

model which has been used extensively to underpin ongoing work and exploration of the phenomenon of stress in many fields including psychology and health care. This model views stress and coping as transactions (Lazarus & Folkman, 1984), mediated by the process of reappraisal of new information and assessment of resources that allow an individual to reformulate their appraisal of and subsequent response to a stressor.

The original Transactional Model of Stress and Coping (Lazarus & Folkman, 1984) is a circular model describing the appraisal of a stressor or stressful event and the effects of coping on ongoing reappraisals. Within this model, stressors are the demands of the environment that affect an individual's physical and psychological well-being, with psychological stress occurring as the emotional response to environmental stimuli exceeds an individual's capacity to cope (Lazarus & Folkman, 1984). The Transactional Model of Stress and Coping (Lazarus & Folkman, 1984) frames the stress response in terms of coping through a transactional lens between the individual or person and their environment (Lazarus & Folkman, 1984) as broadly depicted in Figure 1 below.

Figure 1 Transactional Model of Stress and Coping

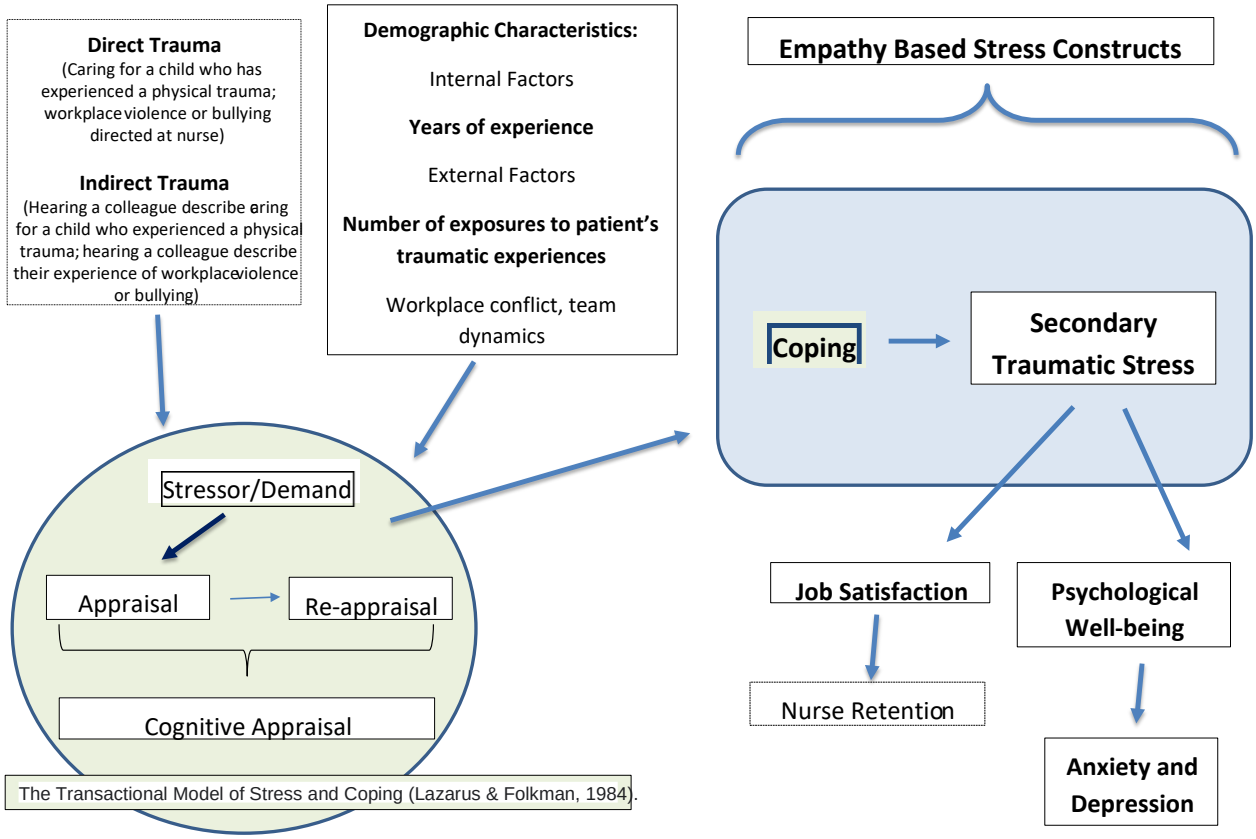


The first purpose of this study was to identify antecedent factors of STS. These can be internal, or personal factors (i.e., years of experience as a pediatric perioperative nurse), or external, environmental factors (i.e., the number of direct exposures to pediatric patients who have experienced a physical trauma, direct exposures to workplace bullying and violence, and indirect workplace exposures to trauma such as hearing about a colleague's exposure to pediatric trauma or exposures to a colleague's experience with workplace bullying or violence) in their relationship with the pediatric perioperative nurse's experience with STS. Of note, nurse coping is framed in this study as an antecedent factor that was examined in relation to the nurse's experience with STS. Further, this study examined linkages between STS and the potential outcomes of pediatric perioperative nurse coping, job satisfaction, anxiety, and depression.

Figure 2 (below) demonstrates an adapted version of the Transactional Model of Stress and Coping that guided this researcher's exploration of constructs directly relevant to the proposed study that are bolded – demographic characteristics, coping, secondary traumatic stress, job satisfaction, and psychological well-being (measures that capture symptoms of anxiety and depression). An in-depth explanation of this researcher's adapted Model for the proposed study is detailed in the following chapter.

Figure 2. Adapted version of the Transactional Model of Stress and Coping

Empathy Based Stress Constructs Experienced by Pediatric Perioperative Registered Nurses



As guided by Lazarus and Folkman (1984), this study examined the potential antecedent and outcome correlates of STS experienced by pediatric perioperative nurses who have been exposed to trauma.

Definition of Terms

The following constructs are defined as they were operationalized within the parameters of the study and as derived from this researcher's review of the literature.

Definitions are also provided for key constructs depicted in Lazarus and Folkman's (1984) Model that guided this researcher's proposed exploratory study.

STS. STS is described as the acute emotional duress that results from an individual hearing firsthand about another's traumatic experiences (Figley, 1995; Kellogg, 2021; Lykins et al., 2021; Peebles-Klieger, 2000; The National Child Traumatic Stress Network, 2023).

Primary appraisal. Primary appraisal is described as the assessment of degree of harm or threat to an individual, and is influenced by internal and external factors (Lazarus & Folkman, 1984).

Internal factors. Internal (person) factors are human aspects that influence an individual's appraisal of a situation (Lazarus & Folkman, 1984), relating to the act of selfregulation in a given circumstance (Bandura, 1986) (e.g., years of clinical experience).

External factors. External factors are environmental and contextual influences on the individual's appraisal of an event (Lazarus & Folkman, 1984). Within the conceptual framework (Figure 2), external factors may include the pediatric perioperative nurse's number of weekly exposures to individuals who have experienced a traumatic event.

Direct Trauma. In this study, direct trauma included the participant's first-hand experiences of caring for a patient who has experienced a physical trauma, or workplace exposures such as experiencing violence or bullying in the perioperative environment.

Indirect trauma. In this study, indirect trauma included the participant's exposure to other's stories and experiences, such as hearing of a colleague's experiences of caring for a child who has experienced a physical trauma, or hearing of a colleague's experience of violence or bullying in the perioperative environment.

Secondary appraisal. Secondary appraisal involves the individual's evaluation of available resources, degree of control over a stressor and ability to cope in the face of a real or perceived threat following initial appraisal (Lazarus & Folkman, 1984).

Reappraisal. Reappraisal describes a re-evaluation and potential change in one's appraisal of a situation that is based on new information being available from one's environment

(Lazarus & Folkman, 1984).

Coping. Coping is the evolving effort, following appraisal, to manage internal and external demands that may exceed a person's resources (Lazarus & Folkman, 1984).

Job Satisfaction. Job satisfaction is defined as the extent of positive affect toward employment (Price & Mueller, 1983).

Anxiety. Anxiety encompasses symptoms such as excess worry that cannot be stopped or controlled, feeling nervous, difficulty relaxing, feeling restless, easily annoyed or irritable, and fear of an impending awful event occurring (Spitzer et al., 2006).

Depression. Depressive symptoms include feelings of hopelessness, decreased interest in activities, feeling down, difficulty falling or staying asleep, feeling tired or having low energy, disordered eating such as overeating or poor appetite, feeling like a failure, trouble concentrating, movement that is extremely slow or extremely fast and thoughts of self-harm (Kroenke et al., 2001).

Research Questions

As guided by this researcher's adapted version of Lazarus and Folkman's (1984) Transactional Model of Stress and Coping, this proposed exploratory study aims to answer the following research questions:

1. What is the prevalence of STS experienced by pediatric perioperative nurses who have been exposed to children who have experienced an acute traumatic event?
2. What is the relationship between the level of STS in pediatric perioperative nurses and the number of weekly exposures to direct and indirect traumatic events as reported by pediatric perioperative nurses over one month?

3. What is the relationship between years of experience in pediatric perioperative nursing and the level of STS as reported by pediatric perioperative nurses?

4. What is the relationship between the levels of STS and coping as reported by pediatric perioperative nurses?

5. What is the relationship between the levels of STS and job satisfaction as reported by pediatric perioperative nurses?

6. What is the relationship between the levels of STS and anxiety as reported by pediatric perioperative nurses?

7. What is the relationship between the levels of STS and depression as reported by pediatric perioperative nurses?

8. What is the relationship between the levels of STS and average weekly direct and indirect exposure to traumatic experiences when controlled for demographic and other predictor variables?

Significance of the Study

While STS has been described in certain areas of nursing, this topic has not been examined among perioperative nurses, and this researcher has not found any empirical work describing STS among pediatric perioperative nurses. Understanding the psychosocial impacts of STS in this population of nurses illuminates the work-related stress that may be experienced by these highly trained professionals. Retention of nurses in specialty care environments like pediatric perioperative care has become a focus for health care organizations facing nursing shortages. Given the current focus on nurse retention, understanding STS in pediatric perioperative nurses and its potential relationship to job satisfaction and subsequent retention of nurses is warranted. Thus, the proposed study findings have the potential to make a valuable

preliminary contribution to the literature by addressing an existing knowledge gap on how to better identify and support pediatric perioperative nurses to cope well when they experience: (a) trauma directly as the result of caring for a patient who has experienced a physical trauma or violence or bullying firsthand in the perioperative environment or (b) trauma indirectly when hearing of a colleague's experiences of caring for a child who has experienced physical trauma or a colleague's experience of violence or bullying in the perioperative environment. This study provides valuable insights into the experiences of pediatric perioperative nurses as they relate to secondary traumatic stress, job satisfaction, anxiety, depression and coping.

Chapter Two – Review of the Literature

Background

Nurses often work with individuals who have experienced traumatic events. Nursing is among the few professions in which caring, empathy and the response to other's stress converge in a unique way to form and impact work-related stress (Clegg, 2001).

Vicarious trauma, secondary traumatic stress (STS) and compassion fatigue are phenomena described as empathy-based concepts (Duarte & Pinto-Gouveia, 2017; Joinson, 1992; Rauvola, Vega & Lavigne, 2019) that are considered occupational hazards within caring professions (Aiken et al., 2002; Clegg, 2001; Pearlman & Saakvitne, 1995). Nurses who are exposed to individuals who have experienced a traumatic event may experience acute STS which can eventually progress to long-term compassion fatigue, decreased well-being, diminished job satisfaction (Golbasi et al., 2008; Healy &McKay, 2000), retention issues (Duffy et al., 2015; Meyer et al., 2015; Sheppard, 2015; Sorenson, 2017; Van Osch et al., 2018), reduced commitment to their profession (Arnold, 2020), and negatively impact the quality of care

provided to their patients (Meyer et al., 2015; Sabery et al., 2017; Sorenson et al., 2017). Health care workers, in general, may be more prone to STS than other professions where other professionals have less exposure to other's traumatic or stressful life events (Oginska-Bulik et al., 2021), with acute care professionals being more impacted than other areas of care (Crumpei &Dafinoui, 2012; Lykins et al., 2021). High levels of stress are related to burnout conditions experienced by nurses (Hayes et al., 2015; Lim, Hepworth & Bogossian, 2010; McConnell, 1982; Oganowski, 1983; Waddill-Goad, 2016).

Numerous studies have described the effects of generalized stress (DeLongis et al., 1988; Monat & Lazarus, 1985; Holroyd & Lazarus, 1982; Oganowski, 1983; Salmond et al., 2005; Schernhammer et al., 2004; Schulz et al., 2011), and the organizational consequences of unaddressed STS include increased absenteeism, decreased morale, and deterioration in team functioning (Seys et al., 2013). Studying the effects of empathy-related stress associated with
STS on caring by nurses can better assist organizations in promoting healthy work environments (Meadors & Lamson, 2008; Maloney, 2012; Noblet & Lamontagne, 2006; Sorenson et al., 2017; Van Den Tooren, & De Jonge, 2008).

The shortage of nurses is a current global concern (Drennan & Ross, 2019; Marc et al., 2019; Murray, 2002). The retention of nurses in specialized environments, such as pediatric perioperative care, is necessary – otherwise, we stand to risk losing nursing staff with extensive education and preparation who are vital to providing safe and competent care (Gillespie & Hamlin, 2009) to patients with complex medical needs (Turris et al., 2007). The following will describe the perioperative nursing role and elements that may impact the perioperative nurse's experience with STS, which in turn may be impacted by poor coping that results in reduced satisfaction and greater levels of mental health symptoms.

Perioperative Nursing

The perioperative nursing role is challenging and encompasses many aspects of patient care. Perioperative nursing has long been recognized as a specialty, and one that has evolved over time (Sigurdsson, 2001). Perioperative nurses provide care to patients undergoing surgical procedures, beginning in the pre-operative preparatory period and admission of the patient to the operating theatre, through the intra-operative phase when the surgical procedure is completed and the perioperative nurse takes on the role of scrub nurse or circulating nurse, to the postoperative phase and transfer of the patient to their designated post-operative unit and turnover of the operating theatre in preparation for the next patient (Rothrock, 2022).

Perioperative nursing care is delivered within complex environments (Bajwa & Mehdiratta, 2021; Goras et al., 2020; Sigurdsson, 2001) with unique workplace cultures (Eskola et al., 2016), where extensive specialty training is necessary to function safely (Alfredsdottir & Bjornsdottir, 2008), and interprofessional team-work is required to deliver safe patient care (Cole et al., 2019; Wallin et al., 2015). The operating room is considered a stressful environment (Brandao & Galvao, 2013; Flood & Allen, 2012; Kingdon & Halvorsen, 2006; Madrid & Glanzner, 2021; Myers, 2017; Naviaux et al., 2022), and represents an area in which specialized care is required (Hartley, 2018). The challenges experienced in the operating room can be classified according to physical factors and psychosocial factors that reside in this work environment, both of which influence the nurse's level of work-related stress (Dos Santos & Beresin, 2009) and which will be described next.

Physical Environment

There are multiple elements to consider when discussing the physical environment where perioperative nurses practice. From a technical perspective, perioperative nurses are responsible

for handling specialty instrumentation and equipment, mastering complex tasks (Minty-Walker et al., 2020; Sutherland-Fraser, 2021), and relying on standards of practice to perform tasks unique to the environment, including the establishment and maintenance of aseptic technique and surgical counts (Gillespie et al., 2008). Perioperative nurses may be required to work extended shifts and long hours if on call, adding an element of physical fatigue that exists in perioperative nursing.

A large part of the perioperative nurse's role is comprised of performing tasks with associated ergonomic risks (Moscato et al., 2010; Simonsen et al., 2012) such as standing for long periods of time in mostly static positions and performing repetitive movements (Apple & Letvak, 2021). Perioperative nurses participate in tasks associated with increased risk for musculoskeletal injury, such as transferring patients, supplies or equipment (Pompeii et al., 2009; Sheikhzadeh et al., 2009; Soylar and Ozer, 2018), and workplace injuries occurring in the perioperative environment can be career-ending (Vural & Sutsunbuloglu, 2016).

The physical demands on the perioperative nurse include sensory based effects on hearing (MClinSci et al., 2021), air quality in the operating room (Barnes et al., 2018) as a result of surgical smoke (arising from cauterization of tissue) in the theatre (Steege et al., 2016), radiation risks (Chaffins, 2008) and potential visual dangers resulting from exposure to energy sources such as laser beams (Andersen, 2004). As an additional occupational hazard, perioperative nurses are consistently exposed to patients' blood and body fluids (Fry, 2007; White & Lynch, 1993).

Perioperative nursing requires a standardized language and nomenclature (Gillespie et al., 2008) to communicate clearly and ensure safe patient care delivery. Additionally, the use of

technology is prevalent in the operating room, and perioperative nurses are required to maintain and update knowledge on all devices and technologies used in the operating room (Johnstone, 1997; Smith & Palesy, 2018).

The perioperative nursing role is one that encounters multiple physical requirements and challenges. In addition to the physical demands of this work, the perioperative nurse also encounters multiple psychosocial factors, which will be discussed next.

Psychosocial Environment

The perioperative nursing specialty is experiencing a shortage of specialty trained staff (Lee et al., 2020; Stott & Johnstone, 2013; Vortman McPherson, 2021). This shortage not only impacts the surgical operations of health care facilities but also the training and development of new hires (Gillespie et al., 2008) and students as the bulk of perioperative nurse training takes place while "on the job". Communication is central to perioperative nursing (Osborne-Smith & Hodgen, 2017). Poor communication has been identified as a root cause of other challenges and conflict (Katz, 2007) in the surgical environment that leads to increased burnout (Bayer & Ozturk, 2019). Perioperative nurses who encounter moral dilemmas relating to consent issues and quality of care (Killen, 2002) are often influenced by poor communication and burnout.

The stressful operating room environment lends itself to conflict (Katz, 2007), and perioperative work-related trauma is categorized in terms of abuse, as relating to practice issues, and patient death (Michael & Jenkins, 2001). Among the interpersonal challenges that may be experienced in the operating room, bullying has been identified as a significant challenge (Chipps et al., 2013; Gilmour & Hamlin, 2003; Lang et al., 2022; Smith, 2011; Spruce, 2019). In general, bullying may be exhibited among interprofessional colleagues; horizontal bullying is exhibited among nursing colleagues (Dunn, 2003). Bullying within the perioperative arena may

include behaviors such as verbal abuse (Cook et al., 2001) or violence (Bigony et al., 2009; Dunn, 2003; Roh & Yoo, 2012). Bullying impacts perioperative nurse levels of burnout (Lang et al., 2021; Teymoori et al., 2022) as it relates to emotional exhaustion (Lee et al., 2020), depersonalization and reduced personal accomplishment (Sillero & Zabalegui, 2018), perceived levels of happiness (Ha, 2021) and intentions to leave the specialty of perioperative nursing (Lodge et al., 2018). Perioperative nurses may demonstrate increased post traumatic symptomology (Ke et al., 2020) which overlaps with STS symptoms (Mordeno et al. 2017; Sprang et al., 2019) according to the Diagnostic and Statistical Manual of Mental Disorders (DSM) 5 (American Psychiatric Association, 2022).

Perioperative nurses, particularly those working in tertiary care settings, must often respond to emergency situations. Responding to unexpected emergency situations arising in the operating room intra-operatively is a stressful part of the perioperative nurse's work (Michael & Jenkins, 2001).They care for patients requiring emergency surgical procedures, or respond to a patient emergency intra-operatively, such as cardiac arrest (O' Donoghue et al., 2015), local anesthetic toxicity (Ferguson et al., 2019), massive transfusions processes (Vortman, 2020) or malignant hyperthermia crisis (Hommertzheim & Steinke, 2006. The latter three of these emergencies represent patient safety events that most often occur in the surgical suite or in the immediate post-operative phase (Hepner et al., 2017), therefore are unique to perioperative nurses compared to other nursing specialties. Additionally, perioperative nurses may experience unexpected patient death (Hartley et al., 2019; Rodger & Hartley, 2019) during the intra-operative period that is a significant source of stress.

Further, perioperative nurses are in the unique position to be among the only group of nurses involved with patient donor organ procurement for tissue donation (depending on the type

of facility they are employed in), and this process has been found to affect the perioperative nurse's psychological health (Bourret et al., 2021; Carter-Gentry & McCurren, 2004; Gao et al., 2017; Peng et al., 2020), however the long-term effects of participating in these types of cases is unknown (Carter-Gentry & McCurren, 2004). A number of qualitative studies have emerged describing the experiences of perioperative nurses involved in cases of organ donation or organ procurement. Nurses described feelings of emotional numbing while needing to stay focused in the pre-operative (preparation) period, as well as desensitization or detachment intra-operatively, and feelings of sadness, depression, helplessness and anger (Carter-Gentry & McCurren, 2004). On the other hand, drawing on inner forces to cope has been identified as a significant protective factor when dealing with perioperative patient death that is related to years of perioperative nursing experience (Perrin et al., 2013). The organ donation experience may be emotionally taxing as the team procuring the organs has minimal time to conduct a transplant procedure on an organ recipient. The emotional toll that this can take is significant, although participating in a transplant procedure immediately following an organ procurement may assist the perioperative nurse with coping through such an event (Carter-Gentry & McCurren, 2004). Given the types of exposures to trauma that the perioperative nurse may experience (for example, patient resuscitation or participation in cases of organ donation), the perioperative setting is a high-risk area for the development of STS.

Skills required of the perioperative nurse include the ability to multitask or manage multiple demands simultaneously (Goras et al., 2019), navigate team-related disputes (Soper, 2019), experience uncertain shifts (i.e. from on call shifts or overtime), and patient acuity (Zhu et al., 2019). As professionals, perioperative nurses engage in teaching responsibilities related to student nurses and new staff (Espiritu et al., 2012), navigate interprofessional teams (Laflamme et al., 2019) and deal with the often-unpredictable nature of emergency cases (Goras et al., 2020). Perioperative nurses might attend to mass casualty trauma events (Melmer et al., 2019)

such as active shooter events. While perioperative nurses deal with unpredictable aspects of their jobs, they are expected to maintain efficiency (Robertson, Kla & Yaghmour, 2021; Rothstein & Raval, 2018; Phieffer et al., 2017) and a safe environment (Chappy, 2006; Steelman et al., 2013) amongst environmental noise (Brommelsiek et al., 2022; Way et a., 2013), and distractions (MacKenzie & Foran, 2019). Perioperative nurses are also expected to focus on quality improvement initiatives (Westra & Peterson, 2016) and exhibit consistent critical thinking (Fesler-Birch, 2010; Jones, 2010; Kingdon & Halvorsen, 2006) that are considered priorities within the operating theatre as they maintain situational awareness (Gillespie et al., 2013) to maintain a safe patient environment.

Pediatric Perioperative Nursing

Within the field of perioperative nursing, nurses can further specialize in areas such as cardiac surgery or pediatric surgery, among others. Thus, to appreciate the complexity of the pediatric perioperative nursing role, pediatric nursing is considered a "specialty within a specialty" and represents a relatively small yet necessary portion of the nursing workforce. Pediatric perioperative nurses may experience an additional challenge of working with minors viewed as a vulnerable patient population.

Nurses caring for pediatric patients may experience higher levels of stress than nurses caring for other patient populations (Kellogg et al., 2018b). Pediatric nurses care for not only their patients but also the pediatric patient's family and caregivers (Kellogg et al., 2018b). In Kellogg et al.'s (2018b) study sample of 350 pediatric nurses, more than half of the nurses identified moderate, high or severe STS; however, length of time working with pediatric patients was not correlated with STS. Pediatric nurses have described their experiences of witnessing the suffering

of pediatric patients as anguish (McGibbon et al., 2010), owing to the additional challenge of caring for innocent and underaged patients experiencing trauma and suffering.

Few have studied STS in pediatric nurses, and this researcher has found no studies describing this phenomenon within perioperative nursing or specifically, pediatric nurses who work in perioperative settings. This exploratory, descriptive study explored STS among pediatric perioperative nurses and described its relationship to job satisfaction, anxiety, depression and coping.

Nomenclature

Multiple works have used different terms and concepts interchangeably with STS (Beck & Gable, 2012; Meadors et al., 2010; Nimmo & Huggard, 2013; Sprang et al., 2019), which has led to confusion in differentiating between the concepts (Sprang et al., 2019; Yang & Kim, 2012). Some of the related terms often employed in the literature include compassion fatigue (Beck, 2011; Figley, 1995; Joinson, 1992; Sorenson et al., 2017), vicarious trauma (Jenkins & Baird, 2002; Hartley et al., 2019; Sabery et al., 2017; Tabor, 2011) and post-traumatic stress disorder (Collins & Long, 2003). Still, there other related terms also employed by authors that include psychological capital (Gang et al., 2016), indirect trauma (Clark & Gioro, 1998), empathic distress (Sinclair et al., 2017), moral stress (Forster, 2009), burnout (Coetzee & Klopper, 2010), emotional contagion (Branson, 2019; Hatfield et al., 1993), countertransference (Tosone et al., 2012), traumatic countertransference (Herman, 1997); emotional strain (Stubin, 2017), emotional labor (Henderson, 2001), and secondary victimization (Hartley et al., 2019; Seys et al., 2013; Wu, 2000).

This diversity in the nomenclature has resulted in challenges to achieving conceptual clarity of STS (Beck & Gable, 2012; Figley, 1995; Sabery et al., 2017; Sprang et al., 2019; Stamm, 1997a). Nonetheless, there are strong arguments that acute STS is a distinct and measurable phenomenon (Beck, 2011; Cieslak et al., 2014; Rauvola et al., 2019) of significance to the health care system, the nurse, and the patient in terms of costs and quality of care outcomes if early attention has not been paid to avert or ameliorate its occurrence. The definitions of secondary traumatic stress, vicarious trauma and compassion fatigue, their defining characteristics and measurement tools are presented in Table 1 (as reported further below in the Literature Review section).

Given the challenges of distinguishing STS from compassion fatigue in the literature, and that some authors have used the terms interchangeably, the below search included the term compassion fatigue with the aim of conducting a broad search of the current literature. However, compassion fatigue is not a variable of focus in this study.

Literature Review

Search Methods

The literature review comprised a search of the following databases: CINAHL, EbscoHost, MEDLINE, PubMed, PsycInfo, Google Scholar, Scopus, ERIC, SAGE, and ProQuest. The following primary search terms were identified: compassion fatigue, STS and vicarious trauma, job satisfaction, anxiety, depression and coping. STS and MESH terms derived from the initial literature search included: empathic strain, compassion discomfort, compassion stress, emotional labor, secondary victimization, burnout, and post-traumatic stress disorder. The identified literature databases were searched in a similar and systematic manner. Literature sources were limited to those in the English language and no time limits were set for data

retrieval to allow for an in-depth and broad examination of the evolution of STS as a concept in the identified databases and across disciplines.

Eligibility Criteria

Selection criteria included articles discussing both STS and compassion fatigue in healthcare professionals including nurses. This review included quantitative and qualitative studies, systematic reviews, case studies as well as lay publications and grey literature. A total of 358 works from literary sources were included in the review and include quantitative and qualitative studies.

The empathy-based concepts of vicarious trauma, STS, and compassion fatigue, and the outcome variables of job satisfaction and anxiety and depression will be reviewed next within the context of pediatric perioperative nursing. The theoretical framework of the Transactional Model of Stress and Coping (Lazarus & Folkman, 1984) will then be described as a guiding framework to comprehend linkages among these variables.

Empathy-Based Concepts

In order to understand the effects of STS in healthcare providers, an understanding of the closely-related concepts of STS, vicarious trauma, and compassion fatigue is necessary. STS, vicarious trauma, and compassion fatigue are all constructs rooted in empathy (Crumpei & Dafinoiu, 2012; (Duarte & Pinto-Gouveia, 2017; Joinson, 1992; Rauvola et al., 2019). Empathy and empathic engagement are essential aspects to the human nature of nursing care as nurses encounter patients' and families' experiences (Figley, 1995; 2002). Empathy comprises both physiological and cognitive processes (Wagaman et al., 2015) that can occur along a continuum

(Bunin et al., 2021). Empathy is defined as the ability to understand patients' emotional experiences and communicate this understanding to them (Bertakis et al., 1991; Hojat et al., 2001).

Figley (1995) argued that those professionals who are able to feel and express empathy toward those they work with are most vulnerable to developing STS symptoms (Arnold, 2020); this suggests that STS is rooted in empathic processes (Rauvola et al., 2019). Aspects of empathy may be predictive of the development of STS symptomology (Oginska et al., 2022; Rauvola et al., 2019; Wagaman et al., 2015). When the nurse is exposed to another person's trauma, an empathy-based stress response can occur that is thought to be an underlying construct of STS (Rauvola et al., 2019).

While this study's aim is to examine STS, a theoretical understanding of the related concepts of vicarious trauma and compassion fatigue (sometimes used interchangeably with STS) encountered in the literature will be discussed to differentiate STS from its closely related and sometimes correlated constructs. Further delineation among these related concepts will provide greater clarity as to this researcher's decision to focus on acute STS within the pediatric perioperative nursing specialty. Of note, previous authors have described the challenges associated with measurement of STS as it overlaps with the construct of compassion fatigue (Cieslak et al., 2014; Jenkins & Baird, 2002).

The following will describe the closely-related concepts of STS, vicarious trauma, and compassion fatigue through the lens of empathy-based stress and its effects. Respective definitions, defining characteristics, and commonly employed measurement tools for each of these concepts are outlined in Table 1 below.

STS

STS results from being exposed to another's traumatic experience (Beck & Gable, 2012; Bride et al., 2004; Collins & Long, 2003; Figley, 1995; Figley, 2002), encountering those who have experienced primary trauma (Bride, 2007), or having an emotional involvement with another's experience(s) (Bratt et al., 2000). It has been defined as a natural consequence of working with traumatized individuals (Bride & Kintzle, 2011), the residue of experiencing others' trauma (Bride et al., 2009) or one of several possible outcomes following indirect exposure to other's trauma (Adams, Boscarino & Figley, 2006). STS has been studied most extensively among counsellors (Bride & Kintzle, 2011) and emergency service workers (Stamm, 1997b). Arnold (2020) argued that the development of STS is a function of exposure to others' trauma, empathy, bonding and personal factors. Nurses often work with traumatized individuals (Beck & Gable, 2012) and may experience trauma themselves following these interactions

(Figley, 1995; Kellogg, 2022). This resulting, temporary trauma has been termed STS (Figley, 1995). The term is used most often with health care providers who have had brief interactions with traumatized individuals (Branson, 2019).

Overall, the development of STS (MacRitchie et al., 2010) is viewed as an acute reaction as opposed to one that occurs over time (Branson, 2019). STS has been described as resulting from the empathic response that occurs between two people, one of which has undergone a traumatic event, and the other traumatized as a result of hearing of the other's experience (Devilly, 2009). This view supports the theory of understanding STS as an empathy-based concept as described by Rauvola et al. (2019).

Defining attributes. STS manifests itself in irritability, inability to concentrate, anger, and sleep disturbances (Bride, 2007; Nolte et al., 2017; Sabo, 2011; Slatten et al., 2011) as well as unintended, intrusive thoughts of patient situations and arousal symptoms (such as jumpiness or sleep disturbances) (Bride et al., 2004). STS symptomatology mimics that of post-traumatic stress disorder (Figley, 1995) as identified in the most recent Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (American Psychiatric Association, 2022; Mordeno et al., 2017). Affected individuals may experience oversensitivity and unwanted mental imagery (Branson, 2019) or intrusive thoughts (Gentry et al., 2002). STS is also marked by isolation (Figley, 1995). Bride (2007) described symptoms of arousal, intrusion, and avoidance, while Devilly (2009) describes STS as a phenomenon encountered from the nurse's sense of caring and emotional involvement with their patients.

STS Among Nurses

STS has been studied extensively among a variety of nursing specialties (Beck & Gable, 2012; Kellogg, 2021; Mottaghi et al., 2020), including critical care (Jeong & Shin, 2023; Moreno-Jimenez et al., 2023; Sacco et al., 2015; Storm & Chen, 2021), psychiatric nurses (Mangoulia et al., 2015; Zerach & Shalev, 2015), emergency nurses (Barleycorn, 2023; Dominguez-Gomez & Rutledge, 2009; Duffy et al., 2015; Xu et al., 2024), trauma nurses (Hinderer et al., 2014), hospice nurses (Melvin, 2015; Shi et al., 2023), pediatric nurses (Czaja et al., 2012; Kellogg et al., 2018; Kleis & Kellogg, 2020; Yehene et al., 2024), labor and delivery nurses (Beck & Gable, 2012; Nicholls et al., 2021), neonatal nurses (Scott et al., 2021), forensic nurses (Townsend & Campbell, 2009), sexual assault nurse examiners (Bance, 2014), oncology

nurses (Partlak Günüşen et al., 2019; Quinal et al., 2009), and vascular nurses (Young et al., 2011). There is evidence that reported levels of STS vary between nursing specialties (Lykins et al., 2021). Nurses who engage empathetically with patients are more likely to develop STS (Beck, 2011). A table presenting previously reported rates of prevalence of STS among nurses is presented in Appendix R. Overall, previous studies indicate that nurses working in emergency departments (Duffy et al., 2015; Nilan, 2019; Ratrout & Hamdan-Mansour, 2017; Yaakubov et al., 2020), with pediatric patients (Berger et al., 2015; Kellogg et al., 2018b; Yehene et al., 2024) and terminally ill patients (Oginska-Bulik & Michalska, 2021) report higher STS than other areas of nursing.

STS is conceptually related to burnout (McHugh et al., 2011; Sabo, 2011; Von Rueden et al., 2010). Researchers have also demonstrated that STS can result in decreased job satisfaction (Oginska-Bulik et al., 2021), increased rates of turnover in the nursing profession (Halfer & Graf, 2006), and may lead to decreased productivity (Jobe et al., 2022), reduced work ability, and increased emotional strain (Bock et al., 2020). Exposure to traumatic events involving children has been found to be especially provocative in development of STS symptoms (Figley, 1995). However, a gap in the literature remains in relation to the experience of STS among pediatric perioperative nurses.

Overall, the literature identifies that unmitigated STS (as an acute condition) can lead to negative sequelae including the long-term consequence of compassion fatigue (Cocker & Joss, 2016; Coetzee & Klopper, 2010). Thus, ongoing studies are warranted to better comprehend how the acute condition of STS can be averted or mitigated to prevent the permanent condition of compassion fatigue from occurring.

Vicarious Trauma

Vicarious trauma is the exposure to another's experience of trauma or suffering (Figley, 1995). Vicarious trauma is a negative outcome of working with individuals (Figley, 2002; Pearlman & Saakvitne, 1995) who have undergone primary trauma, that is, direct contact or experience with a traumatic event (Peebles-Klieger, 2000). There is an empathetic undertone to the engagement between health care provider and traumatized person (Figley, 2002). Vicarious trauma occurs through exposure to traumatized individuals, and was first identified among therapists (Figley, 1995; McCann & Pearlman, 1990). Conceptually, vicarious trauma is rooted in the fields of psychology, psychotherapy, and psychotraumatology (Collins & Long, 2003; Figley, 1995).

Defining attributes. In their concept analysis, Tabor (2011) identified that vicarious trauma may cause negative visual imagery for healthcare professionals working with traumatized individuals, such as with STS (Branson, 2019), or altered memory (Dunkley & Whelan, 2006). This stems from empathic engagement with client situations and the experience of reliving shocking images of suffering that contact with traumatized individuals may reveal (McCann & Pearlman, 1990). Vicarious trauma is often described as preceding the development of STS (Figley, 1995, 2002) by its definition of exposure to an individual who has experienced a firsthand traumatic event (Peebles-Klieger, 2000). The following will describe the empathy-based construct of compassion fatigue, which is described as a slow decrease in compassion (Coetzee & Klopper, 2010) towards others over time and is considered a permanent effect (Figley, 1995) following the experience STS (Rauvola et al., 2019).

Compassion Fatigue

Compassion fatigue was first used as a term in health care by Joinson (1992) who utilized a nursing-based case study to demonstrate the residual effects of caring for others; this contrasted core beliefs in the field of nursing, namely the concept of caring, because nurses are expected to put others' needs before their own (Gauthier et al., 2015).

Compassion fatigue is described as the progressive (Zhang et al., 2018) and cumulative effect of prolonged exposure to sick and traumatized patients (Figley, 1995; Kelly et al., 2015; Melvin, 2015; Sabo, 2006), resulting in emotional exhaustion (Alharbi et al., 2019; Gelsema et al., 2006) and diminished capacity of the care provider when confronted with other's trauma (Adams et al., 2006; Bride et al., 2007; Figley, 1995; Figley, 2002; Pearlman & Saakvitne, 1995 and a loss of the ability to care for others (Hinderer et al., 2014); these descriptions are akin to definitions of compassion fatigue and not STS. Compassion fatigue has been referred to as a desensitization to caring for others, a lack of compassion (Mooney et al., 2017), depersonalization of the patient in the eyes of the care provider (Alharbi et al., 2019), and a state of hyper vigilance (Figley, 1995).

Essentially, compassion fatigue has an element of finality or is viewed as a final product (Coetzee & Klopper, 2010), whereas STS has been described as an acute response to vicarious traumatization (Badger, 2001).

Defining attributes. Compassion fatigue manifests itself in physical, behavioral, psychological and spiritual ways (Wakefield, 2018), and similarly to secondary traumatic stress, includes symptoms such as sleep disturbances (Badger, 2001), emotional numbness (Pratt & Jachna, 2015), hypervigilance and avoidance or numbing behaviors (Figley, 1995; Baird &

Kracen, 2006), and emotional exhaustion (Adams et al., 2006; Boyle, 2015; Coetzee & Klopper, 2010; Kanter, 2007; Nolte et al., 2017; Sheppard, 2016). Compassion fatigue differs from STS in feelings of helplessness (Figley, 1995; Sprang et al., 2019) or hopelessness (Forster, 2009; Kanter, 2007; Nolte et al., 2017). Of note, the literature documents an overlap between the symptomology of compassion fatigue and that of post-traumatic stress disorder (Sprang et al., 2019).

To highlight the differences and similarities across the three empathy-related stress constructs, compassion fatigue relates to being the final product of 'accumulated stress' arising from the prolonged toll of directly witnessing another's trauma experience. STS involves more of an 'acute experience' with another individual's or one's own experience with trauma. Of note, symptoms for compassion fatigue and STS are similar. Often referred to as an antecedent to STS, vicarious trauma speaks in a general sense to 'bearing witness' to another individual who has experienced a trauma that results in negative 'visual imagery' consequences for the witness. While they can all impact individuals in helping professions, understanding their distinctions is crucial for managing and addressing each effectively.

Definition of Terms

Based on this researcher's review, Table 1 provides conceptual definitions for three empathy-based constructs to help delineate differences among vicarious stress, STS, and compassion fatigue.

Table 1. Empathy-related concepts

Table 1.

Empathy-related concept definitions, defining characteristic and measurement tools

Concept	Definition	Defining Characteristics	Measurement
Vicarious Trauma	Vicarious trauma is the **generalized negative outcome** of working with individuals (Figley, 2003; Pearlman & Saakvitne, 1995) who have undergone primary trauma (direct experience with a traumatic event (Peebles-Klieger, 2000).	Negative visual imagery (Tabor (2011); altered memory (Dunkley & Whelan, 2006).	Vicarious trauma scale (VTS) 8item self-report tool, 7-point Likert scale measuring distress levels associated with working with traumatized individuals (Vrklevski & Franklin, 2008), with sound reliability and validity (Cronbach's alpha reliability estimate of 0.88 for the total scale (Benuto et al., 2018).
Compassion Fatigue	Compassion fatigue is the **progressive** (Zhang et al., 2018) **and cumulative effect of prolonged exposure** to sick and traumatized patients (Figley, 1995) and is understood as a final product of accumulated stress (Adams et al., 2006; Figley, 1995, 2002), or when a nurse loses their ability to nurture their patients (Hinderer et al., 2014).	Sleep disturbances, difficulty concentrating (Badger, 2001), emotional numbness, deteriorating clinical performance (Pratt & Jachna, 2015), decreased empathetic ability (Coetzee & Klopper 2010; emotional exhaustion (Adams et al., 2006; Coetzee & Klopper, 2010), and feelings of helplessness (Figley, 1995; Sprang et al., 2019) or hopelessness (Kanter, 2007; Nolte et al., 2017).	Professional Quality of Life Scale (PROQOL); a 30 item self-report tool measuring compassion satisfaction, burnout, STS (with burnout and STS composing compassion fatigue), and work satisfaction. PROQOL has demonstrated sound reliability and validity with Cronbach's alpha reliability estimates ranging between 0.75 and 0.88 for its subscales (Stamm, 2005).
STS	STS is the **acute emotional duress** that results from an individual hearing firsthand about another's traumatic experiences (Figley, 1995; The National Child Traumatic Stress Network, 2023).	Irritability, inability to concentrate (Bride, 2007); sleep disturbances, (Bride et al., 2004); unintended or intrusive thoughts of patient situations (Branson, 2019; Bride et al., 2004; Gentry et al., 2002), and isolation (Figley, 1995).	Secondary Traumatic Stress Scale, a 17-item, 5-point Likert scale self-report tool that measures STS symptoms over 3 sub-scales (intrusion, avoidance, and arousal), with sound psychometric properties (reported internal consistency alpha coefficient of 0.93 on the total STSS (Bride et al., 2004).

In summary, commonly used nomenclature to discuss empathy-related concepts of vicarious trauma, STS, and compassion fatigue was briefly examined and delineated. While these concepts are closely related, the proposed research study focused on the acute experience of STS among pediatric perioperative nurses. The literature identifies STS as an acute condition that precedes the chronic or long-term empathy-based experience of compassion fatigue. To capture

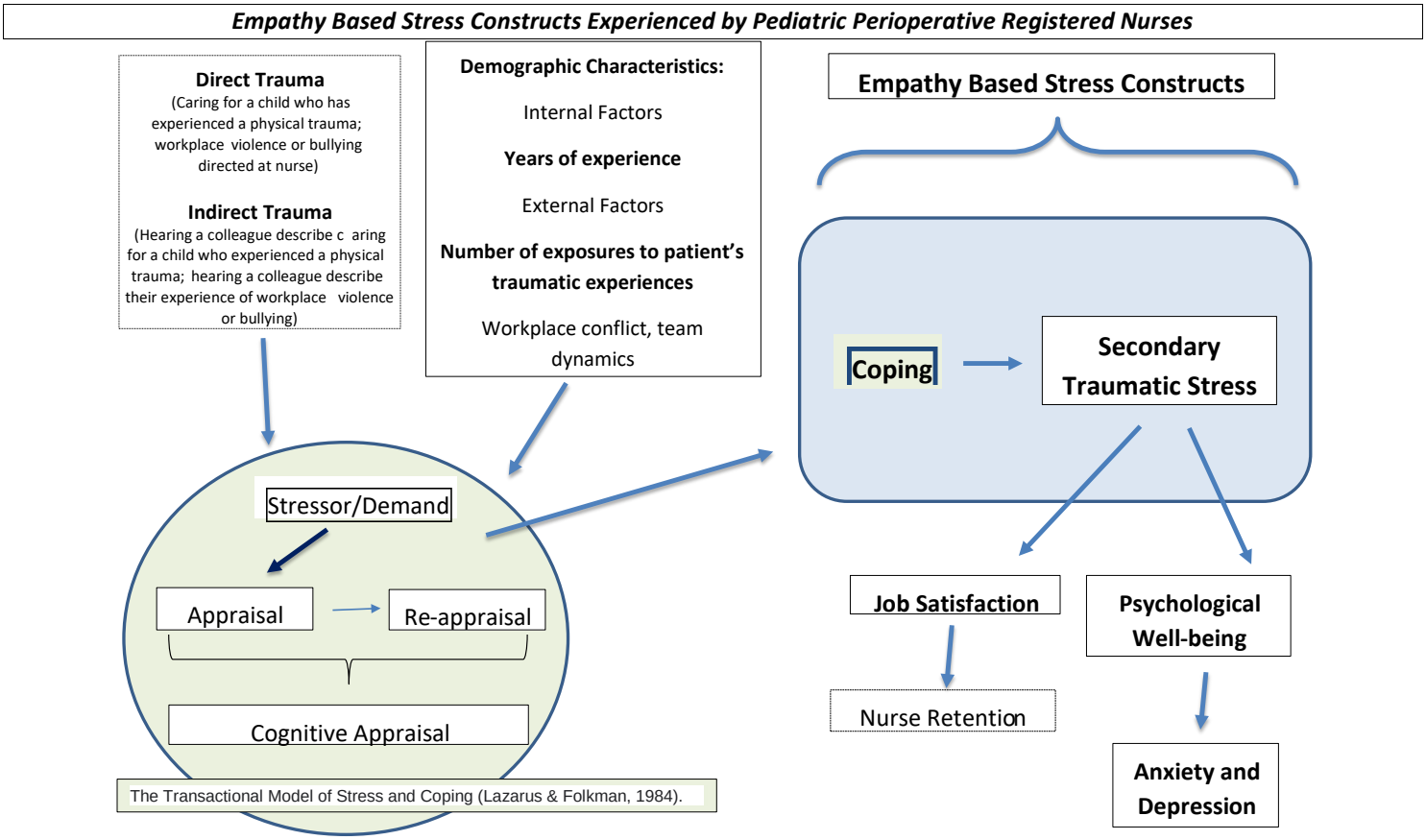
empathy-based concepts in studies, researchers have employed a variety of sound tools, including the well-known and often-used STSS. This review of the literature supports the need to more closely examine the acute response of STS of pediatric perioperative nurses when they have experienced direct or indirect exposure to trauma. An enhanced understanding of STS can aid in preventing the occurrence of the long-term condition of compassion fatigue.

The next section will describe The Transactional Model of Stress and Coping (Lazarus & Folkman, 1984) that served as a guide in examining linkages between STS and its potential antecedent and outcome variables.

Theoretical Framework

In this study, the adapted Transactional Model of Stress and Coping (Lazarus & Folkman, 1984) was used to 'identify' key study variables regarding pediatric perioperative nurse STS experiences. This Model was also utilized as the basis for 'exploring associations' between STS and antecedent variables of STS. According to this Model, antecedent variables can be personal factors, such as years of experience as a pediatric perioperative nurse, or environmental factors such as the number of: (a) direct exposures to pediatric patients who have experienced a physical trauma and to workplace bullying and violence, and (b) indirect workplace exposures to trauma such as hearing about a colleague's exposure to pediatric trauma or exposures to learning of a colleague's experience with workplace bullying or violence). Nurse coping is also identified in this study as an antecedent variable of STS. Further, this study examined linkages between STS and potential outcomes of pediatric perioperative nurse job satisfaction, anxiety, and depression. The adapted version of the Transactional Model of Stress and Coping depicts hypothetical relationships between concepts relevant to this study (see Figure 1 below). Theoretical concepts of interest to this research are bolded.

Figure 1. Empathy based stress and adapted Transactional Model of Stress and Coping.



The Transactional Model of Stress and Coping suggests that an individual's response to stressors results from a disturbance in emotional homeostasis and is a dynamic process between the individual and appraisal of their environment, resulting in a coping process (Lazarus & Folkman, 1984; Walinga, 2010). This Model served as a guide to help this researcher better comprehend the interaction between personal (internal) and environment (external) factors of pediatric perioperative nurses who are exposed to direct trauma (such as in caring for a patient who has experienced a physical traumatic injury or experiencing workplace bullying or violence) and/or indirect trauma (such as when the nurse learns of a colleague's experience of caring for a child who has undergone a physical trauma, or the nurse learns of a colleague's experience with workplace bullying or violence). For instance, the nurse's encounter with the pediatric patient's

trauma can trigger an initial and ongoing appraisal(s) by the perioperative nurse that may mitigate the degree of stress experienced through identified coping mechanisms. Such coping mechanisms have potential to avert or mitigate an acute stress response, such as STS, in the nurse who works in an already challenging perioperative work environment.

Transactional Model of Stress and Coping

Stress has been described as both a response and a stimulus (DeLongis et al., 1988; Walinga, 2010; Lazarus & Folkman, 1984). The stress response model frames stress as a physiological response within general adaptation syndrome as described by Selye in 1954 who proposed that if the stress response was prolonged or severe, it could result in disease or death, a concept that has since been further explored (Lazarus & Fowler, 2000). Stress is understood to include both positive and negative outcomes that are dependent on cognitive interpretations of a physiological experience by the individual (Selye, 1983; Walinga, 2010).

Building on Selye's work (1956), Lazarus and Folkman (1984) proposed the concept of appraisal of stressful events as the core of their Transactional Model of Stress and Coping that consists of primary, secondary and reappraisals. Stressors in this context have been identified as demands made by the environment that affect an individual's physical and psychological wellbeing (Lazarus & Cohen, 1977). This Model expands on Lazarus's earlier work that focused on determining how individuals facing similar challenges respond to and cope with them in contrasting ways (Lazarus & Opton, 1966). Lazarus and Folkman (1984) further described psychological stress as an emotional response to environmental stimuli exceeding the individual's coping capacity. The Transactional Model of Stress and Coping (Lazarus & Folkman, 1984) remains one of few theories that consider stress response in terms of coping through a transactional lens (Lazarus & Folkman, 1987).

The following will describe the main tenets of the Transactional Model of Stress and Coping by using a hypothetical case that involves perioperative nurses who are exposed to the traumatic experiences of pediatric patients.

Cognitive Appraisal

Lazarus and Folkman (1984) described cognitive appraisal as the manner in which an individual categorizes a situation that results in a change in the relationship between the individual and their environment. Cognitive appraisal and coping are a cyclical and an iterative process involving primary, secondary and reappraisals (Lazarus & Folkman, 1984; Walinga, 2010). Personal, or internal factors (such as years of clinical experience) and environmental, or external factors (such as weekly number of exposures to another's trauma) may affect the appraisal process. A primary appraisal involves the assessment of harm or threat to the individual, which may be assessed or perceived as having harm or no harm. Secondary appraisal involves the identification of a coping strategy to manage the threat and the individual's ability to manage the threat in the face of the stressor (Goh, Sawang & Oei, 2010; Lazarus & Folkman, 1984). The appraisal process is a continuous adaptive process in response to stressors that involves the re-examination of a situation (Lazarus & Folkman, 1984). Cognitive appraisal as it relates to coping is influenced by internal (personal) and external (environment) factors which influence individual response to an event (Lazarus, 1966) and how individuals who are presented with certain circumstances appraise and respond in distinct ways, and relate to self-regulation and self-efficacy (Bandura, 1977; Bandura, 1986). Internal and external factors as understood within this researcher's conceptual model will be explained more fully below, drawing on a hypothetical case of a perioperative nurses who is exposed to the traumatic experiences of pediatric patients.

Internal factors. Internal (personal) forces are the internal human aspects that influence an individual's appraisal of a situation and relate to the act of self-regulation, or the ability of an individual to manipulate their environment to produce a desired outcome or regulate their behavioral response to an event (Bandura, 1977, 1986). In the context of this study, internal forces may provide protective and mitigating forces that influence the pediatric perioperative nurse's assessment of an exposure to a patient's traumatic experience. When the nurse's 'usual' pattern of response to various workplace stressors involves self-criticism, these are internal factors that have been correlated with higher levels of STS (Thompson et al., 2014). Among internal protective factors that may accumulate over time as a 'usual' or repeated pattern of response to workplace stressors, mindfulness (Thompson et al., 2014) and self-awareness (Killian, 2008) may mitigate a perioperative nurse's appraisal of an event. Viewing one's work as important and valued (Kapaale, 2018; Robins et al., 2009) may offset the emotional demands of responding to emergency surgery by the perioperative nurse. Anecdotally, perioperative nurses acknowledge that their work is challenging but its necessary nature lends a sense of "doing what one must" to provide restorative and life-sustaining care to patients under lifethreatening circumstances. The nurse's personal trauma history (Caringi et al., 2015), emotional needs (Kellogg et al., 2018), and underlying anxiety (Quinn et al., 2018) are other internal forces that can inform their appraisal and subsequent response to an event.

As in the hypothetical case, the nurse's years of clinical experiences (for example, the nurse previously attended to a pediatric patient under similar circumstances which resulted in patient death in the operating room) or their own emotional experiences (for example, the nurse who previously lost a family member from the same cause) can impact their appraisal process.

Of particular interest to this researcher in this small exploratory study is the nurse's years of experience as a professional, and whether length of perioperative nursing experience in years is linked to the nurse's experience of STS. While others have identified years of experience as a personal, or internal factor of interest to study, they found that years of experienced did not significantly predict STS (Kellogg et al., 2018b) or burnout (Craig & Sprang, 2010) in pediatric nurses. Further investigation is needed to identify factors such as 'years of experiences' that might impact the development of STS in pediatric nurses working in perioperative care settings. To explain further, 'years of experience' as an internal, or personal factor in relation to the Transactional Model of Stress and Coping (Lazarus & Folkman, 1984) may serve as an indicator for more experienced pediatric perioperative nurses who either possess certain personality characteristics or developed adaptive responses to workplace stressors or realized their strengths to deal with pediatric trauma over time.

External factors. Similar to internal forces, external forces are environmental, contextual influences that influence appraisal and can provide protective and mitigating forces that interplay to determine the individual's assessment of an event. External forces can be understood in the context of self-efficacy, where one's behavioral response is influenced by outward forces such as environmental variables (Bandura, 1977, 1986). Evidence demonstrates that there are a number of external or environmental factors in nurses' workplaces that can influence the nurse's appraisal of the event. These factors can include staffing levels in the care area (e.g., whether the unit is sufficiently staffed to attend to a life-threatening emergency surgery), patient acuity, the needs of the pediatric patient's family or caregivers who may exhibit emotional responses to the events involving their child, interprofessional team needs (Kellogg et al., 2018b), and team dynamics including psychological safety, workplace conflict levels, and bullying. Peer and

organizational supports (Bride et al., 2007) can act as mitigating factors when nurses encounter stressful events. These types of supports can extend interpersonal strengths that foster selfregulation and meaning-making thus helping to mitigate the perioperative nurse's response towards pediatric patient's traumatic event(s) (Sprang et al., 2019).

The external factor of perceived "dose of indirect exposure" to patients' traumatic experiences by nurses is of interest to this researcher. Dose of indirect exposure has been predicted to be a factor that determines the nurse's appraisal response to a stressful situation (Sprang et al., 2019, p. 74). For the purposes of this study, dose will be described as the nurse's average weekly number of exposures to colleagues who describe caring for individuals who have experienced a traumatic event or exposure to colleagues who have experienced workplace bullying or violence. While not explored in studies involving nursing, the dose of indirect exposure warrants study in pediatric perioperative nurses.

As depicted in Figure 2 (left hand side), the focus of this study was the internal forces of perioperative nurses as represented by their years of nursing experience. The external forces will include the dose or number of previous exposures to patients' traumatic experiences or workplace bullying or violence that influence the nurse's cognitive appraisal and subsequent coping response to a relevant or unique stressor (Lazarus & Folkman, 1984). Both the internal and external stressors can affect the appraisal process and may provide insight into why different pediatric perioperative nurses view and respond to similar events in distinct ways.

The following will describe in detail the circular sequence of primary appraisal, secondary appraisal, re-appraisal and coping using a hypothetical case describing the experience of the pediatric perioperative nurse exposed to a patient's traumatic experience.

Primary Appraisal

Primary appraisal is recognized as harm assessment that determines the degree to which a stressor poses a threat to the individual (Folkman et al., 1986; Lazarus & Folkman, 1984; Walinga, 2010). Primary appraisal refers to the "motivational relevance" of an event (Lazarus & Folkman, 1984), and consists of three subtypes that might be evaluated by the perioperative nurse such as: (a) a harm, (b) an anticipated harm or (c) as a challenge to mobilize forces for coping, with the understanding that not all harms will be threatening, and the nurse's response to them may be a null or they will not perceive a threat (Lazarus & Folkman, 1984). Appraisal of harm becomes an examination of internal and external factors that inform the individual's response to the stressor (Lazarus & Folkman, 1984). While some have characterized primary appraisal as the equivalent of a fight or flight response (O'Connor et al., 2010), it is important to acknowledge that appraisal may be positive (described as eustress, a moderate stress response which some view as beneficial as it "preserves or enhances well-being") (Lazarus & Folkman, 1984), or negative (leading to distress and a need to preserve oneself when facing a harm or threat) (Gibbons et al., 2010; Lazarus & Folkman, 1984).

Drawing on the hypothetical case, primary appraisal occurs when the pediatric perioperative nurse is exposed directly to a patient who has undergone a traumatic event necessitating emergency surgical care (depicted on the left-hand side of Figure 2 as exposure to another's trauma). Initial exposure may also occur prior to an in-person meeting with the patient, for example during patient report. At the time of exposure, the perioperative nurse appraises the degree to which the stressor poses a harm. The nurse's primary appraisal will be based on their assessment of internal factors such as the length of their nursing experience (for example, a novice nurse who has not cared for a patient in life-threatening circumstances) and external

stressors such as the number of previous exposures to pediatric trauma requiring surgical intervention. The nurse's assessment of the stressor will result in the harm being deemed irrelevant or something that is harmful, threatening, or challenging (Lazarus & Folkman, 1984) to the nurse.

Secondary Appraisal

During the process of secondary appraisal, the individual evaluates their available resources, degree of control over the stressor, and their ability to cope in the face of a real or perceived threat following their initial appraisal (Folkman et al., 1986; Lazarus & Folkman, 1984; Walinga, 2010). With secondary appraisal, the coping response is moderated by the internal and external factors of self-efficacy, perceived control, support, and coping style (Gibbons et al., 2010; Lazarus & Folkman, 1984). In Figure 2, secondary appraisal is depicted as part of the overall cognitive appraisal process.

Drawing on the hypothetical case, during a secondary appraisal the pediatric perioperative nurse evaluates their available resources in relation to their exposure of a patient's traumatic experience. The nurse might rely on internal resources such as personality characteristics or self-efficacy in drawing from past clinical experience(s) and one's previous response style to workplace stressors in conducting this subsequent appraisal. To explain further, perhaps the nurse has been tasked with caring for a patient requiring emergency surgery following a traumatic event. The initial focus of the surgical team is to prepare the patient for surgery in an expedited manner which creates a fast-paced care environment that is necessary to provide lifesaving and time sensitive interventions. As guided by the Transactional Model of Stress and Coping, the secondary appraisal is the time when the pediatric perioperative nurse may evaluate what can be done and what coping options are available to them at this time

(Lazarus & Folkman, 1984). For example, the pediatric perioperative nurse might seek assistance from a colleague to focus on the tasks that they must complete.

Reappraisal

Reappraisal describes a change in one's appraisal of a situation and is based on new information being available from one's environment (Lazarus & Folkman, 1984; Walinga, 2010). Reappraisal depicts the dynamic nature of an individual's stress response and their ongoing appraisal of threat in one's environment as they receive additional or new information regarding an event. As Lazarus and Folkman (1984) indicated, reappraisal that stems from new information may change a previously benign appraisal into one in which a harm or threat is now perceived that depicts the circular nature of the appraisal process described within this theoretical framework.

Relating to the hypothetical case, at some time after the surgical procedure is underway, the perioperative pediatric nurse may learn that their pediatric patient's injuries resulted from abuse by an adult. This may bring out feelings of anger, sadness, or helplessness in the nurse that alter their previous appraisal of the event based on this new information.

Coping

Coping is discussed as the final element of the Transactional Model of Stress and Coping and is recognized as a complex, adaptive process (Lazarus & Folkman, 1984; Monat & Lazarus, 1985). Coping is depicted in Figure 2 as a process occurring after appraisal of exposure to one's own trauma (e.g., related to workplace bullying or violence) or another's trauma that can influence the degree of STS experienced by the perioperative nurse. Coping relates to stress management strategies (Folkman et al., 1986) and is understood as an individual's response to

the process of cognitive appraisal that influences the level of emotional distress experienced by this individual (Lazarus & Folkman, 1984).

Coping is classified as problem-based or emotion-based. Problem-based coping is the action(s) that an individual can take to confront a stressor to change their circumstances or lessen the stress they are experiencing (Lazarus & Folkman, 1984; Lazarus & Lazarus, 2006). Emotion-based coping is described as a passive process of regulating emotional response to the stressor (Folkman et al., 1986; Lazarus & Folkman, 1984; Lazarus & Lazarus, 2006; Walinga, 2010) and centers on addressing one's emotional distress which may lead to ongoing reappraisal (Lazarus &Lazarus, 2006). Previous studies have identified that emotional coping strategies of seeking emotional social support from peers, family and friends helps nurses to mitigate the effects of STS (Berger et al., 2015; de Boer et al., 2014; Von Rueden et al., 2010). In contrast, negative or dysfunctional coping processes (e.g., avoidance) may predict STS in pediatric nurses and are indicative of maladaptive coping (Kellogg et al., 2018b).

Once more referring to the hypothetical case, it is at the stage of coping that the nurse decides whether to take an active role to lessen their stress (problem-based coping); for example, pursuing organizational supports or professional assistance such as counseling. Likewise, the nurse may opt to pursue emotion-based coping such as exhibiting distancing, emphasizing the positive, or engaging in self-blame, isolation or emotional support-seeking (Folkman & Lazarus, 1980a; Skinner et al., 2003).

Based on the Transactional Model of Stress and Coping, adequate coping can serve to mitigate the acute STS experience in the perioperative nurse and prevent the development of compassion fatigue in the long-term. On the other hand, inadequate or ineffective coping may lead to the accumulation of stress in the perioperative nurse and manifest as STS followed by decreased job satisfaction and diminished psychological well-being as measured by anxiety and

depression that has significance to the care of the patient, the nurse, and the wider health care system.

This section discussed the Transactional Model of Stress and Coping that guided this preliminary research study. Elements of this model were reviewed as they relate to STS, including the process of appraisal, coping and reappraisal. The next section will review potential outcomes of STS, specifically job satisfaction, anxiety and depression.

Potential Correlates of STS

This next section will discuss evidence on correlates of STS among nurses who have been exposed to trauma, directly and/or indirectly. While these may generally be understood as outcomes of STS, in the context of the current cross-sectional study they will be discussed as correlates of STS. More specific, a brief review of job satisfaction and anxiety and depression of nurses who have experienced STS will be presented. The outcomes of job satisfaction and anxiety and depression have been chosen as current literature has not well described these outcomes of STS in the pediatric perioperative nursing setting as opposed to other nursing practice settings such as vascular nurses (Young et al., 2011), psychiatric nurses (Mangoulia et al., 2015), pediatric nurses (Kellogg et al., 2018b; Roney & Acri, 2018), or oncology nurses (Quinal et al., 2009). Job satisfaction is significant to the current health care system that is interested in the retention of nurses in the perioperative nursing specialty. Similarly, psychological well-being outcomes may provide insights about the supports needed by perioperative nurses who work in stressful work environments that expose them to pediatric trauma.

Job Satisfaction

Previous studies exploring job satisfaction among perioperative nurses have focused mostly on workplace and team variables that contribute to a nurse's satisfaction with their work. However, perioperative nurses work in complex environments, and there are multiple factors that influence the perioperative nurse's perceived job satisfaction, including STS. Job satisfaction is viewed as a subjective concept with multiple interpretations (James-Scotter et al., 2020). Job satisfaction is a "highly complex, multi-dimensional phenomenon" (Stott & Johnstone, 2013, p. 12) where the enjoyment of one's work (Stamps, 1998) can predict the perioperative nurses' intent to stay in their specialty (Sillero-Sillero & Zabalegui, 2020). However, this phenomenon has mostly been studied in general nursing areas (Hall, 2021) and most of these studies utilized quantitative methods to explore this phenomenon among nurses (Stott & Johnstone, 2013).

To better understand the underlying factors affecting nurse job satisfaction, a review of the literature relating to linkages between nurse job satisfaction and STS was further explored. Of note, some researchers studied job satisfaction as (a) an outcome of STS and (b) a predictor of STS.

Job satisfaction as an outcome of STS. As indicated earlier, there has been scant study of the association between STS and job satisfaction as an outcome in pediatric perioperative nurses. This researcher found one related study examining the effect of STS on job satisfaction among substance abuse counselors in the United States (Bride & Kintzle, 2011). This study employed the STSS to measure STS, and 3 items from the PROQOL scale (Cronbach's alpha = 0.83 for the three summed items) to measure job satisfaction (Bride & Kintzle, 2011). (Of note, based on this researcher's literature review, the PROQOL has been used across different studies not only as a measure of job satisfaction but also the empathy-related stress constructs of

compassion fatigue and STS). These authors found that participants reporting high levels of STS reported low levels of job satisfaction, and indicated that STS significantly predicted level of job satisfaction (Bride & Kintzle, 2011). Further, they found that job satisfaction fully mediated occupational commitment (one of the variables studied) (Bride & Kintzle, 2011), indicating that job satisfaction may play a role in nurse's intent to stay in their profession. Of note, this study sample was comprised of highly educated (most participants had Masters-level degrees) and the mean years of practice were 20 or greater (Bride & Kintzle, 2011); however, neither years of experience or educational levels were associated with job satisfaction in this study (Bride & Kintzle, 2011). Similarly, in a sample of 419 participants consisting of medical professionals, paramedics and nurses, Oginska-Bulik et al. (2021) concluded that STS is the main predictor of job satisfaction.

Job satisfaction as a predictor of STS. Other researchers have focused their attention on job satisfaction as a predictor of STS. A study by Manning-Jones et al. (2017), who employed the STSS scale in a sample of nurses, psychologists, counselors, social workers, and medical doctors and found similar results regarding the mediating role of peer support on the relationship between job satisfaction as a predictor of levels of STS. The role of peer support as a mediating factor on STS has also been reported among emergency nurses (Duffy et al., 2015, using the STSS).

Kelly and Lefton (2017) also found that job satisfaction, as measured using single-item questions rated on 5-point Likert scales to capture overall job satisfaction, overall job enjoyment, and overall job stress was negatively associated with STS (of note: STS in this study was measured by the PROQOL scale with 3 sub-scales that captured burnout, secondary trauma and compassion fatigue; Cronbach alpha coefficients of 0.72, 0.80, and 0.87 were reported

respectively, with no reported alpha for a total scale) in a sample of critical care nurses. Wang et al. (2020) described similar findings in a sample of 1044 nurses working in eleven tertiary care hospitals in China. These authors' findings demonstrated that low levels of job satisfaction were associated with higher levels of STS. They employed the PROQOL-CN (Chinese version) scale where Cronbach's reliability coefficients were 0.875, 0.722 and 0.786 for the compassion satisfaction, burnout, and STS sub-scales, respectively (Jue-Min et al., 2014). The findings of these studies suggest an inverse relationship between STS and job satisfaction, with job satisfaction as predictive of STS among the samples cited.

The above section reviewed literature described the relationship between STS and job satisfaction. Depending on the study, job satisfaction was examined either as a predictor or an outcome of STS levels. The next section will discuss studies that have examined linkages between STS and anxiety and depression.

Anxiety and Depression

From the literature reviewed below, it is noted that there are a variety of studies that explored anxiety and depression among nurses. The common tools employed by researchers have been the GAD and PHQ scales. The studies reviewed below by this researcher include those that examined nurses' psychological well-being as (a) an outcome (anxiety and depression) of STS and (b) a predictor of STS. Finally, there is a growing body of research examining the outcomes of anxiety and depression in health care workers and nurses experiencing STS during and immediately following the COVID-19 global pandemic. These studies are included under a separate heading to delineate psychological well-being (anxiety and depression symptoms) related to STS during and immediately following the acute phase of the COVID-19 pandemic.

Symptoms of psychological well-being as an outcome of STS. A number of studies examined the linkage between symptoms of psychological well-being as an outcome of STS. Some researchers postulated that STS is related to depression and anxiety (Bride et al., 2004). Bock et al. (2020) examined the relationship between reported levels of STS and psychological well-being in their study which took place in a German hospital with a sample size of 320 nurses from various units in the hospital, including pediatrics and surgical care. The participants selfreported levels of anxiety and depression using the Generalized Anxiety Disorder (GAD-7) and Patient Health Questionnaire (PHQ-8) scales, respectively, with both tools reporting sound reliability and validity values (Bock et al., 2020). These researchers found that nurses who experienced STS reported higher depression and anxiety symptoms as compared to nurses who did not report having STS (Bock et al., 2020). Similar results were reported by Hegney et al. (2014) examined the relationship between STS and anxiety and depression levels in their study of 132 nurses working in a tertiary care hospital in Australia. Using the PROQOL scale and the Depression and Anxiety Stress Scale-21 (DASS-21, an abbreviated version of the DASS tool that measures mood symptomology over the period of one week and reports high internal consistency), they found that STS was significantly related to higher levels of anxiety and depression symptoms, however the authors did not report internal consistency and concurrent validity estimates in their sample (Hegney et al., 2014).

Symptoms of psychological well-being as a predictor of STS. A smaller body of studies focused on symptoms of psychological well-being as a predictor of STS. Quinn et al. (2018) discussed factors influencing the development of STS among social workers, with personal anxiety scores being significantly predictive of increased levels of STS. This finding was supported in a study of alcohol and drug service workers in Australia (Ewer et al., 2015) and

in a study of police officers investigating childhood sexual abuse in the United Kingdom using the STSS to assess STS and the HADS tool (which was reported to be reliable and valid in their study sample) to measure anxiety and depression (Hurrell et al., 2018).

Anxiety and depression symptoms relating to STS during the global COVID-19 pandemic. A growing number of studies are emerging that identify symptoms of anxiety and depression as being linked to STS in nurses, during and post-peak of the COVID-19 global pandemic. These works are recognized as important to discuss herein given that the COVID-19 global pandemic represents a collective trauma that has been demonstrated to increase the risk for STS in frontline care workers, given the world-wide, encompassing nature of that event (Ilhan & Kupeli, 2022; Miller & Pehlke, 2022). Kellogg (2021) hypothesized that health care professionals experienced increased levels of STS during the acute phases of the Covid-19 pandemic. Several studies verified this hypothesis by findings (Ilhan & Kupeli, 2022; Miller & Pehlke, 2022) on the impacts of the COVID-19 pandemic on the psychological well-being of health care workers.

In a study of 363 participants, Ilhan and Kupeli (2022) measured STS, anxiety, and depression in a sample of emergency health care workers (including nurses) during the COVID19 pandemic. STS was measured using the STSS scale; anxiety and depression were measured using the HADS tool (Ilhan & Kupeli, 2022). The authors found anxiety levels higher in younger emergency health care workers, although there was no significant relationship between age and STS or depression. Anxiety, depression, and STS rates were higher in those participants reporting low job satisfaction and those experiencing financial difficulties (Ilhan & Kupeli, 2022). Additionally, coping strategies (i.e., described as the engagement in hobbies, healthy diet, or reading) were related to reduced levels of anxiety, depression, and STS (Ilhan &

Kupeli, 2022). Overall, the authors describe high levels of anxiety, depression, and STS among emergency health care workers during the COVID-19 pandemic (Ilhan & Kupeli, 2022).

In a study of 315 Iranian nurses working in hospital settings during the COVID-19 pandemic, Ariapooran et al. (2022) examined anxiety, depression, and suicidal ideation with or without the presence of STS. Just over half of the nurses exhibited symptoms of STS. Nurses experiencing STS reported higher levels of symptoms of anxiety and depression, and suicidal ideation. Well-known reliable and valid tools such as the STS Scale, Beck Anxiety Inventory, and the Beck Scale for Suicidal Ideation, respectively, were employed in this study (Ariapooran et al., 2022). An independent t-test demonstrated higher levels of STS in female respondents compared to male participants. Of note, however, this study did not measure years of experience (i.e., an internal or personal variable in this researcher's study) (Ariapooran et al., 2022). The proposed study examined the demographic variable of years of nursing experience in the perioperative specialty to demonstrate whether there is a measurable relationship with rates of STS, a finding that has been supported in several studies (Craig & Sprang, 2010; Lee, 2021). However, this finding has not been consistent in all studies of STS as described in this review.

Ozkan and Unlu (2021) studied the effects of the COVID-19 pandemic from the perspective of "pandemic workload" on symptoms of depression and anxiety, and stress levels in surgical and operating room nurses. Using the DASS tool in a sample of 166 nurses working in a Turkish hospital setting, reported levels of depression symptoms and stress were higher than reported levels of anxiety symptoms, and there was no correlation between these variables and years of occupational experience (Ozkan & Unlu, 2021). This study specifically provides insight into the experiences of the perioperative nurse on levels of anxiety and depression symptoms as they relate to stress.

While these studies provide valuable insights into the experiences of health care providers during the COVID-19 pandemic, they also provide a baseline from which to study this topic moving forward. As COVID-19 protocols are reduced or removed world-wide and the health care workforce resumes a full workload, resuming work on this topic will provide a basis for comparison of the experiences of STS and its effects on anxiety and depression symptoms among pediatric perioperative nurses. While this study did not engage in a specific examination of the effects of the COVID-19 pandemic on STS, it did target the pediatric perioperative nurse at a time when the health care system is moving forward from the acute phase of the COVID-19 pandemic. This proposed study's finding has potential to provide insights into the stabilization of the pediatric perioperative nurse experience with pediatric trauma as it relates to STS experiences in contemporary practice settings.

In summary, while the reviewed studies provide some insight into the overall psychological well-being of nurses, researchers tended to focus on nurses providing care to adult patients. Regardless, these studies were important to review due to limited research having been conducted on pediatric perioperative nurse symptoms of anxiety and depression. This study examined pediatric perioperative nurse psychological well-being as measured by symptoms of anxiety and depression. In the reviewed studies on the outcomes of psychological well-being of STS in nurses, anxiety and depression symptoms have been captured mainly by using the HADS scale (i.e., a measure of anxiety and depression symptoms), the GAD scale (i.e., a measure of anxiety symptoms) and the PHQ-8 scale (i.e., a measure of depression symptoms). Psychological well-being has been studied mainly as an outcome of STS in the studies reviewed herein.

Summary

This researcher's literature review demonstrates that there is growing evidence describing empathy-based stress among health care workers. STS has been described among nurses working in various areas (Beck & Gable, 2012; Kellogg, 2021; Mottaghi et al., 2020) except in pediatric perioperative care. As guided by the Transactional Model of Stress and Coping (Lazarus & Folkman, 1984) and this researcher's review of relevant nursing literature (Beck, 2011; Beck & Gable, 2012; Wakefield, 2018), this study of STS among pediatric perioperative nurses and its effects on job satisfaction plus psychological well-being symptoms offers insights into the experiences of this population of nurses.

The relationship between STS and job satisfaction has been examined mainly in a crosssectional manner across literature reviewed by this researcher. Most of these articles examined job satisfaction as either a predictor or an outcome of STS. Further, the relationship between STS and job satisfaction has most often been examined by researchers who employed reliable and valid tools, including the STSS, STSI and PROQOL scales. However, this researcher has noted the confusing nature of examining the relationship between STS and job satisfaction as demonstrated by variations in the researchers' use of the PROQOL tool to capture empathyrelated stress constructs of STS or job satisfaction.

The relationship between STS and nurse psychological well-being has been examined by researchers from various perspectives including symptoms of anxiety and depression as predictors of STS or as outcomes of STS. This researcher also reviewed emergent studies since the COVID-19 pandemic that examined the relationship between STS, anxiety and depression symptoms in nurses. Given that previous researchers have demonstrated various directional

relationships between STS and anxiety and depression symptoms, this researcher believes that there may be an existing reciprocal relationship between these variables.

The studies reviewed above have examined professional well-being relating to overall job satisfaction and workplace characteristics such as workplace bullying and social supports. Studies examining the relationship between STS and anxiety and depression symptoms in pediatric perioperative nurses who care for traumatized pediatric patients are limited. However, related evidence exists that these variables are highly correlated and are referred to as comorbidities (Davidson & Fairbank, 1993). During and following the acute phase of the COVID-19 global pandemic, a growing number of studies have examined and continue to examine the effects of STS on symptoms of anxiety and depression in nurses. The recent global pandemic has raised awareness on the mental health experiences and needs of health professionals and front-line care providers. It is important to continue this empirical work that demonstrates the prevalence of STS in all areas of nursing and describes STS effects on the psychological wellbeing (i.e., symptoms of anxiety and depression) of pediatric perioperative nurses.

Overall, as a result of this literature review, this researcher identified the need to capture the prevalence of STS in pediatric perioperative nurses as a result of being exposed to direct and indirect trauma that has not been captured in extant work. Furthermore, this researcher determined the need to capture novel insights on antecedent and outcome correlates of pediatric perioperative nurses who have been exposed to trauma in the workplace. As guided by the Transactional Model of Stress and Coping (Lazarus & Folkman, 1984) and literature reviewed, this researcher examined whether linkages exist between pediatric perioperative nurses' reports on STS and symptoms of psychological well-being (i.e., symptoms of anxiety and depression),

and job satisfaction. Additionally, this researcher utilized the STSS to measure the distinct construct of STS where other studies employed tools such as the PROQOL which measures multiple overlapping constructs (compassion fatigue, STS, and job satisfaction). To restate, due to the paucity of studies conducted with this specialized population of nurses, this researcher determined that further study is warranted to describe nurse experiences of STS and identify antecedent factors that may point to interventions that address STS in pediatric perioperative nurses as they care for traumatized patients.

Chapter Three - Methods

Introduction

This chapter describes the study design and research methodology that were employed to explore the pediatric perioperative nurse's experiences with secondary traumatic stress (STS) and correlates of STS. This chapter includes the study design, sampling methods and setting, instruments used, methods and procedures used to obtain data, and plan for data analyses. Given the paucity of research describing pediatric perioperative nurses' experiences with STS as a result of exposure to direct and indirect trauma, and exploration of related coping, job satisfaction and anxiety and depression, a descriptive correlational study was deemed as the most appropriate design. The purpose of this exploratory study was to: 1) describe the prevalence of STS in pediatric perioperative nurses who were exposed to direct and indirect trauma, 2) examine proposed antecedent correlates of STS (trauma exposure, years of service, and coping), and 3) examine proposed outcome correlates (symptoms of anxiety and depression, and job satisfaction) among pediatric perioperative nurses.

Design and Research Questions

This exploratory study utilized a descriptive, correlational design to address eight research questions that explored the pediatric perioperative nurse's experiences with STS:

1. What is the prevalence of STS experienced by pediatric perioperative nurses who have been exposed to children who have experienced an acute traumatic event?
2. What is the relationship between the level of STS in pediatric perioperative nurses and the number of weekly exposures to direct and indirect traumatic events as reported by pediatric perioperative nurses over one month?

3. What is the relationship between years of experience in pediatric perioperative nursing and the level of STS as reported by pediatric perioperative nurses?

4. What is the relationship between the levels of STS and coping as reported by pediatric perioperative nurses?

5. What is the relationship between the levels of STS and job satisfaction as reported by pediatric perioperative nurses?

6. What is the relationship between the levels of STS and anxiety as reported by pediatric perioperative nurses?

7. What is the relationship between the levels of STS and depression as reported by pediatric perioperative nurses?

8. What is the relationship between the levels of STS and average weekly direct and indirect exposure to traumatic experiences when controlled for demographic and other predictor variables?

Sample and Settings

This was a large internet survey that was conducted with eligible pediatric perioperative nurses who have been exposed to pediatric trauma working in Canada. Eligible pediatric perioperative nurses were recruited with assistance from the special interest group called Operating Room Nurses Association in Canada (ORNAC) described more fully below.

To be included in the study, perioperative nurses in tertiary care settings had to meet the following criteria: (a) must be a registered nurse (RN) or licensed practical nurse (LPN) in Canada; (b) provides direct patient care to pediatric patients aged 0 to 17 years; (c) must work primarily in an operating room setting; (d) must be able to speak, read and write in the English language; and, (e) must have been exposed to direct or indirect trauma over the past month.

Exclusion criteria included nurses not currently in direct pediatric patient care (e.g., educators, researchers, and administrators).

Sample Size

This researcher consulted with the statistician (Dr. Rasheda Rabbani, personal communication, June 9, 2023) at the Manitoba Centre for Nursing and Health Research (MCNHR) to determine estimated sample size to address research question #8 by conducting linear multiple regression, alpha = 0.05, 80% power to calculate the minimum relationship (effect size) and sample size. To determine a moderate relationship (effect size F_2= 0.15) using the main predictor (i.e., combined count of indirect and direct exposures to trauma) without controlling any other variables, a sample size of 55 was needed without any attrition (Aiken & West, 1991). F_2 is the proportion of variance explained by the given effect relative to the proportion of outcome variance unexplained (Aiken & West 1991) and is considered small at a value of 0.02, medium at a value of 0.15, and large at a value of 0.35 (Cohen, 1992).

Feasibility of Sample/Recruitment

ORNAC's membership at the time the study took place totaled approximately 950 nurse members across Canada (Chris Downey, Executive Director, ORNAC, personal communication, June 9, 2023). Of 950 nurse members, there were 131 members who identified as working in a pediatric setting. Perioperative nurses may join this organization at any time during the year, thus this number was an approximate measure of membership as of June 11, 2023 (Chris Downey, Executive Director, ORNAC, personal communication, June 11, 2023).

This researcher initially contacted the ORNAC Executive Director, Chris Downey on May 9, 2023 to describe the study and elicit their assistance with the recruiting nurses across

Canada to the proposed study. As a national organization, ORNAC is comprised of provincial operating room nursing associations and their members. ORNAC provided this researcher with written approval to assist with the email distribution of an online invitation and two email reminders that describe the proposed study to its provincial member organizations and individual members, particularly RNs and LPNs working in the pediatric perioperative care area (Appendix A).

Recruitment Procedure

According to Fricker and Schonlau (2002), when using internet surveys, multiple contacts are an important way to improve response rates. On behalf of this researcher, the ORNAC sent a study invitation via email distribution to all members (RNs and LPNs), which included nurses working in pediatric perioperative care and posted the study link on their website and social media. This email invitation introduced nurses to the on-line survey (Appendix B) followed by two email reminders (via the ORNAC newsletter 1-week part). This email invitation and reminder email invitations provided this researcher's contact information for interested nurses to learn more about the study, their role, and expectations.

Interested participants were instructed to email this researcher about their interest in the study. This researcher then used the screening criteria (Appendix C) to determine the interested participants' eligibility for the study. If the participant met the inclusion criteria and if they agreed to participate, this researcher then provided them with the Qualtrics online link to the implied informed consent form which informed nurses that their participation was voluntary and anonymous (Appendix D). The implied consent form provided RNs and LPNs with a separate general link to access the questionnaire in Qualtrics. The implied consent form explained to the

RNs and LPNs that their consent to participate would be demonstrated through the return of completed online questionnaires.

If the RNs or LPNs consented to participate in the study, they were then directed to the complete one-time questionnaires from their viewpoint as professional nurses. All questionnaire items had to be answered by participants prior to submission of the questionnaire, ensuring that there would be no missing responses. All study participants were provided with the option to receive a $20.00 Amazon gift card honorarium. Participants provided their name and contact information through a separate link indicating their desire to receive a gift card honorarium. Incentives are often used to encourage participation in research studies (Shiyab et al., 2023).

Interested participants were informed that they could share the study recruitment poster (Appendix E) with their colleagues and post a hard copy of the study recruitment poster in common areas such as lounge facilities or staff information boards. The study poster was also advertised on the ORNAC website and social media accounts during the recruitment period. The use of snowball sampling in this study was also employed with participating nurses who agreed to assist in reaching a larger a pool of eligible nurse participants. This helped to increase the sample size by having word of mouth spread to potential participants who may not have otherwise heard of the study (Goodman, 1961).

Protection of Human Subjects

Written ethical approval to conduct this study was obtained from the University of Manitoba Research Ethics Board prior to implementation of the study. Written permission from the ORNAC was obtained to invite pediatric perioperative nurses across Canada to participate in the proposed study (Appendix A). Only those RNs and LPNs who met the inclusion criteria and voluntarily agreed to participate were included in the study. The nurses in this study were

provided with an online invitation to participate in this study (Appendix B), which included a link to the online implied consent form (Appendix D) at time of invitation. The implied informed consent informed participants that they could withdraw from the study at any time. Participants were provided with this researcher's contact information for support services in case of any distress experienced as a result of having participated in this study. Confidentiality was guaranteed by this researcher as described in the consent. The consent form also identified that no personal identifying information would be captured on any of the questionnaires used in the proposed study, and participants' responses would be anonymous. Once study participants completed the study, their names were dissociated from the online data that they provided and they were assigned a code number by this researcher. This code number was linked to study participant's names and along with their implied consent form, was saved on this researcher's University of Manitoba One Drive online account, separate from the participant's data. Only this researcher knows the names of the participants who completed the study materials.

Procedures for Data Collection

Implied consent and data collection occurred online. This researcher sent participants the Qualtrics survey link (described earlier) to complete the implied consent form and questionnaires.

Instruments

Six questionnaires were used in this study. The first questionnaire was a demographic data form (Appendix F). The second questionnaire captured secondary traumatic stress (Appendix G) and the third questionnaire captured job satisfaction (Appendix H). The fourth questionnaire measured anxiety (Appendix I) and the fifth questionnaire captured depression (Appendix J). The sixth questionnaire measured coping (Appendix K). This researcher examined the

Cronbach's alpha reliability estimates for all study tools; the criterion for adequate reliability was established between .70 - .80 (Swan et al., 2023).

The Demographic Data Form

This researcher-developed demographic data form (Appendix F) consisted of 20 questions posed to the participants to describe the sample and to determine if relationships existed between the levels of STS and respective study variables, such as the number of years in pediatric perioperative nursing and the number of exposures per week over one month to direct and indirect trauma. The demographic data form allowed this researcher to collect information about the nurse's age, gender, marital status, whether they have any children and if so, the age of their children, country of birth, whether English is their first language, ethnicity, religion, level of education, nurse designation, workplace setting, occupational status (whether full time vs. part time employed), number of years in nursing, number of years in pediatric perioperative nursing (to answer RQ #3), and the average number of patients the nurse cared for per day. To address Research Question #2, this researcher included 4 demographic data form questions about the number of exposures per week the nurse had to direct (i.e., personal experience of caring for a child who has experienced trauma, or personal experience of workplace bullying or violence) and indirect trauma events (i.e., experience of hearing a colleague describe caring for a child who had experienced trauma, or hearing a colleague describe their experience of workplace bullying or violence).

The Secondary Traumatic Stress Scale (STSS)

To address Research Questions #1 to #8, this researcher selected the STSS, a questionnaire consisting of 17 items (Appendix G). The STSS is often used as a screening tool for the development of STS symptoms to measure intrusion (e.g., "My heart started pounding when I

thought about my work with clients"), avoidance (e.g., "I felt emotionally numb"), and arousal (e.g., "I had trouble sleeping") symptoms in professionals working with individuals who have experienced first-hand trauma. This questionnaire consists of Likert-scale (1, never to 5, very often) response item options for each questionnaire item (Bride et el., 2004). This tool measures the frequency of experiencing the items on the scale as reported by participants over the last seven days (Bride et al., 2004). This tool is scored by summing the individual item scores. Higher scores indicate a higher frequency of STS symptoms. A total score below 28 indicates little to no STS, a score between 28-37 corresponds to mild STS, a score between 38 and 43 indicates moderate STS, a score between 44 to 48 corresponds to high STS, and a score beyond 49 indicates severe STS (Bride, 2007). For this study sample, scores over 38 or greater were considered when reporting on the prevalence of moderate or greater levels of STS. The Cronbach's alpha reliability estimate for this tool has been reported as 0.93 in a sample of 287 licensed social workers (Bride et al., 2004). When applied in a study with registered nurses in a labor and delivery setting, the Cronbach's alpha reliability estimate for this tool was 0.94 (Beck & Gable, 2012), and 0.92 when employed with pediatric nurses (Kellogg et al., 2018a, b).

McCloskey-Mueller Satisfaction Scale (MMSS)

To address Research Question #5, this researcher selected the McCloskey- Mueller Satisfaction Scale (MMSS), a tool developed to specifically measure job satisfaction among nurses (Mueller & McCloskey, 1990) (Appendix H). This 31-item scale with responses rated on 5-point Likert scales) (1, very dissatisfied to 5, very satisfied) measures aspects of work life that are specific to the nursing profession, including working conditions and supervisor support, scheduling, social and interaction opportunities, collegial relationships and support, scholarly opportunities, salary and benefits, and satisfaction with support for family responsibilities

(Mueller & McCloskey, 1990). The global MMSS score can range from 31 to 155. The MMSS is comprised of eight sub-scales as follows: praise/recognition, control/responsibility, scheduling satisfaction, family/work balance, co-workers, interaction, extrinsic awards, and professional opportunities. While the total MMSS tool had a Cronbach's alpha reliability estimate of 0.89, the sub-scales had lower reliability coefficients, ranging from 0.29 to 0.84; the tool's authors acknowledged that sub-scales with the lowest reliability had less items, and this result was expected (Mueller & McCloskey, 1990). The MMSS was re-tested in a sample of Canadian nurses in Ontario, and the findings were consistent with early reports of reliability estimates where Cronbach alpha coefficients for the sub-scales ranged from 0.31 to 0.85 as reported by Tourangeau et al. (2006). The Cronbach's reliability coefficient for the total scale in Tourangeau et al.'s work (2006) was not reported.

The Generalized Anxiety Disorder Scale (GAD-7)

To address Research Question #6, this researcher selected the Generalized Anxiety Disorder scale (GAD-7) scale that is a self-report tool used to assess an anxiety disorder (Jordan et al., 2017; Spitzer et al., 2006) (Appendix I); this tool's reliability and validity (sensitivity 89%, specificity 82%) have been verified (Spitzer et al., 2006). The GAD-7 consists of seven questionnaire items with Likert-scale response options that range from 0 (not at all) to 3 (nearly every day). The GAD-7 measures the frequency of experiencing problems as reported by participants over the last two weeks; these problems included, "feeling nervous, anxious, or on edge", "not being able to stop or control worrying", and "trouble relaxing". The GAD-7 has been employed with RNs in pediatric and neonatal critical care areas, where it demonstrated a Cronbach's alpha reliability estimate of 0.92 and a test-retest reliability estimate of 0.83 (Bursch et al., 2018).

The Patient Health Questionnaire (PHQ-8)

To address Research Question #7, this researcher selected the PHQ-8 instrument that uses DSM-IV criteria to assess for a self-report of depression-related symptoms (American Psychological Association, 2015) and has been used by many disciplines, including nursing (Appendix J). The PHQ-8 consists of eight questions with Likert-scale responses options (0, not at all to 3, nearly every day) and its Cronbach's alpha reliability coefficient was reported to be 0.82 (Pressler et al., 2011). The PHQ-8 is a modified version of the PHQ-9 with the last question on suicidality removed; measurement of depression between the two versions has been noted as nearly identical (Kroenke et al., 2009). Participants are asked whether they were bothered by any of the following problems during the past two weeks, for example: "little interest or pleasure in doing things", "poor appetite or overeating", or "trouble concentrating on things, such as reading the newspaper or watching television". The PHQ-8 has been employed with health care professionals including physicians (Trockel et al., 2018) and nurses during the COVID-19 pandemic with a reported Cronbach's alpha reliability estimate of 0.884 (Kameg et al., 2021).

The Brief COPE Scale

To address Research Question #4, this researcher selected the Brief-COPE scale to assess self-reports of coping among participants. The Brief COPE scale consists of 28 items measuring three sub-scales of coping styles (each composed of multiple facets of coping): problem-focused coping sub-scale (composed of the facets of active coping, use of informational support, positive reframing and planning); emotion-focused coping sub-scale (composed of the facets of emotional support, venting, humor, acceptance, religion and self-blame; and the avoidant coping sub-scale (composed of self-distraction, denial, substance use and behavioral disengagement)

(Carver, 1997). The descriptive statistics of participant responses to the Brief COPE scale are reported in Appendix K. Response item options ranged from 1 (I haven't been doing this at all) to 4 (I've been doing this a lot), and an average scale score was obtained by summing the scores of all items in the scale and then dividing by the number of items in the specific scale (Carver, 1997). The Brief-COPE was initially validated among a sample of hurricane victims (Carver, 1997), and has acceptable reliability among health professionals with a reported Cronbach's alpha reliability coefficient of 0.87 in a sample of oncology nurses (Gomes et al., 2013).

Following the Brief COPE scale items, participants were asked one stand-alone question, "I have reached out for support in my workplace (example, my manager or Employee Assistance Program) following exposure to the traumatic event(s)?" The response options for this question were yes, no, and prefer not to answer.

Data Analysis Plan

The preliminary data analysis plan was reviewed by the statistician at the MCNHR (Dr. Rasheda Rabbani, personal communication, June 20, 2023). All questionnaires were scored according to the respective tool developers' instructions. Descriptive statistics (i.e., means, standard deviations, ranges, and percentages) of sample characteristics (e.g., demographics, workplace, years of experience in pediatric perioperative care, and exposure to indirect and direct traumatic experiences) and study variables as captured on study questionnaires were conducted. The most appropriate and rigorous inferential statistics (parametric or nonparametric) were employed to conduct correlational analyses. This researcher reviewed the questionnaires and there was no missing data.

Research Question #1 stated, "What is the prevalence of STS experienced by pediatric perioperative nurses who have been exposed to children who had experienced an acute traumatic

event?" Secondary traumatic stress in pediatric perioperative nurses was measured using the STSS. To describe STS prevalence, this researcher calculated total scores from 17 items then used cut-off ranges provided by Bride (2007) to define STS level categories as follows: if the total score is 28 or less, as little to no STS; 28-37, as mild STS, 38 – 43, as moderate STS; 44 – 48, as high STS; and, a score 49 and beyond as severe STS. This researcher calculated the percentages for each category of STS levels in the study population. This researcher also reported on three STS sub-scale mean scores for intrusion, avoidance, and arousal as they addressed symptomatology experienced by pediatric perioperative nurses.

Research Question #2 stated, "What is the relationship between the level of STS in pediatric perioperative nurses and the number of weekly exposures to direct and indirect traumatic events over one month?" The number of weekly exposures to direct and indirect traumatic events, as reported by the pediatric perioperative nurse, was calculated by adding counts across four questions (i.e., for two direct and two indirect exposure questions) to determine the total score on exposures to trauma. This researcher employed the Pearson productmoment correlation coefficient (r) to determine if there was a linkage between the number of weekly exposures to direct and indirect traumatic events (ratio variable) and the total and subscale scores on the STS (interval variable). A supplementary non-parametric analysis was conducted using Kendall's tau b correlation coefficient; this statistical test is recommended when using data that originates from ordinal scales that are often regarded in data analysis as interval scales (Wu & Leung, 2017). This relates to the response items on the STSS that are inherently ordinal data but often treated as if they are interval.

Research Question #3 stated, "What is the relationship between years of experience in pediatric perioperative nursing and STS?" This researcher employed the Pearson

productmoment correlation coefficient (*r*) to determine if there was a linkage between years of experience (ratio variable) and level of STS (interval variable). As for Research Question #2 above, a supplementary non-parametric analysis was conducted using Kendall's tau b correlation coefficient as is recommended when using data that originates from ordinal scales that are regarded as interval scales for the purposes of data analysis (Wu & Leung, 2017). As noted above, the Likert-type responses on the STSS are inherently ordinal.

Research Question #4 stated, "What is the relationship between reported levels of STS and coping?" This researcher employed the Pearson product-moment correlation coefficient (*r*) to determine if coping (measured using problem-focused, emotion-focused and avoidant coping subscales) (interval variable) was linked to STS (interval variable). Seeing as the Likert-type responses on both the STSS and the Brief COPE scales are inherently ordinal, a supplementary non-parametric analysis was conducted using Kendall's tau b correlation coefficient.

Research Question #5 stated, "What is the relationship between reported levels of STS and job satisfaction among pediatric perioperative nurses?" This researcher calculated the total score of job satisfaction according to the tool developer's instructions. This researcher employed the Pearson product-moment correlation coefficient (*r*) to determine if there was a linkage between job satisfaction (interval variable) and levels of STS (interval variable). Again, the Likert-type responses in the STSS and MMSS sale are inherently ordinal. Therefore, a supplementary non-parametric analysis was conducted using Kendall's tau b correlation.

Research Question #6 stated, **"**What is the relationship between the level of STS and anxiety as reported by the pediatric perioperative nurse?" This researcher employed the Pearson product-moment correlation coefficient (*r*) to determine if anxiety (interval variable) was

associated with the level of STS (interval variable) as reported by the pediatric perioperative nurse. Both the STSS and GAD-7 are comprised of Likert-type or ordinal level response items. Therefore, a supplementary non-parametric analysis was conducted using Kendall's tau b correlation. An analysis of variance test was also conducted to test for differences in anxiety scores according to STSS cut-off score groups.

Research Question #7 stated, "What is the relationship between the level of STS and depression as reported by the pediatric perioperative nurse?" This researcher employed the Pearson product-moment correlation coefficient (*r*) to determine if depression (interval variable) was associated with the level of STS (interval variable) as reported by the pediatric perioperative nurse. Both STSS and PHQ-8 are comprised of Likert-type or ordinal level response items. Therefore, a supplementary non-parametric analysis was conducted using Kendall's tau b correlation. An analysis of variance was also conducted to test for differences in depression scores according to STSS cut-off scores groups.

Research Question #8 stated, "What is the relationship between the level of STS and direct and indirect exposure to traumatic experiences (combined counts of direct and indirect exposure) when controlled for demographic and other predictor variables?"

This researcher employed hierarchical regression modelling (Munro, 2005) to explore associations between the STSS score and significant bivariate results for RQs #2 to 4 that indicated potential predictor variables (e.g., counts of exposure to trauma, years of clinical experience, and nurse coping) of STS as guided by Lazarus and Folkman's (1984) model. Before employing this model, preliminary analyses were conducted to ensure that there were no violations of the assumptions of normality, absence of multicollinearity, and homoscedasticity; all assumptions were met.

Summary

This chapter described the methods that were employed to recruit participants to conduct this study and for quantitative data collection. A description of the instruments employed in this study was provided. The next chapter will discuss the results of data analyses including a description of the characteristics of the study sample and the reliability estimates of study instruments. Statistical analyses of research questions #1 to #8 are presented in conjunction with a report of the major findings.

Chapter Four - Results of Data Analysis

The purpose of this study was to: 1) describe the prevalence of STS in pediatric perioperative nurses who were exposed to direct and indirect trauma, 2) examine proposed antecedent correlates of STS (trauma exposure, years of service, and coping), and 3) examine proposed outcome correlates (anxiety, depression, and job satisfaction) among pediatric perioperative nurses.

The study invitation and recruitment poster were sent to approximately 950 nurses who were members of the specialty interest group called the Operating Room Nurses Association of Canada (ORNAC). Of the ORNAC members who identified as pediatric perioperative nurses (n=130), 25 percent (n = 33) responded to the invitation to participate in the study. Data for this study were collected over a 6-week period between January 2024 and March 2024. Data collected from each participant included the demographic questionnaire, the Secondary Traumatic Stress Scale, McCloskey-Mueller Satisfaction Scale, the Generalized Anxiety Disorder Scale, the Patient Health Questionnaire, and the Brief COPE scale. The Statistical Package for the Social Sciences (version 25) for Windows was utilized for data analyses. Descriptive statistical analyses were conducted to describe the study sample and study variables that included the prevalence of STS in the study population. The most appropriate and rigorous inferential statistics (parametric or nonparametric) were employed to conduct correlational analyses to address Research Questions #2 to #7. Hierarchical multiple linear regression was employed to address Research Question #8 about the relationship between STSS score and direct and indirect exposure to traumatic experiences (a combined total of the weekly average number of direct and indirect exposures) by controlling for avoidant coping as a pediatric perioperative nurse.

Demographic Characteristics of Participants

The study sample was comprised of 33 nurses who volunteered to participate in the study. The demographic characteristics of this study's participants are reported in Table 2 below. A convenience sample of 30 (90.9%) women and 3 (9.1%) men participated in the study. Eightyfive percent (n = 28) described their ethnic origin as Canadian. The mean age of the nurses participating in the study was 36.18 years [SD = 9.46], with a range of 23 – 55 years. Eightyeight percent (n = 29) of the participants were Registered Nurses and 12 percent (n = 4) were Licensed Practical Nurses. Eighty-five percent (n = 28) of nurses participating in the study identified working in a tertiary care facility. Seventy-six percent (n = 25) of responding nurses were employed full-time, and twenty-four percent (n = 8) were employed part-time. The mean number of years that the participants were employed as nurses was 11.9 [SD = 8.79] years, and the mean number of years participants were employed as a pediatric perioperative nurse was 9.44 [SD = 7.77] years. Eighty-four percent (n = 28) of the participants reported having a Baccalaureate degree or higher. Forty-two percent (n = 14) of the participants were married, and forty-six percent (n = 15) had children. Among those participants who identified having children, the mean number of children was 2.43 [SD = .852], and the ages of the children ranged from 18 months to 37 years of age. Fifteen percent (n = 5) of the participants identified English as their second language. Ninety-one percent (n = 30) of the participants indicated that their ethnicity was Caucasian. There were no Indigenous participants. Sixty-four percent (n = 21) of participants identified their religion as Roman Catholic. The mean number of pediatric perioperative patients the participants cared for per day was 3.58 [SD = 1.41] patients.

Table 2

Demographic characteristics of Pediatric Perioperative Nurses (n=33)

Demographic Characteristic	N

Gender	
Male	3 (9.1%)
Female	30 (90.9%)
Marital Status	
Single	10 (30.3%)
Married	14 (42.4%)
Common-Law	5 (15.2%)
Divorced	2 (6.1%)
Separated	1 (3.03%)
Prefer not to answer	1 (3.03%)
Children	
Yes	15 (45.5%)
No	18 (54.5%)
English is second language	
Yes	5 (15.2%)
No	28
Born in Canada	
Yes	28 (84.8%)
No	5 (15.2%)
Highest educational level	
College Diploma	4 (12.1%)
Bachelor's Degree	27 81.8%)
Master's Degree	1 (3.03%)
Prefer not to answer	1 (3.03%)
Professional Title	
Registered Nurse	29 (87.9%)
Licensed Practical Nurse	4 (12.1%)
Years employed as a pediatric perioperative nurse	
0-5	7 (21.2%)
6-10	7 (21.2%)
11-15	6 (18.2%)
16-20	3 ((9.1%)
21-25	7 (21.2%)
> 26	1 (3.03%)
Work Setting	
Community Hospital	4 (12.1%)
Tertiary Care Facility	28 (84.8%)
Clinic Setting	1 (3.03%)
Employment Status	
Full-time	25 (75.8%)
Part-time	8 (24.2%)

Table 2

Demographic characteristics of Pediatric Perioperative Nurses (n=33)

Demographic Characteristic	N
Religion	
Roman Catholic	8 (24.2%)
Lutheran	1 (3.03%)
United Church	4 (12.1%)
Anglican	1 (3.03%)
Presbyterian	1 (3.03%)
Baptist	2 (6.06%)
Other	12 (36.4%)
Prefer not to answer	4 (12.1%)

Study Variable Descriptives

Exposure to direct and indirect trauma

On the demographic form, participants were asked four questions relating to direct and indirect trauma experiences in the workplace. The first direct trauma exposure question asked the participant for a weekly average over the past month of direct trauma in the form of caring for a child who has undergone a physical trauma; the mean reported score for this question was 2.39 [SD = 3.71] exposures. The second direct trauma exposure question asked the participants for a weekly average over the past month of direct trauma in the form of personal exposure to bullying or violence in the workplace; the mean response for this question was 2.06 [SD = 2.24] exposures. The third question measured indirect trauma exposure by asking participants for a weekly average over the past month of hearing a colleague describe their experience of caring for a child who had experienced a physical trauma; the mean response for this question was 2.52 [SD = 5.12] exposures. The fourth and final question measured indirect trauma exposure by asking participants for a weekly average over the past month of hearing a colleague describe their experiences of bullying or violence in the workplace; the mean response to this question

was 2.09 [SD = 1.79] exposures. The sum of the mean of each of the four individual trauma exposures (two direct and two indirect questions) provided a mean total trauma exposure score. The mean total trauma exposure in this study was 9.06 [SD = 9.60] average weekly exposures over the past month for each participant.

Coping

The theoretical range score on the Brief-COPE scale is 1 to 4 for the problem focused sub-scale, 1 to 4 for the emotion focused sub-scale, and 1 to 4 for the avoidant coping sub-scale (Novopsych, 2023). For the Brief-COPE scale, the mean sub-scale scores were as follows: 2.12 [SD = .67] for the problem-focused coping sub-scale, 1.96 [SD = .46] for the emotion-focused coping sub-scale, and 1.49 [SD = .34] for the avoidant coping sub-scale. In response to this researcher's added question on the Brief-Cope scale, 42 percent (n =14) of respondents indicated that they had reached out for support in the workplace following a traumatic event, such as in the form of employee extended benefits; 55 percent of respondents indicated that they did not seek such support in the workplace. One participant indicated that they preferred not to answer this question. The frequencies of item responses on the Brief COPE scale are reported in Appendix P.

Anxiety (GAD-7)

The theoretical range score on the GAD-7 scale is from 0 to 21 (Spitzer et al., 2006). A GAD-7 score of 0 to 4 indicates minimal anxiety symptoms, a score of 5 to 9 indicates mild anxiety symptoms, a score of 10 to 14 indicates moderate anxiety symptoms, and a score of 15 to 21 indicates severe anxiety symptoms (Spitzer et al., 2006). The mean anxiety symptom score in this sample was 12.9 [SD = 3.74], which indicates moderate anxiety on the GAD-7 scale. The frequencies of individual item responses on the GAD-7 scale are reported in Appendix L.

Depression (PHQ-8)

The theoretical range score on the PHQ-8 scale is from 0 to 24 (Kroenke et al., 2009). A PHQ-8 score of 0 to 4 indicates no significant depressive symptoms, a score of 5 to 9 indicates mild depressive symptoms, a score of 10-14 indicates moderate depressive symptoms, a score of 15 to 19 indicates moderately severe depressive symptoms and, a score of 20 to 24 is indicative of severe depressive symptoms (Kroenke et al., 2009). The mean depression score in this sample was 13.45 [SD = 3.37] for depression that indicates moderate depressive symptoms on the PHQ-8 scale. The frequencies of individual item responses on the PHQ-8 are reported in Appendix M.

Following the PHQ-8 scale, participants were asked a separate, stand-alone functional health assessment question, "if you checked any problems, how difficult have they made this for you to do your work, take care of things at home, or get along with other people?" Seventy percent of respondents indicated a response of "somewhat difficult".

Job satisfaction (MMSS)

The theoretical range score on the full MMSS scale (total) is from 0 to155, and the theoretical range score for the sub-scales (which is divided by the number of items in the subscale to obtain a mean sub-scale score) is as follows: 0 to 10 for the co-workers scale, 0 to 20 for the interaction sub-scale, 0 to 20 for the praise/recognition sub-scale, 0 to 25 for the control/responsibility sub-scale, 0 to 20 for the professional opportunities sub-scale, 0 to 30 for the scheduling sub-scale, 0 to 15 for the family/work balance scale, and 0 to 15 for the extrinsic awards sub-scale (Mueller & McCloskey, 1990). In this study sample, the total MMSS score was 84.73 [SD = 21.2] (i.e., the sum of all item responses) and the mean satisfaction score was 2.73 [SD = .684] (i.e., obtained by dividing the mean full-scale result by the number of items in the scale). The MMSS sub-scale mean scores were as follows: 2.61 [SD = .955] for the extrinsic sub-

scale, 2.55 [SD = .903] for the scheduling satisfaction sub-scale, 3.40 [SD = 1.22] for the family/work balance sub-scale, 2.09 [SD = .939] for the co-workers sub-scale, 2.26 [SD = .789] for the interaction sub-scale, 2.85 [SD = .667] for the professional opportunities sub-scale, 2.73 [SD = .809] for the praise/recognition sub-scale, and 3.12 [SD = 1.09] for the control/responsibility sub-scale. The frequencies of individual item responses on the MMSS scale are reported in Appendix N.

Instrument Reliability

Secondary Traumatic Stress Scale (STSS)

The internal consistency reliability of the STSS was estimated using Cronbach's coefficient alpha. Cronbach's alpha reliability coefficients of .89 were obtained as follows: .89 for the total STSS, .824 for the intrusion sub-scale (5 items), and .804 for the avoidance subscale (7 items) providing evidence of the excellent internal consistency reliability of the total STSS scale and these two sub-scales. However, a less than acceptable Cronbach's alpha reliability estimate of .609 was obtained for the arousal sub-scale (5 items).

The McCloskey-Mueller Satisfaction Scale (MMSS)

The internal consistency reliability of the MMSS was estimated using Cronbach's coefficient alpha. The following reliability coefficients were obtained that provide acceptable reliability of the total MMS scale and several sub-scales: .935 for the total scale, .758 for the praise/recognition sub-scale (4 items), .856 for the control/responsibility sub-scale (5 items), .822 for the scheduling satisfaction sub-scale (6 items), .742 for the family/work balance subscale (3 items),.795 for the interaction sub-scale (4 items), and .725 for the extrinsic awards subscale (3 items). Less than acceptable Cronbach's alpha coefficients were obtained for two subscales: .681

for the co-worker's sub-scale (2 items) and .631 for the professional opportunities sub-scale (4 items).

Generalized Anxiety Disorder 7-item (GAD-7)

The internal consistency reliability of the GAD-7 was estimated using Cronbach's coefficient alpha. An acceptable reliability coefficient of .892 was obtained.

Patient Health Questionnaire (PHQ-8)

The internal consistency reliability of the PHQ-8 was estimated using Cronbach's coefficient alpha. An acceptable reliability coefficient of .803 was obtained.

Brief COPE Scale

The internal consistency reliability of the Brief COPE scale was estimated using Cronbach's coefficient alpha. Acceptable reliability coefficients of .917 (for the full scale), .917 for the problem-focused coping sub-scale (8 items), and .786 for the emotion-focused sub-scale (12 items) were obtained providing evidence of the internal consistency reliability of the scale and its sub-scales. However, the avoidant coping sub-scale yielded a Cronbach's alpha coefficient of .657 (8 items) that demonstrated a slightly less than acceptable scale reliability.

Analysis of the Research Questions

Research Question #1. What is the prevalence of STS experienced by pediatric perioperative nurses who have been exposed to children who had experienced an acute traumatic event?

In this study, pediatric perioperative nurses (n = 33) reported a total STSS mean score of 39.89 [SD = 8.69], which is defined as a moderate level of STS (Bride, 2004). The theoretical score range on the STSS is 17 to 85. Sixty-one percent of participants (n = 20) reported STS levels of moderate or greater. The frequencies for each category of STS level are depicted in Table 3 below.

Table 3

Frequencies of STSS Total Scores (n = 33)

Level of Reported STS	Frequency
Little to no STS	2 (6.1%)
Mild STS	11 (33.3%)
Moderate STS	7 (21.2%)
High STS	7 (21.2%)
Severe STS	6 (18.2 %)

On the STSS sub-scales, the means are as follows: 11.42 [SD = 2.94] for the intrusion sub-scale, 15.85 [SD = 4.33] for the avoidance sub-scale and 12.6 [SD = 2.65] for the arousal sub-scale. The theoretical ranges of the STSS sub-scales are: 5 to 25 for the intrusion sub-scale, 7 to 35 for the avoidance sub-scale, and 5 to 25 for the arousal sub-scale (Bride et al., 2004). The symptom frequencies for each of the three STSS sub-scales are reported in Appendix Q. On the intrusion sub-scale item frequencies, most participants reported a range of 'never' to 'occasionally' on 5 items, and the symptom, "reminders of my work with patients upset me" had the highest mean score (2.64 out of 4), whereas "it seemed as if I was reliving the trauma(s) experienced by my patients" had the lowest mean score (1.97 out of 4). On the avoidance subscale, most participants reported a range of 'never' to 'very often' on 5 items. The symptom "feeling emotionally numb" had the highest mean score (2.64 out of 4), and "I noticed gaps in my memory about patient sessions" had the lowest mean score (1.70 out of 4). On the arousal sub-scale, most participants reported a range of 'never' to 'often' on 5 items. The symptom "I had trouble sleeping" had the highest mean score (2.94 out of 4) and the symptom with the lowest mean score was "I felt jumpy" (2.06 out of 4).

Supplementary descriptive analysis of mean STSS scores according to demographic characteristics was conducted (see Appendix O). Female participants reported higher STS mean scores (m=40.87, SD ±8.35) than males (m=30.00, SD ±6.08). Participants with children

reported a higher mean STSS score (m=41.67, SD±9.17) than participants without children (m=38.39, SD±8.24). Participants who were born outside of Canada reported higher mean STSS scores (m=43.76, SD±7.04) than participants born in Canada (m=39.26, SD±9.01). Nurse participants working in pediatric perioperative nursing between 0 to5 years (m=42.43, SD±6.70) and between 21 to 25 years (m=44.57, SD±10.06) reported the highest mean STSS scores in this study. Nurses working full-time reported higher STSS scores (m=40.96, SD±8.58) than their colleagues working part-time (m=36.50, SD±8.71).

Research Question #2. What is the relationship between the level of STS (total scale) in pediatric perioperative nurses and the number of weekly exposures to direct and indirect traumatic events over one month?

A Pearson correlation coefficient was computed to assess the linear relationship between level of STS (interval data) and the number of weekly exposures to total trauma (combined direct and indirect exposures) (ratio data) over one month. There was a significant positive correlation between the two variables, $r(31) = .418$, $p = .015$. A supplementary analysis yielded a Kendall's tau b correlation coefficient of .443 ($p = .01$) that was also significant.

Research Question #3. What is the relationship between years of experience in pediatric perioperative nursing and STS?

A Pearson correlation coefficient was computed to assess the linear relationship between level of STS on the total scale (interval data) and the number of years of experience pediatric nursing (ratio data). There was no significant relationship found between the two variables, Pearson's $r(31) = .017$ ($p = .923$). A supplementary analysis yielded a Kendall's tau b correlation coefficient of .010 ($p = .938$) that was also not significant.

Research Question #4. What is the relationship between reported levels of STS and coping?

A Pearson correlation coefficient was computed to assess the linear relationship between level of STS total scale (interval data) and the Brief Cope sub-scales (interval data). In this study, STS (total scale) and the Brief COPE avoidance coping sub-scale were significantly positively corelated $r(31) = .467$ ($p = .006$). The remaining Brief COPE sub-scales were not significantly correlated with STS where the correlations were as follows: $r(31) = .327$ ($p = .063$) on the emotion-focused coping sub-scale and $r(31) = .096$ ($p = .596$) on the problem-focused coping sub-scale. A supplementary non-parametric analysis employing the Kendall's Tau coefficient yielded a significant correlation between STS and the avoidant coping scale ($\tau b = .360$, $p = .005$). However, Kendall's Tau coefficients for the emotion-focused ($\tau b = .198$, $p = .063$) and problem-focused ($\tau b = .096$, $p = .445$) sub-scales were not statistically significant. The frequencies of individual item responses on the Brief COPE scale and mean sub-scale scores are reported in Appendix P.

Research Question #5. What is the relationship between reported levels of STS and job satisfaction among pediatric perioperative nurses?

A Pearson correlation coefficient was computed to assess the linear relationship between level of STS on the total scale (interval data) and job satisfaction (interval data) sub-scale scores. In this sample of pediatric perioperative nurses, the STS (total scale) and job satisfaction (total MMS scale) were not significantly correlated with $r(31) = .292$ ($p = .105$). STS was significantly correlated with the MMSS professional opportunities sub-scale $r(31) = .463$ ($p = .007$). The remaining MMSS sub-scales were not significantly correlated with STS. A supplementary nonparametric analysis reported one significant result between the STS and MMSS professional opportunities sub-scale ($\tau b = .370$, $p = .001$); non-parametric analyses of the other MMSS subscales yielded non-significant results. The frequencies of the individual item responses on the

MMSS and mean sub-scale scores are presented in Appendix N.

Research Question #6. What is the relationship between the level of STS and anxiety as reported by the pediatric perioperative nurse?

A Pearson correlation coefficient was computed to assess the linear relationship between level of STS on the total scale (interval data) and anxiety total scale (interval data) scores. In this study, STS (total scale) and anxiety (total scale) were significantly positively correlated with $r(31) = .620$ ($p < .001$). A supplementary analysis yielded a Kendall's tau_b correlation coefficient of .499 ($p = .01$) that was also significant. All three STSS sub-scales were significantly positively correlated with anxiety: $r(31) = .286$ ($p = .01$) for the intrusion sub-scale, .601 ($p = .01$) for the avoidance sub-scale, and .683 ($p = .01$) for the arousal scale. The frequencies of the individual item responses on the GAD-7 scale are presented in Appendix L.

A supplementary analysis involving the Analysis of Variance (ANOVA) test was conducted to test for mean differences between anxiety level scores according to STS cut-off score categories. The findings revealed a significant result, $F(4, 28) = 4.58$, $p = .006$. The results of this analysis are reported in Table 4 below.

Table 4

ANOVA Means, Standard Deviations, and One-Way Analyses of Variance in GAD-7 Scores per STSS Cut-off Score Categories, n=33

STSS Score Category	N	GAD-7 Score	SD	F, p
Little to no STS	2	7.00	0.00	4.58, .006
Mild STS	11	11.18	3.87	
Moderate STS	7	13.86	2.67	
High STS	7	13.71	2.69	
Severe STS	6	16.17	2.64	
Total STSS	33	12.94	3.74	

Research Question #7. What is the relationship between the level of STS and depression as reported by the pediatric perioperative nurse?

A Pearson correlation coefficient was computed to assess the linear relationship between level of STS on the total scale (interval data) and depression total scale (interval data) scores. In this study sample, STS (total scale) and depression (total scale) were significantly positively correlated with $r(31) = .586$ ($p < .001$). The frequencies of item responses for the PHQ-8 scale are presented in Appendix M.

A supplementary analysis involving a test of mean differences between depression scores (measured on the PHQ-8) according to STSS cut-off score categories. The ANOVA test revealed the effect of STS cut-off score levels on depression total scores was significant, $F(4,28) = 3.39$, $p = .022$. The results of this analysis are reported in Table 5 below.

Table 5

Means, Standard Deviations, and One-Way Analyses of Variance in PHQ-8 Scores per STSS Cut-off Score Categories, n=33

STSS Score Category	N	PHQ-8 Score	SD	F, p
Little to no STS	2	9.00	1.41	3.385, .022
Mild STS	11	11.91	3.05	
Moderate STS	7	13.57	3.41	
High STS	7	14.86	2.97	
Severe STS	6	16.00	2.37	
Total STSS	33	13.45	3.37	

Supplementary Analyses to Identify Potential Predictors of STS Levels

To identify potential predictors of STS levels in the regression model (see RQ #8 below), a correlational table is presented (Table 6 below). Table 6 revealed statistically significant relationships between proposed antecedent correlates of STS (trauma exposure, years of service, and coping) and proposed outcome correlates of STS (anxiety, depression, and job satisfaction. As well, supplementary analyses involving tests of differences were conducted on STS levels according to demographic groups and sub-groups (Table 7 below).

Table 6

Descriptive Statistics and Correlations for Study Variables

	n	M	SD	1	2	3	4	5	6	7	8	9	10
STSS (1)	33												
STSS – Intrusion (2)	33	11.42	2.95	.784**									
STSS – Avoidant (3)	33	15.85	4.33	.913**	.505**								
STSS – Arousal (4)	33	12.60	2.64	.919**	.635**	.802**							
Direct Trauma (5)	33	4.45	4.36	.386*	.449**	.320	.246						
Indirect Trauma (6)	33	4.60	6.63	.415*	.339	.417*	.303	.848**					
Coping – Avoidant (7)	33	1.49	0.34	.467**	.089	.581**	.484**	.053	.083				
Coping – Problem Focused (8)	33	2.12	0.68	.096	-.054	.171	.095	.104	-.013	.543**			
Coping – Emotion Focused (9)	33	1.96	0.46	.327	.051	.403*	.360*	.063	.077	.698**	.773**		
MMSS Total (10)	33	84.94	21.13	.292	.081	.343	.307	.260	.280	.205	.182	.133	
Praise/recognition(11)	33	2.70	0.81	.088	-.209	.224	.156	.062	.131	.206	.213	.110	.881*
Control/Responsibility (12)	33	3.12	1.09	.322	.113	.370*	.327	.458**	.390*	.301	.387*	.293	.829**
Scheduling satisfaction (13)	33	2.55	0.90	.271	.078	.371*	.198	.297	.331	.197	.062	.056	.829**
Family/work balance (14)	33	3.40	1.23	.132	.213	.018	.166	.142	.040	-.102	.150	-.006	.630**
Interaction (15)	33	2.26	0.79	.165	.136	.142	.159	.187	.326	-.116	-.202	-.113	.683**
Extrinsic Rewards (16)	33	2.60	0.96	.329	.050	.383*	.398*	.084	.196	.324	.262	.203	.696**
Co-Workers (17)	33	2.09	0.94	.145	-.139	.253	.216	-.102	-.005	.174	.031	.145	.719**
Professional Opportunities (18)	33	2.86	0.67	.463**	.250	.468**	.476**	.367*	.299	.413*	.244	.265	.867**
GAD-7 Total (19)	33	12.9	3.74	.620**	.334	.601**	.683**	.241	.283	.452**	.175	.527**	.365**
PHQ-8 Total (20)	33	13.5	3.37	.586**	.272	.604**	.634**	.149	.158	.655**	.397*	.607**	.556**

* significant at the 0.05 level

**significant at the 0.01 level

Table 6

Descriptive Statistics and Correlations for Study Variables

	n	M	SD	11	12	13	14	15	16	17	18	19
STSS (1)	33											
STSS – Intrusion (2)	33	11.42	2.95									
STSS – Avoidant (3)	33	15.85	4.33									
STSS – Arousal (4)	33	12.60	2.64									
Direct Trauma (5)	33	4.45	4.36									
Indirect Trauma (6)	33	4.60	6.63									
Coping – Avoidant (7)	33	1.49	0.34									
Coping – Problem Focused (8)	33	2.12	0.68									
Coping – Emotion Focused (9)	33	1.96	0.46									
MMSS Total (10)	33	84.94	21.13									
Praise/recognition(11)	33	2.70	0.81									
Control/Responsibility (12)	33	3.12	1.09	.754**								
Scheduling satisfaction (13)	33	2.55	0.90	.665**	.587**							
Family/work balance (14)	33	3.40	1.23	.496**	.460**	.279						
Interaction (15)	33	2.26	0.79	.541**	.419**	.602**	.416*					
Extrinsic Rewards (16)	33	2.60	0.96	.622**	.523**	.537**	.386*	.256				
Co-Workers (17)	33	2.09	0.94	.774**	.603**	.532**	.315	.484**	.447**			
Professional Opportunities (18)	33	2.86	0.67	.670**	.818**	.747**	.499**	.458**	.627**	.533**		
GAD-7 Total (19)	33	12.9	3.74	.173	.326	.289	.248	.246	.384*	.126	.541**	
PHQ-8 Total (20)	33	13.5	3.37	.358*	.573**	.415*	.329	.169	.578**	.327	.734**	.755**

* significant at the 0.05 level

**significant at the 0.01 level

To further identify potential relationships between demographic characteristics (that are categorical and ordinal level data) and STS levels, the below table (Table 7) reveals that there were no statistically significant mean differences (independent t-tests and analyses of variance) found.

Table 7

Tests of Difference in STS levels according to Demographic Characteristics (N=33)

Demographic Characteristic	N	STS	
		M ± SD	t or F(*p*)
Gender			
Male	3	30.0±6.08	-1.472 (.597)
Female	30	40.87±8.35	
Marital Status			
Single	10	35.3±8.76	1.612 (.199)
Married	14	40.35±7.96	
Common-Law	5	45.8±10.01	
Divorced	2	45.5±0.71	
Separated	2	39.0±7.07	
Children			
Yes	15	41.67±9.17	1.081 (.931)
No	18	38.39±8.24	
Born in Canada			
Yes	28	39.26±9.01	-.032 (.794)
No	5	43.67±7.04	
ESL			
Yes	5	44.0±7.03	1.157 (.372)
No	28	39.14±8.86	
Highest educational level College Diploma			
Bachelor's Degree	4	39.25±13.04	2.250 (.104)
Master's Degree	27	38.93±7.47	
Prefer not to answer	1	58±0	
	1	50±0	
Professional Title			
RN	29	39.72±8.70	-.271 (.569)
LPN	4	41.0±9.90	

Years as a pediatric perioperative nurse			
0-5			
6-10	14	42.43±6.70	1.154 (.357)
11-15	6	35.15±7.73	
16-20	3	40.17±8.40	
21-25	7	39.00±6.08	
≥26	2	44.57±10.06	
	1	24±0	

Table 7

Tests of Difference in STS levels according to Demographic Characteristics (N=33)

Employment Status	25	40.96±8.58	1.275 (.864)
Full-time	8	36.5±8.71	
Part-time			
Religion			
Roman Catholic	8	38.00±9.01	.717 (.659)
Lutheran	1	49.00±0	
United Church	4	42.75±7.09	
Anglican	1	45.00±0	
Presbyterian	1	32.00±0	
Baptist	2	31.00±0	
Other	12	40.75±9.58	
Prefer not to answer	4	41.00±9.76	

Research Question #8. What is the relationship between the level of STS and direct and indirect exposure to traumatic experiences (combined counts of direct and indirect exposure) when controlled for demographic and other predictor variables?

Statistical consultation was obtained to determine whether a regression analysis was recommended (Loring Chuchmach, George & Fay Yee Centre for Healthcare Innovation, April 10, 2024). Given the small sample size in this study, the suggestion was made to perform hierarchical regression modelling to explore associations between the STSS total score and two significant bivariate variables identified in Research Questions #2 to #4 (i.e., as potential independent variables for the model). The independent variables identified for the model included counts of direct trauma and indirect trauma, and avoidant coping. These independent variables were entered in two steps. In the first step, weekly direct and indirect trauma exposure

(main predictor correlation) was entered into the model. In the second step, avoidant coping was entered into the model. In each regression, the dependent variable was STS. Avoidant coping (β = .438, t = 2.953, p = .006) was the only significant predictor of pediatric perioperative nurses' STS levels; that is, when accounting for the effects of direct and indirect trauma, avoidant coping maintained its significance as a predictor of STS. The independent effect seen in indirect and direct trauma load may have been driven by its relationship with avoidant coping. Table 8 reports the results from the hierarchical multiple linear regression analysis.

Table 8

Hierarchical multiple linear regression analysis for variables predicting STS in pediatric perioperative nurses (n=33)

Variable	B	SD	p-value
Direct Trauma	.152	.557	.591
Indirect Trauma Exposure	.433	.250	.380
Avoidant Coping	.438	.475	.006

Summary

This chapter described the methods that were used to carry out a descriptive, correlational study aimed at exploring the prevalence of STS in pediatric perioperative nurses in addition to the possible linkage of indirect and direct trauma, years of experience in pediatric perioperative nursing, coping, job satisfaction, anxiety, and depression with STS levels experienced by pediatric perioperative nurses. The theoretical framework by Lazarus and Folkman (1984) for this study guided this researcher's identification of influential personal and environmental factors, and outcomes of STS to test for associations and their predictive ability for STS experiences of pediatric perioperative nurses. The researcher-developed demographic

questionnaire and psychometrically sound coping, STS, job satisfaction, anxiety, and depression scales were used to collect data. The reliability and validity of the scales, data collection methods, and data analysis plans in this study were discussed. The procedure of ensuring protection of human subjects was also discussed.

Chapter Five – Discussion

This study was designed to examine STS, coping, job satisfaction, anxiety, and depression as they relate to exposure to direct and indirect traumatic experiences among pediatric perioperative nurses. The Transactional Model of Stress and Coping by Lazarus and Folkman (1984) provided the theoretical foundation for conceptualizing this study.

While STS has been described in certain areas of nursing, this topic has not been examined among pediatric perioperative nurses. This study addressed that gap in research and aimed to describe the psychosocial correlates of STS in this population of nurses while illuminating the work-related stress that may be experienced by these highly trained professionals. STS describes the acute response of pediatric perioperative nurses when they have experienced direct or indirect exposure to trauma. An enhanced understanding of the acute STS response can aid in preventing the occurrence of the long-term condition of compassion fatigue and possible retention of nurses in this specialty area. Although nurse retention in this study was not directly studied, it is reasonable to assume that pediatric perioperative nurse experiences with STS, coping, job satisfaction, anxiety, and depression have some degree of impact on nurse retention in this specialized care setting.

The findings from this study make a valuable preliminary contribution to the literature by addressing an existing knowledge gap on how to better identify and support pediatric perioperative nurses to help them cope well when they experience direct trauma (e.g., as a result

of caring for a patient who has experienced a physical trauma or directly experiencing violence or bullying oneself in the perioperative environment) or as a result of indirect trauma (e.g., as a result of hearing of colleague's experiences of caring for a child who has experienced physical trauma or a colleague's experience of violence or bullying in the perioperative environment). This study provides insights into the experiences of pediatric perioperative nurses as they relate to STS and subsequent outcomes of job satisfaction, anxiety, depression and coping. Major findings are interpreted in this chapter and subsequent conclusions are presented. Following a discussion of this current study's limitations, nursing practice, education, and research implications are discussed.

Discussion of the Findings

Representativeness of the Sample

Most of the nurses in this study were female, of Caucasian descent, had achieved a Bachelor's degree or higher, and were employed as full-time RNs. While the participants' mean age of 36.18 [SD = 9.455] years may be representative of the wider population of pediatric perioperative nurses, the remaining characteristics do not necessarily reflect the diverse population of pediatric perioperative nurses practicing in Canada. The generalizability of this study is limited by the small sample of 33 nurses. While a homogenous sample of pediatric perioperative nurses was sought, the demographic characteristics of this small sample makes it questionable whether this study's sample is representative of a larger population.

Reliability of Instruments

In light of this researcher's examination of the postulated theoretical linkages between key constructs based on Lazarus and Folkman's (1984) model, it is important to discuss the reliability of each of the instruments employed in this current study. On the total STSS and the

intrusion and avoidance sub-scales, excellent internal consistency reliability (Cronbach's alpha reliability coefficients >.80) were reported. However, the arousal sub-scale had a reliability estimate that was < .70 which indicates the tool was less reliable in this study's nurse population. In previous studies, factor correlations between arousal and avoidance items has been reported to often approach unity which implies poor discriminant validity of the arousal and avoidance sub-scales (Benuto et al., 2018; Ting et al., 2012). In a previous study of secondary traumatic stress among pediatric nurses, the reported Cronbach's alpha reliability coefficient for the arousal sub-scale was .81 (Kellogg et al., 2018a). This researcher theorizes that it is possible that the arousal sub-scale was not reliable in this study's sample of pediatric perioperative nurses due to their professional training (such as emergency preparedness training), and may have been affected by the study's small sample size. The STSS arousal sub-scale contains five items including "I felt jumpy" and "I expected something bad to happen" that may not be relevant to pediatric perioperative nurses.

For the MMSS, reliability coefficients were > .70. However, two of the sub-scales had Cronbach's alpha coefficients < .70 (i.e., the co-worker's sub-scale and the professional opportunities sub-scale). Both of these scales consisted of a small number of items (2 and 4 items, respectively) which may explain the low reliability coefficients that were obtained. These two scales also produced Cronbach's alpha coefficients < .70 when the MMSS was first validated by the tool's developers (i.e., Mueller & McCloskey, 1990). These authors explained the low reliability estimates by the small number of items contained in both sub-scales (Mueller & McCloskey, 1990). Subsequent validation has also reported findings of a low alpha reliability coefficient for the co-worker's sub-scale (Tourangeau et al., 2006).

In this current study, the GAD-7 and PHQ-8 scales both demonstrated excellent internal consistency with Cronbach's alpha coefficients .80. Finally, the Brief COPE total scale and the problem-focused and emotion-focused sub-scales obtained Cronbach's reliability coefficients > .70. The avoidant coping sub-scale yielded a Cronbach's alpha coefficient < .70 which is consistent with a previous study examining coping among caregivers of individuals with advanced cancer where the Cronbach's alpha reliability coefficient was .54 (Kershaw et al., 2004). This scale includes items such as "I've been giving up trying to deal with it" and "I've been giving up the attempt to cope". These items allude to giving up or having an element of finality in being unable to cope which may not be reflective of the practicing pediatric perioperative nurse's experience. Another plausible reason for the low reliability of this subscale is related to item questions about the use of alcohol and drugs that nurse participants might have been reluctant to answer. Previous literature demonstrated that substance abuse in nurses is underreported and may be due to stigma or nurses fearing reprisal or loss of employment (Monroe & Kenaga, 2011); underreporting may be as high as 20% in the nursing profession (Bell et al., 1999).

Prevalence of STS in Pediatric Perioperative Nurses

This study aimed to describe the prevalence of STS among a sample of pediatric perioperative nurses caring for children who have undergone trauma or experienced workplace bullying or violence. In this sample of pediatric perioperative nurses, 61% (n = 20) of participants identified a moderate or greater level of STS (total scale). While this was a small study conducted in Canada with a relatively small sample size, the findings are consistent with previous studies examining the level of STS among nurses (see Appendix R). Previous studies have reported a prevalence of moderate or greater STS among pediatric nurses between 50 and

78% (Berger et al., 2015; Kellogg et al., 2018a; Yehene et al., 2024) and, across 17 related studies, the overall reported prevalence of STS among nurses who care for patients who have experienced a trauma was high (70% or greater), as relayed in Appendix L. Further, mean STSS scores among pediatric nurses were higher than in other areas of nursing (Duffy et al., 2015; Nilan, 2019; Ratrout and Hamdan-Mansour, 2017; Yaakubov et al., 2020) such as hospital nurses (Bock et al., 2020; Lykins et al., 2024), labor and delivery nurses (Beck & Gable, 2012), or NICU nurses (Beck et al., 2017). Six studies reported a prevalence of moderate or greater levels of STSS of 50% or more (Berger et al., 2015; Duffy et al., 2015; Kellogg, 2018a; Nilan, 2019; Ratrout and Hamdan-Mansour, 2017; Yehene et al., 2024).

Plausible reasons for the high prevalence of STS reported in this study may be due to the nature of caring for pediatric patients (Kellogg et al., 2018b), the acute nature of care for traumatized patients that occurs in the perioperative environment, and the work environment itself that is often dynamic in nature and characterized by unanticipated circumstances. Pediatric care providers may feel additional responsibility when caring for children (Robins et al., 2009), and others have noted that when caring for children, witnessing others' trauma is intensified (Vredenburgh, 1992). Further, working with vulnerable individuals or those who are traumatically injured or dying is highly stressful and increases the care provider's risk for STS with "a significant negative effect on mental health" (Beaton & Murphy, 1995, p. 53).

STSS and STSS Sub-scales

The most frequently reported symptoms in the STSS 'intrusion' (defined as the reexperiencing of a traumatic event (Dominguez-Gomez & Rutledge, 2009) sub-scale were "reminders of work with clients as being upsetting" followed by "intrusive thoughts about patients". These findings are consistent with those reported in another study's sample of nurses

working in a pediatric inpatient acute care cardiology unit who described intrusive thoughts as thinking about their patients when the nurse was not present at work (Cook, 2012). On the STS 'avoidance' (defined as the evasion of triggers to the traumatic event, Dominguez-Gomez & Rutledge, 2009) sub-scale, the most commonly reported symptoms were "feeling emotionally numb" and "feeling discouraged about the future". Figley (1995) described that feelings of numbness are among the symptoms of STS. On the 'arousal' (defined as a heightened state of agitation, Dominguez-Gomez & Rutledge, 2009) sub-scale, the most commonly reported symptoms were "trouble sleeping", "being easily annoyed", and "trouble concentrating". Sleep disturbances and inability to concentrate are among the defining features of STS (Bride, 2007; Nolte et al., 2017; Sabo, 2011; Slatten et al., 2011).

These findings are supported by other studies where intrusive thoughts, feelings of numbness and trouble sleeping are well described as symptoms of STS among health care providers (Bride, 2004; Sabo, 2011; Nolte et al., 2017). Of note, the STS sub-scale scores reported in this current study are higher than those reported in previous studies that involved nurses working in an emergency in Scotland (Morrison & Joy, 2016) and frontline nurses during the COVID 19 pandemic (Zakeri et al., 2021). According to Lazarus and Folkman (1984), the elevated STS sub-scales reported by nurse participants in this study are not surprising. In other words, the effects of the environment (e.g., the mean total trauma exposures per week was 9.06) on the person (i.e., the pediatric perioperative nurse) was found to have a positive correlation with participants' reported moderate STS levels as supported by the Transactional Model of Stress and Coping (Lazarus & Folkman, 1984). This theoretical linkage between environmental and stress variables is further discussed below.

Main Findings on Theoretical Constructs and Their Linkage to STS

The Transactional Model of Stress and Coping (Lazarus & Folkman, 1984) served as a guiding framework in this researcher's identification and systematic exploration of associations between key theoretical constructs and pediatric perioperative nurse experiences with STS when exposed to traumatic events. The following theoretical constructs were the focus of this study: (a) the external factor of exposure to direct and indirect trauma, (b) the internal factor of years of experience in pediatric perioperative nursing, (c) coping as an adaptive process, (d) STS as the acute emotional duress that results from an individual hearing firsthand about another's traumatic experiences, and potential outcomes of job satisfaction, anxiety, and depression that are associated with STS experiences of nurses. The following will outline the descriptive findings for each construct plus each construct's association with STS.

STS and the External Factor of Exposure to Trauma

Health care literature describes the experience of indirect trauma that will be discussed more fully below. However, the impact of direct trauma and how it relates to STS in pediatric perioperative nurses remains undescribed. This researcher examined whether STS levels are related to nurse exposure to both direct trauma or external factors as described in the Transactional Model of Stress and Coping (i.e., trauma experienced by the pediatric perioperative nurse when caring for a patient who has experienced a physical trauma or workplace exposures to violence or bullying in the perioperative environment) and indirect trauma or internal factors as described in the Transactional Model of Stress and Coping (i.e., trauma experienced by the nurse when exposed to hearing of a colleague's experiences in caring for a child who has experienced a physical trauma or hearing of a colleague's experience of violence or bullying in the perioperative environment).

The average number of weekly exposures to total trauma (i.e., the combined direct and indirect exposures) in this current study were significantly positively correlated with STS. In other words, the more exposure to trauma the higher the level of STS reported by pediatric perioperative nurses. In fact, this study's participants reported an average of 4.45 weekly direct trauma exposures and 4.6 weekly indirect trauma exposures. For the pediatric perioperative nurse employed full-time this equals approximately two trauma exposures per day. Findings arising from this current study and a related study report that nurses can experience both indirect and direct trauma related to workplace bullying or violence, and witnessing or hearing about pediatric trauma experiences. For comparison, Adriaenssens et al. (2012) conducted a study with a sample of emergency nurses in Belgium and found that the majority of participants witnessed a traumatic event once per month over a time frame of 6 months, with traumatic events including patient death, resuscitation and being the target of aggression and threats (Adriaenssens et al., 2012).

In accordance with Lazarus and Folkman's (1984) model, workplace bullying and violence are external environment factors that are cited as one of the top challenges in health care according to a recent study of nurse leaders in the United States (American Organization for Nursing Leadership, 2024). Bullying in operating rooms has also been well described in other related literature (Chipps et al., 2013; Kerterz & Garbarini, 2022; Kwak, 2020; Lang et al., 2022; Villafranca et al., 2019; Yang & Zhou, 2021). Previous work corroborates the findings in this researcher's study on the reported prevalence of workplace bullying experienced either directly or indirectly by nurse participants. For instance, a study examining workplace incivility among certified registered nurse anesthetists in the United States reported that half of the sample experienced at least one weekly exposure with workplace incivility (Kwak, 2020). In another

study conducted in the United States, 59% of a sample of nurses, surgical technologists, and other unlicensed perioperative personnel reported witnessing bullying behaviors in the workplace weekly, and 34 % reported witnessing at least two instances of bullying weekly (Chipps et al., 2013). In that particular study, bullying behaviors in the operating room included ignoring another's opinion, being shouted at, being humiliated or ridiculed and facing hostility (Chipps et al., 2013). Of note, the definition of workplace bullying is broad and encompasses many different aspects of interpersonal interactions (Smith, 2011).

These findings are corroborated by another large study in which 97% of perioperative health care personnel participants reported witnessing or experiencing a disruptive behavior in the past year such as "speaking ill of others", "disparaging other professions" and, "use of offensive language" (Villafranca et al., 2019) and that that underline how pediatric perioperative nurses are exposed to both direct and indirect trauma in the workplace. Similarly, an Australian study conducted with a sample of perioperative nurses reported that 42% of participants reported a weekly or greater bullying exposure relating to work tasks, 39% reported a weekly or greater exposure relating to attacks on competence or reputation, and 36% reported a weekly or great exposure relating to personal attacks (Lang et al., 2022), of which are examples of direct trauma and external factors as discussed in Lazarus and Folkman's Transactional Model of Stress and Coping. Of note, 41% of participants in that study also reported that nurses did not disclose or report instances of bullying (Lang et al., 2022). Another study reported other examples of direct trauma and external factors experienced by operating room nurses in the workplace in the form of "having your opinions and views ignored" and "being exposed to an unmanageable workload" (Yang & Zhou, 2021, p. 28). Incidents of interpersonal conflict and bullying may be

underreported in the perioperative setting, as there is evidence of underreporting of these events in other areas of nursing (Kroning, 2019).

Study findings also show that nurses working with individuals who have directly experienced trauma experience greater levels of STS (Alhaarbi et al., 2020; Choi & Bae, 2020; Stamm, 1997; Clark & Gioro, 1998; Crumpei & Dafinoiu, 2012). Nurses view perioperative patients as vulnerable (Alfredsdottir & Bjornsdottir, 2008; Cousley, 2014, 2015). The pediatric perioperative patient is one that may be seen as thrice as vulnerable with reference to the inherent nature of children's vulnerability (Mullin, 2014) and the added vulnerability of a child alone in an operating theatre with strangers. Perioperative nurses are a frequent witness to children who experience pre-operative anxiety (Chicas et al., 2023). Undergoing a procedure that requires the use of anesthesia may also make the child neurologically vulnerable (Turner et al., 2021), which may result in emergence delirium in the acute postoperative period (Moore & Anghelescu, 2017), experiences that the nurse may experience as a direct trauma.

Related supportive literature indicates that STS risk is related to nurses' frequent exposure (i.e., at least weekly) to patients who have experienced a trauma (Gates & Gillespie, 2008) (aka exposure to direct trauma in this study), including physical trauma (Ratrout & Hamdan-Mansour, 2020; Walsh & Buchanan, 2011; Yao et al., 2024). The physical trauma that perioperative nurses may experience include: (a) witnessing patients admitted directly to the operating room with critical and life-threatening injuries such as penetrating injury or chest trauma for life-saving surgery (Laukkanen, 2005; Wieck et al., 2018) or patient death in the operating room (Hartley et al., 2019; Rodger & Hartley, 2019); (b) participating in forensic cases that involve law enforcement or investigation (Ozsaker et al., 2020) or patient cardiopulmonary resuscitation (O' Donoghue et al., 2015; Porteous, 2009); and (c) caring for patients who have

suffered injuries necessitating surgical care as a result of abuse (Pandya et al., 2009; Yu et al., 2018), patients undergoing organ retrieval procedures (Bourret et al., 2021; Carter-Gentry & McCurren, 2004; Gao et al., 2017; Peng et al., 2020; Regehr et al., 2004; Smith et al., 2015, 2017) or victims of mass casualty trauma events (Melmer et al., 2019).

In summary, this study's findings indicate that when pediatric perioperative nurses are exposed to direct trauma that is coupled with their exposure to indirect trauma, this equals to almost two traumatic workplace exposures per day for the nurse who is employed full-time. In this study, the combined indirect and direct exposure to trauma is shown to be linked to moderate levels of STS. Essentially, this study's findings serve as a warning that pediatric perioperative nurses' frequent exposure to both direct and indirect trauma significantly impacts their mental health and well-being. This finding implies that without supportive attention in the workplace, untoward effects can lead to decreased job satisfaction and increased anxiety and depression as discussed below.

STS and the Internal Factor Years of Experience

This researcher found no significant correlation between STS levels and years of experience as a pediatric perioperative nurse (i.e., an internal factor described in the Transactional Model of Stress and Coping). This finding is supported by previous work that examined levels of STS in a sample of emergency department nurses (Duffy et al., 2015). Kellogg et al. (2018b) also reported that neither age or years of experience served as significant predictors of STS in their sample of pediatric nurses. Another study's findings found no link was observed between the number of years of practice and STS in a sample of nurses working with terminally ill patients (Oginska-Bulik & Michalska, 2021). This may be due to personal factors, personal coping styles, and/or collegial or unit-based support from colleagues that have been

cited as critical mitigating (or coping) factors in the development of STS (Cook, 2012; Gunusen et al., 2019; Morrison & Joy, 2016). However, the evidence regarding the linkage between STS and years of experience is mixed where other studies found that STS was correlated with years of clinical experience (Chrestman, 1995; Dominguez-Gomez, & Rutledge, 2009; Hinderer et al., 2014). Lavoie et al. (2011) discovered that, although exposure to traumatic events increased with years of experience among nurses in an emergency department, years of experience were negatively correlated with STS symptomatology.

STS and Coping

In relation to the Transactional Model of Stress and Coping, coping is recognized as a complex adaptive process (Lazarus & Folkman, 1984). Coping occurs after appraisal of exposure to one's own trauma (e.g., exposure to workplace bullying or violence) or another's trauma (e.g., exposure to pediatric trauma) that can influence the degree of STS experienced by the perioperative nurse. Coping represents the individual's response to the process of cognitive appraisal that influences the level of emotional distress experienced by this individual (Lazarus & Folkman, 1984). Of note, pediatric perioperative nurses' cognitive appraisal of exposures to trauma was not captured in this study.

In this study, there was a significant moderate positive correlation found between STS (total scale) and the Brief COPE avoidant coping sub-scale. In other words, the higher the avoidant coping employed by the participants, the higher their STS levels. Over 60% of nurse participants in this study identified moderate or high levels of STS which indicates maladaptive coping (Carver, 1997). To comprehend this positive relationship between STS levels and avoidant coping, this finding suggests this sample of participants engaged in some degree of maladaptive coping. Maladaptive coping may result in a residual accumulation of past exposure

to trauma that increases the risk for developing STS (Gates & Gillespie, 2008). This is a plausible explanation in this current study in light of the elevated number of nurse exposures to direct and indirect trauma in the perioperative care setting.

Next this researcher will discuss this study's sub-scale mean scores on coping while comparing the coping levels reported in previous work. In this researcher's study, the problemfocused sub-scale mean score was 2.12 (SD = 0.67) (note: the theoretical range of scores in this sub-scale is 1 to 4 units; Novopsych, 2023). This sub-scale describes the use of active coping measures, informational support, planning, and positive reframing (Novosych, 2023). The emotion-focused sub-scale mean score was 1.96 (SD = 0.46) (note: the theoretical range of scores is 1 to 4 units; Novopsych, 2023). This sub-scale describes the use of emotional support, acceptance, venting, humor, self-blame, and religion (Novopsych, 2023). Lastly, the avoidant sub-scale mean score was 2.49 (SD = 0.34) (note: the theoretical range of scores was 1 to 4; Novopsych, 2023). This sub-scale describes coping through distraction, denial, substance abuse and behavioral disengagement (Novopsych, 2023). Across three Brief COPE sub-scales, nurse participants reported a low to moderate level of coping; avoidant coping appeared to be the most reported style of coping in this study's sample. Further, this study's sub-scale mean scores are comparable to those reported in a study by Poulus et al. (2020) who examined coping in a sample of athletes that was used to validate the scale. Poulus et al. (2020) found the following mean sub-scale scores were: 2.47 [SD = 0.63] on the problem-focused sub-scale, 2.23 [SD = 0.49] on the avoidant coping sub-scale, and 1.64 [SD = 0.45] on the emotion-focused sub-scale.

The moderate scores on the coping sub-scales may be attributed to study participants either: not feeling that they have any stressors to cope with, experiencing an inability or motivation to reflect on their stressors, experiencing a limited desire to disclose personal

information, or lacking or being unaware of their coping skills (Novopsych, 2023); it may also be possible that this moderate score reflects the ongoing nature of processing their experiences to trauma exposures (given the average number of weekly workplace exposures to direct and indirect trauma reported in this study).

This researcher will next discuss challenges associated with identifying studies that provided a reliable or a complete report of findings on nurse coping which can be compared to those found in this current study. First, studies examining the relationship between STS and coping have provided either mixed or an incomplete report of results. In a study of stress and coping among oncology nurses in Portugal, the correlations between stress and coping (measured by the total Brief COPE scale and its sub-scales) were not reported (Gomes et al., 2013). In another study examining STS in pediatric nurses (using the STSS scale), negative coping processes were predictive of STS (Kellogg et al., 2018b). While higher levels of emotional support were linked to higher levels of STS, correlational results between STS and the Brief COPE sub-scales were not reported (Kellogg et al., 2018b). In yet another study that involved lack of transparent reporting, coping was reported as being predictive of STS where higher coping levels were associated with higher STS levels (Ratrout & Hamdan-Mansour, 2019). In this next study the authors reported a total scale Brief COPE score despite the tool's developers indicating that scoring on the scale is only intended for the sub-scales (Carver, 1997). Overall, having access to a limited number of study reports on total Brief COPE scale scores poses a constraint in being able to compare previous study findings with those arising from this current study.

Another challenge encountered is that related studies employed variations of the Brief COPE scale that are based on the number of factors studied. There is a current debate that

surrounds the factor structure of the Brief COPE scale and focuses on the variability in psychometric properties that have been reported in different models of the tool (Solberg et al., 2022). The original scale validation included 14 facets of coping, however, the tool's developer disclosed that the Brief COPE scale was flexible and open to adaptation as needed by subsequent researchers to determine the number of factors appropriate to their studies (Carver, 1997). This has resulted in varied interpretations of the number of sub-scales or coping reactions that the scale measures. For example, subsequent studies have employed either a 4-factor model (Solberg et al., 2022), 9 sub-scales (Wise et al., 2023), or 11 coping sub-scales (Fteropoulli et al., 2021). Another validation study with sample of nurses utilized a two-factor, 22-item scale (of the 28 original items in the Brief COPE tool) (Rahman et al., 2021). The employment of variations in the tool across studies obviously makes it difficult to compare their results with this current study's findings.

Researchers of validation studies on the psychometric properties of the Brief COPE proposed a valid and reliable version of the Brief COPE that consists of 3 sub-scales that have been employed in several studies (Dias et al., 2012; Poulus et al., 2020). The three-sub-scale model (i.e., problem-, emotion-, and avoidant coping styles) was chosen for this study as it is the model that corresponds most closely to the coping factors identified in the Transactional Model of Stress and Coping.

Workplace Support. In this study, over half of participants (55%) indicated that they did not seek support in the workplace, such as support from a manager or Employee Assistance Program (EAP) following a traumatic experience. This was an additional question posed to participants as to whether they sought workplace supports that was not captured in the Brief Cope Scale. This finding is consistent with recent Canadian data that indicates more than 50% of

employees have never sought EAP benefits (Dialogue, 2024). As Doran (2022) explained, EAP programs are often underused. As found in a recent study of nurses in Ontario, only nine percent of participants had sought EAP support (RNAO, 2021), despite institutional resources being deemed a critical component to facilitate coping in a sample of nurses employed in a pediatric inpatient acute care cardiology unit in their qualitative study (Cook et al., 2012). In another study, Quinal and Rutledge (2009) reported that only five percent of nurse participants working with oncology patients had sought help from a counselor for work related stress. Potential reasons for not seeking assistance may be that nurses either: believe that the experience will pass on its own, perceive a lack of time to seek support or engage with an EAP program, or fear reprisal or being seen as not being able to handle their job and related stressors (Gates & Gillespie, 2008). Further, a nursing unit's unspoken culture may determine acceptable or expected norms of coping which could influence a professional's response to a traumatic event (Papadatou, 2000). However, it is also possible that nurses seek support outside of the workplace.

In their qualitative study, Maytum et al. (2004) outlined coping strategies that were employed by nurse participants and categorized them as personal or work-related coping strategies. Possible barriers to work-related coping may include years of experience or a lack of time to seek formal support (Morrison & Joy, 2016). In this current study, 66% of participants had less than ten years of pediatric perioperative nursing experience. (Supplementary sub-group analysis of nurses with less than ten years of pediatric perioperative nurse experience was conducted to study the association between STS and avoidant coping; no significant correlation was found). However, 80% of nurses in this current study with less than ten years of pediatric perioperative nurse experience indicated that they had not sought workplace support in the form

of EAP or from a manager following a traumatic event. Less experienced nurses are learning to navigate professional employment and may have varying knowledge and/or access to informal and formal supports. They also may be unwilling to let supervisors know that they are not coping at work (Morrison & Joy, 2016). However, in a sample of nurses caring for patients who had experienced trauma, Von Rueden et al. (2010) found that less experienced nurses were more likely to rely on support systems for coping and thus reported less STS; support systems that were used included colleagues, friends, religious connections, family, pets and others. Previous research has identified that nurses lacking support are at risk for STS (Gates & Gillespie, 2008). Studies examining length of employment, STS, and coping in other professions did not find linkages between the variables (Perron & Hiltz, 2006).

Nurses working with pediatric patients describe their work as both stressful and rewarding (Kleis & Kellogg, 2020). The reward aspect of this work may be a mediating factor to the coping response of the pediatric nurse. Interestingly, while nurses' reports on direct and indirect trauma exposures in this study were high, they were most satisfied with their nursing and their physician colleagues. This suggests that despite the stressful nature of perioperative nursing and potential workplace bullying or violence that occur, interpersonal relationships are a possible mitigating factor to these trauma exposures that warrant further study. Numerous studies have described that interpersonal relationships and social support in the workplace are significant mitigating factors to work related stress (Cook, 2012; Morrison & Joy, 2016; Stelnicki et al., 2020).

STS and Job Satisfaction Outcomes

Overall, the participants in this study reported a mean job satisfaction score that fell between "moderately dissatisfied" and "neither satisfied nor dissatisfied" on the MMSS scale.

For individual MMSS items in this study, nurses were most satisfied with their nursing peers, the opportunity for social contact at work, and the physicians they work with. Nurses were most dissatisfied with workplace childcare facilities, work life balance and childcare needs, and participation in organizational decision making that imply their desire for more control in the work environment.

This study's job satisfaction total mean score is lower than the score reported in a study of nurses working in a regional hospital in Oman (note: this study employed a modified version of the MMSS, using 27 of the 31 items in the tool) (Al Maqbali, 2015) and in a related study where job satisfaction was examined in a sample of registered nurses and registered nursing assistants working in public hospitals in Slovenia, in which 29 out of the original 31 items in the MMSS scale were employed (Prosen & Piskar, 2013). This difference in MMSS sores may be explained by cultural differences of nursing in North America versus abroad; for example, it is possible that expectations for workplace conditions are higher in North America (and thus in this sample) than in nurses working elsewhere. The mean satisfaction score reported in this study was also less than that reported by Gurkova et al. (2013), who studied job satisfaction in a sample of Slovak and Czech nurses.

The only significant correlation found was between the STS and the MMSS Professional Opportunities sub-scale (i.e., measures professional opportunities for growth and advancement available to the nurse), with $r(31) = .463$, $p < 0.01$. This positive moderate correlation suggests that, while nurse participants experienced a high level of STS, they also appreciated opportunities to advance their nursing roles and knowledge. It is plausible that such opportunities were viewed by nurse participants as a means to better enable their ability to positively impact their workplace and facilitate changes that directly address or mitigate their STS experiences.

The moderate overall job satisfaction score reported in this study also implies an existing ambivalence by study participants towards either their clinical practice with patients, their group of co-workers, or aspects of work that were not addressed in this study (e.g., overtime hours, additional shifts worked to cover a shortage of staff, or added workplace responsibilities such as teaching, acting as a preceptor, or mentoring new staff or students). This current study's finding is consistent with the job satisfaction score reported in a sample of Jordanian nurses (Salahat & Al-Hamdan, 2022), who also reported nurses were most satisfied with their work peers (nurses and physicians) and least satisfied with work-life balance.

On the other hand, other studies reported no statistically significant relationship between STS and job satisfaction by nurses (Lindsay, 2021). Meyer et al. (2015) found no correlation between stress (note: they measured stress using the Life Events Checklist) and job satisfaction (measured using the MMSS) in a sample of pediatric novice nurses. In another study involving nurse residents, there was no reported link between stress (measured by the Life Events Checklist) and job satisfaction (measured using the MMSS, Li et al., 2014).

Overall, it is difficult to compare this current study's findings with previous studies based on their use of varied tools to capture job satisfaction. Furthermore, most of the related studies were conducted in countries outside of North America where nurses experiencing STS may hold different expectations for workplace conditions and collegial supports that influence their job satisfaction.

STS and Anxiety/Depression Outcomes

Employee mental health has been cited as the top human resources challenge in the workplace in Canada, with 70 to 80 percent of employee assistance program (EAP) usage relating to mental health concerns (Dialogue, 2024). A recent study in the United States cited

employee wellbeing as a top concern for nurse leaders who recognize the strain of the COVID 19 pandemic as having affected staff beyond the acute stage of that event (American Organization of Nurse Leaders, 2024). A large online survey in Canada previously found that half of the nurse respondents (working in a variety of practice settings) screened positive for at least one mental disorder (RNAO, 2017). Another large study that examined the rates of mental disorders in Canadian nurses found 36 percent of participants screened positive for major depressive disorder, and 26 percent screened positive for generalized anxiety disorder (Stelnicki et al., 2020). Previous studies have reported that nurses who experience STS also report higher prevalence of anxiety and depression (Bock et al., 2022; Hegney et al., 2014; Ilhan & Kupeli, 2022; Miller & Pehlke, 2022). The following will discuss this study's descriptive findings on nurse anxiety and depression, as well as their association with STS, respectively.

Anxiety. First, this researcher will discuss the mean levels and prevalence of anxiety symptoms captured in this current study of pediatric perioperative nurses who experienced direct and indirect trauma in the workplace. This study's sample of pediatric perioperative nurses reported a mean anxiety score of 12.9 or a clinically significant moderate level of anxiety on the GAD-7 tool; 73% of the sampled nurses reported a moderate or higher score of anxiety symptoms. An analysis of variance showed that the effect of STS on anxiety symptoms was significant, $F(4, 28) = 4.58$, $p = .006$. This study's findings of anxiety symptoms levels are supported by a related study conducted in China where a moderate mean level of anxiety was also reported at 11.76 [SD=1.13] and 31% percent of emergency and intensive care nurse participants experienced a moderate or greater level of anxiety symptoms (measured using the GAD-7 scale), with anxiety levels predictive of STS, which were measured using the STSS (Yao et al., 2024). Gul and Kilic (2021) studied anxiety among operating room nurses in Turkey

during the Covid 19 pandemic and also reported moderate mean levels of anxiety symptoms (note: they measured anxiety using the Beck Anxiety Inventory). In another study examining anxiety symptoms in operating room nurses in Iran, half of participants reported intermediate or greater mean levels of anxiety symptoms (note: they measured anxiety using the Spielburger State-trait anxiety inventory) (Kayalha et al., 2013).

On the other hand, a number of related studies reported lower mean GAD-7 scores than in the current study (i.e., 12.9). For example, Currie et al. (2022) found when employing a mental health intervention that the mean baseline GAD-7 score of 5.03 [SD = .29] existed in a convenience sample of health care providers (i.e., that included physicians, nurses, and other health care workers; care units were not identified). Oteir et al. (2022) reported a GAD-7 mean score of 8.5 [SD=5.2] in their sample of health care workers in Jordan that included physicians, nurses, and paramedics (note; the care units were not specified) and Kameg et al. (2021) similarly reported a GAD-7 mean score of 7.48 [SD = 5.96] in a sample of psychiatric nurses.

Rather than mean anxiety scores, other studies reported on the prevalence levels of anxiety in their respective study samples that were lower than the prevalence level of moderate anxiety found in this current study (i.e., 73%). For instance, Fteropoulli et al. (2021) reported a prevalence of clinical anxiety (i.e., a score greater than ten on the GAD-7 scale) of 28 percent in a sample of health care professionals which included physicians, nurses, allied health professionals, health scientists, and academics working in various care areas including primary care, outpatient, inpatient, intensive care, and public health in Cyprus. Kelly et al. (2022) reported a prevalence of 18% of generalized anxiety disorder among hospital staff consisting of nurses and physicians (note the practice areas were not identified) in the state of North Dakota. Zakeri et al. (2021) reported a prevalence of 29% of anxiety in a sample of frontline nurses

during the COVID 19 pandemic, with a GAD-7 mean score of 7.85 [SD = 5.0] which is lower than the score reported in this study. Cohen et al. (2022) measured anxiety at two separate time points during the Covid 19 global pandemic; they reported a prevalence of anxiety of 19% and 31% in a sample of frontline nurses working in a variety of units including the Intensive Care Unit, Operating Room, Emergency Department, clinic and inpatient settings, respectively. Finally, Pappa et al. (2020) reported a pooled prevalence of anxiety of 23.21% in their metaanalysis of 12 studies examining anxiety in health care workers across a variety of settings during the COVID-19 pandemic.

Overall, there is a range of nurse reports of anxiety levels reported across related studies, but without authors clearly identifying their studies' practice settings. Further, many of the related studies provided reports of anxiety across disciplines and during the pandemic period. Thus, it remains difficult to provide a comparative discussion on the degree of anxiety of pediatric perioperative nurses who have been exposed to trauma in comparison to other studies.

To address this study's research question about the linkage between STS and anxiety levels, this researcher found that STS and anxiety were significantly moderately correlated and 73% of pediatric perioperative nurses screened positive for moderate or greater levels of anxiety. Ariapooran et al. (2022) also examined the linkage between STS and anxiety in Iranian nurses working in emergency, ICU and other medical wards) as measured on the STSS scale. These authors found that their sample of nurses reported higher mean levels of anxiety (note: they measured anxiety using the Beck Anxiety Inventory) than nurses who reported lower STS levels. In another study of STS and anxiety among nurses working on surgical, pediatric, psychiatric and internal medicine case units, nurses experiencing STS (measured using 2 questions from the Freiburg PTSD Screen) reported higher symptoms of anxiety (measured using the GAD-2 scale)

(Bock et al., 2020).

Overall findings in this current study are somewhat supported by other related study findings of moderate levels of anxiety experienced by nurses who work in practice settings other than pediatric perioperative care and in other countries. Generally, study reports on anxiety levels experienced by nurses who work across a range of specialty areas and in different countries remain mixed. Further, the moderate association between STS and anxiety of pediatric perioperative nurses found in this study was supported by two previous studies conducted in other countries and with nurses working in specialty areas other than pediatric perioperative care.

Based on the range of reported anxiety levels by nurses who worked across different practice settings, there is the implication of nuanced working conditions and supports experienced or 'perceived' by nurses that warrant further examination. Therefore, in accordance with Lazarus and Folkman's (1984) model, it would have been helpful to comprehend nurses' 'appraisals' of their exposure to direct and indirect trauma, in addition to their coping strategies, that most likely contributed toward the moderate positive relationship found between STS and anxiety levels. To date there remains a paucity of systematic research on the linkages between 'appraisals' of internal and external factors and subsequent levels of coping, STS, anxiety, and depression in pediatric perioperative nurses. A more fulsome examination of relationships between key constructs as posited by Lazarus and Folkman's (1984) model is warranted to better explain the association between STS and anxiety outcomes found across different nursing specialties and practice settings.

Depression. This researcher will first discuss the mean levels and prevalence of depression symptoms captured in this current study of pediatric perioperative nurses. In this study, STS and depression were significantly moderately correlated; 85 percent of nurses

screened positive for moderate or greater severity depressive symptoms, and the mean PHQ-8 score in this sample fell in the clinically significant moderate range (i.e., 13.45). An analysis of variance showed that the effect of STS on depression symptoms was significant, $F(4, 28) = 3.39$, $p = .022$. Similarly, Yao et al. (2024) described that 85 percent of their sample reported a moderate level or greater level of symptoms of depression (note: as measured by the PHQ-9) in their study of emergency and intensive care nurses in China. One systematic review also described an overall moderate level of depression in intensive care nurses among the 13 studies reviewed (Karanikola et al., 2015). These previous study findings corroborate the findings from this study, as the working conditions for pediatric perioperative nurses are similar to nurses working in emergency and intensive care departments.

On the other hand, a number of studies that examined depression in nurses across practice settings and countries found a wide range of low, moderate, and high levels of mean depression scores. Of note, a number of these related studies reported on nurse depression while using the PHQ-9 and not the PHQ-8 as in this current study; PHQ-9 poses an additional question on suicidal ideation (e.g., Oteir et al., 2022, Letvak et al. 2012, and Vasconcelos et al. 2018) that will not be included in this discussion. A number of studies that employed the PHQ-8 tool found mean depression scores and prevalence rates of moderate depression that were lower in comparison to this current study's findings. For example, Currie et al. (2022) examined the use of a mental health intervention in a sample of physicians and nurses (note: their practice area was not described) and reported a baseline PHQ-8 mean score of 6.3 (SD = .34). Kameg et al. (2021) also reported a mean PHQ-8 score of 7.72 (SD = 5.78) in a sample of psychiatric nurses.

Other studies reported only on the prevalence of depression that were also lower than the prevalence rate found in this current study. However, unclear reporting was evident across

related studies that challenged this researcher in comparing this current study's reports of depression with previous work done in this area. For instance, while Vasconcelos et al. (2018) reported a lower 5.5% prevalence of depression in their sample of ICU nurses, they did not report on the mean level of depression. Other authors provided a clearer report on prevalence and/or mean levels of depression in their respective samples but they did not identify their practice settings. For instance, Cohen et al. (2022) reported a prevalence of depression of 18 and 37 percent (i.e., data was collected at two time points during the COVID 19 pandemic) of frontline nurses who screened positive (score of ten or greater) on the PHQ-8 scale. Fteropoulli et al. (2021) also reported a prevalence level of 27 percent for clinical depression (PHQ-8 score of 10 or greater) in a sample of health professionals in Cyprus. Zakeri et al. (2021) reported an 18% prevalence of severe depression in a sample of frontline nurses working during the COVID19 pandemic. In a sample of health care professionals including nurses, physicians and allied health professionals, researchers reported a 14% prevalence of moderate or greater depression (as measured by the PHQ-8 scale), and the mean PHQ-8 scale score was 4.5 [SD = 4.5] (Cahill et al., 2022). In their systematic review and meta-analysis of depression among health care providers during the Covid 19 pandemic, Pappa et al. (2020) reported a pooled prevalence of depression of 22.82% in 10 studies.

Overall, it appears that depending on the practice setting, there is a range of prevalence rates of moderate depression as reported by nurses. It remains challenging to compare study findings with previous work that do not identify the practice setting of nurses where depression rates were captured. In addition, there was variations in: the use of different anxiety measures, the measurement of depression across a range of health care professionals and in different contexts or time periods (e.g., during the pandemic), and how the findings were reported (i.e.,

either means or frequencies). The mean depression score reported in this current study was high in comparison to most of the other studies reviewed above. This researcher speculates that one reason for this study's elevated depression score is that pediatric perioperative nurses work in a taxing environment that continuously exposes them to a highly vulnerable pediatric patient population in comparison to other nursing specialties.

To address this study's research question about the linkage between STS and depression levels, this researcher found that STS and depression were significantly moderately correlated. Similarly, a number of related studies found moderate positive correlations between these two variables; for example, Yilmaz et al. (2022) described a positive correlation between STS (measured using the STSS) and depression (note: as measured by the Beck Depression Inventory) in their sample of midwives and nurses working in areas such as public health, family health and Covid-19 services and Ariapooran et al. (2022) also reported a positive correlation between STS and depression (note: as measured using the Beck Depression Inventory) in their sample of nurses working in emergency, ICU and other medical wards. Likewise, in a sample of health care teams that included nurses caring for heart and lung transplant patients Carey et al. (2019) further reported a positive correlation between STS and depression. .

To speculate on this study's findings of a moderate correlation between moderate levels of STS and depression, pediatric perioperative nurses' reports of high levels of exposure to traumatic circumstances and witnessing of other's trauma on a weekly basis likely contributed toward this relationship. However, in accordance with Lazarus and Folkman's (1984) model, it would have been helpful to have captured nurses' 'appraisals' of their high levels of exposure to direct and indirect trauma to better comprehend conditions that contributed to their STS and consequential depression levels.

Summary

In summary, the current state of the health care system indicates a crisis in recruiting staff (Kiel, 2020), staff working much overtime (Canadian Institute for Health Information, 2023), and an overall sense of a health care system that is burned out (McGillis Hall & Visekruna, 2020). Evidence gleaned from the STS, GAD-7 (anxiety), PHQ-8 (depression) and Brief COPE avoidance subscale responses of health care workers, as captured in this current study and related work, offers us insights into the mental well-being of nurses (including pediatric perioperative nurses) in Canada (Carey et al., 2019; Gul & Kilic, 2021). There is a large body of research that has emerged during and following the emergence of the COVID-19 global pandemic that focused on health care provider's mental health (Ilhan & Kupeli, 2022; Kellogg, 2022; Miller & Pehlke, 2022; Zakeri et al., 2020). However, this study's findings focused on a key gap in understanding the working conditions of pediatric perioperative nurses in the post pandemic environment that has impacted their job satisfaction, depression and anxiety linked with STS when exposed to direct and indirect trauma. While pediatric perioperative nurse burnout was already high before the Covid 19 pandemic (Aiken et al., 2023), they still face uncertainty with regard to the working conditions following the Covid 19 pandemic (Khairina, Maisa & Rahman, 2024). To gain greater clarity of the pandemic effects, this researcher suggests that external environment factors according to Lazarus and Folkman (1984) need to be studied to determine whether: working additional hours (to cover for missing staff), having added responsibilities at work (e.g., teaching new staff), and the changing workplace and expectations have an impact on pediatric perioperative nurses' psychological wellbeing (i.e., besides their experiences with exposures to direct and indirect trauma).

Limitations of the Study

This researcher has identified several limitations of this study that will be addressed. First, the generalizability of this study is limited by the small sample size of 33 pediatric perioperative nurses across Canada. Although a homogeneous sample of pediatric perioperative nurses caring for pediatric patients who have experienced trauma was obtained, one cannot determine whether this study's sample is representative of a larger population of pediatric perioperative nurses. The homogeneity of this sample consisting of mainly White, Canadianborn females also pose limitations on the generalizability of study findings. Of note, nurse participants were not asked to specifically identify their workplace setting in Canada. In addition, this small study sample may have increased the chances of sampling error and produced less accurate estimates than larger samples (Polit & Hungler, 1991) that undermine the internal and external validity of this study (DeVon et al., 2007). Thus, a caveat is warranted in relation to the reliability of findings reported based on inferential analyses conducted (e.g., correlational analyses, tests of mean differences between sub-groups, and regression analysis).

Second, this study measured STS associated with trauma exposures at only one point in time. It is possible that nurses' perceptions of STS may change over time as associated with Lazarus and Folkman's (1984) theoretical notions of internal environment factors (e.g., selfcriticism, mindfulness, valuing one's work, personal trauma history, and emotional needs) and external environment factors (e.g., staffing levels, patient acuity, family needs, team dynamics, workplace conflict, and organizational supports) that were not measured in the current study.

Third, it is also possible that volunteer bias may have been present where pediatric perioperative nurses who agreed to participate may be different from non-volunteers (Krishna et

al. 2010) (e.g., they might have experienced more exposures to direct and indirect trauma than pediatric perioperative nurses who did not participate in the study). In other words, it is possible that nurses in this study's sample were personally impacted by the research topic and were more motivated to participate in the current study.

Fourth, the appropriateness of the measure employed to capture job satisfaction in this study is in question. The MMSS does not address some of the contemporary challenges encountered in the current health care environment, such as potentially working in environment that is short staffed or with increased responsibilities for nurses. Questions such as these would provide a more fulsome and relevant depiction of the challenges that pediatric perioperative nurses currently face in the post-acute pandemic era of clinical practice.

Fifth, this study did not examine specific types of supports that are utilized by pediatric perioperative nurses to cope with their exposure to indirect and direct trauma exposures. Further, this study did not capture whether they are satisfied with the workplace supports that are available to them and if they seek or have sought support outside of the workplace. It would have also been helpful to have captured specific measures or types of supports that pediatric perioperative nurses desire to reduce work-related stress.

Sixth, one of the biggest limitations in this study was the lack of a qualitative component to this study. A qualitative approach would have allowed this researcher to describe the holistic experience of the pediatric perioperative nurse (Carr, 1994) by providing them with the opportunity to expand on the fulsome conditions of having been exposed to traumatic events. Lavoie et al. (2011) explained that the context and surrounding circumstances can be as significant as the event (e.g., exposure to trauma) itself (Lavoie et al. 2011). According to

Lazarus and Folkman's (1984) model, the context of the trigger 'event(s)' should include an examination of external or environmental conditions that could influence nurses' 'appraisals' of having been exposed to direct and indirect trauma in the pediatric perioperative care setting. More specific, while the STSS poses probing questions regarding experiences, an open-ended question would have garnered further input from participants as evidence for themes relevant to STS levels experienced in pediatric perioperative nursing practice. For future studies, this researcher recommends that researchers employ open-ended question(s) that allow participants to describe their experiences with and conditions surrounding their exposure to trauma in addition to the challenges they encounter in their work environment to cope with this event.

Implications for Practice and Education

This study has implications not only for pediatric perioperative nurses, but also perioperative nurses and their health care team members. Perioperative nurses practice in complex, fast paced, and often stressful environments. Providing urgent surgical care to patients who have experienced a traumatic event within the complexity of a multi-disciplinary care team requires early recognition of an acute STS response by nurses to not engage in avoidant coping that is linked to increased STS levels.

Avoidant coping was reported by this sample of perioperative nurses. Avoidance is a primary indicator on post-traumatic stress symptomatology (R. El-Gabalawy, personal communication, May 22, 2024). Avoidance exacerbates traumatic stress symptoms (Foa & Kozak, 1986; Resick & Schnicke, 1993). The literature identifies exposure therapy as the 'gold standard' treatment for trauma which can be delivered virtually (Wells et al, 2020), through online counseling platforms (Better Help, 2024) or using virtual reality (Hawajri et al., 2023).

Exposure therapy involves systematic exposure to triggering events, thereby reducing avoidance (Rauch et al., 2012). Health care organizations should be aware of the treatment needed for staff who experience STS and may engage in avoidant coping.

Half of the nurses in this current study indicated they had not sought support in their workplace, whether from a manager or workplace EAP program following a stressful event. This behavior demonstrates a form of avoidant coping that can lead to an unrecognized and increased acute STS responses, contributing to decreased job satisfaction, anxiety, and depression. Thus, a key recommendation is the education of staff to ensure that nurses and other health care team members in perioperative care are informed about the importance of early awareness and identification of signs of stress associated with exposure(s) to trauma.

Specifically, education about the signs and symptoms of STS can help nurses and health care team members in their appraisals of having been exposed to direct and indirect trauma in the workplace. Taking positive and active steps is also vital to avert the risk of developing STS in such situations. Managers and nurse educators should discuss the challenges associated with the perioperative nurse role upon hire and during the orientation process. This would help to ensure that the newly hired perioperative nurse is aware of the resources available to them, how to access these resources and supports, and that they can seek assistance freely and whenever needed.

Nurses need adequate supports from their managers and team members to help them avert avoidant coping that can lead to an acute STS response and subsequent negative outcomes. As demonstrated in this study, better attention to STS and its related outcomes (low job satisfaction, anxiety, and depression) require immediate attention in our post-pandemic health care system where the mental health of nurses and their health care teams has been negatively affected.

Relationships with colleagues was found to be one of the top measures of pediatric perioperative nurse's job satisfaction in this study, and research has demonstrated that collegial support is a mitigating factor to the development of STS (Cook, 2012; Gunusen, 2019; Morrison & Joy, 2016). To highlight the importance of interpersonal relationships in the workplace, another study identified that having a friend or a mentor in the workplace helped to alleviate stress in study participants (Duffy et al., 2015). Thus, pediatric perioperative nurses should be encouraged to foster these relationships in the workplace , such as through a concept employed in the United States Army called "battle buddies". With battle buddies, a peer colleague is identified who acts as a support and may be the first person to notice that their peer is not coping well (Albott et al., 2020). Lastly, healthcare organizations may benefit from the introduction of a formalized mentorship program to further facilitate and foster interpersonal relationships among staff. As another example, there also exist facilitated peer support programs such as Care for Caregivers that train health care providers in peer support methods such as active listening techniques, encourage the sharing of stories or ideas to cope with stress and whose effectiveness has been demonstrated, with participants of the intervention reporting feeling more supported in the workplace as well as finding their workplace being more empathetic (Chambers, 2021).

Nurses in this study explicitly relayed their low satisfaction with workplace child care facilities, work-life balance, and participation in organizational decision-making (all of which represent external environmental factors influencing the nurse's experience with STS within the Transactional Model of Stress and Coping) These findings highlight important aspects for health care organizations to consider, or ameliorate as antecedent factors for nurses' experiences with STS. While not examined as part of this descriptive study, it is possible that added sources of stress, for example, regarding seeking child care facilities may impact the pediatric perioperative

nurse's baseline stress levels (aka external environmental factor that can impact STS levels). It is also possible that a lack of work-life balance (another external environmental factor) may contribute to underlying stress in the pediatric perioperative nurse and affect their appraisal of stressful situations encountered in the workplace. Finally, allowing pediatric perioperative nurses to provide feedback or input in organizational decision-making may contribute to a greater level of job satisfaction in this population as it could provide a measure of control over their surrounding external, or environmental, factors that may contribute to stress in this nursing population.

Implications for Research

To the best of this researcher's knowledge, this descriptive correlational study was the first to describe the prevalence of STS and its association with coping, job satisfaction, anxiety, and depression among pediatric perioperative nurses who were exposed to trauma in the workplace. Further studies aiming to describe this phenomenon with a larger sample and over time are needed to describe the negative sequelae of STS and mental health among perioperative nurses. Systematic studies that further uncover Lazarus and Folkman's (1984) internal and external risk factors for STS would be helpful in the early identification of or avoidance of this response by pediatric perioperative nurses who are exposed to direct and/or indirect trauma. Furthermore, qualitative studies on the nature of direct and indirect trauma experienced by perioperative nurses are needed to more fully understand influential factors on STS levels in the operating room environment. Qualitative studies are also warranted to provide greater clarity on specific coping strategies employed by perioperative nurses that might be useful in the workplace and the avoidance of STS and its potential impact on nurse job satisfaction, anxiety, and

depression. Finally, further research is needed to determine the coping strategies that are employed by pediatric perioperative nurses.

Conclusion

Pediatric perioperative nurses are highly specialized professionals who undergo extensive training to care for a vulnerable patient population that requires empathetic and safe care. However, pediatric perioperative nurses are frequently exposed to direct and indirect trauma in the workplace in the form of working with children who have experienced trauma and as part of the health care team where interpersonal conflicts have been identified. The nurse's response to experiencing direct and indirect trauma in their workplace can pose a risk to their ongoing provision of empathetic and safe care to their patients. This study is the first to describe the incidence of STS among a sample of pediatric perioperative nurses and its relation to job satisfaction, anxiety, depression and coping. This study's findings are significant in that they provide a novel glimpse into the veiled reality of perioperative nursing that is not well understood by health care providers outside of the operating room. One such significant finding is that pediatric perioperative nurses experience almost ten direct and indirect trauma exposures per week. This finding serves as a strong signal for health care institutions and supervisors to pay greater attention to the trauma experiences of perioperative nurses and their subsequent avoidant coping that is linked to acute STS response, job satisfaction, anxiety, and depression.

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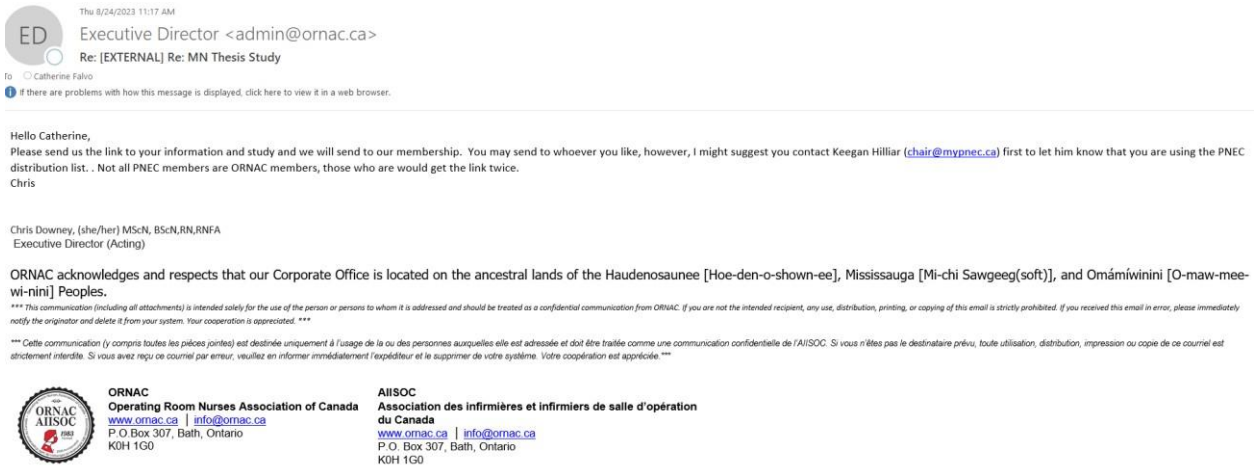
Appendix A

ORNAC Approval Email



Thu 8/24/2023 11:17 AM

ED Executive Director <admin@ornac.ca>

Re: [EXTERNAL] Re: MN Thesis Study

To Catherine Falvo

If there are problems with how this message is displayed, click here to view it in a web browser.

Hello Catherine,

Please send us the link to your information and study and we will send to our membership. You may send to whoever you like, however, I might suggest you contact Keegan Hilliar (chair@mypnec.ca) first to let him know that you are using the PNEC distribution list. . Not all PNEC members are ORNAC members, those who are would get the link twice.

Chris

Chris Downey, (she/her) MScN, BScN,RN,RNFA

Executive Director (Acting)

ORNAC acknowledges and respects that our Corporate Office is located on the ancestral lands of the Haudenosaunee [Hoe-den-o-shown-ee], Mississauga [Mi-chi Sawgeeg(soft)], and Omámíwinini [O-maw-mee-wi-nini] Peoples.

*** This communication (including all attachments) is intended solely for the use of the person or persons to whom it is addressed and should be treated as a confidential communication from ORNAC. If you are not the intended recipient, any use, distribution, printing, or copying of this email is strictly prohibited. If you received this email in error, please immediately notify the originator and delete it from your system. Your cooperation is appreciated. ***

*** Cette communication (y compris toutes les pièces jointes) est destinée uniquement à l'usage de la ou des personnes auxquelles elle est adressée et doit être traitée comme une communication confidentielle de l'AIISOC. Si vous n'êtes pas le destinataire prévu, toute utilisation, distribution, impression ou copie de ce courriel est strictement interdite. Si vous avez reçu ce courriel par erreur, veuillez en informer immédiatement l'expéditeur et le supprimer de votre système. Votre coopération est appréciée.***

ORNAC AIISOC

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Appendix B

Email Invitation from the Investigators

Date: January 22, 2024

To: Pediatric Perioperative Nurses (RNs and LPNs)

Fr: Kara Gillies, Executive Director, ORNAC

Re: Invitation from the Researcher to Participate in the Study, "Secondary Traumatic Stress, Job Satisfaction, Anxiety, Depression and Coping among Pediatric Perioperative Nurses: A Descriptive Correlational Study"

Funder: College of Nursing Endowment Fund Graduate Student Research Grant.

The Operating Room Nurses Association in Canada (ORNAC) has received Ms. Catherine Falvo's request for assistance with her study as noted above. Catherine Falvo is a graduate student in the Master of Nursing Program at the University of Manitoba, College who is doing a study as part of her thesis requirements. Dr. Michelle Lobchuk, RN, PhD, Associate Professor, College of Nursing is Catherine's thesis supervisor. ORNAC is assisting Catherine by distributing an email invitation and two email reminders associated with her thesis project.

Catherine is studying the experience of secondary traumatic stress among pediatric perioperative nurses. This is an area in which there is currently a lack of literature, and potentially impacts recruitment and retention of nurses in this highly specialized area.

You are being asked to complete 6 online questionnaires, including a demographic data form, about your experiences with coping, secondary traumatic stress, job satisfaction, anxiety, and depression. You will complete a demographic data form which will elicit information about your age, gender, and years of experience as nurse among other personal characteristics. You will complete the: (a) Secondary Traumatic Stress Scale, which measures self-reported levels of secondary traumatic stress, (b) the McCloskey-Mueller Satisfaction Scale, which measures nursing job satisfaction, (c) the Generalized Anxiety Disorder Scale, (d) the Patient Health Questionnaire, two tools that measure anxiety and depression, respectively, and (e) the Brief COPE Scale, a measure of coping. Completion of all of the online surveys will take up to 20 minutes.

Catherine is requesting that you pass along the enclosed information to your work colleagues and peers who may also be interested in learning about this research study and participating. You are permitted to post a copy of the study poster in a staff lounge area or staff information board in your place of work.

If you decide to participate, you will be offered a $20 Amazon gift card as an honorarium. If you decide not to participate, this decision will not lead to any penalty to you. All information provided will be kept strictly confidential.

If you are interested in learning more about this study, you can contact Catherine Falvo at urbanikc@myumanitoba.ca. Thank you for your time in considering your participation in this important study.

This project has been approved by the Research Ethics Board at the University of Manitoba, Fort Garry campus. If you have any concerns or complaints about this project you may contact any of the above-named persons or the Human Ethics Officer at 204-474-7122 or HumanEthics@umanitoba.ca

1st Email Reminder Invitation from the Researcher

Date: January 29, 2024
To: Pediatric Perioperative Nurses (RNs and LPNs)
Fr: Kara Gillies, Executive Director, ORNAC
Re: 1st email reminder from the Researcher to Participate in the Study, "Secondary Traumatic Stress, Job Satisfaction, Anxiety, Depression and Coping among Pediatric Perioperative Nurses: A Descriptive Correlational Study"
Funder: Insert grant name when awarded College of Nursing Endowment Fund Graduate Student Research Grant.

The Operating Room Nurses Association in Canada (ORNAC) has received Ms. Catherine Falvo's request for assistance with her study as noted above. Catherine Falvo is a graduate student in the Master of Nursing Program at the University of Manitoba, College who is doing a study as part of her thesis requirements. Dr. Michelle Lobchuk, RN, PhD, Associate Professor, College of Nursing is Catherine's thesis supervisor. ORNAC is assisting Catherine by distributing an email invitation and two email reminders associated with her thesis project.

This email serves as a reminder for you to consider participating in the study, "Secondary Traumatic Stress, Job Satisfaction and Psychological Quality of Life among Pediatric Perioperative Nurses: A Descriptive Correlational Study" that is being conducted by Catherine. Catherine is studying the experience of secondary traumatic stress among pediatric perioperative

nurses. This is an area in which there is currently a lack of literature, and potentially impacts recruitment and retention of nurses in this highly specialized area.

You are being asked to complete six online questionnaires, including a demographic data form, about your experiences with coping, secondary traumatic stress, job satisfaction, anxiety, and depression. You will complete a demographic data form which will elicit information about your age, gender, and years of experience as nurse among other personal characteristics. You will complete the: (a) Secondary Traumatic Stress Scale, which measures self-reported levels of secondary traumatic stress, (b) the McCloskey-Mueller Satisfaction Scale, which measures nursing job satisfaction, (c) the Generalized Anxiety Disorder Scale, (d) the Patient Health Questionnaire, two tools that measure anxiety and depression, respectively, and (e) the Brief COPE scale, a measure of coping. Completion of all of the online surveys will take up to 20 minutes.

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If you decide to participate, will be offered a $20 Amazon gift card as an honorarium. If you decide not to participate, this decision will not lead to any penalty to you. All information provided will be kept strictly confidential.

If you are interested in learning more about this study, you can contact Catherine Falvo at urbanikc@myumanitoba.ca. Thank you for your time in considering your participation in this important study.

Note: If you have already agreed to participate, thank you very much for your participation. Please ignore this email. You will receive a 2nd reminder notice in 7 days which you can also ignore.

This project has been approved by the Research Ethics Board at the University of Manitoba, Fort Garry campus. If you have any concerns or complaints about this project you may contact any of the above-named persons or the Human Ethics Officer at 204-474-7122 or HumanEthics@umanitoba.ca

2nd Email Reminder Invitation from the Researcher

Date: February 5, 2024
To: Pediatric Perioperative Nurses (RNs and LPNs)
Fr: Chris Downey, Executive Director, ORNAC
Re: 2nd email reminder from the Researcher to Participate in the Study, "Secondary Traumatic Stress, Job Satisfaction, Anxiety, Depression and Coping among Pediatric Perioperative Nurses: A Descriptive Correlational Study"
Funder: College of Nursing Endowment Fund Graduate Student Research Grant.

The Operating Room Nurses Association in Canada (ORNAC) has received Ms. Catherine Falvo's request for assistance with her study as noted above. Catherine Falvo is a graduate student in the Master of Nursing Program at the University of Manitoba, College who is doing a study as part of her thesis requirements. Dr. Michelle Lobchuk, RN, PhD, Associate Professor, College of Nursing is Catherine's thesis supervisor. ORNAC is assisting Catherine by distributing an email invitation and two email reminders associated with her thesis project.

This email serves as a reminder for you to consider participating in the study, "Secondary Traumatic Stress, Job Satisfaction and Psychological Quality of Life among Pediatric Perioperative Nurses: A Descriptive Correlational Study" that is being conducted by Catherine. Catherine is studying the experience of secondary traumatic stress among pediatric perioperative

nurses. This is an area in which there is currently a lack of literature, and potentially impacts recruitment and retention of nurses in this highly specialized area.

You are being asked to complete six online questionnaires, including a demographic data form, about your experiences with coping, secondary traumatic stress, job satisfaction, anxiety and depression. You will complete a demographic data form which will elicit information about your age, gender, and years of experience as nurse among other personal characteristics. You will complete the: (a) Secondary Traumatic Stress Scale, which measures self-reported levels of secondary traumatic stress, (b) the McCloskey-Mueller Satisfaction Scale, which measures nursing job satisfaction, (c) the Generalized Anxiety Disorder Scale, (d) the Patient Health Questionnaire, two tools that measure anxiety and depression, respectively, and (e) the Brief COPE scale, a measure of coping. Completion of all of the online surveys will take up to 20 minutes.

Catherine is requesting that you pass along the enclosed information to your work colleagues and peers who may also be interested in learning about this research study and participating. You are permitted to post a copy of the study poster in a staff lounge area or staff information board in your place of work.

If you decide to participate, will be offered a $20 Amazon gift card as an honorarium. If you decide not to participate, this decision will not lead to any penalty to you. All information provided will be kept strictly confidential.

If you are interested in learning more about this study, you can contact Catherine Falvo at urbanikc@myumanitoba.ca. Thank you for your time in considering your participation in this important study.

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Appendix C

Participant Screening Script

Thank you for your interest in my study. I have a few questions to ask of you to determine your eligibility to participate:

1) Are you a registered nurse (RN) or licensed practical nurse (LPN)?
2) Do you provide direct patient care to pediatric patients aged 0 to 17 years?
3) Do you work primarily in an operating room setting?
4) Are you able to speak, read and write in the English language?
5) Have you been exposed to direct or indirect trauma over the past month? I will provide you with some examples.
    a. Direct trauma is your first-hand experiences of caring for a patient who has experienced a physical trauma, or direct experience with workplace violence or bullying. Examples include caring for a child who has experienced a physical trauma, or first-hand experience of being bullied by another while at work
    b. Indirect trauma is a second-hand exposure to other's stories and experiences, such as hearing of a colleague's experiences of caring for a child who has experienced a physical trauma, or hearing of a colleague's experience of violence or bullying at work

Appendix D

Pediatric Perioperative Nurse Informed Consent (Online)

[University of Manitoba letterhead in Qualtrics]

Pediatric Perioperative Nurse Informed Consent (Online)

Research Project Title: Secondary Traumatic Stress, Job Satisfaction, Anxiety, Depression and Coping among Pediatric Perioperative Nurses: A Descriptive Correlational Study **Researcher:**

Catherine Falvo, RN Masters of Nursing student, College of Nursing, Rady Faculty of Health Sciences, University of Manitoba
Email: urbanikc@myumanitoba.ca

Supervisor:

Michelle Lobchuk, RN, PhD, Associate Professor, College of Nursing, Rady Faculty of Health Sciences, University of Manitoba
Email: Michelle.Lobchuk@umanitoba.ca
Phone: 204-474-7135 (Office)

Renée El-Gabalawy, PhD Associate professor, Max Rady College of Medicine
Clinical Health Psychology, University of Manitoba
Winnipeg, MB R3E 3N4
Email: renee.el-gabalawy@umanitoba.ca
Phone: 204-787-7424

Wanda Chernomas, RN, PhD, Associate professor, College of Nursing, Helen Glass Centre for Nursing, University of Manitoba
Email: wanda.chernomas@umanitoba.ca
Phone: 204-474-6819

Sponsor:

College of Nursing Endowment Fund Graduate
Student Research Grant

Please print this consent page so that you have a copy for your records and reference. This consent form is only part of the process of informed consent. It should give you the basic idea of

what the project is about and what your participation will involve. If you would like more detail about something mentioned here, or information not included here, you should feel free to ask. Please take the time to read this carefully and to understand any accompanying information.

What is the nature and purpose of the study?

The purpose of my thesis project is to measure secondary traumatic stress among pediatric perioperative nurses, as well as self-reported coping, job satisfaction and anxiety and depression.

What am I being asked to consent to? What is the nature of my participation in the study?

As a pediatric perioperative nurse, you are asked to complete 1 online demographic data form and 5 online surveys. Please take your time to review and read this consent form carefully and any accompanying information. It should give you the basic idea of what the project is about and what your participation will involve.

I will provide you with a hyperlink to access the demographic data form and the five study questionnaires to complete online. I am using the Qualtrics online survey software. Qualtrics is an American company that may store your data on servers located in the United States and as such is subject to the Patriot Act which means the US government may access the data you have provided if they deem it to be necessary.

First, the online demographic data tool asks 20 questions about your age, gender, marital status, children status, country of birth, whether English is a second language for you, ethnicity, educational level, nurse designation, workplace setting, the number of years you have been employed as a perioperative nurse, exposure to pediatric trauma, and your religious affiliation. This questionnaire takes approximately 5 minutes to complete.

The second questionnaire measures coping and consists of 28 brief questions. This tool assesses how often you have undertaken different coping methods by asking you to rate questions such as “I've been getting emotional support from others”, “I've been making jokes about it”, and “I've been praying or meditating”, among others. This questionnaire takes approximately 5 minutes to complete.

The third questionnaire measures secondary traumatic stress, asking questions relating to your exposures to pediatric patients who have experienced a traumatic event, and how these made you feel. This survey takes approximately 3 minutes to complete.

The fourth questionnaire will assess job satisfaction and comprises 31 questions. The types of questions you will be asked include your satisfaction with your salary, hours of work, opportunities for interaction with colleagues, and opportunities for career advancement, among others. This questionnaire takes approximately 5 minutes to complete.

The fifth questionnaire measures anxiety, and consists of 7 questions. This questionnaire asks questions regarding how nervous you feel, if you worry, and if you feel restless or irritable. This questionnaire takes approximately 2 minutes to complete.

The sixth (final) questionnaire assesses depression, and consists of 9 questions, such as whether you have interest in activities, if you ever feel down, if you ever feel bad about yourself and if you have ever had thoughts about harming yourself. This questionnaire takes approximately 2 minutes to complete.

If you would like more detail about something mentioned here, or information not included here, you should feel free to ask me at urbanikc@myumanitoba.ca

How will the information be handled during and after the study?

Your privacy is important. Your responses will be kept confidential. You will be asked to identify yourself by name in the online questionnaires. To protect your identity, once you have completed the study, your name will be dissociated from the data you provided and you will be assigned a code number by me. This code number will be linked to your name and along, with your consent form, will be saved on the University of Manitoba One Drive, separate from your data. Only I will know the names of those who have completed the study materials.

All of the coded data collected can only be accessed by me as the researcher and Dr. Michelle Lobchuk who is my Supervisor. I will have access to completed study questionnaires. Data files will be kept on the University of Manitoba One Drive. Data obtained from Qualtrics will be downloaded as an excel file and also stored in a separate file in the University of Manitoba One Drive. All study documents will be kept for seven years and erased in October 2030. Any hard copies of your data will be stored for seven years and then destroyed by shredding in October 2030.

The results from this project will be published in my Master's Thesis and in a peer-reviewed journal and presented to administrators, clinical leaders, and nursing staff at perioperative practice settings; and at academic conferences, scientific meetings, seminars, or workshops. Under no circumstances will your identity be revealed. Information will be reported in aggregate or group form as opposed to individual responses. Once the research is complete and a final report of the results is prepared, we will provide you with a summary about how your participation helped our project.

Some data and information from this study may be sent outside of the University of Manitoba to other researchers, organizations, or made publicly available. This is for further analysis, testing, as part of the research study, or a requirement by a granting agency or journal. Any information sent out of the University of Manitoba will not show your name or address, or any other identifiable personal information about you. However, despite efforts to keep your personal information confidential, absolute confidentiality cannot be guaranteed. Your personal information may be disclosed if required by law.

What happens if I withdraw consent from the study?

Your consent is voluntary. You may choose to withdraw your consent at any time during the study by notifying me. If you withdraw from the study, there will be no penalty against you. Upon your request, I will destroy any data collected from you.

What are the benefits and burdens associated with participating in the study?

There are no immediate benefits to you for taking part in this project.
The findings from this project will provide valuable insight into the levels of secondary traumatic stress, coping, job satisfaction, anxiety and depression among pediatric perioperative nurses. These findings will interest pediatric perioperative nurses to understand and advocate for themselves and their colleagues for needed education or supports in their practice environments. Perioperative nursing is not well understood by other disciplines or care areas, and the insights gained from this study will speak directly to the experiences of pediatric perioperative nurses as they relate to stress, coping, job satisfaction, anxiety and depression.

There is minimal risk to taking part in this study. Minimal risk is defined as those risks which might be encountered in everyday life. If participants need sensitive assistance as a result of participating in any phase of the study, I will be available as a resource to participants. I am a registered nurse who has worked in the operating room for over 15 years. My contact information is provided in this consent form. You may also seek counselling resources from your employer.

Reimbursement
To compensate for your time provided in participating in this study, as a study participant you will be offered a $20 Amazon gift card. To indicate your interest in receiving the gift card, please provide a name and email address at the end of this informed consent form.

Can I Get a Copy of the Results of the Study?

A summary of the results of the project will be made available to you if you would like to receive them once the project is completed before (February 2024). To indicate your interest in receiving a summary of the project, please provide your name and contact information at the end of this informed consent form.

In checking the below consent box, you freely agree to participate in this project. You authorize the use of data that you provide only for scientific and educational purposes specified above. You have been told that your name will not appear in any report or publication resulting from this project.

By completing and submitting the demographic questionnaire, YOUR FREE AND INFORMED CONSENT IS IMPLIED. Completing and submitting the questionnaire indicates that you have understood to your satisfaction the information regarding participation in the project and agree to participate as a subject. In no way does this waive your legal rights nor release the researchers,

sponsors, or involved institutions from their legal and professional responsibilities. Your consent is voluntary. You may choose to withdraw your consent at any time by notifying me. If you withdraw from the study, there will be no penalty against you and you can keep the gift card honoraria. You may also refrain from answering any questions that you prefer to omit, without prejudice or consequence. Your continued participation should be as informed as your initial consent, so you should feel free to ask for clarification or new information throughout your participation.

The University of Manitoba may look at your project records to see that the project is being done in a safe and proper way.

This project has been approved by the Research Ethics Board at the University of Manitoba, Fort Garry campus. If you have any concerns or complaints about this project, you may contact any of the above-named persons or the Human Ethics Officer at 204-474-7122 or HumanEthics@umanitoba.ca. A copy of this consent form will be retained by you for your records and reference.

☐ **I confirm that I am aged 18 or over and that I consent to take part in this study.**

☐ **I do not consent to take part in this study.**

PLEASE COMPLETE THE NEXT PAGE FOR A SUMMARY OF FINDINGS AND RECEIPT OF A GIFT CARD

Summary of study results

Do you want to receive a summary of the results of this project?

_____Yes _____ No

If yes, please fill out the form below:

Name of the person to who results should be sent:

Contact information (for example: email or your mailing address)

Gift card

Are you interested in having your name and contact information to receive a $20 Amazon gift card ?

_____Yes _____ No

If yes, please fill out the form below:

Name of the person to who the electronic gift card should be sent:

Email address:

Appendix E

Study Poster for Registered Nurses in Pediatric Perioperative Clinical Practice

University of Manitoba | Rady Faculty of Health Sciences

This Photo by Unknow

Volunteers needed

Secondary Traumatic Stress, Job Satisfaction, Anxiety, Depression and Coping among Pediatric Perioperative Nurses: A Descriptive Correlational Study

Study investigator: Catherine Falvo, RN, Masters of Nursing student
Supervisor: Michelle Lobchuk, Associate Professor, College of Nursing, Rady Faculty of Health Sciences, University of Manitoba Email: michelle.lobchuk@umanitoba.ca

Study purpose

I am a Masters of Nursing student who is collecting online information about secondary traumatic stress, coping, job satisfaction, anxiety, and depression in pediatric perioperative nurses who have been exposed to traumatic events. With the assistance of the Operating Room Nurses Association of Canada (ORNAC), I am recruiting interested nurses to participate in my study. It will take 20 minutes to complete six questionnaires.

You may qualify if you:

-are a registered nurse (RN) or licensed practical nurse (LPN)
-provide direct patient care to pediatric patients aged 0 to 17 years
-work primarily in an operating room setting
-are able to speak, read and write in the English language; and,
-have been exposed over the past month to any or all the following traumatic events in your workplace, such as:

-your direct exposure to a pediatric traumatic event,

-you heard about a colleague's exposure to a pediatric traumatic event, -your direct exposure to workplace bullying or violence, and

-you heard about a colleague's exposure to workplace bullying or violence.

Participation is completely voluntary. If you decide to participate, you will be offered a $20 Amazon gift card. All information provided will be kept strictly confidential.

FOR MORE INFORMATION, please contact Catherine Falvo, urbanikc@myumanitoba.ca

This research has been approved by the Research Ethics Board at the University of Manitoba, Fort Garry campus.

Appendix F

Data Collection Instrument - Demographic Survey (On-Line)

I would like to gather some demographic information about yourself. Please leave any questions you are not comfortable answering blank.

1. Age (years): _____

   Prefer not to answer _____

2. Gender: Woman_____ Man_____ Non-binary/Trans/Gender Diverse: _____

Other: _____(please specify) Prefer not to answer: _____

3. What is your marital status? Single ___ Married _____ Common Law _____ Divorced _____ Separated _____ Widowed _____ Prefer not to answer _____

4. Do you have any children? Yes _____ No _____ Prefer not to answer _____

4a. If yes, how many children do you have? _____

4b. If yes, what are the ages of all of your children? _____ (in months or years).

5. Were you born in Canada?

Yes: _____ No: _____ Prefer not to answer _____

5a. If 'No,' where were you born?

_____

6. Is English your second/additional language? Yes: _____ No: _____

Prefer not to answer _____

7. Ethnicity: White (Caucasian): ____ Indigenous/ Aboriginal ancestry: _____ Black: _____ South Asian: _____ Filipino: _____ Chinese: _____ Arab/ West Asian: _____ Japanese: _____ Other: _____ Prefer not to answer _____

7a. If Indigenous, do you self-identify as First Nations, Métis, or Inuit?

_____

8. Highest level of education received today: High School Diploma: _____

College Diploma: _____ Bachelors: _____ Masters: _____ Doctorate: _____ Prefer not to answer _____

9. Are you an: RN _____ LPN _____ Prefer not to answer _____

10. Where do you work? Community hospital _____ Tertiary Care Facility _____ Clinic Setting _____ Prefer not to answer _____

11. What is your occupational status? Part-time _____ Full-time _____

Prefer not to answer _____

12. Number of years you have been employed as a nurse: _____years

Prefer not to answer _____

13. Number of years you have been employed as a pediatric perioperative nurse: _____ years

Prefer not to answer _____

14. What is the average number of pediatric perioperative patients you care for each day? _____

Prefer not to answer _____

15. Do you work with pediatric patients who have undergone trauma? Yes _____ No _____ Prefer not to answer _____

16. Think about the last month in your practice. How many times on average, per week over the last month did you care for a pediatric patient who has experienced a physical trauma? _____

Prefer not to answer ____

17. Think about the last month in your practice. How many times on average, per week over the past month were you exposed to violence or bullying in the workplace? _____

Prefer not to answer ____

18. Think about the last month in your practice. How many times on average, per week over the past month did you hear a colleague describe their experience of caring for a child who had experienced a physical trauma? _____

Prefer not to answer ____

19. Think about the last month in your practice. How many times on average, per week over the past month did you hear a colleague describe their experience of violence or bullying in the workplace? _____

Prefer not to answer _____

20. Religion: Roman Catholic: _____ Pentecostal: _____ Lutheran: _____ Greek Orthodox: _____ Muslim: _____ Buddhist: _____ Sikh: _____ Hindu: _____ Jewish: _____ United Church: _____ Anglican: _____ Presbyterian: _____ Baptist: _____ Other: _____ Prefer not to answer _____

Appendix G

Secondary Traumatic Stress Scale

SECONDARY TRAUMATIC STRESS SCALE

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

NOTE: *"Client" is used to indicate persons with whom you have been engaged in a helping relationship. You may substitute another noun that better represents your work such as consumer, patient, recipient, etc.*

	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 clients	1	2	3	4	5
3. It seemed as if I was reliving the trauma(s) experienced by my client(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 clients 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 clients 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 clients	1	2	3	4	5
13. I had disturbing dreams about my work with clients	1	2	3	4	5
14. I wanted to avoid working with some clients	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 client sessions	1	2	3	4	5

Intrusion Subscale (add items 2, 3, 6, 10, 13)	Intrusion Score	_____
Avoidance Subscale (add items 1, 5, 7, 9, 12, 14, 17)	Avoidance Score	_____
Arousal Subscale (add items 4, 8, 11, 15, 16)	Arousal Score	_____
TOTAL (add Intrusion, Arousal, and Avoidance Scores)	Total Score	_____

Appendix H

McCloskey/Mueller Satisfaction Scale (MMSS)

How satisfied are you with the following aspects of your current job? Please circle the number that applies.

	Very Satisfied	Moderately Satisfied	Neither Satisfied nor Dissatisfied	Moderately Dissatisfied	Very Dissatisfied	I Choose not to Respond
1. Salary	5	4	3	2	1	0
2. Vacation	5	4	3	2	1	0
3. Benefits package (insurance, retirement)	5	4	3	2	1	0
4. Hours that you work	5	4	3	2	1	0
5. Flexibility in scheduling your hours	5	4	3	2	1	0
6. Opportunity to work straight days	5	4	3	2	1	0
7. Opportunity for part-time work	5	4	3	2	1	0
8. Weekends off per month	5	4	3	2	1	0
9. Flexibility in scheduling your weekends off	5	4	3	2	1	0
10. Compensation for working weekends	5	4	3	2	1	0
11. Maternity leave time	5	4	3	2	1	0
12. Child care facilities	5	4	3	2	1	0
13. Your immediate supervisor	5	4	3	2	1	0
14. Your nursing peers	5	4	3	2	1	0
15. The physicians you work with	5	4	3	2	1	0
16. The delivery of care method used on your unit (e.g. functional, team, primary)	5	4	3	2	1	0
17. Opportunities for social contact at work	5	4	3	2	1	0

	Very Satisfied	Moderately Satisfied	Neither Satisfied nor Dissatisfied	Moderately Dissatisfied	Very Dissatisfied	I Choose not to Respond
18. Opportunities for social contact with your colleagues after work	5	4	3	2	1	0
19. Opportunities to interact professionally with other disciplines	5	4	3	2	1	0
20. Opportunities to interact with faculty of the College of Nursing	5	4	3	2	1	0
21. Opportunities to belong to department and institutional committees	5	4	3	2	1	0
22. Control over what goes on in your work setting	5	4	3	2	1	0
23. Opportunities for career advancement	5	4	3	2	1	0
24. Recognition for your work from superiors	5	4	3	2	1	0
25. Recognition of your work from peers	5	4	3	2	1	0
26. Amount of encouragement and positive feedback	5	4	3	2	1	0
27. Opportunities to participate in nursing research	5	4	3	2	1	0
28. Opportunities to write and publish	5	4	3	2	1	0
29. Your amount of responsibility	5	4	3	2	1	0
30. Your control over work conditions	5	4	3	2	1	0
31. Your participation in organizational decision making	5	4	3	2	1	0

Appendix I

Generalized Anxiety Scale (GAD-7)

GAD-7 Anxiety

Over the last two weeks, how often have you been bothered by the following problems?	Not at all	Several days	More than half the days	Nearly every day
1. Feeling nervous, anxious, or on edge	0	1	2	3
2. Not being able to stop or control worrying	0	1	2	3
3. Worrying too much about different things	0	1	2	3
4. Trouble relaxing	0	1	2	3
5. Being so restless that it is hard to sit still	0	1	2	3
6. Becoming easily annoyed or irritable	0	1	2	3
7. Feeling afraid, as if something awful might happen	0	1	2	3

Column totals _____ + _____ + _____ + _____ =

Total score _____

If you checked any problems, how difficult have they made it for you to do your work, take care of things at home, or get along with other people?

Not difficult at all	Somewhat difficult	Very difficult	Extremely difficult
☐	☐	☐	☐

Source: Primary Care Evaluation of Mental Disorders Patient Health Questionnaire (PRIME-MD-PHQ). The PHQ was developed by Drs. Robert L. Spitzer, Janet B.W. Williams, Kurt Kroenke, and colleagues. For research information, contact Dr. Spitzer at ris8@columbia.edu. PRIME-MD® is a trademark of Pfizer Inc. Copyright® 1999 Pfizer Inc. All rights reserved. Reproduced with permission

Scoring GAD-7 Anxiety Severity

This is calculated by assigning scores of 0, 1, 2, and 3 to the response categories, respectively, of "not at all," "several days," "more than half the days," and "nearly every day."
GAD-7 total score for the seven items ranges from 0 to 21.

0–4: minimal anxiety

5–9: mild anxiety

10–14: moderate anxiety

15–21: severe anxiety

Appendix J

Patient Health Questionnaire (PHQ-8)

Patient Health Questionnaire –8 (PHQ-8)

Name:_____

Date of Birth: _____ Today's Date:_____

Over the last 2 weeks, how often have you been bothered by any of the following problems?		Not at all	Several days	More than half the days	Nearly every day
1.	Little interest or pleasure in doing things	☐	☐	☐	☐
2.	Feeling down, depressed, irritable or hopeless	☐	☐	☐	☐
3.	Trouble falling or staying asleep, or sleeping too much	☐	☐	☐	☐
4.	Feeling tired or having little energy	☐	☐	☐	☐
5.	Poor appetite or overeating	☐	☐	☐	☐
6.	Feeling bad about yourself – or that you are a failure or have let yourself or your family down	☐	☐	☐	☐
7.	Trouble concentrating on things, such as school work, reading or watching television	☐	☐	☐	☐
8.	Moving or speaking so slowly that other people could have noticed? Or the opposite – being so fidgety or restless that you have been moving around a lot more than usual	☐	☐	☐	☐

Scoring Instructions:

Total score is determined by adding together the scores of each of the four items. Scores are rated as normal (0-2), mild (3-5), moderate (6-8), and severe (9-12).

Total score ≥3 for first 2 questions suggests anxiety.

Total score ≥3 for last 2 questions suggests depression.

Appendix K

Brief COPE Scale

Brief COPE

These items deal with ways you've been coping with the stress in your life since you were exposed to trauma in your workplace. There are many ways to try to deal with problems. These items ask what you've been doing to cope with this one. I want to know to what extent you've been doing what the item says. How much or how frequently. Don't answer on the basis of whether it seems to be working or not—just whether or not you're doing it. Use these response choices. Try to rate each item separately in your mind from the others.

1 = I haven't been doing this at all
2 = I've been doing this a little bit
3 = I've been doing this a medium amount 4 = I've been doing this a lot

1. I've been turning to work or other activities to take my mind off things.
2. I've been concentrating my efforts on doing something about the situation I'm in.
3. I've been saying to myself "this isn't real.".
4. I've been using alcohol or other drugs to make myself feel better.
5. I've been getting emotional support from others.
6. I've been giving up trying to deal with it.
7. I've been taking action to try to make the situation better.
8. I've been refusing to believe that it has happened.
9. I've been saying things to let my unpleasant feelings escape.
10. I've been getting help and advice from other people.
11. I've been using alcohol or other drugs to help me get through it.
12. I've been trying to see it in a different light, to make it seem more positive.
13. I've been criticizing myself.
14. I've been trying to come up with a strategy about what to do.
15. I've been getting comfort and understanding from someone.
16. I've been giving up the attempt to cope.
17. I've been looking for something good in what is happening.
18. I've been making jokes about it.

19. I've been doing something to think about it less, such as going to movies, watching TV, reading, daydreaming, sleeping, or shopping.
20. I've been accepting the reality of the fact that it has happened.
21. I've been expressing my negative feelings.
22. I've been trying to find comfort in my religion or spiritual beliefs.
23. I've been trying to get advice or help from other people about what to do.
24. I've been learning to live with it.
25. I've been thinking hard about what steps to take.
26. I've been blaming myself for things that happened.
27. I've been praying or meditating.
28. I've been making fun of the situation.

Additional question:

I've reached out for support in my workplace (example: my manager or Employee Assistance Program) following exposure to the traumatic event(s)?

Appendix L

Frequencies of GAD-7 Scale item responses reported by pediatric perioperative nurses

Table 9

Frequencies of GAD-7 Scale item responses reported by pediatric perioperative nurses (n=33)

Item	Not at all	Several Days	More than half the days	Nearly every day	Mean	SD
Feeling nervous, anxious, or on edge	8 (24.2%)	19 (57.6%)	4 (12.1%)	2 (6.1%)	2.00	.791

Not being able to stop or control worrying	11 (33.3%)	17 (51.5%)	5 (15.2%)	0	1.82	.683
Worrying too much about different things	8 (24.2%)	19 (57.6%)	6 (18.2%)	0	1.94	.659
Trouble relaxing	7 (21.2%)	19 (57.6%)	5 (15.2%)	2 (6.1%)	2.06	.788
Being so restless that it is hard to sit still	16 (48.5%)	17 (57.6%)	0	0	1.52	.508
Becoming easily annoyed or irritable	8 (24.2%)	19 (57.6%)	5 (15.2%)	1 (3.0%)	1.97	.728
Feeling afraid, as if something awful might happen	14 (42.4%)	17 (57.6%)	2 (6.1%)	0	1.64	.603

Total Scale 12.9 3.74 **Appendix M**

Frequencies of PHQ-8 Scale item responses reported by pediatric perioperative nurses

Table 11

Frequencies of PHQ-8 Scale item responses reported by pediatric perioperative nurses (n=33)

	Not at all	Several days	More than half the days	Nearly every day	Mean	SD
Little interest or pleasure in doing things	15 (45.5%)	15 (45.5%)	3 (9.1%)	0	1.64	.653
Feeling down, depressed, or hopeless	17 (51.5%)	15 (45.5%)	1 (3.0%)	0	1.52	.566
Trouble falling or staying asleep, or sleeping too much	8 (24.2%)	17 (51.5%)	7 (21.2%)	1 (3.0%)	2.03	.770
Feeling tired or having little energy	5 (15.2%)	20 (60.6%)	8 (24.2%)	0	2.09	.631
Poor appetite or overeating	21 (63.6%)	9 (27.3%)	3 (9.1%)	0	1.45	.667
Feeling bad about yourself – or that you are a failure or have let yourself or your family down	14 (42.4%)	13 (39.4%)	6 (18.2%)	0	1.76	.751
Trouble concentrating on things, such as reading the newspaper or watching television	12 (36.4%)	16 (48.5%)	5 (15.2%)	0	1.79	.696

Moving or speaking so slowly that other people could have noticed? Or the opposite – being so fidgety or restless that you have been moving around a lot more than usual	27 (81.8%)	6 (18.2%)	0	0	1.18	.392
Total Scale					13.45	3.37

Appendix N

Frequencies of MMSS item responses and mean sub-scale scores reported by pediatric perioperative nurses

Table 11

Frequencies of MMSS item responses and mean sub-scale scores reported by pediatric perioperative nurses (n=33)

	Very satisfied	Moderately satisfied	Neither satisfied nor dissatisfied	Moderately dissatisfied	Very dissatisfied	I choose not to respond	Mea
Extrinsic Awards Sub-scale							2.60
Salary	7 (21.2%)	11 (33.3%)	7 (21.2%)	7 (21.2%)	1 (3.0%)	0	2.52
Vacation	6	11 (33.3%)	3 (9.1%)	5 (15.2%)	8 (24.2%)	0	2.94
Benefits Package (insurance, retirement)	2 (6.1%)	22 (66.7%)	4 (12.1%)	5 (15.2%)	0	0	2.36
Scheduling Sub-scale							2.55
Hours that you work	9	14 (42.4%)	4 (12.1%)	5 (15.2%)	1 (3.0%)	0	2.24
Flexibility in scheduling your hours	2 (6.1%)	13 (39.4%)	7 (21.2%)	7 (21.2%)	4 (12.1%)	0	2.94

Opportunity to work straight days	5 (15.2%)	9 (27.3%)	10 (30.3%)	6 6 (18.2%)	2 (6.1%)	1 (3.0%)	2.82
Weekends off per month	11 (21.2%)	10 (30.3%)	4 (12.1%)	6 6 (18.2%)	2 (6.1%)	0	2.33
Flexibility in scheduling your weekends off	9 (27.3%)	10 (30.3%)	3 (9.1%)	8 (24.2%)	3 (9.1%)	0	2.58
Compensation for working weekends	8 (24.2%)	13 (39.4%)	6 (18.2%)	3 (9.1%)	3 (9.1%)	0	2.39
Family/Work Balance Sub-scale							3.40
Opportunity for part-time work	6 (18.2%)	5 (15.2%)	12 (36.4%)	5 (15.2%)	3 (9.1%)	2 (6.1%)	3.00
Maternity leave time	5 (15.2%)	7 (21.2%)	11 (21.2%)	2 (6.1%)	1 (3.0%)	7 (21.2%)	3.24
Child care facilities	1 (3.0%)	1 (3.0%)	15 (45.5%)	4 (12.1%)	5 (15.2%)	7	3.97
Praise/Recognition Sub-scale							2.73
Your immediate supervisor	5 (15.2%)	20 (60.6%)	5 (15.2%)	1 (3.0%)	1 (3.0%)	1	2.27

Table 11

Frequencies of MMSS item responses and mean sub-scale scores reported by pediatric perioperative nurses (n=33)

	Very satisfied	Moderately satisfied	Neither satisfied nor dissatisfied	Moderately dissatisfied	Very dissatisfied	I choose not to respond	Mean	SD
Recognition for your work from superiors	6 (18.2%)	11 (33.3%)	5 (15.2%)	7 (21.2%)	4 (12.1%)	0	2.76	1.324
Recognition of your work from peers	9 (27.3%)	11 (33.3%)	7 (21.2%)	2 (6.1%)	4 (12.1%)	0	2.42	1.300
Amount of encouragement and positive feedback	5 (15.2%)	15 (45.5%)	6 (18.2%)	4 (12.1%)	3 (9.1%)	0	2.55	1.175
Co-Workers Sub-scale							2.09	.939
Your nursing peers	13 (39.4%)	13 (39.4%)	3 (9.1%)	3 (9.1%)	1 (3.0%)	0	1.97	1.075
The physicians you work with	9 (27.3%)	14 (42.4%)	5 (15.2%)	4 (12.1%)	1 (3.0%)	0	2.21	1.083
Interaction Sub-scale							2.25	.789

The delivery of care method used on your unit (e.g. functional, team, primary)	6 (18.2%)	19 (57.6%)	6 (18.2%)	1 (3.0%)	0	1 (3.0%)	2.18	.983
Opportunities for social contact at work	8 (24.2%)	18 (54.5%)	5 (15.2%)	1 (3.0%)	0	1 (3.0%)	2.09	1.011
Opportunities for social contact with your colleagues after work	6(18.2%)	11 (33.3%)	13 (39.4%)	1 (3.0%)	2 (6.1%)	0	2.45	1.034
Opportunities to interact professionally with other disciplines	7 (21.2%)	13 (39.4%)	10 (30.3%)	2 (6.1%)	1 (3.0%)	0	2.30	.984
Professional Opportunities Sub-scale							2.86	.667
Opportunities to interact with faculty of the College of Nursing	1 (3.0%)	22 (66.7%)	6 (18.2%)	2 (6.1%)	0	2 (6.1%)	3.45	.905
Opportunities to belong to department and institutional committees	1 (3.0%)	11 (33.3%)	17 (51.5%)	3 (9.1%)	0	1 (3.0%)	2.79	.893

Table 11

Frequencies of MMSS item responses and mean sub-scale scores reported by pediatric perioperative nurses (n=33)

Opportunities to participate in nursing research	10 (30.3%)	14 (42.4%)	4 (12.1%)	3 (9.1%)	0	2 (6.1%)	3.18	1.158
Opportunities to write and publish	2 (6.1%)	21 (63.6%)	3 (6.1%)	2 (6.1%)	0	5 (15.2%)	3.63	1.217
Control/Responsibility Sub-scale							3.12	1.09
	Very satisfied	Moderately satisfied	Neither satisfied nor dissatisfied	Moderately dissatisfied	Very dissatisfied	I choose not to respond	Mean	SD
Control over what goes on in your work setting	1 (3.0%)	9 (27.2%)	9 (27.2%)	12 (36.3%)	2 (6.1%)	0	3.15	1.004
Opportunities for career advancement	3 (9.1%)	14 (42.4%)	6 (18.2%)	4 (12.1%)	5 (15.2%)	1 (3.0%)	2.91	1.355
Your amount of responsibility	4 (12.1%)	18 (54.5%)	7 (21.2%)	3 (9.1%)	1 (3.0%)	0	2.36	.929
Your control over work conditions	1 (3.0%)	10 (30.3%)	9 (27.3%)	10 (30.3%)	3 (9.1%)	0	3.12	1.053

Your participation in organizational decision making	0	4 (12.1%)	11 (33.3%)	9 (27.3%)	9 (27.2%)	0	3.70	1.015

Appendix O

Mean STSS Scores According to Demographic Characteristics

Table 12

Mean STSS scores per demographic characteristics

Demographic Characteristic	N	Mean STSS	Standard Deviation
Gender			
Male	3	30.00	6.08
Female	30	40.87	8.35
Marital Status			
Single	10	35.30	8.76
Married	14	40.35	7.96
Common-Law	5	45.80	10.01
Divorced	2	45.50	0.71
Separated	1	34.00	0
Prefer not to answer	1	44.00	0
Children			
Yes	15	41.67	9.17
No	18	38.39	8.24
English is second language			
Yes	5	44.00	7.03
No	28	39.14	8.86
Born in Canada			
Yes	28	39.26	9.01
No	5	43.67	7.04
Highest educational level			
College Diploma	4	39.25	13.04
Bachelor's Degree	27	38.93	7.47
Master's Degree	1	58.00	0
Prefer not to answer	1	50.00	0
Professional Title			
Registered Nurse	29	39.72	8.70
Licensed Practical Nurse	4	41.00	9.90

Years employed as a pediatric perioperative nurse			
0-5	7	42.43	6.70
6-10	7	35.15	7.73
11-15	6	40.17	8.40
16-20	3	39.00	6.08
21-25	7	44.57	10.06
> 26	1	24.00	0

Table 12

Mean STSS scores per demographic characteristics

Work Setting			
	4	36.25	6.85
Community Hospital	28	40.11	8.94
Tertiary Care Facility	1	48.00	
Clinic Setting			
Employment Status			
Full-time	25	40.96	8.58
Part-time	8	36.50	8.71
Religion			
Roman Catholic	8	38.00	9.01
Lutheran	1	49.00	0
United Church	4	42.75	7.09
Anglican	1	45.00	0
Presbyterian	1	32.00	0
Baptist	2	31.00	0
Other	12	40.75	9.76
Prefer not to answer	4	41.00	

Note: STS total scores > 38 = moderate or greater STS

Appendix P

Frequencies of Brief COPE item responses reported by pediatric perioperative nurses

Table 13

Frequencies of Brief COPE item responses reported by pediatric perioperative nurses (n = 33)

	I haven't been doing this at all	I've been doing this a little bit	I've been doing this a medium amount	I've been doing this a lot	Mean	SD

Problem-focused sub-scale					2.12	.674
I've been concentrating my efforts on doing something about the situation I'm in.	7 (21.2%)	17 (51.5%)	6 (18.2%)	3 (9.1%)	2.15	.870
I've been taking action to try to make the situation better.	6 (18.2%)	15 (45.5%)	8 (24.2%)	4 (12.1%)	1.73	.719
I've been getting help and advice from other people.	5 (15.2%)	21 (63.6%)	6 (18.2%)	1 (3.0%)	2.03	.770
I've been trying to see it in a different light, to make it seem more positive.	8 (24.2%)	17 (51.5%)	7 (21.2%)	1 (3.0%)	2.15	.939
I've been trying to come up with a strategy about what to do.	10 (30.3%)	10 (30.3%)	11 (33.3%)	2 (6.1%)	1.12	.331
I've been looking for something good in what is happening.	9 (6.1%)	14 (42.4%)	9 (27.3%)	1 (3.0%)	2.36	.859
I've been trying to get advice or help from other people about what to do.	7 (21.2%)	18 (54.5%)	7 (21.2%)	1 (3.0%)	2.12	.992
I've been thinking hard about what steps to take.	11 (33.3%)	10 (30.3%)	9 (27.3%)	3 (9.1%)	2.12	.992
Emotion-focused sub-scale					1.96	.457
I've been getting emotional support from others.	4 (12.1%)	18 (54.5%)	8 (24.2%)	3 (9.1%)	2.30	.918
I've been saying things to let my unpleasant feelings escape.	13 (39.4%)	17 (51.5%)	2 (6.1%)	1 (3.0%)	1.24	.678
I've been criticizing myself.	12 (36.4%)	11 (21.2%)	8 (24.2%)	2 (6.1%)	2.06	.704
I've been getting comfort and understanding from someone.	6 (18.2%)	20 (60.6%)	6 (18.2%)	1 (3.0%)	2.06	.827

Table 13

Frequencies of Brief COPE item responses reported by pediatric perioperative nurses (n = 33)

	I haven't been doing this at all	I've been doing this a little bit	I've been doing this a medium amount	I've been doing this a lot	Mean	SD
I've been making jokes about it.	11 (33.3%)	18 (54.5%)	2 (6.1%)	2 (6.1%)	2.24	.902

I've been accepting the reality of the fact that it has happened.	6 (18.2%)	17 (51.5%)	6 6 (18.2%)	4 (12.1%)	1.76	.902
I've been expressing my negative feelings.	6 (18.2%)	17 (51.5%)	8 (24.2%)	2 (6.1%)	2.06	.747
I've been trying to find comfort in my religion or spiritual beliefs.	16 (48.5%)	11 (33.3%)	4 (12.1%)	2 (6.1%)	2.30	.883
I've been learning to live with it.	5 (15.2%)	17 (51.5%)	7 (21.2%)	4 (12.1%)	1.70	.883
I've been blaming myself for things that happened.	17 (51.5%)	11 (33.3%)	3 (9.1%)	2 (6.1%)	1.70	.883
I've been praying or meditating.	16 (48.5%)	11 (33.3%)	3 (9.1%)	3 (9.1%)	1.79	.960
I've been making fun of the situation.	15 (45.5%)	16 (48.5%)	1 (3.0%)	1 (3.0%)	1.64	.699
Avoidant sub-scale					1.49	.339
I've been turning to work or other activities to take my mind off things.	8 (24.2%)	15 (45.5%)	9 (27.3%)	1 (3.0%)	2.06	.805
I've been saying to myself "this isn't real"	27 (81.8%)	4 (12.1%)	1 (3.0%)	1 (3.0%)	1.27	.674
I've been using alcohol or other drugs to make myself feel better.	26 (78.8%)	5 (15.2%)	2 (6.1%)	0	1.27	.574
I've been giving up trying to deal with it.	23 (69.7%)	9 (27.2%)	0	1 (3.0%)	1.21	.415
I've been refusing to believe that it has happened.	26 (78.8%)	7 (21.2%)	0	0	2.09	.678
I've been using alcohol or other drugs to help me get through it.	26 (78.8%)	6 (18.2%)	1 (3.0%)	0	2.00	.935
I've been giving up the attempt to cope.	29 (87.9%)	4 (12.1%)	0	0	1.85	.795
I've been doing something to think about it less, such as going to movies, watching TV, reading, daydreaming, sleeping, or shopping.	5 (15.2%)	14 (42.4%)	11 (33.3%)	3 (9.1%)	2.18	.808

Appendix Q

Frequencies of secondary traumatic stress symptoms reported by pediatric perioperative nurses

Table 14

Frequencies of secondary traumatic stress symptoms reported by pediatric perioperative nurses (n=33)

	Never	Rarely	Occasionally	Often	Very Often	Mean	SD
Intrusion Sub-Scale						11.42	2.940
My heart started pounding when I thought about my work with clients	5 (15.2%)	16 (48.5%)	11 (33.3%)	1 (3.0%)	0		0.751
It seemed as if I was reliving the trauma(s) experienced by my patients	8 (24.2%)	19 (57.6%)	5 (15.2)	1 (3.0%)	0	1.97	0.728
Reminders of my work with patients upset me	3 (9.1%)	9 (27.3%)	18 (54.5%)	3 (9.1%)	0	2.64	0.783
I thought about my work with patients when I didn't want to	2 (6.1%)	15 (45.5%)	13 (39.4%)	2 (6.1%)	1 (3.0%)	2.55	0.833
I had disturbing dreams about my work with patients	9 (27.3%)	14 (42.4%)	10 (30.3%)	0	0	2.03	0.770
Avoidance Sub-Scale						15.85	4.33
I felt emotionally numb	3 (9.1%)	12 (36.4%)	13 (39.4%	4 (12.1%)	1 (3.0%)	2.64	0.929
I felt discouraged about the future	5 (15.2%)	10 (30.3%)	14 (42.4%)	4 (12.1%)	0	2.52	0.906
I had little interest in being around others	7 (21.2%)	14 (42.4%)	9 (27.3%)	3 (9.1%)	0	2.24	0.902
I was less active than usual	4 (12.1%)	17 (51.5%)	8 (24.2%)	3 (9.1%)	1 (3.0%)	2.39	0.933
I avoided people, places and things that reminded me of my work with patients	10 (30.3%)	11 (33.3%)	10 (30.3%)	2 (6.1%)	0	2.12	0.927
I wanted to avoid working with some patients	8 (24.2%)	12 (36.4%)	11 (33.3%)	1 (3.0%)	1 (3.0%)	2.24	0.969
I noticed gaps in my memory about patient sessions	16 (48.5%)	12 (36.4%)	4 (12.1%)	1 (3.0%)	0	1.70	0.810
Arousal Sub-Scale						12.6	2.65
I had trouble sleeping	2 (6.1%)	6 (18.2%)	17 (51.5%)	8 (24.2%)	0	2.94	0.827
I felt jumpy	7 (21.2%)	18 (54.5%)	7 (21.1%)	1 (3.0%)	0	2.06	0.747
I had trouble concentrating	5 (15.2%)	14 (42.4%)	9 (27.3%)	5 (15.2%)	0	2.42	0.936
I was easily annoyed	3 (9.1%)	7 (21.2%)	17 (51.5%)	6 (18.2%)	0	2.79	0.857
I expected something bad to happen	5 (15.2%)	12 (36.4%)	14 (42.4%)	2 (6.1%)	0	2.39	0.827
Full STSS						39.88	8.69

Note. The theoretical score range on the STSS is 17 to 85. The ranges of the STSS sub-scales are as follows: 5 to 25 for the intrusion sub-scale, 7 to 35 for the avoidance sub-scale, and 5 to 25 for the arousal sub-scale (Bride et al., 2004).

Appendix R

Prevalence of secondary traumatic stress in nurses

Table 15

Prevalence of STS in nurses

Authors, Year	Sample	Tool	Mean STSS or Prevalence of STS
Kellogg, 2018a	Pediatric nurses	STSS	50% identified moderate or greater STS
Berger et al., 2015	Pediatric nurses	STSS	78% identified moderate or greater STS
Yehene et al., 2024	Pediatric nurses	STSS	78% identified moderate or greater STS
Nilan (2019)	Pediatric emergency department physicians and nurses	ProQOL	78% identified moderate or greater STS
Duffy et al., 2015	Emergency department nurses	STSS	70% identified a moderate or greater level of STS Mean STSS 45.9 [SD = 14.0]
Dominguez-Gomez & Rutledge (2009)	Emergency department nurses	STSS	Mean STSS score of 37.4 [SD = 11.0],
Morrison & Joy (2016)	Emergency department nurses	STSS	Mean STSS score 37.7 [SD = 17]
Von Rueden et al., (2010)	Nurses working in a Level 1 trauma center		Seven percent of the sample reported STS
Ratrout and HamdanMansour (2017)	Emergency department nurses	STSS	Ninety-four percent of participants identifying a moderate or greater level of STS, with a mean STSS score of 46 [SD = 12.45]
Yaakubov, Hoffman & Rosenbloom, (2020)	Emergency department nurses	STSS	Reported a mean STSS score of 40.56 [SD = 12.57].
Oginska-Bulik & Michalska, 2021	Nurses working with terminally ill patients	STSS	Mean STSS score of 41.19 [SD = 10.7],
Quinal & Rutledge (2009)	Oncology nurses		Mean STSS score of 33.9 [SD =9.9]
Bock et al. (2020)	Hospital nurses		STS in twenty-five percent of a sample
Beck et al. (2017)	NICU nurses	STSS	Forty-nine percent of the sample experienced a moderate or greater level of STSS, with a mean STSS score of 38 [SD = 11.63].
(Beck & Gable, 2012)	Labor and delivery nurses		Mean STSS score was 33.7 [SD – 12.20] and thirty-five percent of the nurses reported a moderate or greater level of STS
Lykins et al., 2024	Nurses working in the intensive care, emergency, general medical wards, oncology and psychiatry units of an academic medical center		Mean reported STSS score was 22. 9 [SD = 6.1], with emergency and ICU nurses reporting the highest scores
Oginska-Bulik et al., 2021	Trauma nurses		Mean STSS score of 31.00 [SD = 19.59]