Personality Traits, Meaning Making, and Moral Injury: Nurses' Characteristics After Exposure to Morally Injurious Events Associated with a Patient Safety Incident

By

Mady C. Stovall - Culverhouse

A Manuscript Dissertation

Presented to

Oregon Health & Science University School of Nursing

in partial fulfillment of the requirements for the degree of

Doctor of Philosophy

March 13, 2020

Table of Contents

Funding Acknowledgements

This work was supported in part by the Oregon Health & Science University School of Nursing Dean's Alumni Scholarship (2015-2017), the Oncology Nursing Foundation PhD Scholarship (2016), the Beta Psi Chapter of Sigma International for the Naomi Ballard Dissertation Award (2018), the OHSU Dean's Dissertation Award (2018), and the Delta-Alpha-at-Large Chapter of Sigma International for a Doctoral Dissertation Award (2018).

Personal Acknowledgements

I would like to give thanks to my cohort, Kalisha, Jen, Emily, Kiki, Mashael, Suzi, Molly, and Jenny. Without all of your feedback, listening, laughter and love through the darkest of days and longest of nights, this work would have never come to fruition. Thank you.

I am especially grateful to my chair, Lissi, who has supported me through some very challenging years, over a distance, under circumstances that were not her ideal for working with a doctoral student. But she made it work – and I am so very thankful for all her support.

Nate and Michelle – thank so much. I am most thankful for your patience, Nate. And, Michelle, I am most appreciative of your pen.

Lastly, and most importantly, I want to thank my beautiful family.

Zenon and Zora were just babies when I started this journey, and here they are, 8 and 9 years old. I am so incredibly proud of each of one of them. I hope that mommy has made them proud. I am so deeply grateful for my husband, Zenon (AKA Dr Z), for being my first (and often last) reader, and cheerleader for all causes that I choose to invest in… Also, for constantly listening to the plight of nursing and truly caring about the issues because I care so deeply… and most importantly, for continuing every day to choose to share life's journey with me.

Chapter I

This three-manuscript dissertation explored philosophically, conceptually, and empirically morally injurious experiences (MIEs) and subsequent moral injury (MI) experienced by registered nurses (RNs) involved with a patient safety incident (PSI) (historically referred to as *second victims*). The first manuscript describes symptoms of moral injury empirically observed in RNs in the aftermath of a PSI with a critical review of nurse *second victim* literature. The second manuscript reports the relationships between the personality traits, perfectionism and neuroticism, and the traumatic outcomes of re-experiencing, avoidance, and alcohol abuse severity of RNs who have been involved with a PSI. The third and final manuscript is a mixed methods study that describes and quantifies the potential MIEs and morally injurious outcomes, operationalized as guilt, shame, loss of trust, anxiety, depression, changing a job, and intention to leave the profession, of RNs in the aftermath of a PSI.

MIEs are those that violate deeply held moral values and beliefs, and can put an individual at risk for burnout and other trauma-related problems, such as symptoms of posttraumatic stress disorder (PTSD) (Currier, McCormick, & Drescher, 2015). Unlike PTSD, MI is not a psychiatric diagnosis. It has been posited that MI can occur when there has been: 1) *A feeling of betrayal of what's right*; 2) either by someone who holds legitimate authority, (Shay, 1991, 2014) or by one's self (Litz et al., 2009); 3) in a high-stakes situation. Betrayal traumas very powerfully disrupt relationships by fostering a shift in trust-mistrust (Parse, 2014) for individuals, groups, and societies (Bunkers, 2018). For these reasons, MI may be a significant nurse safe practice readiness issue. Yet, to date researchers have not systematically or comprehensively been collecting the data that would confirm or deny the link between the occupational MIEs and MI that can lead to the shrinking moral horizon of nurses, or other healthcare clinicians.

According to Shay, a person's moral and social horizon begin to shrink after a MIE, and when the moral horizon shrinks, so does an individual's ideals, attachments, and ambitions (Shay, 2014), which in nurses may manifest as compassion fatigue, burnout, self-doubt, guilt, fear, and shame.

Applying Jinkerson's concept of MI as a syndrome, core symptoms of MI will include guilt, shame, spiritual/existential conflict, and loss of trust (Jinkerson, 2016). Depression, anxiety, anger, re-experiencing, self-harm, and social problems are secondary symptoms of MI (Jinkerson, 2016). Jinkerson suggests that to identify MI, there must be an exposure to a MIE, guilt, plus two other symptoms from the core or secondary symptoms (Jinkerson, 2016). MI holistically depicts the potential totality of what has been described as the *second victim* phenomenon, although has not theoretically or empirically been evaluated in *second victims*. Coined by Wu (2000), clinicians traumatized by involvement with a PSI and/or the aftermath are referred to as *second victims* (Scott et al., 2009; Van Gerven, Bruyneel, et al., 2016; Wu, 2000), with patients/family being the first victims. Involvement with a PSI can be viewed as antithetical to a clinician's personal identity. The PSI and/or events thereafter (herein considered a potential MIE) may deliver a devastating blow to a RN's deontological core – a potential violation of their duty ethic (Berlinger, 2005; Wolf, Serembus, Smetzer, Cohen, & Cohen, 2000). Scott's frequently cited *second victim* study found that, regardless of gender, professional type (e.g., nurse, physician, pharmacist), or years of experience, becoming a *second victim* was determined to be a **life-altering event** that left a **permanent imprint on** most individuals (Scott et al., 2009).

This dissertation work specifically focuses on those currently referred to as nurse *second victims*. Some or all of the **symptoms** of PTSD are frequently described in nurses and/or other

clinicians after involvement with a PSI. Additionally, other symptoms such as guilt, shame, demoralization, self-handicapping behaviors, and even suicide (symptoms more commonly associated with MI) are often described in *second victim* literature. However, the symptoms of MI have not been explored with intention in *second victims*. Furthermore, there has not been any work towards understanding and classifying PSI and the aftermath of such incidents as potential MIEs.

Core MI symptoms are substantially evidenced in nurse *second victim* empirical literature despite not being systematically measured by the researchers as such. For example, symptoms of guilt are empirically captured in 93% of qualitative studies (13 of 14 studies (Arndt, 1994; Crigger & Meek, 2007; de Freitas et al., 2011; Delacroix, 2017; Laurent et al., 2014; Rassin, Kanti, & Silner, 2005; Rinaldi, Leigheb, Vanhaecht, Donnarumma, & Panella, 2016; Santos, Silva, Munari, & Miasso, 2007; Schelbred & Nord, 2007; Scott et al., 2009; Treiber & Jones, 2010; Ullstrom, Andreen Sachs, Hansson, Ovretveit, & Brommels, 2014; Van Gerven, Deweer, et al., 2016)), 60% of quantitative studies (9 of 15 studies (Chard, 2010; Edrees, Paine, Feroli, & Wu, 2011; Harrison et al., 2015; Karga, Kiekkas, Aretha, & Lemonidou, 2011; Meurier, Vincent, & Parmar, 1997; Mira et al., 2015; O'Beirne, Sterline, Palacios-Derflinger, Hohman, & Zwicker, 2012; Taifoori & Valiee, 2015; Van Gerven, Bruyneel, et al., 2016)), and 40% of mixed methods studies (2 of 5 studies (Jones & Treiber, 2010; Wolf et al., 2000)). Guilt was captured or measured in all but only one qualitative study (Coli, dos Anjos, & Pereira, 2010), six quantitative studies (Joesten, Cipparrone, Okuno-Jones, & DuBose, 2015; Kao et al., 2015; Lewis, Baernholdt, Guofen, & Guterbock, 2015; Martens et al., 2016; Quillivan, Burlison, Browne, Scott, & Hoffman, 2016; Van Gerven, Vander Elst, et al., 2016), and three mixed method studies (Maiden, Georges, & Connelly, 2011; Treiber & Jones, 2018a, 2018b). While not all of the core

and secondary symptoms are meaningfully captured in nurse *second victim* literature, *second victim* researchers have not evaluated the constellation of MI symptoms with intention (refer to Table 1 later in Chapter I for a review of MI symptoms in nurse *second victim* empirical literature). Organizing the symptomology in the population traditionally referred to as *second victims*, MI symptom prevalence appears substantial enough to warrant further investigation. Furthermore, referring to a nurse traumatized after a PSI as 'morally injured', or having been exposed to a potential MIE, retains the desirable aspects of Wu's *second victim* while also avoiding its pitfalls (Wu, 2000; Wu et al., 2017). Examples of pitfalls from *first victims* (that is, the affected patient and family/friends) is that they are dissatisfied with the term "second victim" as they have expressed feelings that it minimizes their own experience as a victim of a PSI. Clinicians who have made errors often feel like a perpetrator, and the word "victim" leaves the affected health care provider feeling confused and trapped as both a "victim" and perpetrator, with no opportunity for moving beyond the label. Thus, shifting our referent language may even reveal more about the injurious experience and how it affects a person, given its emphasis on moral betrayal.

Research describes military MI as most often emerging from organizational circumstances, environmental circumstances, cultural and relational circumstances, and/or psychological circumstances (Currier et al., 2015). These same circumstances echo in situations surrounding those referred to as *second victims*. For example, the inadequacies of institutional supports and interventions after a PSI have repeatedly been highlighted as harmfully influencing *second victim* outcomes (Anonymous, 1990; Charles, Warnecke, Wilbert, Lichtenberg, & DeJesus, 1987; Christensen, Levinson, & Dunn, 1992; Engel, Rosenthal, & Sutcliffe, 2006; Gallagher, Waterman, Ebers, & al., 2003; Goldberg, Kuhn, Andrew, & Thomas, 2002; Hilfiker,

1984; Newman, 1996; Scott, Hirschinger, & Cox, 2008; Waterman et al., 2007; White, Waterman, McCotter, & Others, 2008; Williams et al., 2010; Wolf et al., 2000). Specifically, nurse *second victims* have been shown to suffer as a result of organizational circumstances (e.g., employer, leadership, or legal or regulatory bodies), environmental circumstances (high stress perfectionistic workplaces), cultural/relational circumstances (e.g., a true *Just Culture* vs. one saturated in lateral violence or bullying), and/or psychological circumstances (e.g., personal resilience, ways of coping, perceptions of safety and trust) (Anonymous, 1990; Charles et al., 1987; Christensen et al., 1992; Engel et al., 2006; Gallagher et al., 2003; Goldberg et al., 2002; Hilfiker, 1984; Newman, 1996; Scott et al., 2008; Waterman et al., 2007; White et al., 2008; Wolf et al., 2000). These are examples of potential MIEs for nurses. A critical element to *second victim* effective coping includes disclosure and/or talking/debriefing constructively about the PSI/aftermath (Burlison, Scott, Browne, Thompson, & Hoffman, 2014; Chan, Khong, & Wang, 2017; Edrees et al., 2011; Gazoni, Amato, Malik, & Durieux, 2012; Harrison et al., 2015; Lewis et al., 2015; Maiden et al., 2011; May & Plews-Ogan, 2012; Mira et al., 2015; Stangierski et al., 2012; Ullstrom et al., 2014; Williams et al., 2010). Healing the wounds of *second victim* requires a community (e.g., a true *Just Culture* environment both laterally and vertically in healthcare relationships, intentionally empathetic colleagues and leadership, opportunities for sharing their story and participating in the post-PSI error analysis) for recovery and resilience (Burlison et al., 2014; Edrees et al., 2011; Sattler, Boyd, & Kirsch, 2014).

This work is timely and significant to nursing science. Much work is currently striving to cultivate a culture of *resilient* nurses, which is tremendously important. However, **more** important is creating conditions that enable skilled, knowledgeable, experienced, and caring RNs to thrive in the workforce because they provide better quality care with fewer PSIs than nurses

without these characteristics (Hayhurst, Saylor, & Stuenkel, 2005; Kash, Naufal, Dagher, & Johnson, 2010). Fifteen years ago, as many as twenty-five percent of nurses may have considered leaving their current hospital unit of employment as a result of witnessing injurious consequences of care (Maxfield, Grenny, McMillan, Patterson, & Switzler, 2005) (a potential MIE). Aiken and colleagues recently demonstrated that only 21% of 535 surveyed-hospitals substantially improved their clinical work environments between 2005-2016; with 71% making no improvements, and 7% having deteriorating work environments (Aiken et al., 2018). Of significance, is that hospitals with improved work environments also had improved patient safety indicators, whereas patient safety grades remained the same for hospitals where work environments remained the same, and fell by 19% in hospitals with worsening care environments (Aiken et al., 2018). A gap is widening between healthy work environments and unhealthy ones, which is clearly impacting patient safety. With this evidence, it is not surprising that one in five newly licensed RNs will leave their first nursing job within a year, and one in three within two years (Kovner, Brewer, Fatehi, & Jun, 2014). And with the cost of replacing just one skilled hospital nurse is estimated at $145,000 (Li & Jones, 2012), organizations have strong financial motivation to holistically understand the forces that influence the well-being of the largest professional group employed by health systems, especially given the mounting evidence of clinician well-being directly correlating to patient satisfaction and patient safety.

Background and Significance of Studying Nurses Exposed to MIE

There are no accurate measures to identify *second victims*, thus epidemiology of adverse events, medical or medication errors, or unanticipated negative outcomes are frequently used as proxy measures to ascertain potential *second victim* prevalence. Errors are defined as an act of

commission (doing something wrong) or omission (failing to do the right thing) leading to an undesirable outcome or a significant potential for such an outcome (Patient Safety Network, 2018). Adverse events are any injuries caused by medical care (Patient Safety Network, 2018). A **patient safety incident** (PSI) is defined as an event or circumstance that resulted, or could have resulted, in unnecessary or unanticipated harm to a patient (World Health Organization, 2009). Henceforth, PSI will be an umbrella term for medical (including medication) errors, unanticipated adverse event, or any other care incident related to patient safety.

PSIs occur in the quotidian of day-to-day healthcare practice (Conway, Federico, Stewart, & Campbell, 2011). Medical errors were the eighth leading cause of U.S. hospital deaths in 1999 (Kohn, 2000), and increased to the third cause in 2010 (National Quality Forum, 2010). Despite patient-safety initiatives over the past two decades, medical errors continue to be the third leading cause of USA hospital deaths today (James, 2013; Makary & Daniel, 2016). Errors in healthcare annually may lead to over $10.3 billion in potentially avoidable healthcare spending (Zimmerman & House, 2016). Medication errors specifically have been shown to have moral implications for nurses at the personal, institutional, and professional levels (Arndt, 1994). It is estimated that more than 7 million serious and preventable medication errors occur each year, with more than half of these med-errors occurring during the course of inpatient care (National Priorities Partnership (NPP), 2010). One-third of a hospital nurses' time is spent in medication-management activities (Keers, Williams, Cooke, & Ashcroft, 2013; Pepper, 1995), and for this reason, it is no surprise that research on nurses involved with an error often focuses specifically on medication errors (one-third of nurse *second victim* studies) (Arndt, 1994; Jones & Treiber, 2010; Kao et al., 2015; Maiden et al., 2011; Rassin et al., 2005; Santos et al., 2007; Schelbred & Nord, 2007; Treiber & Jones, 2010, 2018a, 2018b; Wolf et al., 2000). As frequent as 25% of the

time medication is distributed, an error occurs (Curtis, 2004; Gagnon, 2004; Schifano et al., 2003). And since one nurse may administer as many as 50 different medications during one hospital shift, the probability of error is extremely high (Greshtensky, 2004; Mayo & Duncan, 2004). Further, while nurses have numerous risks for a variety of errors to occur in their day-to-day practices, medication errors remain the most prevalent medical and nursing error-type recorded worldwide (Weeks, Sabin, Pontin, & Woolley, 2013). One in four medical errors may result in death, disability, or severe pain (Blendon, 2002).

Perfection is not humanly possible – yet, the nursing profession, individual nurses, and healthcare-cultures altogether promote a perfectionism imperative (Leape, 1994). Healthcare environments are complex, multifaceted, and necessarily interdisciplinary. Accidents and errors are inevitable, and most often result from multilevel/multi-system failures – not failures on the part of an individual agent (Reason, 2004). Increasing knowledge after errors, accidents, and unanticipated negative outcomes in healthcare is critical to advancing safety science and has grown exponentially in the past two decades, including evidence illuminating the *second victim* experience. However, empirical *second victim* evidence specific to RNs still has so much to grow and learn.

Concepts in the Study RNs Moral Injury After a PSI

Nursing Perfectionism Imperative

The perfectionism imperative. Indoctrination into the nursing profession involves professional socialization (one might consider this a molding of nurses' personalities) – and this includes promoting socially prescribed perfectionistic and neurotic tendencies. Socially prescribed perfection is the perception that others demand perfection from oneself. Some of this may be propagated through educational methods in our professional schools and workplaces, but

these tendencies may also be subconsciously acquired through mirror neurons activated during practical and social learning situations. A rigidity of dichotomous perfectionistic thinking (i.e., right/wrong, good/bad) is fostered from early training and throughout nursing practice. To this end, invariably nursing has been identified as one of the most stressful professions (Roberts, 2012). Professional nurses hold themselves, and are held to, unattainable standards (Smith & Forster, 2000). In fact, a nursing culture perfectionism-imperative exists such that *good* nurses must not make mistakes (Mason, 2006). Hence, our preoccupation with perfection (Newman, 1996; Smith & Forster, 2000) is normative. Nursing and other healthcare cultures define what constitutes a mistake, and thus what is morally virtuous/good, commendable, and perfect. Likewise, these same cultures define deviations from perfect only because a perfect has been determined and an imperfect may be juxtaposed against it (Crigger, 2005). In 1994, Leape referred to this unattainable standard as a *perfectibility model*, wherein nursing and other clinician cultures used blame to promote proper performance, and that errors occurred in the setting of a lack of attention, carelessness, negligence, or knowledge (Leape, 1994; Mattox, 2012). Importantly, Leape and others rejected the concept of this *perfectibility model* and proposed the solution to errors in healthcare would rely upon how clinicians themselves actively reframed their fundamental thinking about errors (Leape, 1994; Vincent, 2010) (birthing the *Just Culture* movement in healthcare).

Just Culture. The *Just Culture* movement accelerated in the 2000s as healthcare organizations began to model safety-initiatives after other high-risk environments such as the aviation industry. *Just Culture* is a balance between patient safety and safety culture (Reason, 1997). A *Just Culture* is one that acknowledges humans are destined to make mistakes and, because of this, no system can be designed to produce perfect results; thus, a culture of

individual blame and concealment is not conducive to error reduction, rather it is harmful to individuals and systems (American Nurses Association, 2010; National Quality Forum, 2010). In 2010, the American Nurses Association put forth their first position statement on *Just Culture*, recognizing the need for nursing to fully embrace this model. Nearly a decade later, most hospital systems have policies and procedures in place that promote *Just Culture* principles and practices, yet professional culture still strives towards the perfectionist divinity.

Despite the overwhelming evidence and frequent dialogue surrounding how a positive work environment (i.e., a true *Just Culture*) has a measurable impact on reducing PSI, only 21% of over 530 hospitals (representing nearly 25% of patient discharges in the USA) improved their work environment scores between 2005 and 2016 (Aiken et al., 2018). And sadly, 7% of work environments deteriorated (Aiken et al., 2018). Sixty-percent of RNs surveyed from 2015-2016 felt that the quality of care in their own hospital was less than excellent, and 55% of them would not definitely recommend their own facility to a family member or friend in need of care (Stimpfel, Sloane, McHugh, & Aiken, 2015). Almost 30% of the RNs viewed their facility as unfavorable in terms of PSI (Stimpfel et al., 2015). In fact, a poor working environment has been associated with lower patient survival rates (McHugh et al., 2016).

PSIs most often result from multisystem breakdowns (Reason, 1990, 2000, 2004) in areas such as policy, organization, equipment, technology, and communications. Nurses often blame themselves for these breakdowns, and feel guilty regardless of whether the PSI resulted in harm (Treiber & Jones, 2010). Causing a PSI can be devastating to any nurse – leading to questioning of one's own competency and skill (Scott, 2015; Scott et al., 2009). Perceptions of mistakes as character- or competency- deficits can make nurses reluctant to divulge errors when they are made or observed (Crigger, 2005).

Personality Traits and Nursing

Perfectionism. Perfectionism is a multidimensional construct reflecting a strong commitment to unrealistically high standards for accomplishment and inability to accept one's own mistakes (Frost, Marten, Lahart, & Rosenblate, 1990). Dysphoric emotions triggered by a PSI may be influenced by perfectionistic (Christensen et al., 1992; Newman, 1996) dispositions in clinicians. In non-nurses, perfectionism has been shown to contribute significantly to post-trauma processing (Brown & Kocovski, 2014; Shikatani, Antony, Cassin, & Juo, 2015). Outcomes of nurse burnout (a phenomenon prevalent in nurse *second victims*) have been linked to perfectionism that is *adaptive* or *maladaptive* (Chang, 2012). Adaptive perfectionists set high standards, wherein one sets high performance expectations; and maladaptive perfectionists experience a discrepancy by forming self-critical performance evaluations (Chang, 2012). Nurses are trained to be perfectionists, with one study showing perfectionism among nursing students (30%) being higher than this trait in the general population (Kelly & Clark, 2017). Nurses with socially prescribed perfectionism (the perception that others demand perfection from oneself) can have negative psychological outcomes, and are more likely to experience burnout (Hajloo, Garamaleki, Tamarasi, & Haghighatgoo, 2011). Perfectionism (Melrose, 2011), and trauma-related guilt (Kubany et al., 1996), have also been associated with an increased risk of suicide.

A recent work explored *cognitive dissonance* in clinicians – defined as when individual clinicians perform an action, or confront new information, that is contradictory to their existing beliefs, ideas, or values (D'Llima, Murray, & Brett, 2018). Interestingly, those clinicians who exhibit perfectionist tendencies may experience cognitive dissonance in performing their work (i.e., when a nurse has to perform an action such as the provision of patient care that is at odds with his/her beliefs about the optimal level of care that **should** be given). The impact of

cognitive dissonance in this setting is that individuals with perfectionist tendencies may experience greater stress and isolation over time, as the dissonance between their belief system and the practical reality of delivering what they perceive to be compromised care becomes more pronounced. The negative emotion experienced when an individual is in cognitive dissonance can be related to the concept of moral distress and over time may contribute to burnout or leaving a job (D'Llima et al., 2018). Perfectionistic patterns have been correlated with nurse burnout (Balevre, 2001). New nurses (less than 3 years' experience) cite perfection as being an integral component of their personal identity and is a critical responsibility that has been reiterated professionally, but grew out of their nursing school encounters with instructors (Deppoliti, 2008). Student nurses with perfectionistic standards have been shown to have a significantly higher risk of psychological distress (Henning, Ey, & Shaw, 1998).

Neuroticism. Importantly, neuroticism exists as a universal trait in part because it does have certain benefits for adaptive functioning (Crespi, 2014). Neuroticism is the general baseline tendency to experience negative affects such as anxiety, depressive moods, self-consciousness, and an exaggerated reactivity to stressors (Costa & McCrae, 1992). Neuroticism has been linked as a risk for and a response to PTS symptoms (Borja, Callahan, & Rambo, 2009; LaFauci Schutt & Marotta, 2011; Lauterbach & Vrana, 2001) (Dunkley, Mandel, & Ma, 2014; Gunty et al., 2011; Suls & Martin, 2005). After exposure to a trauma, individuals are more likely to have higher scores of neurotic personality trait measures (Lee, Lee, Lee, & Kim, 2012). Compared to perfectionism, neuroticism is a broader personality dimension. Of the Big Five personality dimensions (openness, conscientiousness, extraversion, agreeableness, neuroticism) (Goldberg, 1993) , neuroticism has been shown to influence nurse burnout (Geuens, Van Bogaert, & Franck, 2017), specifically impacting nurse personal accomplishment, depersonalization, and emotional

exhaustion (Geuens et al., 2017). The relationship between stress and neuroticism is also established in nurses (Shimizutani et al., 2008; Wu, Ge, Sun, Wang, & Wang, 2011b), and more frequently observed in younger nurses (Edwards & Burnard, 2003; Watson et al., 2008). There is conflicting evidence in nurse *second victims* research regarding the impact of years of practice on outcomes, with some finding novice nurses having more difficulty after a PSI (Lewis, Baernholdt, & Hamric, 2013), and others finding that years of practice is not a factor (Van Gerven, Deweer, et al., 2016). Life stressors will affect neuroticism scores more intensely than those with lesser intense life stressors (Suls & Martin, 2005).

Trauma and personality traits in nursing. Trauma has been called the 'atom-smasher' of personality (Epstein, 1991). Increasing evidence from nurse *second victims* demonstrates how involvement with a PSI can leave a nurse traumatized. The nature of trauma is that the nurse experiences something of such great significance to his/her perceived well-being that it cannot be ignored, and is so discrepant with the nurses' fundamental schemata in his/her conceptual system, that it cannot be assimilated (Epstein, 1994). By definition, traumatic events are unique from day-to-day stressful events, and are situations that are generally outside of an individual's usual experiences. Thus, most individuals have not developed the necessary repertoires to deal with traumatic events (even though RNs and other clinicians are trained to function in highly stressful environments often fraught with other's-traumas).

As earlier noted in non-nurses, perfectionism has been shown to contribute significantly to post-trauma processing (Brown & Kocovski, 2014; Shikatani et al., 2015). Outcomes of nurse burnout (a phenomenon prevalent in nurse *second victims*) have been linked to perfectionism that is *adaptive* or *maladaptive* (Chang, 2012).

Also as previously noted, neuroticism has been linked as a risk for symptoms of (Borja et al., 2009; LaFauci Schutt & Marotta, 2011; Lauterbach & Vrana, 2001) and a response to PTS (Dunkley et al., 2014; Gunty et al., 2011; Suls & Martin, 2005). After exposure to a trauma, individuals are more likely to have higher scores of neurotic personality trait measures (Lee et al., 2012).

While perfectionism and neuroticism are prevalent in nurses and may be associated with the experiences *second victims*, these specific traits have not yet been evaluated in nurse *second victims*.

Meaning Making in the Aftermath of a PSI

Meaning making. Meaning making involves approach oriented intra-psychic efforts to reduce discrepancies between appraised and global meaning (Park, 2013). After a trauma (a PSI), the affected person must change either the meaning of the traumatic event(s) (*appraised meaning*) in a process of assimilation, or change his or her global beliefs and goals to improve the fit between the appraised meaning of the trauma and global meaning, similar to attribution (the process of inferring causes of events or behaviors) (Park, 2010a). Situations of low control (e.g., a PSI) are not amenable to logical problem solving, thus strategies of problem-focused and emotion-focused coping are less likely to be beneficial (Park, 2010b). To date, coping-strategies (e.g., problem-focused or emotion-focused) have dominated *second victim* research (Crigger & Meek, 2007; Delacroix, 2017; Harrison et al., 2015; Karga et al., 2011; Santos et al., 2007). However, given the unpredictability of PSIs, focusing on nurse *second victims'* coping-strategies may be less informative than focusing on meaning making. In a traumatic situation (a "low control" situation), meaning making has been shown to be most adaptive (Park, 2010b, 2013). Appraising traumatic experiences in positive terms has been associated with better psychological

functioning (Schok, Kleber, Elands, & Weerts, 2008), and that meaningfulness in life has been associated with fewer PTS symptoms (Owens, Steger, Whitesell, & Herrera, 2009). Making meaning may entail both reorganization of existing cognitive-motivational structures, as well as reappraisal or reinterpretation of not only the event, but also the context of the event in a person's life. The *centrality of events* (that is, the degree to which an individual believes that a negative event has become a core part of their identity) may be a contributor to the posttraumatic distress in an aftermath of a PSI. How an event becomes central to one's identity can be associated with both positive and negative self-reported outcomes, with those finding meaning in the event experiencing higher levels of positive growth (Groleau, Calhoun, Cann, & Tedeschi, 2013). Nurse *second victims* have frequently described attempts to make meaning of the PSI (Arndt, 1994; Crigger & Meek, 2007; de Freitas et al., 2011; Laurent et al., 2014; Schelbred & Nord, 2007; Scott et al., 2009; Skaggs & Barron, 2006; Treiber & Jones, 2010; Ullstrom et al., 2014).

No nurse *second victim* studies have quantitatively evaluated personal meaning making and the potential relationships with personality traits or nurse *second victim* traumatic symptom outcomes. No *second victim* studies have qualitatively associated meaning making after a PSI with traumatic symptom outcomes.

Nurses Traumatic Outcomes After a PSI

Despite the efforts and significant advances in energies to better understand and promote patient safety, nursing continues to be at the sharp end of the inquiry when PSIs happen. Nurses are the last line of defense for institutionalized patients. Healthcare systems function hierarchically, and nurses (viewed primarily through hospital-based practice since more than 50% of RNs are employed by hospitals (Bureau of Labor Statistics. U.S. Department of Labor,

2016) are particularly vulnerable when mistakes happen. Nurses make up the largest professional group employed in hospitals, and spend more time in direct contact with patients than any other professional. The burdens nurses routinely bear, both physically and psychologically, as occupational hazards are diverse and well established. Occupational burdens contribute to high turnover rates of professional hospital nursing staff (Duffield, Roche, Homer, Buchan, & Dimitrelis, 2014; Khan, Jackson, Stayt, & Walthall, 2018). Some evidence even suggests that nurses can become *second victims* as a result of moral distress, compassion fatigue, burnout, or lateral violence (Davidson, Agan, & Chakedis, 2016; Scott et al., 2009; Scott et al., 2010; Seys et al., 2013), which further supports exploring the MIE of nurses, even in the absence of a PSI.

Most *second victim* research comes from physician samples (Christensen et al., 1992; Gazoni et al., 2012; Hayashino, Utsugi-Ozaki, Feldman, & Fukuhara, 2012; Hu et al., 2012; Luu et al., 2012; Pinto, Faiz, Bicknell, & Vincent, 2013; Shanafelt et al., 2011; Venus, Galam, Aubert, & Nougairede, 2012), or blended samples of nurses, physicians, pharmacists, or other hospital staff (Burlison et al., 2014; Edrees et al., 2011; Harrison et al., 2015; Joesten et al., 2015; Laurent et al., 2014; Mira et al., 2015; O'Beirne et al., 2012; Scott et al., 2009; Ullstrom et al., 2014; Van Gerven, Bruyneel, et al., 2016; Van Gerven, Deweer, et al., 2016; Van Gerven, Vander Elst, et al., 2016; Wolf et al., 2000), or are single-institution studies. Nurse-only *second victim* samples (Arndt, 1994; Chard, 2010; Coli et al., 2010; Crigger & Meek, 2007; de Freitas et al., 2011; Delacroix, 2017; Jones & Treiber, 2010; Kao et al., 2015; Karga et al., 2011; Lewis et al., 2015; Maiden et al., 2011; Meurier et al., 1997; Rassin et al., 2005; Santos et al., 2007; Schelbred & Nord, 2007; Taifoori & Valiee, 2015; Treiber & Jones, 2010) often focus on medication errors (~50% of studies) (Arndt, 1994; Jones & Treiber, 2010; Kao et al., 2015; Rassin et al., 2005; Santos et al., 2007; Schelbred & Nord, 2007; Treiber & Jones, 2010). Only two studies report

nurse *second victim* emotional symptoms compared to physician *second victims*, and nurses had more unhealthy emotions (i.e., worry, fear, distress, nervousness) (Harrison et al., 2015; Wolf et al., 2000). While physician *second victims* may abuse medications in the aftermath of an error, nurse *second victims* more frequently abuse alcohol (Van Gerven, Deweer, et al., 2016). Also, about one-third of *second victims* report feeling less able to perform at work, have a loss of confidence, or are feel unable to perform their work safely and effectively (Crigger & Meek, 2007; Joesten et al., 2015; Laurent et al., 2014).

Operationalizing Morally Injurious Trauma. A most basic definition of psychological trauma is that it is a deeply disturbing or distressing personal experience. The injury this experience inflicts can produce a mixture of emotional, social, behavioral, cognitive, and somatic consequences that can reverberate for a long time and that most people are not equipped to handle by themselves (Dekker, 2013). As previously described, herein MI has been operationalized as a syndrome with core symptoms of guilt, shame, spiritual/existential conflict, and loss of trust, and secondary symptoms including depression, anxiety, anger, re-experiencing, self-harm, and social problems are secondary symptoms of MI (Jinkerson, 2016). Table 1 provides a descriptive summary of nurse *second victim* literature evidence of the symptoms of moral injury as operationalized. Comparing MI themes in Table 1, core MI symptoms expressed in qualitative and mixed methods studies do not appear to be adequately replicated in quantitative studies. Secondary symptoms of anger, re-experiencing, and self-harm have also not been explored with intention in quantitative studies. It is important to note that the summary in Table 1 only demonstrates if a concept was captured empirically (which for quantitative methods means the concept would have had to have been measured with intention). Chapter II of this dissertation manuscript will explore this evidence in great detail.

Table 1. Evidence of MI in nurse *second victim* literature

Core MI Symptoms	Qualitative Studies n = 14	Quantitative Studies n = 15	Mixed Methods Studies n = 5	Total n = 34
Guilt	13 (93%)	9 (60%)	2 (40%)	24 (71%)
Shame	12 (86%)	7 (47%)	4 (80%)	23 (68%)
Spiritual or Existential Crisis	2 (14%)	0	2 (40%)	4 (12%)
Trust	10 (71%)	6 (40%)	2 (40%)	18 (53%)
Secondary MI Symptoms				
Depression	6 (43%)	4 (27%)	2 (40%)	12 (35%)
Anxiety	11 (79%)	9 (60%)	4 (80%)	24 (71%)
Anger	10 (71%)	5 (33%)	4 (80%)	19 (56%)
Re-Experiencing	10 (71%)	5 (33%)	2 (40%)	17 (50%)
Self-Harm	3 (21%)	2 (13%)	1 (20%)	6 (18%)
Social Problems	7 (50%)	9 (60%)	1 (20%)	17 (50%)
Other trauma symptoms potentially associated with MI				
Change in Worldview	11 (79%)	5 (33%)	1 (20%)	17 (50%)
Leaving	7 (50%)	7 (47%)	2 (40%)	16 (47%)
Hyperarousal	7 (50%)	1 (7 %)	1 (20%)	9 (26%)
Physical Symptoms	7 (50%)	2 (13%)	3 (60%)	10 (29%)
Meaning Making	6 (43%)	1 (7%)	1 (20%)	8 (24%)

Psychological distress of some form is ubiquitous finding in all clinician *second victim* research. In nurse *second victim* research, symptoms of PTSD have been recorded in four qualitative studies (Arndt, 1994; de Freitas et al., 2011; Rassin et al., 2005; Schelbred & Nord, 2007) and three quantitative studies (Harrison et al., 2015; Kao et al., 2015; Van Gerven, Vander Elst, et al., 2016); depression in six qualitative studies (de Freitas et al., 2011; Rinaldi et al., 2016; Schelbred & Nord, 2007; Scott et al., 2009; Ullstrom et al., 2014; Van Gerven, Bruyneel, et al., 2016), four quantitative studies (Chard, 2010; Edrees et al., 2011; Karga et al., 2011; Taifoori & Valiee, 2015) and two using mixed methods (Jones & Treiber, 2010; Wolf et al., 2000). Burnout is generally characterized a syndrome of emotional exhaustion, depersonalization, and low personal accomplishment (Lewis et al., 2015). In nurse *second victim* research, burnout has frequently been identified (Crigger & Meek, 2007; Harrison et al., 2015;

Jourdain & Chenevert, 2010; Kao et al., 2015; Karga et al., 2011; Lewis et al., 2015; Treiber & Jones, 2010; Van Gerven, Deweer, et al., 2016; Wolf et al., 2000). Additionally, evidence of moral distress (Arndt, 1994; Coli et al., 2010; Jones & Treiber, 2010; Kao et al., 2015; Lewis et al., 2015; Lewis, Baernholdt, et al., 2013; Maiden et al., 2011; Rassin et al., 2005; Santos et al., 2007; Schelbred & Nord, 2007; Ullstrom et al., 2014; Wolf et al., 2000) is prevalent. All these symptoms (e.g., PTSD, depression, burnout, and moral distress) are also known contributors to turnover and increased risks of PSI. Physical symptoms such as insomnia, fatigue, and appetite changes are common findings (Burlison et al., 2014; Laurent et al., 2014; Mira et al., 2015; Rassin et al., 2005; Schelbred & Nord, 2007; Scott et al., 2009; Taifoori & Valiee, 2015; Ullstrom et al., 2014). Fear for a nurse *second victim* most often manifests as concern for the patient first, then as fear for self (e.g., potential reprimand, job loss, blame, uncertainty, legal repercussions) (Crigger & Meek, 2007; de Freitas et al., 2011; Harrison et al., 2015; Karga et al., 2011; Wolf et al., 2000). Comparing qualitative and quantitative nurse *second victim* research in Table 1, it appears that quantitative efforts still have much to glean from qualitative empirical evidence to optimally tease out the nuances of potential MI in the aftermath of a PSI.

While the aforementioned symptoms are well established, there are still areas of debate and less clear outcomes. For example, conflicting results regarding the outcomes and influences of gender and professional role are unclear. While it is not a priority to determine which gender or professional has better or worse outcomes, the priority lies in exploring and gaining insight into the unique stressors (potential MIEs) that may significantly influence individual outcomes so that the professional nurse or physician can optimize resource utilization for surviving and thriving in the aftermath of a PSI. For example, in evaluating 34 nurse *second victim* empirical studies (qualitative, quantitative, and mixed methods), a total of 12,491 subjects were sampled (about

77% of which were nurses), with four studies apparently reporting from the same samples of two populations (Jones & Treiber, 2010; Treiber & Jones, 2010, 2018a, 2018b). Gender stratification was not always reported (missing in 12.3% of subjects), but of the remaining 87.7% of those sampled, 8524 females and 2435 males are represented (likely less than 500 duplicated). Five studies compare gender, with Scott et al. (2009) finding no difference (n=31) (Scott et al., 2009), Treiber & Jones (2010) do not specifically address gender (n=202) except in one case where a "male nurse indicated that being in the minority increased his feelings of isolation... . [he] felt his gender led to differential workload assignments. As a man, he did not readily get needed assistance from his women coworkers" (Treiber & Jones, 2010, p. 1338). O'Beirne et al. (2012) sampled 238 clinicians (42% were nurses), and found women physicians were less likely to report using a coping-strategy than their male counterparts (O'Beirne et al., 2012). Mira et al. (2015) reported female physicians had more intense guilt, anxiety, re-experiencing, difficulty concentrating, insomnia, and feelings of self-doubt and loss of self-trust compared to their male counterparts (Mira et al., 2015). And most recently, Van Gerven et al. (2016) sampled 913 subjects (80% were nurses) and found female clinicians experienced a significantly higher impact after a PSI than males ($\beta=5.61$, $p<0.0001$), but their recovery was also stronger ($\beta=-3.93$, $p=0.0001$) (Van Gerven, Bruyneel, et al., 2016).

A recent clinician *second victim* review by Wu et al. (2017) stemmed from 9751 sampled physicians (87.3%) and only 1044 sampled nurses (9.3%) – 3.4% were not stratified by discipline (Wu et al., 2017), reporting an equivalent *second victim* experience between professions. Based upon a review of nurse *second* victim studies, my assessment is that this equivalence has not been sufficiently empirically established (a potential betrayal to nurses who have less power in healthcare environments compared to physicians). According to Wolf et al.

(2000) nurses felt more guilt, worried, and embarrassed than pharmacists and physicians after a medication error (Wolf et al., 2000). Scott et al. (2009) found no differences between physician and nurse responses after an error/mistake/mishap/PSI (but the study only an n = 31, of which 11 were nurses) (Scott et al., 2009). When O'Beirne et al. (2012) analyzed female participants alone, physicians were more likely to report an emotional response compared to other clinic staff (O'Beirne et al., 2012). Also, Mira et al. (2015) reported physicians had more intense guilt, anxiety, re-experiencing, difficulty concentrating, insomnia, and feelings of self-doubt and loss of self-trust compared to 'other *second victims*'(Mira et al., 2015). However, Harrison et al. (2015) found nurses were more fearful for patients, feared disciplinary action more, and feared punishment more than pharmacists and physicians. Harrison also found greater disruption in physician work performance than nurses (F1, 260 = 9.35, P G 0.005); and identified a significant difference in commonly reported emotions (F15, 247 = 3.13, P G 0.001), particularly with regard to the following items: feeling upset, worried, distressed, scared, and nervous, for which, nurses reported significantly higher scores (Harrison et al., 2015). Van Gerven et al. (2016) found that nurses and physicians differed in the impact of events (IES) scores depending on the outcome of the affected patient (e.g., nurses fared worse when patients died but physicians fared worse when incidents has severe or moderate harm (not death)) (Van Gerven, Bruyneel, et al., 2016). Also, a different study by Van Gerven et al. (2016) showed physicians involved in a PSI were more likely to have problematic medication use ($\beta = 0.30$, $p < 0.01$) but less excessive alcohol consumption ($\beta = 0.45$, $p < 0.01$) than nurses (Van Gerven, Vander Elst, et al., 2016). Thus, reviewing nurse *second* victim literature that includes blended samples of professionals, the equivalent experience of nurses and physicians after a PSI is not clear. More work needs to be

done to clarify the unique circumstances (i.e., pMIEs) that each professional may face in the aftermath of a PSI to better understand the outcomes of the affected clinician.

There are significant gaps in knowledge pertaining to nurse *second victim* factors pre- and post-PSI that predict dropping out (Scott et al., 2009). For example, dropping out may be operationalized as leaving a job, the profession, or even leaving life (suicide). The emotional distress in the aftermath of a PSI, including anxiety, depression, and feelings of guilt, often transfers into personal life is long lasting (Scott et al., 2009; Wolf et al., 2000). Nurses have described emotional distress symptoms more than 10 years after a PSI in three studies (Rassin et al., 2005; Schelbred & Nord, 2007; Ullstrom et al., 2014). Yet, despite the prevalence of psychological distress after a PSI in physicians and nurses, 31% of clinicians in one study felt too "embarrassed" to seek psychological help (Joesten et al., 2015). Suicidal ideation is not widely gaged, and suicidality has not been quantitatively measured in **any** *second victim* research. Suicidal ideation has been reported in qualitative research (2 of 10 participants in one nurse *second victim* study reported suicidal thoughts, and one-third of the same study's potential participants declined, frequently citing reasons related to 'avoiding revisiting the memories [of the PSI aftermath]' (Schelbred & Nord, 2007)). There are numerous nurse (and physician) *second victim* posthumous suicide case reports (Lander, Connor, & Shah, 2006; Laville, 2012; Ostrom, 2011; Schelbred & Nord, 2007; Serembus, Wolf, & Youngblood, 2001; Shanafelt et al., 2011). And, an elevated suicide risk over the general population is already associated with both physician and nursing work (Alderson, Parent-Rocheleau, & Mishara, 2015; Hawton et al., 2002; Windsor-Shellar, 2017). For physicians, this risk has been reported as double the general population risk for suicide (~ 400 physicians annually) (Moss, 2018), with nurses also having near the same relative risk compared to physicians (Alderson et al., 2015; Davidson, Proudfoot, Lee, & Zisook,

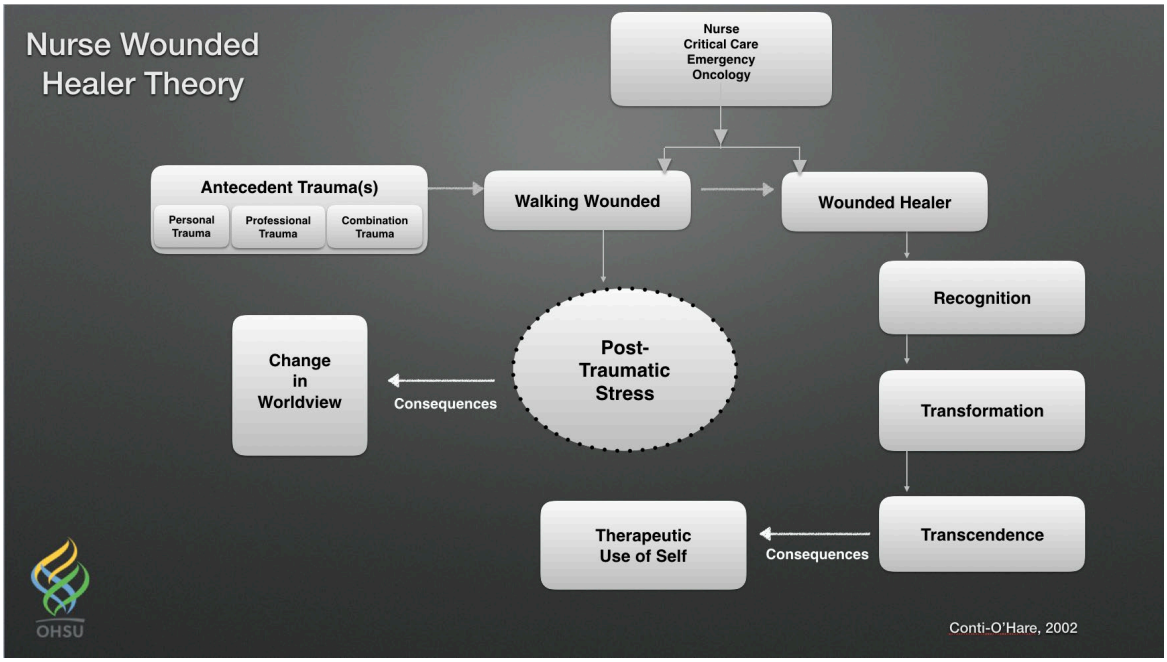
2019). Yet, the methods and samples contributing to the *second victim* literature neither adequately measure, nor intentionally capture, suicidality, which is surely a betrayal to all those affected by the suicide of a *second victim*.

Despite the growing body of evidence in nurse *second victim* literature, there remain substantial gaps in knowledge of the experiences of nurses pertaining to the feelings of guilt, shame, spiritual/existential conflict, loss of trust/betrayals, anger, social problems, dropping out, and even self-harm, that have been described in the literature, yet not explored with theoretical or empirical intent.

Theoretical framework

This dissertation work developed originally using Conti-O'Hare's (2002) middle-range nurse wounded healer theory (Conti-O'Hare, 2002) (see Figure 1). Like the philosophy of Carl Jung, Conti-O'Hare supposes all humans experience trauma in their lives that shapes them as individuals. Specific to nurses, that trauma can be of a personal nature (e.g., childhood abuse, rape, disaster), a professional nature (e.g., involvement with a PSI, witnessing the horrors of humanity in a warzone or disaster area, or working in environments where one witnesses profound morbidity on a regular basis), or a combination thereof. The pain and fear from experiencing these antecedent traumas can be carried throughout life (hence the arrows move forward), and the way nurses cope will have a profound effect on their ability to provide care.

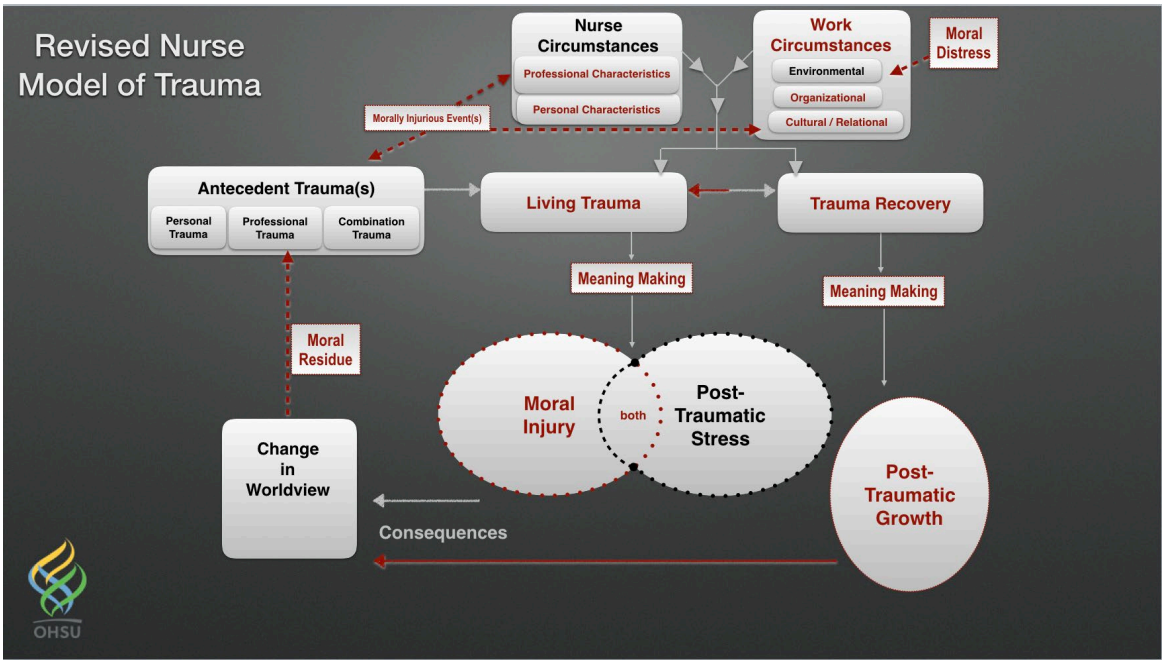
Figure 1. Nurse Wounded Healer Mid-Range Theory



Concepts that fed into the Walking Wounded or Wounded Healer pathways included the professional nurse characteristics and work-environment. Mealer and Jones (2013) conceptualized the Walking Wounded as a nurse who has experienced trauma in their lives that they have not dealt with and this alters their ability to cope with current stressors, leading to negative results (Mealer & Jones, 2013). The Walking Wounded path in their model pointed to PTSD, which then pointed to a concept of 'negative change in worldview'. On the other hand, Wounded Healers were conceptualized as nurses who, through self-reflection and spiritual growth, achieved expanded consciousness, through which their trauma was processed, converted, and healed (Mealer & Jones, 2013). The Wounded Healer path pointed to healing, transformation and transcendence of trauma, which then pointed to the concept of 'therapeutic use of self'. The Wounded Healer remained scarred, but this gave the nurse a greater ability to understand others' pain (Mealer & Jones, 2013).

In the revised nurse model of trauma advanced in this Dissertation (see Figure 2), the major concepts in the original nurse wounded healer theory are reformulated using language more representative of the global concepts. For example, nurse circumstances and work circumstances are two different concepts in the revised model, enabling more clear definition of each concept and the unique potential betrayals or MIEs that may plague the sub-concepts. Professional nurse characteristics may include (but not be limited to) educational background, participating in a nurse residency program, years of practice, and work habits. Personal characteristics might include personality type or psychological circumstances such as personal resilience, ways of coping, and perceptions of safety and trust (Anonymous, 1990; Charles et al., 1987; Christensen et al., 1992; Engel et al., 2006; Gallagher et al., 2003; Goldberg et al., 2002; Hilfiker, 1984; Newman, 1996; Scott et al., 2008; Waterman et al., 2007; White et al., 2008; Williams et al., 2010; Wolf et al., 2000), or even competing priorities such as marriage, young children living at home, self-care practices, spiritual health, financial health, personal physical health, and many others. For this dissertation, nurse personal characteristics of perfectionism and neuroticism will be a focus. The work-environment has been further subcategorized for the revised nurse model of trauma to include environmental circumstances in the workplace (e.g., high stress perfectionistic workplaces, intensive care units), organizational circumstances (e.g., employer, leadership, or legal or regulatory bodies), and cultural/relational circumstances (e.g., a true *Just Culture* vs. one saturated in lateral violence or bullying). The substantial body of work on moral distress in nursing also informs potential MIEs that may occur in a variety of work circumstances; thus, moral distress is shown in the revised model as influencing the workplace. Also, there is a cumulative effect in acquiring the multiplicities of mini-betrayals (or mini-traumas) in life/the workplace, which can reach a crescendo as a MIE.

Figure 2. Revised nurse model of trauma



Once there is trauma, the nurse either makes meaning of the trauma in a healthy way leading to post-traumatic growth (the revised transform-transcend concept in the revised nurse model of trauma). If the nurse has difficulty making meaning of the trauma, he/she may have difficulty enduring and suffer from PTSD, MI, or some combination thereof. An individual can begin down one path, say the Trauma Recovery path and then return to the Living Trauma when new stressors or difficulty with meaning making arise. Additionally, a person can be suffering with symptoms of MI and have an experience that helps them to advance to Trauma Recovery as they work for Post Traumatic Growth. Hence, the arrows between Living Trauma and Trauma recovery are bidirectional.

Whether continuing to live with the effects of trauma or having recovered, a consequential concept in both pathways is Change in Worldview. With ongoing MI and/or PTSD, individuals may suffer with, for example, insomnia and night-frights, anxiety, depression,

intention to leave, anger, or social problems. This is where we might see examples of Shay's shrinking moral and social horizon (Shay, 2014), where individual ideals, attachments, and ambitions fade, and nurses affected by the MIEs of a PSI may manifest as compassion fatigue, burnout, self-doubt, guilt, fear, and shame. For those who have achieved post-traumatic growth, their change in worldview manifest as greater pride, hubris, empathy, and therapeutic use of self.

Moral residue is an arrow that has been added to the revised nurse model of trauma to demonstrate that these events do not have a final completion point, rather there is always a residue left from the trauma (Conti-O'Hare's "scar"). The residue may add strength or may be a limitation, depending on whatever new circumstances present themselves to the nurse today. The prior trauma experience will always reside with the concept of Antecedent Trauma(s).

In order for trauma to resolve itself, there must be an intervention. The transformation and transcendence of trauma influences the ways that trauma-experience can then be used to benefit others. For Conti-O'Hare, healing involved traumatized individuals moving from the Walking Wounded stage (herein termed the Living Trauma stage) to the Wounded Healer staged (herein termed the Trauma Recovery stage). Mealer & Jones (2013) expanded upon the theory by further developing conceptual definitions and pointing to the unique posttraumatic stress nurses experience in the course of their work (Mealer & Jones, 2013). In order to provide the highest level of therapeutic use of self, one must have transcended to Wounded Healer (herein, Trauma Recovery).

Implications for Nursing Practice

As a result of this cumulative research on moral injury in nurses after a PSI, a number of important contributions to nursing practice emerge. First, through advancing potential MIEs and MI associated with a PSI and/or the aftermath in RNs, clinicians and organizations can be

empowered to advance training and intervention programs aimed at holistically caring for healthcare clinicians in the aftermath of a PSI. One goal is to revise our language so as to stop the subtle betrayals victim-language creates, so that new opportunities for healing can eventually be explored. Second, the theoretical model derived from this dissertation will make significant contributions to multiple areas of inquiry, including theory, measurement, research, and practice. Third, the mixed method cross-sectional study will be the first to consider potential MIEs after a PSI linking changing jobs and intention to leave the profession with MIEs and moral injury after a PSI, in addition to the quantitative study being the first to explore personality traits influencing potential MI outcomes in RNs after a PSI. Next steps should include designing intervention programs targeting nurse residency programs to intervene with the most vulnerable nurses to dropping out of the workforce. Another novel program to design would be targeting new advanced practice nurses (APNs) providing support at specific intervals after entry into practice after graduation. While traditional programs are housed within a single institution, a novel study design for structured support for APNs could be developed on-line to support a larger cohort of new graduate APNs from a wider geographic region. The implications of advancing knowledge of perfectionistic imperatives, MIEs, and MI after a traumatic experience are crucial as nursing education and practice settings develop and implement programs aimed at improving research methods, safety, resilience, and retention of the nursing workforce.

Summary

In summary, the overarching purpose of this Dissertation is to contribute new knowledge to nursing science about MIEs and MI in RNs in the aftermath of a PSI. First, by critically analyzing existing literature, we expose gaps and potential biases in existing nurse *second victim* literature in a manuscript titled: *A critical review: Moral injury in nurses in the aftermath of a*

patient safety incident. Second, by synthesizing disparate literature from military psychiatry, nursing moral distress, and psychology we advance an inductively derived and empirically based revised nurse model of trauma. Third, we produce a quantitative study titled: *Personality traits and traumatic outcome symptoms in registered nurses in the aftermath of a patient safety incident*. Fourth, we produce a third manuscript titled: *A mixed methods study of moral injury in registered nurses in the aftermath of a patient safety incident*. Most importantly, with this Dissertation, we empirically advance occupational MIEs and MI of RNs in the aftermath of a PSI, which provides a unique opportunity to develop future studies, including potential intervention studies for RN moral injuries.

Dissertation Purpose and Aims

Table 2. Chapters and Aims

Chapter I	Background and Significance
Chapter II: *A critical review: Moral injury in nurses in the aftermath of a patient safety incident*	Aim 1: The aim of this review of nurse *second victim* literature is to describe symptoms of moral injury empirically observed in nurses in the aftermath of a PSI.
Chapter III: *Personality traits and traumatic outcome symptoms in registered nurses in the aftermath of a patient safety incident*	Aim 2: To investigate the relationship between the personality traits, perfectionism and neuroticism, and the traumatic outcomes of re-experiencing, avoidance, and alcohol abuse severity of RNs who have been involved with a PSI.
Chapter IV: *A mixed methods study of moral injury in registered nurses in the aftermath of a patient safety incident*	Aim 3a: To explore the guilt, shame, loss of trust, anxiety, depression, changing a job, and intention to leave the profession of RNs in the aftermath of a PSI. Aim 3b: To describe the experiences of RNs in the aftermath of a PSI.

	Aim 3c: To make empirical associations between the morally injurious outcomes for RNs who actually changed a job, or who had intentions to leave the profession, in the aftermath of a PSI.
Chapter V	Discussion, Summary and Implications, Conclusion

Chapter II

A critical review: Moral injury in nurses in the aftermath of a patient safety incident

Authors

Mady Stovall, MSN, ANP-BC, RN, PhD Student

Delta Alpha at Large Sigma Chapter

StovallM@ohsu.edu

Lissi Hansen, PhD, RN, Professor

Beta Psi Sigma Chapter

HansenLi@ohsu.edu

Michelle van Ryn, PhD, MPH, Professor

vanRyn@ohsu.edu

Funding Acknowledgement(s)

OHSU Dean's Dissertation Award

Beta Psi Sigma International for the Naomi Ballard Award, and

Delta-Alpha-at-Large Sigma International for a Dissertation Award

Journal Acknowledgement

Accepted for Publication 26 February 2020 in

Journal of Nursing Scholarship

doi:10.1111/jnu.12551

Impact factor 2.540 – H index 72

Abstract

Background

To date, there has been no published work towards understanding or classifying patient safety incidents (PSIs) or their aftermath as potential morally injurious experiences (pMIEs). A morally injurious experience is one that violates deeply held moral values and beliefs, and can put an individual at risk for burnout, posttraumatic stress disorder, and other trauma-related problems. This can also set the stage for **moral injury** which can occur when there has been a *betrayal of what is right* by someone in a position of legitimate authority, or by one's self, in a high-stakes situation.

Objective

The objective of this review of nurse second victim literature is to describe symptoms of moral injury empirically observed in nurses in the aftermath of a PSI.

Methods

A critical review using a SALSA (search, appraisal, synthesis, analysis) method commenced with a search of electronic data based indexed original evidence between 1980 and December 2018, focusing on registered nurses involved with a PSI.

Results

Nurse empirical literature reviewed included qualitative (n=10), quantitative (n=7), and mixed methods (n=4) studies (total n=21). Core moral injury symptoms included guilt (67%), shame (71%), spiritual/existential crisis (9%), and loss of trust (52%). Secondary symptoms of moral injury included depression (33%), anxiety (57%), anger (71%), self-harm, (19%), social problems (48%).

Implications

Moral injury better describes what historically has been called the nurse *second victim phenomenon*. Through identification of pMIEs and symptoms of moral injury, nurses and organizations can be empowered to advance training and intervention programs addressing pMIEs that affect nurses' safety and retention in the aftermath of a PSI.

Clinical Relevance

By describing the experiences associated with a PSI as potentially morally injurious, we set the stage to describe the potential consequences associated with the aftermath of the PSI. Furthermore, this language avoids victimizing those involved by more accurately reflecting the pMIEs of the aftermath.

A critical review: Moral injury in nurses in the aftermath of a patient safety incident

Frontline hospital nurses are often described as *working in the trenches,* language associated with war theatres. Hospital nurses walk daily through *minefields* of inadequate/unsafe staffing (Rees et al., 2019); complex and often, suboptimal technology (Schulte & Fry, 2019); organizational culture difficulties (Aiken et al., 2018) and blatant violence, laterally and horizontally from colleagues (Christie & Jones, 2013; Spence Laschinger & Nosko, 2015) – even from patients, families, and the public (World Health Organization [WHO], 2018). While some of these systemic failures may be anticipated, they still betray individuals and groups of nurses on a daily basis and are rooted in organizational-, environmental-, and cultural-/relational-circumstances.

On hospital *battlegrounds*, nurses are keenly aware they are the *last line of defense* for patient safety. Holding the duty to protect the patient as sacred, a nursing perfectionism-imperative becomes normative. By definition, perfectionists have a strong commitment to unrealistically high standards for accomplishment and an inability to accept one's own mistakes (Frost et al., 1990). New nurses, those with less than 3 years- experience, cite perfection as being an integral component of their personal identity and a critical responsibility that has been reiterated professionally, but one grew out of their nursing school encounters with instructors (Deppoliti, 2008). Students of nursing have demonstrated 30% higher perfectionism than this trait in the general population (Kelly & Clark, 2017). But, while nurses may strive for perfection, the functioning of hospitals, the provision and medical care, and the human condition is fraught with imperfections. A nurse striving for perfection in an imperfect environment will find himself/herself experiencing moral distress.

Jameton originally defined **moral distress** in nursing as knowing the ethically appropriate action, but being constrained from acting accordingly (1984). But most recently, **moral distress** has been defined as actively *doing* or partaking in something ethically wrong, but having *little power* in the situation to enact change (Epstein, Whitehead, Prompahakul, Thacker, & Hamric, 2019). Epstein and Hamric produced a model of the crescendo effect of moral distress (see Figure 1) that opened a new paradigm (2009). In this model, a uniquely distressing circumstance happens (for example, poor staffing or technology that creates unsafe conditions, or even a medical error), causing a *crescendo* effect. The accumulation of these morally distressing events and environments on the nurse may result in a *crescendo* of moral distress. While the nurse may find resolution to the morally distressing circumstance, or the situation may simply move into history without resolution, the nurse will carry a memory of the experience, which is the *moral residue* (see Figure 1).

Nurses have morally distressing encounters in their day-to-day practice. In some work environments, these morally distressing experiences may be more frequent or anticipated than in others. The evidence suggests that an escalation in baseline moral residue will lead to increasingly high crescendos, and can evoke stronger reactions from nurses when awakening prior memories and negative emotions (Epstein & Hamric, 2009). To do no harm is a core principle of nurses, and violating this principle will leave many nurses feeling significant moral distress (Santos et al., 2007). Medication errors specifically have been shown to have moral implications for nurses at the personal, institutional, and professional levels (Schelbred & Nord, 2007). Nurses involved with patient safety incidents routinely cite perfectionism imperatives as a source of distress in the aftermath of the event (Coli et al., 2010; Crigger & Meek, 2007; Jones & Treiber, 2010; Rassin et al., 2005; Scott et al., 2009; Treiber & Jones, 2010).

Figure 1. Model of Moral Distress Crescendo Effect (Epstein & Hamric, 2009, p. 15)

Building upon Epstein and Hamric's premise, with repeated morally distressing exposures and increasing moral residue, we propose the cumulative crescendos of betrayals that occur in the context of healthcare environments can be potentially morally injurious. **Morally injurious events** (MIEs) are those, such as perpetrating, failing to prevent, or bearing witness to, acts that transgress deeply held moral beliefs and expectations (Litz et al., 2009). Violations of moral values and beliefs can put an individual at risk for burnout, post-traumatic stress disorder (PTSD), and other trauma-related problems (Currier et al., 2015). Exposure to MIEs, or even *potential* morally injurious events (pMIEs), are associated with poor metal health outcomes (e.g., PTSD, depression, anxiety, suicidal thinking) and seem to influence behaviors such as hostility, in both military and non-military contexts (Williamson, Stevelink, & Greenberg, 2018). This can also set the stage for **moral injury**, which can occur when there has been: 1) A *feeling of betrayal of what is right*; 2) either by someone who holds legitimate authority (Shay, 1991, 2014), or by one's self (Litz et al., 2009); 3) in a high-stakes situation. Moral injury has most commonly been associated with war veterans.

Purpose

The purpose of this critical review is to describe symptoms of moral injury empirically observed in nurses in the aftermath of a patient safety incident (PSI). A **critical review** presents, analyzes, and synthesizes material from diverse sources and is unique in that it provides an opportunity to "take stock" of the evidence (Grant & Booth, 2009). Sources from military medicine, psychiatry, and philosophy have contributed to this review of moral injury. This work is timely and significant to nursing science because this it synthesizes evidence of nurses'

outcomes in the aftermath of a PSI, and provides an overview that embodies this phenomenon in a new manner, using language that is more responsive to the nurse descriptions of their lived experience.

Background/Significance

According to the World Health Organization, a **patient safety incident** (PSI) is defined as an event or circumstance that resulted, or could have resulted, in unnecessary or unanticipated harm to a patient (2009). Henceforth, PSI will be an umbrella term for medical (including medication) errors, unanticipated adverse event, or any other care incident related to patient safety. PSIs occur in the routines of daily healthcare practices (Conway et al., 2011). Despite patient-safety initiatives over the past two decades, medical errors continue to be the third leading cause of U.S. hospital deaths today (James, 2013; Makary & Daniel, 2016).

As previously noted, new nurses particularly cite perfection as an integral component of their personal identity (Deppoliti, 2008). The PSI and events thereafter (herein considered a potential morally injurious experience (pMIEs)) may deliver a devastating blow to a nurse's deontological core – a potential violation of their duty ethic (Berlinger, 2005). Scott, Hirschinger, Cox, Brandt, and Hall's oft cited study found, regardless of gender, professional type (e.g., nurse, physician, pharmacist), or years of experience, healthcare providers traumatized after involvement with a PSI determined it to be a **life-altering event** that left a **permanent imprint** on most individuals (2009).

PSIs most often result from multisystem breakdowns in areas such as policy, organization, equipment, technology, and communications (Reason, 2000). Yet, nurses often blame themselves for these breakdowns, and feel guilty regardless of whether or not the PSI resulted in harm (Treiber & Jones, 2010). A nurse whose actions, or inactions, led to a PSI can

devastate the nurse – leading them to question their own competency and skill (Scott, 2015; Scott et al., 2009). Perceptions of mistakes as deficits in character or competence, makes nurses reluctant to divulge errors when made or observed (Crigger, 2005). With evidence of self-blame, guilt, and changes in reporting behaviors, we believe the PSI and the circumstances in the aftermath may be pMIEs. Exposure to pMIEs can lead to negative long-term outcomes - that is, long-term emotional, psychological, behavioral, spiritual, and social symptomology (Litz et al., 2009). When applying Jinkerson's concept of moral injury as a syndrome, core symptoms of moral injury will include guilt, shame, spiritual/existential conflict, and loss of trust (2016). Depression, anxiety, anger, re-experiencing, self-harm, and social problems are secondary symptoms of moral injury (Jinkerson, 2016).

Betrayal trauma involves a social dimension of psychological trauma, independent of PTS reactions and occurs when the people, or institutions, on which the nurse depends for surviving in the workplace, significantly violate that nurses' trust and well-being (Freyd, 2008). This work is the first to classify pMIEs in the context of a PSI and in healthcare, and is the first to intentionally explore symptoms of moral injury in nurses involved with a PSI.

Methods

The authors performed the critical review using a SALSA (search, appraisal, synthesis, analysis) method (Grant & Booth, 2009) commencing with a search of electronic data based indexed original empirical articles (in MEDLINE, PsycINFO, Scopus, and CINHAL) from 1980 to December 2018. Medical errors were not explicitly acknowledged prior to 1980 and would not be objectively captured in empirical literature reliably, thus the limiting date (Sirriyeh, Lawton, Gardner, & Armitage, 2010). Articles were delimited to English language, and published in peer-reviewed journals focusing the MeSH terms: [medical errors or patient safety incident or adverse

event or second victim] AND [psychological stress or emotions or psychological adaptation or occupational accidents or occupational diseases or posttraumatic stress disorder or PTSD] AND [nurses or nurse's role or nursing care or nursing staff] applying Boolean logic. Since mistakes are a universal human experience, international studies were included. Excluded works were those focused on error-cause or prevention or those that did not report the individual nurse response. No limits were applied by practice setting, level of education, or definition of medical error. Specific aims, tools, and results of the evidence were reviewed eliminating studies focusing exclusively on organizational, team-, or patient-outcomes. Next, we read entire articles to further rule out evidence that, when further scrutinized, had not met earlier inclusion/exclusion criteria. Limiting studies to those with nurse-only samples, 21 articles were identified (Arndt, 1994; Chard, 2010; Coli et al., 2010; Crigger & Meek, 2007; de Freitas et al., 2011; Delacroix, 2017; Jones & Treiber, 2010; Kable, Kelly, & Adams, 2018; Kao et al., 2015; Karga et al., 2011; Lewis et al., 2015; Maiden et al., 2011; Meurier et al., 1997; Quillivan et al., 2016; Rassin et al., 2005; Santos et al., 2007; Schelbred & Nord, 2007; Taifoori & Valiee, 2015; Treiber & Jones, 2010, 2018a, 2018b).

Figure 2 (SALSA Search Methods)

Results

RN Symptoms of Moral Injury in Aftermath of PSI

Twenty-one empirical studies met our search criteria. First, studies were evaluated by design methods, then by error definition. Next, each study measure/tool was evaluated. Finally, each study was systematically evaluated extracting our symptoms of interest (guilt, shame, spiritual/existential conflict, loss of trust, depression, anxiety, anger, re-experiencing, self-harm,

and social problems). With the first reviews, only exact matches of descriptive words (i.e., "guilt") coded by the empirical results were used for coding our results. With later reviews of the empirical literature, close reading allowed for interpretive coding of our themes of interest. See each section below for a detailed description of the coding and extraction.

Table 1. Results of critical review of empirical literature

Qualitative Critical Review

Qualitative designs. Of the 10 qualitative studies, one used a grounded theory approach (Crigger & Meek, 2007), and one use a purely descriptive approach (Kable et al., 2018). Four used descriptive phenomenological approaches (Coli et al., 2010, Rassin et al., 2005; Santos et al., 2007; Schelbred & Nord, 2007), and four used interpretive phenomenological approaches (Arndt, 1994, de Freitas et al., 2011, Delacroix, 2017, Treiber & Jones, 2010).

Qualitative definition of error. Five studies explicity focused on medication errors as the type of nursing error (Arndt, 1994; Rassin et al., 2005; Santos et al., 2007; Schelbred & Nord, 2007; Treiber & Jones, 2010). Five studies allowed the nurse to decide what constituted the error of significance in their nursing practice (Coli et al., 2010; Crigger & Meek, 2007; de Freitas et al., 2011; Delacroix, 2017; Kable et al., 2018).

Qualitative methods. Most of the semi-structured qualitative interviews posited the same line of questioning and thus elicited a similar discussion from the study participants (Crigger, 2005; de Freitas et al., 2011; Delacroix, 2017; Kable et al., 2018; Rassin et al., 2005; Santos et al., 2007; Schelbred & Nord, 2007). One open-ended guides allowed further and deeper interviews, thus elicited a wider range of responses from participants (de Freitas et al., 2011).

Qualitative data coding and extraction. In 9 of the 10 studies, guilt was explicitly described. While one study did use the word "guilty, the authors also clearly describe a participant as stating, "I suggested that the doctor use this special type of endotracheal tube for hard-to-intubate patients… Immediately there was blood everywhere? …I have always felt that if I hadn't suggested that he use that tube, the patient wouldn't have died" (Crigger & Meek, 2007, p. 180), which we agreed would be coded as feelings of guilt. One study did not explicitly use the word "guilt", but assigned a main theme as "primacy of responsibility" and chose to use the words "fallibility", "responsibility" and "fault" throughout the text instead of guilt (Delacroix, 2017). This same method applied to the symptoms of interest, including shame, spiritual/existential conflict, loss of trust, depression, anxiety, anger, re-experiencing, self-harm, and social problems.

Moral injury symptoms in qualitative literature. Critically analyzing the ten qualitative studies, guilt was identified in 90% of the evidence (Arndt, 1994; Crigger & Meek, 2007; de Freitas et al., 2011; Delacroix, 2017; Kable et al., 2018; Rassin et al., 2005; Santos et al., 2007; Schelbred & Nord, 2007; Treiber & Jones, 2010), shame in 80% (Arndt, 1994; Crigger, 2005; de Freitas et al., 2011; Delacroix, 2017; Kable et al., 2018; Rassin et al., 2005; Santos et al., 2007; Schelbred & Nord, 2007), spiritual/existential crises in 10% (de Freitas et al., 2011), and loss of trust in 70% (Arndt, 1994; Crigger, 2005; de Freitas et al., 2011; Delacroix, 2017; Kable et al., 2018; Rassin et al., 2005; Schelbred & Nord, 2007). These qualitative studies did not specifically set out to measure, nor intentionally explore these symptoms, yet three of the four core moral injury symptoms emerged in more than 70% of the evidence. Secondary symptoms of moral injury were also frequently identified, including symptoms of: Depression (30%) (de Freitas et al., 2011; Kable et al., 2018; Schelbred & Nord, 2007), anxiety (70%)

(Crigger, 2005; de Freitas et al., 2011; Delacroix, 2017; Kable et al., 2018; Rassin et al., 2005; Santos et al., 2007; Treiber & Jones, 2010), as well as anger (80%) (Coli et al., 2010; Crigger & Meek, 2007; de Freitas et al., 2011; Kable et al., 2018; Rassin et al., 2005; Santos et al., 2007; Treiber & Jones, 2010), re-experiencing (70%) (Crigger & Meek, 2007; de Freitas et al., 2011; Kable et al., 2018; Rassin et al., 2005; Santos et al., 2007; Schelbred & Nord, 2007; Treiber & Jones, 2010), self-harm (30%) (de Freitas et al., 2011; Kable et al., 2018; Schelbred & Nord, 2007), and social problems (50%) (de Freitas et al., 2011; Delacroix, 2017; Kable et al., 2018; Rassin et al., 2005; Schelbred & Nord, 2007). Anger was seen as self-directed or towards-others. Self-harm was broadly defined as abusing alcohol or other substances (including overeating) or suicidal ideations. Other symptoms in the analysis potentially associated with moral injury included: A change in worldview (60%) (Crigger & Meek, 2007; de Freitas et al., 2011; Delacroix, 2017; Kable et al., 2018; Schelbred & Nord, 2007; Treiber & Jones, 2010), consideration of leaving a job or the profession (30%) (de Freitas et al., 2011; Delacroix, 2017; Schelbred & Nord, 2007), hyperarousal (50%) (de Freitas et al., 2011; Delacroix, 2017; Kable et al., 2018; Santos et al., 2007; Schelbred & Nord, 2007), physical symptoms (30%) (de Freitas et al., 2011; Delacroix, 2017; Schelbred & Nord, 2007), and attempts at making meaning of the PSI and the aftermath (50%) (Arndt, 1994; Delacroix, 2017; Kable et al., 2018; Santos et al., 2007; Treiber & Jones, 2010).

Table 2. References of critical review of qualitative empirical literature

Quantitative critical review

Quantitative designs. Six of the seven quantitative studies used descriptive correlational study methods (Chard, 2010, Kao et al., 2015; Karga et al. 2011, Lewis et al., 2015, Meurier et al., 1997, Quillivan et al., 2016). One used purely descriptive methods (Taifoori & Valiee, 2015).

Quantitative definition of error. One quantitative study explicity used medication errors as the type of nursing error (Kao et al., 2015). Five quantitative studies allowed the nurse to decide what constituted the error of significance in their nursing practice (Chard, 2010; Karga et al., 2011; Lewis et al., 2015; Quillivan et al., 2016; Taifoori & Valiee, 2015). And one quantitatative study specified an error definition that was not medication related (Meurier et al., 1997).

Quantitative measures. Six of the seven quantitative studies used unique measures with their study population. Lewis et al. used the Maslach Burnout Inventory plus the Agency for Healthcare Research and Quality (AHRQ) Hospital Suvey on Patient Safety Culture (HSOPSC) (2015). Chard (2010) created the Perioperative Nurse Questionnaire, which Taifoori and Valiee (2015) translated and reproduced in Iranian operating room nurses. Meuier and colleagues (1997) modified a 1991 22-item questionnaire that Wu et al. had developed to assess house officer mistakes. Karga et al. (2011) then modified Meuier's tool. Kao and colleagues (2015) created the Inventory for Perceptions of Medication Adminstration Errors (IPMAE) in Taiwan. Lastly, Quillivan et al. (2016) used the Second Victim Experience and Support Tool (SVEST) which measures both personal and organizational outcomes.

Moral injury symptoms in quantitative literature. Critically analyzing the seven qualitative studies, guilt and shame were measured in 57% of the studies (Chard, 2010; Karga et al., 2011; Meurier et al., 1997; Taifoori & Valiee, 2015), loss of trust in 43% (Karga et al., 2011; Meurier et al., 1997; Taifoori & Valiee, 2015), and spiritual/existential crisis were not measured

in any of the seven studies. Depression (43%) (Chard, 2010; Karga et al., 2011; Taifoori & Valiee, 2015), anxiety (57%) (Chard, 2010; Kao et al., 2015; Karga et al., 2011; Meurier et al., 1997) and anger (57%) (Chard, 2010; Karga et al., 2011; Meurier et al., 1997; Taifoori & Valiee, 2015), re-experiencing (29%) (Chard, 2010; Meurier et al., 1997), self-harm (14%) (Meurier et al., 1997), and social problems (71%) (Chard, 2010; Kao et al., 2015; Karga et al., 2011; Lewis et al., 2015; Meurier et al., 1997) were also highly prevalent. In this exploration, other symptoms found potentially associated with moral injury included a change in worldview (57%) (Chard, 2010; Karga et al., 2011; Lewis et al., 2015; Meurier et al., 1997), intention to leave (29%) (Kao et al., 2015; Karga et al., 2011), and physical symptoms (14%) (Taifoori & Valiee, 2015).

Table 3. References of critical review of quantitative empirical literature

Mixed method studies critical review

Mixed study methodology designs. All four of the mixed-methods studies used descriptive methods for at least one of their main study designs, with two studies using mixed descriptive methods (Treiber & Jones, 2018a, 2018b). One also applied interpretive phenomenology (Jones & Treiber, 2010), whereas Maiden and colleagues (2011) applied correlational statistical methods.

Mixed methods studies definitions of error. All four studies explicity used medication errors as the type of nursing error (Jones & Treiber, 2010; Maiden et al., 2011; Treiber & Jones, 2018a, 2018b).

Moral injury symptoms in mixed methods literature. Critically analyzing the four mixed methods studies, shame was identified in 75% of the evidence (Jones & Treiber, 2010; Maiden et al., 2011; Treiber & Jones, 2018b), while guilt (Jones & Treiber, 2010), loss of trust

(Jones & Treiber, 2010), and spiritual/existential crisis (Maiden et al., 2011) were present in 25% of studies. Depression (Jones & Treiber, 2010) and re-experiencing (Treiber & Jones, 2018a) were found in 25% of the evidence. Anxiety (Maiden et al., 2011; Treiber & Jones, 2018a, 2018b) and anger (Jones & Treiber, 2010; Treiber & Jones, 2018a, 2018b) were also common secondary moral injury symptoms in the mixed methods studies, present in 75% of the evidence. Intention to leave (Maiden et al., 2011) was captured in 25% of these studies and physical symptoms (Treiber & Jones, 2018a, 2018b) were in 50% of the mixed method studies.

Table 4. References of critical review of mixed methods empirical literature

Potential Morally Injurious Experiences Associated with a PSI

To date, there is no published work examining the degree to which PSIs and the aftermath of such occurrences result in potential moral injury, and this gap limits our understanding of the unique experiencing of nurses after a PSI.

With the evidence presented of core, secondary, and other potential symptoms associated with moral injury in this review of literature of nurses involved with a PSI, we believe the PSI and circumstances in the aftermath are pMIEs. MIEs most often stem from organizational circumstances, environmental circumstances, cultural and relational circumstances, and/or psychological circumstances (Currier et al., 2015). Like moral distress, many of these same pMIE circumstances are rooted in the same minefields that betray nurses in the quotidian of daily practice (organizational-, environmental-, and cultural-/relational-circumstances (Hamric, Borchers, & Epstein, 2012).

In the setting of a PSI, established morally distressing hazards can become pMIEs. For example: Practicing in high stakes, rapidly dynamic, environments with limited resources (e.g.,

lack of functional, appropriate, or up-to-date equipment/technologies (Chard, 2010; Jones & Treiber, 2010; Taifoori & Valiee, 2015; Treiber & Jones, 2018b); poor staffing (Arndt, 1994; Maxfield et al., 2005; Meurier et al., 1997; Taifoori & Valiee, 2015)); Punitive response to PSIs (negative experiences with harsh or even unjust application of consequences) (Arndt, 1994; Jones & Treiber, 2010; Karga et al., 2011) ; Unsupportive leadership or unhelpful and insensitive comments by colleagues (Arndt, 1994; Delacroix, 2017; Schelbred & Nord, 2007), or conversations avoided altogether (Meurier et al., 1997; Schelbred & Nord, 2007); Lateral or horizontal bullying or violence in the workplace (i.e. "feeling blamed by physicians" (Schelbred & Nord, 2007, p. 316) or as a "scapegoat" (Karga et al., 2011; Meurier et al., 1997)). Interestingly, even when systems or environments are recognized to contribute to errors, "nurses did little to exonerate or aide the affected [nurse]" (Jones & Treiber, 2010, p. 215), an attestation to the difficulty nurses may encounter in finding support in the aftermath of a PSI, even by their colleagues, adding to the crescendo of distress, and pMIE.

Limitations

This literature review stems from a sample size of eligible evidence (n=21). Two of the four mixed methods studies appear to be sampled from the same populations (Jones & Treiber, 2010; Treiber & Jones, 2010, 2018a, 2018b). While a critical review may be criticized as compared to more structured approaches of literature reviews, the emphasis of this particular type of review is on the conceptual contribution of the literature. The interpretative elements of a critical review are necessarily subjective and the resulting product is the starting point for further evaluation, not an endpoint in itself.

Discussion

Nurses involved with PSI are exposed to MIEs such as staffing letdowns, technology failures, and condemning or non-supportive *Just Culture* environments (i.e., in which individual clinicians are held accountable for system failings over which they have no control), similar to the betrayals first described herein by *frontline* hospital nurses. In this review, core moral injury symptoms were prevalent, including guilt, shame, spiritual/existential crisis, and loss of trust. Secondary and other potential symptoms were also documented, including depression, anxiety, anger, self-harm, social problems, leaving a job/the profession, and change in worldview. While neither moral injury nor pMIEs have been explored theoretically or empirically elsewhere in literature of nurses in the aftermath of a PSI, this work validates the phenomenon as operationalized according to Jinkerson (2016). MIEs are difficult to reconcile, and giving them meaning consistent with one's own worldview can be difficult. In fact, moral injury has been described as "a deep soul wound that pierces a person's identity, sense of morality, and relationship to society" (Silver, 2011).

Clinical Relevance

This moral injury research is aimed at exposing the complex betrayal traumas affecting the safety, retention, and satisfaction of our nursing workforce. Moral injury describes the potential totality of what has historically been referred to as the *second victim* phenomenon, without the victimization associated with this label. Through identification of pMIEs and the symptoms of moral injury, nurses and organizations can be empowered to advance training and intervention programs addressing pMIEs and moral injury stemming from organizational, environmental, cultural/relational, and psychological circumstances that affect nurses' safety, resilience, and retention, in the aftermath of a PSI.

The implications are of this work are critical in the broad context of the retention of our nursing workforce. Only once we name these moral betrayal traumas, we can begin to reframe them, and rebuild our moral community with an aim towards healing and retaining our highly qualified workforce. Creating and advancing nursing knowledge in moral injury research is urgent for building safe, resilient, and thriving moral nursing communities.

Figure 1. Model of Moral Distress Crescendo Effect (Epstein & Hamric, 2009, p. 15)

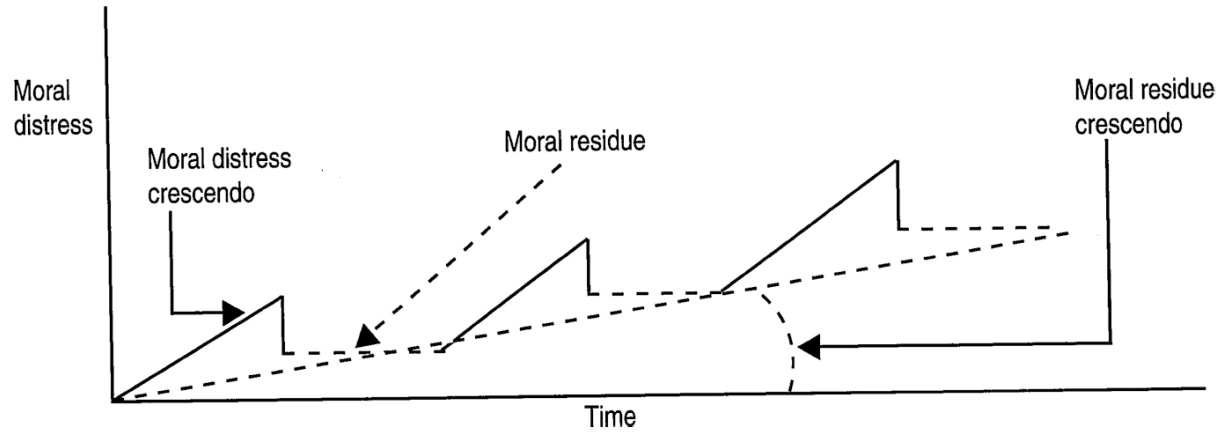


Figure 1. Model of the Crescendo Effect
Solid lines indicate moral distress; dotted lines indicate moral residue.

Figure 2. SALSA Search Results

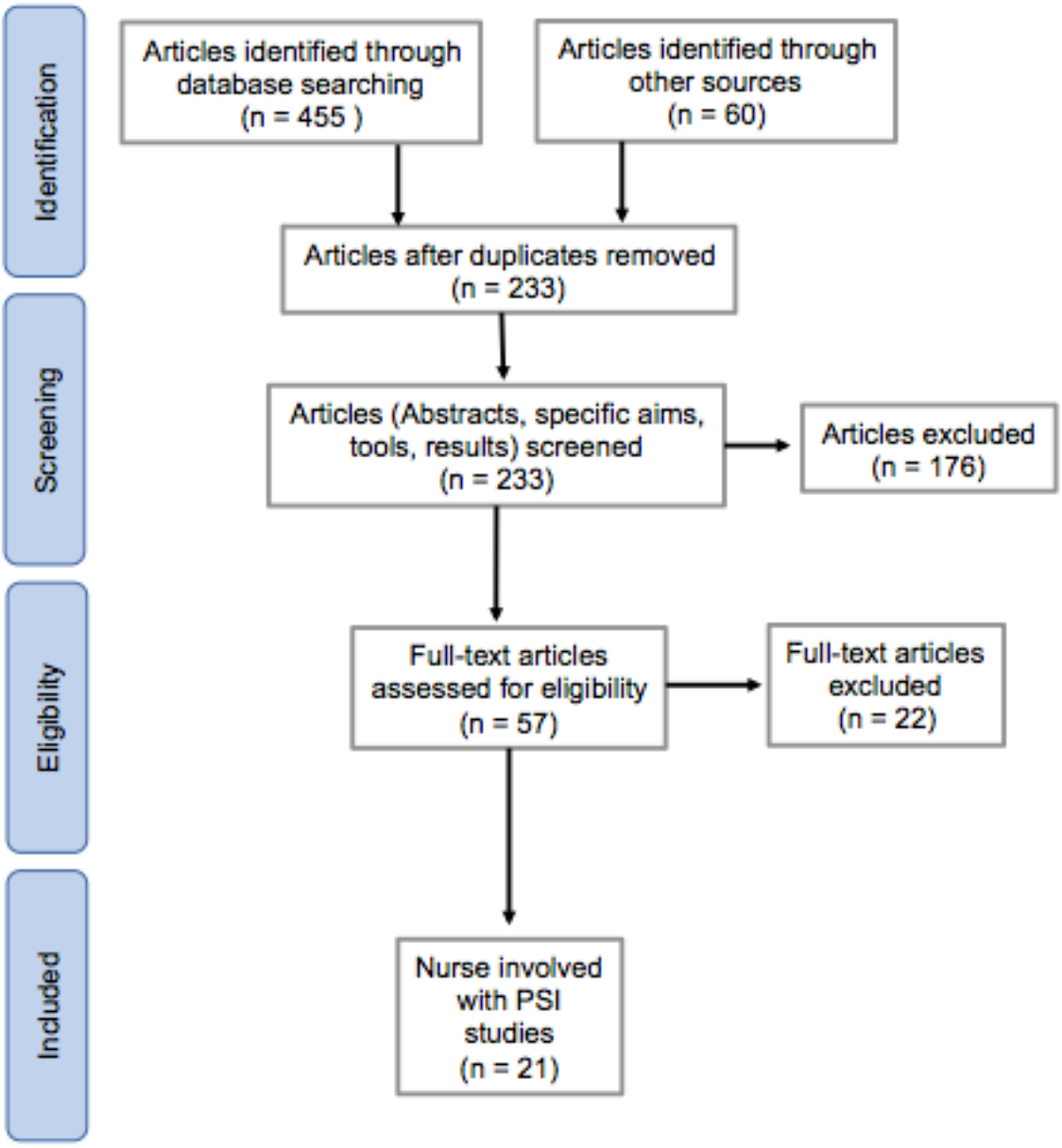


Table 1. Results of critical review of empirical literature (Nurses involved with a PSI)

	Qualitative (n = 10)	Quantitative (n = 7)	Mixed Methods (n = 4)	Total Studies (n = 21)
Core Symptoms of Moral Injury				
Guilt	9***	4*	1	14*
Shame	8**	4*	3**	15*
Spiritual/Existential crisis	1	0	1	2
Trust difficulties	7**	3	1	11*
Secondary Symptoms of Moral Injury				
Depression	3	3	1	7
Anxiety	7*	4*	1	12*
Anger	8**	4*	3**	15*
Re-experiencing	7**	2	1	9
Self-harm	3	1	0	4
Social problems	5*	5*	0	10
Other Symptoms Potentially Associated with Moral Injury				
Change in worldview	6*	4*	0	10
Leaving	3	2	1	6
Hyperarousal	5*	0	0	5
Physical symptoms	3	1	2*	6
Meaning making	5*	0	0	5

Table 2. References of critical review of qualitative empirical literature (Nurses involved with a PSI)

	Arndt (1994)	Coli et al. (2010)	Crigger & Meek (2007)	de Frietas et al. (2011)	Delacroix (2017)	Kable (2018)	Rassin et al. (2005)	Santos et al. (2007)	Schelbred & Nord (2007)	Treiber & Jones (2010)	% Evidence
Core Symptoms of Moral Injury											
Guilt	Y		Y	Y	Y	Y	Y	Y	Y	Y	90
Shame	Y		Y	Y	Y	Y	Y	Y	Y		80
Spiritual / Existential crisis				Y							10
Loss of trust	Y		Y	Y	Y	Y	Y		Y		70
Secondary Symptoms of Moral Injury											
Depression				Y		Y			Y		30
Anxiety			Y	Y	Y	Y	Y	Y		Y	70
Anger		Y	Y	Y	Y	Y	Y	Y		Y	80
Re-experiencing			Y	Y		Y	Y	Y	Y	Y	70
Self-harm				Y			Y		Y		30
Social problems				Y	Y	Y	Y		Y		50
Other Symptoms Potentially Associated with Moral Injury											
Change in worldview			Y	Y	Y	Y			Y	Y	60
Leaving				Y	Y				Y		30
Hyperarousal				Y	Y	Y		Y	Y		50
Physical symptoms				Y	Y				Y		30
Meaning making	Y				Y	Y		Y		Y	50

Table 3. References of critical review of quantitative empirical literature (Nurses involved with a PSI)

	Chard (2010)	Kao et al. (2015)	Karga et al. (2011)	Lewis et al. (2015)	Meurier (1997)	Quillivan (2016)	Taifoori & Valiee (2015)	% Evidence
Core Symptoms of Moral Injury								
Guilt	Y		Y		Y		Y	57.1
Shame	Y		Y		Y		Y	57.1
Spiritual / Existential crisis								0
Loss of trust			Y		Y		Y	42.9
Secondary Symptoms of Moral Injury								
Depression	Y		Y				Y	42.9
Anxiety	Y	Y	Y		Y			57.1
Anger	Y		Y		Y		Y	57.1
Re-experiencing	Y				Y			28.6
Self-harm					Y			14.3
Social problems	Y	Y	Y	Y	Y			71.4
Other Symptoms Potentially Associated with Moral Injury								
Change in worldview	Y		Y	Y	Y			57.1
Leaving		Y	Y					28.6
Hyperarousal								0
Physical symptoms							Y	14.3
Meaning making								0

Table 4. References of critical review of mixed methods empirical literature (Nurses involved with a PSI)

	Jones & Treiber (2010)	Maiden (2011)	Treiber & Jones (2018a)	Treiber & Jones (2018b)	% Evidence
Core Symptoms of Moral Injury					
Guilt	Y				25
Shame	Y	Y	Y		75
Spiritual / Existential crisis		Y			25
Loss of trust	Y				25
Secondary Symptoms of Moral Injury					
Depression	Y				25
Anxiety		Y	Y	Y	75
Anger	Y		Y	Y	75
Re-experiencing				Y	25
Self-harm					0
Social problems					0
Other Symptoms Potentially Associated with Moral Injury					
Change in worldview					0
Leaving		Y			25
Hyperarousal					0
Physical symptoms			Y	Y	50
Meaning making					0

Chapter III

Title

Personality traits and traumatic outcome symptoms in registered nurses in the aftermath of a patient safety incident

Authors

Mady Stovall, MSN, ANP-BC, RN, PhD Student

StovallM@ohsu.edu

Jenny Firkins, PhD, RN, Assistant Professor

FirkinsJ@ohsu.edu

Lissi Hansen, PhD, RN, Professor

HansenLi@ohsu.edu

Nathan F. Dieckmann, PhD, Associate Professor

dieckman@ohsu.edu

Michelle van Ryn, PhD, MPH, Professor

vanRyn@ohsu.edu

Journal Acknowledgement

Submitted 22 February 2020 to

Accepted April 23, 2020

Journal of Patient Safety

doi:

Impact Fact 3.386 – H Index 29

Funding Acknowledgement(s)

OHSU School of Nursing Dean's Dissertation Award,

Delta-Alpha-at-Large Sigma International for dissertation funding, and

Beta Psi Sigma International for the Naomi Ballard Dissertation Award

Acknowledgement

REDCap (Research Electronic Data Capture) is a secure, web-based software platform designed to support data capture for research studies, providing 1) an intuitive interface for validated data capture; 2) audit trails for tracking data manipulation and export procedures; 3) automated export procedures for seamless data downloads to common statistical packages; and 4) procedures for data integration and interoperability with external sources.

Keywords

moral injury, patient safety, perfectionism, neuroticism, nurse second victim

ABSTRACT

Objectives

The purpose of this study was to investigate the relationship between personality traits, perfectionism and neuroticism, and the traumatic outcomes of re-experiencing, avoidance, and alcohol abuse severity of registered nurses (RNs) who have been involved with a patient safety incident (PSI). We hypothesized that higher scores for perfectionism and neuroticism would predict higher re-experiencing and avoidance symptoms in RNs in the aftermath of a PSI. Also, RNs with higher perfectionism and neuroticism sum scores would be more likely to abuse alcohol.

Methods

A descriptive, correlational study design was utilized to characterize the relationships of personality traits and potential traumatic outcomes of RNs in the aftermath of a PSI. The Almost Perfect Scale-Revised, Neuroticism Scale, PTSD Check List for DSM-V, and Alcohol Use Disorders Identification Test-Consumption measures were administered to RNs licensed in Oregon and New York.

Results

Perfectionist-discrepancy personality traits ($p<0.01$) were the strongest predictors for re-experiencing symptoms and neuroticism ($p<0.05$) was the strongest predictor for avoidance symptoms, when controlling for sociodemographics and experience. We found a negative linear

relationship between perfectionism-order and alcohol abuse severity (β= - 0.15, $p<0.01$, CI= - 0.24 + 0.05).

Conclusions

This study supported a statistically significant relationship between perfectionism-discrepancy and re-experiencing and, between neuroticism and re-experiencing and avoidance, each explaining 4% of variance of their model. Results inform nurse *second victim* literature by validating two PTSD symptoms in RNs in the aftermath of a PSI. RNs with perfectionism-order were less likely to abuse alcohol.

Personality traits and traumatic outcome symptoms in registered nurses in the aftermath of a patient safety incident

Introduction

A **patient safety incident** (PSI) is defined as an event or circumstance that resulted, or could have resulted, in unnecessary or unanticipated harm to a patient (World Health Organization, 2009). Nurses traumatized by involvement with a PSI (often referred to as *second victims)* routinely cite perfectionism imperatives as a source of distress in the aftermath of the event (Coli et al., 2010; Crigger & Meek, 2007; Edrees et al., 2011; Jones & Treiber, 2010; Rassin et al., 2005; Scott et al., 2009; Treiber & Jones, 2010; Ullstrom et al., 2014; Wolf et al., 2000). **Perfectionism** is a multidimensional construct reflecting a strong commitment to unrealistically high standards for accomplishment and the inability to accept one's own mistakes (Frost et al., 1990). A positive correlation between perceived stress and personality characteristics such as perfectionism (Kelly & Clark, 2017) and neuroticism (Shimizutani et al., 2008; Wu, Ge, Sun, Wang, & Wang, 2011a) has been established in nurses. **Neuroticism** can be defined by its items referring to irritability, anger, sadness, anxiety, worry, hostility, self-consciousness, and vulnerability, which have been found to be substantially correlated with one another in factor analyses (Costa & McCrae, 1992; Goldberg, 1993; Lahey, 2009). For individuals who are high on neuroticism, negative emotional responses to challenges are both frequent and tend to be out of proportion to the circumstances (McCrae & Costa, 2003). Additionally, persons high in neuroticism are often self-critical, sensitive to the criticism of others, and feel personally inadequate (Lahey, 2009). Neuroticism scores have been shown to be

significantly lower in nurses and physicians who have not made medical errors compared to those who have made medical errors (Babaei, Mohammadian, Abdollahi, & Hatami, 2018).

Perfectionism, in non-nurses, has been shown to contribute significantly to post-trauma processing (Brown & Kocovski, 2014; Shikatani et al., 2015). Numerous subscales measuring perfectionism exist with different iterations. Perfection-order is defined as *a preoccupation with organization* (Smith et al., 2019). High Standards is defined as *constantly striving for excellence* (Smith et al., 2019). Individuals with High Standards are concerned over mistakes, but tend to be complex, analytic, philosophical and innovative in their responses. Perfection-discrepancy is defined as *a perceived gap between how one is and how one would like to be* (Smith et al., 2019), and has been shown to be a maladaptive trait (Rice & Richardson, 2014). Nurses with maladaptive perfectionism often keep their problems to themselves and cannot admit their failures to others, which can seriously compromise teamwork among their nursing and medical colleagues (Melrose, 2011), and potentially negatively impact patient safety. Maladaptive, discrepant, perfectionists tend to be highly self-critical, distressed, and have emotion-regulation problems (Rice & Aldea, 2006; Rice, Richardson, & Tueller, 2014). These types of perfectionists participate in self-ruminating as well as constant playback of mistakes (Dunkley et al., 2014; Olson & Kwon, 2008), 'playback' is a form of re-experiencing. Specifically, this re-experiencing is an intrusive symptom and part of the DSM-V posttraumatic stress disorder (PTSD) diagnostic criteria (American Psychiatric Association. Diagnostic and Statistical Manual Task Force, 2013) (APA DSMTF). In one study, one-third of potential nurse study participants declined to enroll, frequently citing reasons related to wanting to '*avoid revisiting the memories* [of the PSI and

aftermath]' (Schelbred & Nord, 2007). Importantly, DSM-V PTSD diagnostic criteria also includes at least one avoidance symptom (APA DSMTF, 2013) .

Evidence linking PTSD and alcohol abuse severity (Pietrzak, Goldstein, Southwick, & Grant, 2011), perfectionism and alcohol abuse severity (Mackinnon, Ray, Firth, & O'Connor, 2019; Mackinnon et al., 2011; Sherry et al., 2012), and neuroticism and alcohol abuse severity (Kopera et al., 2018; Perrin et al., 2014; Pombo, Luísa Figueira, Walter, & Lesch, 2016; Sells et al., 2016; Zilberman, Yadid, Efrati, Neumark, & Rassovsky, 2018) exists, although has yet to be shown specifically in nurses. One study found persons with comorbid PTSD and alcohol dependency, have more difficulty with anxiety, mood disorders, neuroticism, and aggression (Sells et al., 2016) compared to those without alcohol dependency. However, in terms of nurses, we do have evidence they are likely to abuse alcohol in the aftermath of a PSI (Seys et al., 2013; Van Gerven, Vander Elst, et al., 2016; White et al., 2008).

Purpose. The purpose of this study was to examine whether there was a relationship between personality traits, perfectionism and neuroticism, and trauma-related outcomes (re-experiencing, avoidance, and alcohol abuse severity) of RNs who have been involved with a PSI. We hypothesized that higher scores for perfectionism and neuroticism would predict higher re-experiencing and avoidance symptoms in RNs in the aftermath of a PSI. Additionally, we predicted in the aftermath of a PSI, nurses with higher perfectionism and neuroticism sum scores would be more likely to abuse alcohol.

Significance. This work is timely and significant because this important phenomenon has received insufficient study. To our knowledge, there is only one nurse *second victim* study to date that demonstrated a relationship between PSI and PTSD (Rassin et al., 2005). Yet, nurse *second victims* have described having PTSD trauma symptoms after involvement with a PSI, and

they are long lasting, even more than a decade, after involvement with a PSI (Rassin et al., 2005; Schelbred & Nord, 2007; Scott et al., 2009; Serembus et al., 2001; Ullstrom et al., 2014; Van Gerven, Bruyneel, et al., 2016; Wolf et al., 2000). This study specifically works to fill these gaps. Only one *second victim* study, a blended nurse and physician sample, has empirically measured alcohol consumption (Van Gerven, Vander Elst, et al., 2016) in the aftermath of a PSI. Again, our study addresses this gap by empirically measuring alcohol use in our population of interest given the known risk.

Methods

Design. A descriptive, correlational study design was utilized to characterize the relationships of personality traits and potential traumatic outcomes of RNs in the aftermath of a PSI. The data presented in the paper is a portion of an analysis of a larger study data set, that included seven additional measures and a single open-ended qualitative item.

Sample. After Institutional Review Board approval, we recruited RNs from the state board registries from Oregon (OR) and New York (NY). Study inclusion criteria required working in a clinical setting within the past 5 years, admit to having been involved in a PSI during their nursing career, and currently licensed as a RN in the state of OR or NY. The first 200 study participants were incentivized with a $20 Amazon eGift card for completing the study.

Data Collection. Study data were collected, anonymized, and managed using REDCap (Research Electronic Data Capture) electronic data capture tools hosted at Oregon Health & Science University (Harris, Taylor, Minor, al., & The REDCap Consortium, 2019; Harris et al., 2009).

We used Excel to generate a vector of random numbers corresponding to each of the potential participant email addresses. After the random numbers were generated, the numbers

and corresponding emails were sorted from lowest to highest order. The first 1000 emails were selected to be in potential participant cohort number 1. Then, we sent groups of 2500 emails in an additional four different cohorts until we reached a minimum of 200 study participants (11,000 random recruitment messages sent). A total of 2,569 emails were returned as undeliverable.

Measures

The Almost Perfect Scale-Revised, Neuroticism Scale, PTSD Check List for DSM-V (PCL-5) (measuring only re-experiencing and avoidance), and the Alcohol Use Disorders Identification Test-Consumption (AUDIT-C) measures were administered to study participants. Additionally, study participants contributed information regarding sociodemographics and unique study variables pertaining to PSIs.

Measures of independent variables

Almost Perfect Scale-Revised (APS-R). The APS-R was used to measure aspects of perfectionism. The scale is composed of 23 items scored on a 7-point Likert-scale from 1 (*strongly disagree*) to 7 (*strongly agree*). The APS-R consists of three subscales: High Standards, Order, and Discrepancy. The High Standards scale is scored by summing items 1, 5, 8, 12, 14, 18, and 22 and a range between 25-49 indicates perfectionism (Slaney, Rice, Mobley, Trippi, & Ashby, 2001). The Order scale is scored by summing items 2, 4, 7, and 10, with a score between 14-28 indicates perfectionism (Slaney et al., 2001). The Discrepancy scale is scored by summing items 3, 6, 9, 11, 13, 15, 16, 17, 19, 20, 21, and 23, with a score between 42-84 indicating perfectionism (Slaney et al., 2001). This measure has high reliability ($\alpha \geq .85$ (Slaney et al., 2001)). In the current study, α reliability was .89.

Neuroticism (N). Participants' tendency to experience negative emotional states, or neuroticism, was measured using a subset of four items previously adapted (Benet-Martinez & John, 1998; John, Donahue, & Kentle, 1991; John, Naumann, & Soto, 2008). Items are summed to provide a total severity score (range 7-28). Along a 7-point range, anchored by 1 (*strongly disagree*) and 7 (*strongly agree*) respondents were asked to indicate their level of agreement with four separate statements. Specifically, whether they consider themselves to be someone who: (a) worries a lot, (b) can be tense, (c) gets nervous easily, and (d) can be moody (α = .89) (Lagoe & Atkin, 2015). Scores of all four items were summed. Along this scale, higher scores denote increased neurotic tendencies. In the current study, α reliability was .86 (Slaney et al., 2001).

Measures of outcome variables

PTSD Checklist (PCL-5) measuring only re-experiencing and avoidance. The PTSD Check List (PCL-5) (Blevins, Weathers, Davis, Witte, & Domino, 2015; Bovin et al., 2016; National Center for PTSD, 2016; Valenstein et al., 2009; Weathers et al., 2013) assessed re-experiencing and avoidance symptoms presence and severity over the past month. Participants were requested to report symptoms relative to their PSI (the specific stressor, based upon the PCL-S (Weathers & Keane, 2007). PCL-5 is a self-report measure of 20-items on a 5-point Likert scale ranging from 0 (*not at all)* to 4 (e*xtremely)*. Items are summed to provide a total severity score (range 0-80). Re-experiencing and avoidance can be measured by totaling the scores of items 1–5 and items 6–7 of the PCL-5, respectively. This scale has high reliability (α = .95 (Weathers et al., 2013)). In the current study, α reliability was .93.

Alcohol abuse severity. The AUDIT-C is a brief alcohol screening tool that reliably identifies persons who are hazardous drinkers or have active alcohol use disorders (Bush,

Kivlahan, McDonell, Fihn, & Bradley, 1998). AUDIT-C uses cutoff score of 3 points for women (4 for men) as the threshold for potentially hazardous drinking. Items are summed to provide a total severity score (range 0-12). Given our study participants are 93% female, we chose to use 3 as a cutoff point and to treat all study participants as female. This scale performs well for females with areas under the receiver operating characteristic curves (AUROCs) (sensitivity .73, specificity .91) (Bradley et al., 2007).

Data Analysis. Data were analyzed using StataMPv16 (College Station, TX). Standard descriptive statistics were calculated for the sample. Proportion of variance explained was evaluated with r^2 coefficient of determination. Preliminary and post-estimation analyses were conducted to ensure that no assumptions of normality, linearity, homoscedasticity, or multicollinearity were violated. To examine the direct effects of personality traits, three multiple linear regression models were constructed using the RN traumatic outcome dimensions as outcome variables. To control for their unique effects, demographic and experience variables (age, years licensed as RN, highest earned nursing degree, highest earned non-nursing degree, years at current job, and degree of patient harm) along with the hypothesized personality traits were entered simultaneously into our regression model to assess for the effects of the potentially traumatic outcomes associated with involvement in a PSI. After regression modeling, we quantified the variance inflation factor (VIF) values in a post-hoc analysis of collinearity with a cut-off point set to 10. Our VIF for years RN and age were 5.07 and 4.87, respectively because the longer a nurse had been licensed the older in age the RN. This correlation is logical and expected. All other VIFs were below 2. All the model residuals were examined as well to ensure no assumptions were violated. Finally, we reran all of the models with robust standard errors because of concerns of heterogeneity, and came to the same substantive conclusions.

Results

A total of 216 RNs met inclusion criteria and completed more than 75% of the survey between June and September 2019. A 2.55% response rate was achieved. Due to missing data, this study analysis had 187 participants.

Nurses ranged in ages from 23 to 74 years (M = 44) and were licensed as an RN from 1 – 49 years (M = 16.22). The sample identified as 93% female, 5% male, 1% non-binary, and 2% did not wish to disclose. Table 1 displays the demographic data for years in current job, highest earned nursing degree, highest earned non-nursing degree, current primary professional practice role, primary area of specialty practice, and the patient safety incident variable. Most nurses had been in their current job for 6 years, had a bachelor of science in nursing, did not have any other college degree, practiced clinical nursing in a hospital, and the PSI of significance in their career had caused temporary harm to a patient.

Table 2 shows the means and standard deviations (SD) and range values for the independent variables, perfectionism-high standards (43.35 ± 4.67), order (24.03 ± 3.19), discrepancy (41.61 ± 15.56) and neuroticism (18.34 ± 5.80), and the dependent outcome variables, re-experiencing (3.16 ± 3.91), avoidance (1.33 ± 1.94), and alcohol abuse severity (2.17 ± 1.79).

Table 3 shows the regression model results for re-experiencing, avoidance, and alcohol use among nurses involved with a PSI. There is a positive linear relationship between neuroticism and re-experiencing (β=0.12, p=0.05, confidence interval (CI)= < - 0.01–0.24) and between neuroticism and avoidance (β=0.08, p<0.05, 95%CI= 0.02–0.14). This finding suggests that the higher a nurse scored in neurotic traits, so too was the that nurse's tendency to significantly experience avoidance and re-experiencing symptoms. Table 3 demonstrates the

findings that supported our hypotheses that the personality traits of perfectionist with discrepancy traits ($p<0.01$) contributed to predicting re-experiencing symptoms (R^2= 18.94%, 19, 181) when controlling for sociodemographics and experience variables, which explained 4% of the variance in the model (eta-squared 0.04, df=1, 95% CI= 0.002-0.115). This finding suggests that nurses with a perceived gap between how one is and how one would like to be were more likely to suffer re-experiencing symptoms. Furthermore, we hypothesized, and it was confirmed, that the personality trait of neuroticism ($p<0.05$) would predict avoidance symptoms, which explained 4% of the variance in the model (R^2= 13.50%, 19, 178) when controlling for sociodemographics and experience variables (eta-squared 0.04, df=1, 95% CI= 0.002-0.111). Unexpectedly, the personality trait of perfectionism–order ($p<0.01$) had a protecting effect against alcohol abuse severity symptoms (R^2= 13.56%, 19, 183), when controlling for sociodemographics and experience variables, which explained 5% of the variance in the model (eta-squared 0.051, df=1, 95% CI= 0.006-0.128). This finding suggests that RNs who have a preoccupation with organization were significantly less likely to abuse alcohol.

Discussion

In *second victim* studies, re-reexperiencing (Chard, 2010; Crigger & Meek, 2007; Harrison et al., 2015; Joesten et al., 2015; Kable et al., 2018; Mira et al., 2015; Rassin et al., 2005; Santos et al., 2007; Schelbred & Nord, 2007; Treiber & Jones, 2010) has been described as "long lasting – for months or even years" (Edrees et al., 2011, p. 104) but there has been little investigation of what factors exacerbate or protect from these persistent effects. RNs with perfectionist-discrepancy traits were significantly more likely to suffer re-experiencing symptoms, and RNs with neuroticism traits were significantly more likely to experience re-

experiencing and avoidance symptoms (Cohen, 1988; Cohen, 1992). Our findings add to the *second victim* literature by suggesting RN perfectionists, those with maladaptive tendencies, participate in self-ruminating as well as constant playback of mistakes (Dunkley et al., 2014; Olson & Kwon, 2008), and are more likely at risk for PTSD, although this work needs to be reproduced with a larger sample. Our finding that discrepant-perfectionists endure re-experiencing is consistent with Melrose (2011) report that nurses with maladaptive perfectionism tend to become preoccupied with ruminating about their problems along with strong emotional responses (p. 638). Also, our findings are congruent with prior evidence that suggest persons high in neuroticism are more likely to use inefficient escape avoidance strategies to cope with stress (Bolger, 1990; Lahey, 2009), and this further supports a risk for PTSD.

In our study, RNs with perfectionist–order traits were significantly less likely to abuse alcohol. This finding was unanticipated. The findings of Van Gerven, Vander Elst, et al. (2016), and historical *second victim* literature report increased alcohol abuse severity in the aftermath of a PSI (Seys et al., 2013; White et al., 2008). Our study is the first to offer a protective factor against alcohol abuse severity, however increasing evidence shows the perfectionist-order subscale does not offer empirical predictive benefit over perfectionist-high standards or perfectionist-discrepancy subscales, and use of this sub-scale has even been recommended against (Rice & Richardson, 2014; Stoeber & Otto, 2006). Based upon our findings, it would be inappropriate to make strong assumptions about our population based on this one sub-scale.

The goal of this study was to investigate the effect of personality traits of perfectionism and neuroticism on the traumatic outcomes of re-experiencing, avoidance, and alcohol abuse severity of RNs who have been involved with a PSI. The results of this study indicate that, in the aftermath of a PSI, RNs with perfectionist-discrepancy traits were more likely to have re-

experiencing symptoms. Those with neuroticism personality traits were more likely to have re-experiencing and avoidance symptoms. And, those with perfectionist–order traits were less likely to abuse alcohol.

The findings of this study have important implications for nurses, administrative managers in healthcare organizations, and researchers. This study served as a pioneering effort to the current understanding between personality traits and traumatic outcomes in RNs involved in PSIs. RNs with neurotic traits were statistically more likely to suffer re-experiencing and avoidance symptoms in the aftermath of a PSI in our study. As previously noted, a very small study showed neuroticism sum-scores were significantly higher in nurses and physicians who had made medical errors compared to those who had not ($n=95$, $t=34.59$, $p=0.001$) (Babaei et al., 2018).

Limitations. First, our study data were collected with self-reported questionnaires, which may have resulted in underreporting, especially troublesome given the sensitive nature of our subject data. However, self-report is the gold standard for the phenomena being measured here. Second, all of the personal experiences and characteristics of the nurses may influence the answers on the questionnaires, which may create bias, potentially resulting in residual confounding.

Partly due to the intrusive symptoms, and other fear factors, recruitment for *second victim* research is challenging. Having low response rates of surveys wherein clinicians, especially nurses, are asked to describe events or errors that could be negligent, criminal, unethical, or troubling is not unexpected (Dillman, 2014). Of the few nurse *second victim* studies that have applied random sampling, response rates (RR) are low. One group achieved an 8.2% RR (Jones

& Treiber, 2010; Treiber & Jones, 2010) and another a 6.35% RR (Wolf et al., 2000). Our study achieved a 2.55% RR. There are four primary reasons for professionals' nonparticipation in surveys, identified in a seminal article by Sudman (1985): Time constraints, poor perceived value, issues of confidentiality, and perceptions of bias (Sudman, 1985). Nurses in particular may not see the relevance of particular research to their practice, and thus may not participate based upon this misperception (Broyles, Rodriguez, Proce, Bayliss, & Sevick, 2011; VanGeest & Johnson, 2011). Nonresponse bias is most likely to be a threat where reasons for survey nonresponse are related to the survey topic or to a characteristic that the survey aims to measure (Lewis, Hardy, & Snaith, 2013). Participation may have been low because of participants suspicions about how email-address were obtained (from each respective state Board of Nursing), which we failed to disclose in the recruitment message This simple oversight likely created a lack of confidence and a high non-response rate. Sensitive subject studies should proactively disclose how potential subjects came to be in the pool of contacts. A major limitation of this study is the low RR, which is a concern to the extent that the observed relationship between variables differs between respondents and non-respondents. While there is not obvious reason why the relationship between variables would be different in this sample versus the full population, future studies should seek to recruit a larger sample to overcome limitations encountered herein. Advancing methods for reducing non-response by assuaging fear of self-incrimination, blame, shame, or exposure to painful memories (Cho, Johnson, & Van Geest, 2013; Crespi, 2014; Jinkerson, 2016; Mealer & Jones, 2013) is an important goal to advance the quality of studies.

Methods of recruitment need to consider the timing, location, and privacy protections of

potential participants. Mode of data collection (i.e., mail, online, mixed modes) is significantly related to survey RR (Cho et al., 2013; VanGeest & Johnson, 2011), with paper often yielding higher RR in nurse *second victim* research than electronic (Chard, 2010; Jones & Treiber, 2010; Wolf et al., 2000). Privacy of subjects is imperative and trust is paramount to obtaining reliable data. Future works may even need to obtain a certificate of confidentiality to help ensure litigation protection.

Of note is that traditionally, personality has been viewed as fairly stable across adulthood (McCrae & Costa, 2008), but other researchers have suggested that personality is malleable across the life span and may be influenced by person-environment interactions, including stressful life experiences (Roberts, Wood, & Caspi, 2008). Our study measured a single point in time and did not make attempts to measure changes in the state of neuroticism or perfectionism.

Conclusion

Our study supported a statistically significant relationship between perfectionism-discrepancy and re-experiencing and, between neuroticism and re-experiencing and avoidance. The implications of these findings are important to nurse *second victim* literature because this adds to the empirical evidence of PTSD symptoms, specifically re-experiencing and avoidance, in RNs in the aftermath of a PSI.

Additionally, in our study, RNs with perfectionism-discrepancy traits were statistically more likely to suffer re-experiencing symptoms in the aftermath of a PSI. We recommend using the APS-R measures, but only the High Standards and Discrepancy sub-scales. In our study, as in Rice and Richardson (2014), and Stoeber and Otto (2006), the perfectionism-order results were not as robust. Our APS-R-order sub-scale alpha was 0.81.

We are concerned about the potential abuses of using neuroticism or other theoretically negative personality traits as a predictive method for screening employees. Neuroticism exists as a universal trait in part because it does have certain benefits for adaptive functioning (Crespi, 2014). However, appreciating the personality traits of employees can help to understand those most at risk for burnout (Shimizutani et al., 2008), PTSD (Mealer & Jones, 2013), or moral injury (Stovall, Hansen, & van Ryn, 2020). Through early identification of at-risk RNs, therapeutic interventions (i.e., individual counseling) can be instituted prior to the RN reaching the point of dropping out of the workforce.

Future work. Cultivating empirical evidence to support and emancipate RNs in the aftermath of a PSI of morally injurious experiences is imperative. Future studies should empirically validate other PTSD symptoms (APA DSMTF, 2013; (Weathers et al., 2013), such as functional impairment, hyper-arousal, negative mood, or morally injurious symptoms (Jinkerson, 2016) such as guilt, shame, or loss of trust. Ideally a longitudinal study could also consider measuring the centrality of the event to the potentially traumatized RN as a method of correlating the potential change in personality traits with the PSI of significance (Sutin, Costa, Wethington, & Eaton, 2010). Only through empirically validating the trajectory of RNs experiences in the aftermath of a PSI can we confidently build programs aimed at supporting and retaining our highly qualified workforce.

Closing summary. In summary, this study addresses several gaps in nurse *second victim* literature: 1) we are the first to specifically evaluate personality traits of perfectionism and neuroticism in RNs in the aftermath of a PSI, 2) we specifically measure the DSM-V diagnostic

criteria for re-experiencing and avoidance, and validate the occurrence of two PTSD symptoms in our population, and 3) we empirically evaluate alcohol use in our population.

Table 1: Demographic Data		
	Range (*Mean*)	n (%)
Years in Current Job	0 – 41 (*6.4*)	213 (99)
Highest Earned Nursing Degree	ADN BSN MSN DNP PHD	40 (18.6) 131 (60.93) 37 (17.2) 5 (2.33) 2 (0.93)
Highest Earned Non-Nursing Degree	Not Applicable Associates Bachelors Masters Doctorate	100 (48.78) 40 (19.51) 50 (24.39) 13 (6.34) 2 (0.98)
Current Primary Professional Practice Role	Clinical RN – Hospital Clinical RN – Outpatient RN – Community Based Nurse Practitioner Clinical Nurse Specialist Nurse Administrator – Hospital Nurse Administrator – Outpatient Clinic Certified Registered Nurse Anesthetist Nurse Educator Other, Not Listed	116 (54.21) 27 (12.62) 20 (9.35) 9 (4.21) 1 (0.47) 5 (2.34) 6 (2.8) 3 (1.4) 6 (2.8) 21 (9.81)
What is your primary area of specialty practice? May select more than one specialty area, thus sum is great than 100%.	Primary Care Critical Care Oncology Mental Health Women's Health Pediatrics Orthopedics Gerontology Research Administration Operating Room Emergency Department Education Medical / Surgical Not Listed	9.4% 15.7% 6% 7.2% 9.8% 6% 2.1% 3.8% 0.4% 2.1% 8.1% 11.1% 4.26% 21.3% 25.5%
Patient Safety Incident Variable		
In thinking about the PSI of most significance in your career, rate the degree of harm to the patient.	Unknown No Harm Temporary Harm Permanent Harm Death	11 (5.12%) 67 (31.16%) 84 (39.07%) 22 (10.23%) 31 (14.42%)
ADN = Associate Degree Nursing; BSN = Bachelor Degree Nursing; MSN = Master Degree Nursing; DNP = Doctorate of Nursing Practice; PHD = Doctor of Philosophy; RN = Registered Nurse		

Table 2: Personality Trait Independent Variables		
	mean ± SD	Range
Almost Perfect Score – High Standards	43.35 ± 4.67	25-49
Almost Perfect Score – Order	24.03 ± 3.19	14-28
Almost Perfect Score – Discrepancy	41.61 ± 15.56	42-84
Neuroticism	18.34 ± 5.80	7-28
Traumatic Outcome Variables		
	mean ± SD	
Re-experiencing Symptoms	3.16 ± 3.91	0-20
Avoidance Symptoms	1.33 ± 1.94	0-8
Alcohol Abuse Severity	2.17 ± 1.79	0-12

Table 3. Regression Model of Re-experiencing, Avoidance, and Alcohol Use Among Nurses involved with a PSI						
Variable	**Outcome 1: Re-experiencing**		**Outcome 2: Avoidance**		**Outcome 3: Alcohol Abuse Severity**	
Demographic	**β**	**95% Conf. Interval**	**β**	**95% Conf. Interval**	**β**	**95% Conf. Interval**
Age	- 0.02	- 0.11 - 0.08	< 0.01	- 0.04 – 0.06	- 0.01	- 0.06 – 0.03
Years Licensed as RN	< 0. 01	- 0.10 – 0.10	< - 0.01	- 0.07 – 0.04	< 0.01	- 0.04 – 0.06
Years at Current Job	- 0.02	- 0.11 – 0.07	< 0.01	- 0.04 – 0.05	0.02	- 0.02 – 0.06
Highest Earned Nursing Degree Associates - 1 Bachelors – 2 Masters - 3 DNP - 4 PhD - 5	 - 0.91 - 0.04 - 0.14 - 1.67	 - 2.47 – 0.65 - - 1.64 – 1.71 - 4.11 – 3.83 - 9.72– 6.39	 - 0.38 - - 0.19 - 0.11 - 0.48	 - 1.18 – 0.41 - - 1.04 – 0.66 - 2.10 – 1.88 - 4.53 – 3.57	 - 0.11 - 0.16 - 1.73 - 0.79	 - 0.85 – 0.61 - - 0.61 – 0.93 - 3.58 – 0.11 - 4.54 – 2.96
Highest Earned Non-Nursing Degree Associates - 1 Bachelors - 2 Masters- 3 Doctorate – 4 Having No Other Degree – 5	 - 0.65 0.15 - 0.58 - 0.22 -	 - 1.53 – 1.66 - 1.28 – 1.59 - 3.07 – 1.91 - 5.33 – 5.77 -	 0.94 - 0.15 - 0.70 0.09 -	 - 0.71 – 0.89 - 0.88 – 0.58 - 2.01 – 0.60 - 2.69 – 2.87 -	 - 0.34 0.46 - 0.28 2.04 -	 - 1.08 – 0.40 - 0.21 – 1.13 - 1.43 – 0.88 - 0.54 – 4.62 -
Degree of Patient Harm No Harm – 0 Temporary Harm- 1 Permanent Harm - 2 Death - 3 Unknown - 4	 - - 0.08 < - 0.01 0.18 - 0.10	 - - 1.43 – 1.27 - 2.12 – 2.11 - 1.64 – 2.00 - 2.99 – 2.78	 - 0.05 0.39 0.26 - 0.67	 - - 0.64 – 0.73 - 0.69 – 1.48 - 0.66 – 1.18 - 2.05 – 0.71	 - - 0.16 0.41 - 0.40 - 0.10	 - - 0.79 – 0.46 - 0.57 – 1.40 - 1.24 – 0.45 - 1.38 – 1.18
Personality Traits						
APS - High Standards	0.06	- 0.09 – 0.21	0.12	- 0.06 – 0.09	0.05	- 0.02 – 0.12
APS – Order	0.05	- 0.16 – 0.26	0.03	- 0.07 – 0.14	- 0.14*	- 0.24 – - 0.05
APS - Discrepancy	0.06**	0.02 – 0.11	0.01	- 0.01 – 0.04	< 0.01	- 0.02 – 0.03
Neuroticism	0.12	0.01 – 0.24	0.08*	0.02 – 0.14	0.02	- 0.04 – 0.07
R^2	0.1894*		0.1350		0.1356*	

β = standardize regression coefficient; RN = Registered Nurse; DNP = Doctorate of Nursing Practice; PhD = Doctor of Philosophy; APS = Almost Perfect Scale-Revised; R^2=variance; *p<0.05, **p<0.01

Chapter IV

Title

A mixed methods study of moral injury in

registered nurses in the aftermath of a patient safety incident

Authors

Mady Stovall, MSN, ANP-BC, RN, PhD Student
StovallM@ohsu.edu

Lissi Hansen, PhD, RN, Professor
HansenLi@ohsu.edu

Nathan F. Dieckmann, PhD, Associate Professor
dieckman@ohsu.edu

Jenny Firkins, PhD, RN, Assistant Professor
FirkinsJ@ohsu.edu

Michelle van Ryn, PhD, MPH, Professor
vanRyn@ohsu.edu

Journal Acknowledgement

Submitted May 2, 2020 to

Nursing Ethics

Impact Fact 1.957 – H Index 59

Funding Acknowledgement(s)

Beta Psi for the Naomi Ballard Dissertation Award and

Delta-Alpha-at-Large Sigma International for dissertation funding

OHSU Dean's Dissertation Award

Keywords

moral injury, patient safety, guilt, shame, nurse *second victim*

ABSTRACT

BACKGROUND

We operationalize moral injury as a syndrome (i.e., guilt, shame, loss of trust, anxiety, re-experiencing, self-harm). Nurse *second victims* frequently experience these symptoms in the aftermath of a patient safety incident (PSI). There are knowledge gaps pertaining to the factors post-PSI, and whether moral injury predicts dropping out of the workforce.

RESEARCH OBJECTIVES

In RNs in the aftermath of a PSI, this study has three aims: 1) To explore the guilt, shame, loss of trust, anxiety, depression, changing a job, and intention to leave the profession; 2) To describe individual RN experiences; and 3) To merge and compare the qualitative and quantitative data then make empirical associations between the morally injurious outcomes for RNs who actually changed a job, or who had intentions to leave the profession.

RESEARCH DESIGN

This study applies a descriptive, cross-sectional study, in a convergent, parallel mixed-methods design.

PARTICIPANTS & RESEARCH CONTEXT

We recruited 216 RNs from the state board registries from Oregon and New York.

ETHICAL CONSIDERATIONS

This study was approved by the Institutional Review Board at Oregon Health & Science University.

FINDINGS

In the aftermath of a PSI, guilt and loss of trust influenced intensions to leave the profession. RNs with anxiety were 1.17 times more likely (95%CI 1.03 – 1.33) to change jobs, but level of education was also a strong predictor. Three categories were found in the qualitative data: 1) Morally injurious experiences (MIEs); 2) Morally injurious outcomes, and; 3) Morally courageous outcomes.

DISCUSSION

Anxiety was meaningful in both the quantitative and qualitative data. RNs who changed jobs are not necessarily the same RNs who consider leaving the profession.

CONCLUSION

This study sets a foundation for future research. It is imperative we assess and intervene with MIEs and moral injury so as to keep RNs in the workforce after they have been involved with a PSI.

A mixed methods study of moral injury in

registered nurses in the aftermath of a patient safety incident

BACKGROUND

The World Health Organization defines a **patient safety incident** (PSI) as an event or circumstance that resulted, or could have resulted, in unnecessary or unanticipated harm to a patient (World Health Organization, 2009). Clinicians, including registered nurses (RNs), in a healthcare setting that are traumatized by involvement with a PSI and/or the aftermath have been referred to as ***second victims*** (Scott et al., 2009; Van Gerven, Vander Elst, et al., 2016; Wu, 2000).

PSIs occur in the quotidian of healthcare practice (Conway et al., 2011). These PSIs most often result from multisystem breakdowns (Reason, 1990, 2000, 2004), yet RNs often blame themselves for these breakdowns, and feel guilty regardless of whether the PSI resulted in harm (Treiber & Jones, 2010). Causing a PSI can be devastating to any nurse – leading to questioning of one's own competency and skill (Scott, 2015; Scott et al., 2009). In fact, nearly one-third of *second victims* report feeling less able to perform at work, have a loss of confidence, or feel unable to perform their work safely and effectively (Crigger & Meek, 2007; Joesten et al., 2015; Laurent et al., 2014) in the aftermath.

When mistakes happen, trust is broken institutionally (Simpson, 2002; Smith, 2017) and individually (Karga et al., 2011; Schelbred & Nord, 2007). Involvement with an error at work may cause a psychological trauma, which can be a deeply disturbing or distressing personal experience. The experience produces a mixture of emotional, social, behavioral, cognitive, and somatic consequences that can reverberate for a long time and most people are not equipped to

handle by themselves (Dekker, 2013). A review of *second victim* literature shows the emotional distress in the aftermath of a PSI includes anxiety, depression, and feelings of guilt (see **Table 1**) – and these often transfer into personal life and are long lasting (Scott et al., 2009; Wolf et al., 2000). Nurses have described these distress symptoms even 10 years after a PSI (Rassin et al., 2005; Ullstrom et al., 2014). Yet, despite the prevalence of psychological distress after a PSI, 31% of clinicians in one study felt too "embarrassed" to seek psychological support (Joesten et al., 2015).

Research shows that RNs who are *second victims* have a tendency to drop out (Scott et al., 2009). Dropping out may be operationalized as changing a job or leaving the profession and is associated with the *second victim* phenomenon. And, while the term *second victim* has gained traction over the past decade, we prefer to treat the RN involved with a PSI as potentially morally injured. Variables which consistently have shown to influence RN intention to leave in the aftermath of a PSI include age, higher education, years in current job, work environment (i.e., compassionate nurse manager), positive support, and participation in disclosure (Lewis, Baernholdt, et al., 2013). There is conflicting evidence regarding the impact of years of practice on RN outcomes after a PSI, with the *nurse experience of medical error* model showing novice nurses having more difficulty in the aftermath (Lewis, Baernholdt, et al., 2013), but Van Gerven, Deweer, et al. (2016) reporting that years of practice is not a factor after a PSI.

While several studies have evaluated changing a job (Joesten et al., 2015; Maiden et al., 2011; Martens et al., 2016; Schelbred & Nord, 2007; Van Gerven, Vander Elst, et al., 2016) or leaving the profession (Crigger & Meek, 2007; Joesten et al., 2015; Kao et al., 2015; Karga et al., 2011; Mira et al., 2015; Schelbred & Nord, 2007) (see **Table 2** for a review of dropping out literature), no studies have examined dropping out relative to PSI degree of harm, or nurses'

personal characteristics such as personality traits (i.e., neuroticism or perfectionism), alcoholic consumption behaviors, mental health (i.e., anxiety, depression, re-experiencing, avoidance), or feelings of guilt, shame, loss of trust, social functioning, or searching for meaning in the aftermath of a PSI.

There is data informing us on the consequences of dropping out. For example, for every newly licensed RN who leaves their job in the first year of practice, it costs the institution up to three times the nurse's annual salary when factoring in the costs associated with recruitment, training and orientation (Unruh & Zhang, 2014). Nurse burnout, depression, and self-harm is currently a public health epidemic throughout the world that not only threatens the well-being of nurses, but is a major threat to healthcare quality and safety (Dzau, Kirch, & Nasca, 2018).

RESEARCH OBJECTIVES & DESIGN

Moral injury occurs when the RN feels that there has been a *betrayal of what is right*, *by someone* (which may even be oneself) *in a position of authority, in a high stakes' situation (Shay, 2010)*. For this study, we have operationalized moral injury as a syndrome according to Jinkerson with core and secondary symptoms. Core symptoms of moral injury may include guilt, shame, spiritual/existential conflict, and loss of trust (Jinkerson, 2016). Secondary symptoms may include depression, anxiety, anger, re-experiencing, self-harm, and social problems (Jinkerson, 2016).

Design. The study used a descriptive, convergent, parallel mixed-methods design (Creswell & Plano Clark, 2011). We collected two independent strands of quantitative and qualitative data. The data for each strand was independently analyzed. Finally, the two strands of data were merged. See **Figure 1** for a diagram representation of the study design.

Study aims. The first aim of this study is to explore the guilt, shame, loss of trust, anxiety, depression, changing a job, and intention to leave the profession of RNs in the aftermath of a PSI. The second aim is to describe the experiences of RNs in the aftermath of a PSI. The third aim of this study is to merge and compare the qualitative and quantitative data and then make empirical associations between the morally injurious outcomes for RNs who actually changed a job, or who had intentions to leave the profession, in the aftermath of a PSI.

Study methods. A cross-sectional study design was utilized to explore the study aims. The data presented in the paper is based on 32 items and a single open-ended qualitative item, and is a portion of an analysis of a larger study data set (11 measures/91 total items).

PARTICIPANTS & RESEARCH CONTEXT

Setting. This study was approved by the Institutional Review Board at Oregon Health & Science University (OHSU).

Sample. Study inclusion criteria required working in a clinical setting within the past 5 years, being involved in a PSI during nursing career, and currently licensed as a RN in the state of Oregon or New York.

Measures. See **Figure 2** for an illustration of the two scales.

The *State Shame and Guilt Scale (SSGS)* is a self-rating scale of in-the-moment (state) feelings of shame and guilt experiences. For this study, we used only the ten-items subset evaluating shame and guilt (Marschall, 1996; Marschall, Sanftner, & Tangney, 1994). Each item is rated on a 5-point Likert scale (1 to 5) anchored by respondent options from *not feeling this way at all* to *feeling this way very strongly*. The referent sum score for shame is 7.81 (M=4.01) and guilt is 8.37 (M=3.84). Participants were directed to think about PSI related events as

opposed to other events or general perspectives on the world when responding to the SSGS items (Lancaster, 2018), with sum scores ranging from 5 to 25. The shame and guilt subscales historically have high reliability ($\alpha = 0.9$ and $\alpha = 0.88$, respectively) (Lancaster, 2018).

The *Trustworthiness & Goodness of People (TGP)* is a six-item subset of the World Assumptions Questionnaire (Kaler, 2009). It is a self-rating scale of in-the-moment (state) feelings of trust. Respondents were asked to respond to each item on a 6-point Likert scale (1 to 6) anchored by the respondent options of *strongly disagree* and *strongly agree*, with sum scores possible from 6 to 36, and the referent mean score of M=3.82. The TGP assesses beliefs regarding the trustworthiness/goodness of others and has previously demonstrated strong content, construct, and face validity ($\alpha = 0.8$) (Janoff-Bulman, 1992; Kaler, 2009).

The Patient Health Questionnaire-9 (PHQ-9) (Kroenke, Spitzer, & Williams, 2001) was used to assess nine possible symptoms included in the diagnostic criteria for major depressive disorder (e.g., anhedonia, depressed mood, disturbances in sleep and appetite, self-disparagement, psychomotor agitation). PHQ-9 is a widely used instrument that asks respondents to rate the frequency of these symptoms over the past month, with scores ranging from 0 (*not at all)* to 3 (*nearly every day*). PHQ-9 total scores for the nine items range from 0 to 27, with alpha reliability of .89 (Erbea, Eicherta, Rietza, & Ebert, 2016). Scores of 5, 10, 15, and 20 represent cut-points for mild, moderate, moderately severe, and severe depression, respectively (Kroenke et al., 2001).

The Generalized Anxiety Disorder-7 (GAD-7) (Spitzer, Kroenke, Williams, & Lowe, 2006) was used to screen for, and assess severity of, anxiety, but also has moderately good operating characteristics for panic disorder, social anxiety disorder, and posttraumatic stress disorder (PTSD), which are three common anxiety disorders. GAD-7 total scores for the seven

items ranges from 0 to 21, with scores of 5, 10, and 15 representing cut-points for mild, moderate, and severe anxiety, respectively. A cut-point for further evaluation clinically would be a score of 10 or greater. GAD-7 also historically performs well ($\alpha = 0.89$) (Lowe et al., 2008; Spitzer et al., 2006).

Data Collection. We randomly recruited RNs from the state board registries from Oregon and New York. Survey data were collected, anonymized, and managed using REDCap (Research Electronic Data Capture) electronic data capture tools hosted at OHSU. REDCap is a secure, web-based software platform designed to support data capture for research studies, providing 1) an intuitive interface for validated data capture; 2) audit trails for tracking data manipulation and export procedures; 3) automated export procedures for seamless data downloads to common statistical packages; and 4) procedures for data integration and interoperability with external sources (Harris et al., 2019; Harris et al., 2009).

Recruitment. We used Excel to generate a vector of random numbers corresponding to each of the potential participant email addresses. After the random numbers were generated, the numbers and corresponding emails were sorted from lowest to highest order. The first 1000 emails were selected to be in potential participant cohort number 1. Then, groups of 2500 emails were sent in four different cohorts until we reached a minimum of 200 study participants (11,000 random recruitment messages sent). A total of 2,569 emails were returned as undeliverable. A 2.55 % response rate was achieved. The first 200 study participants efforts were acknowledged with a $20 Amazon eGift card for completing the study. Due to missing data, the quantitative study analysis had 180 participants. Due to missing data, the qualitative study analysis had 200 study participants.

Quantitative Analysis. Quantitative data were analyzed using StataMPv16 (College Station, TX). Standard descriptive statistics were calculated for the sample. Preliminary analyses were computed to ensure that no major assumptions of multicollinearity were violated. To examine the influence of changing a job or intention to leave the profession, two logistic regression models were constructed using the RN morally injurious outcomes as independent variables. To control for their unique effects, demographic and experience variables (age, years licensed as RN, highest nursing degree earned, and years in current job) were entered into each model. We control for age, highest degrees earned, years licensed as an RN, and years in current job because these have found in a review of literature to influence outcomes in nurse *second victims* (Lewis, Baernholdt, et al., 2013). The morally injurious outcomes were also entered into the regression model. After logistic modeling, we quantified the variance inflation factor (VIF) values in a post-estimation analysis of collinearity with a cut-off point set to 10. Our VIF for guilt and shame were 4.54 and 4.40, respectively. VIF for age and years licensed as RN were 6.09 and 5.93, respectively, which is expected.

Qualitative Analysis. Qualitative description (Sandelowski, 2000) was used to analyze the responses to the following open-ended item:

> *Please describe in as much detail as you can remember your experience(s) after being involved with one or more patient safety incidents (PSIs), especially the aftermath of the incident. A PSI is defined as an event or circumstance that resulted, or could have resulted, in unnecessary or unanticipated harm to a patient. PSIs include medical errors, medication errors, mistakes, mishaps, and adverse events.*

Reflecting upon the PSI and the aftermath, consider all your feelings and experiences, including what was most difficult in the immediate period then days, weeks, months, and years after this experience.

FINDINGS

Characteristics of the sample. A total of 216 RNs met inclusion criteria and completed more than 75% of the survey between June and September 2019. The sample was primarily female (93.5%) and middle-aged (*M*=44). Most had a baccalaureate degree in nursing (BSN) (60.9%) and over half the sample worked as clinical hospital RNs. **Table 3** shows the demographic data for years in current job, highest earned nursing degree, highest earned non-nursing degree, current primary professional practice role, and primary area of specialty practice. Additionally, we asked participants to simply answer *yes* or *no* to PSI-questions. Sixty-three percent report their direct actions or inactions have led to a PSI during their career, and 95% been involved with a PSI as part of a team during their career. Only 21% report their direct actions or inactions have led to a PSI during the past 12 months, whereas 54% report having been involved with a team PSI in the past 12 months. While only 18% have changed jobs in the aftermath of a PSI, 27% have reported considered leaving the nursing profession in the aftermath of a PSI. See **Table 4** for the results of these PSI variables.

Quantitative Results. Our correlation matrix showed age and years licensed as a RN were highly correlated, which is an expected finding. Guilt and shame were correlated at 0.866, which we anticipated since these are difficult emotions to assess and differentiate at the state level (Tangney, 2019). None of the other variables were correlated near 0.8.

Table 5 contains the means scores for the measures. Alpha reliability was ≥ 0.89 for all measures except TGP, which was 0.79. Our participants experienced higher than average guilt and shame (which were highly correlated). Our sample was mild-moderately depressed. The participants presently measured mildly anxious. Lastly, the mean for trust (*M* = 21.8) was remarkably high for our sample compared to our referent value (*M* = 3.8). Trust showed a wide range (11-30) and high mean (*M*=21.8). Loss of trust was not statistically significant in our regression models for considering leaving the profession (p = 0.06), or changing a job (p= 0.97) in the aftermath of a PSI.

Table 6 shows the logistic regression models of RNs who have changed jobs and those with intention to leave the profession after involvement with a PSI. RNs with anxiety were 1.17 times more likely (95% CI= 1.03 – 1.33) to change a job in the aftermath of a PSI compared to those without anxiety. Level of education was also a strong predictor across the board to changing a job in the aftermath of a PSI, showing those RNs with a non-nursing master's degree were 5.26 times more likely (95% CI=1.20 – 23.18) to change jobs compared to those with no other college degree. An example of non-nursing master's degree is a masters of business administration (MBA). Nursing degrees mattered too. Those RNs who are master's degree (MSN) prepared were 3.32 times as likely (95% CI= 1.13 – 9.74) to have changed a job in the aftermath of a PSI compared to RNs with a bachelor's degree (BSN). Those RNs who are doctoral degree (doctorate of nursing practice or doctorate of philosophy) prepared were 13.13 times as likely (95% CI= 1.22 – 141.22) to have changed a job in the aftermath of a PSI compared to RNs with a bachelor's degree (BSN).

We also used a Pearson Chi-square test to examine if there was a difference between those RNs who have actually changed jobs in the aftermath of a PSI and those with intentions to

leave the profession in the aftermath, and found a statistically significant difference (Pearson $\chi^2(1, n=216) = 32.44, p<0.001$). Thus, the RNs who changed jobs in the aftermath of a PSI are not necessarily the same ones who expressed thoughts of leaving the profession.

Qualitative Results. Out of 216 participants, 200 answered the qualitative items. Two authors (M.S. and L.H.) read 200 narratives, coded all 200 independently, and then discussed the coding until agreement was reached. Three overarching categories and 41 sub-categories clearly emerged from the data: 1) morally injurious experiences (MIEs), 2) potentially morally injurious outcomes, and 3) morally courageous outcomes. See **Table 7** for a matrix of the qualitative sub-categories presented in each category by order of prevalence. MIEs are those that violate deeply held moral values and beliefs, and can put an individual at risk for burnout and other trauma-related problems, such as symptoms of PTSD or moral injury (Currier et al., 2015). As previously noted, moral injury is a feeling of a betrayal of what is right, by someone (or oneself) in a position of authority, in a high-stakes situation. Moral courage involves overcoming fear and becoming an advocate despite conflicting obligations (Dinndorf-Hogenson, 2015; Lachman, 2010; Lamiani, Borghi, & Argentero, 2017; Maxfield, Grenny, Lavandero, & Groah, 2011). In each category, sub-categories were organized as being situated in psychological circumstances, organizational circumstances, cultural/relational circumstances, or environmental circumstances (Currier et al., 2015), and then according to whether it was a clinical situation, a factor internal to the RN, or a factor external in the situation or environment (Hamric et al., 2012). Psychological circumstances include personal resilience, ways of coping, and perceptions of safety and trust. Organizational circumstances include employers, leadership, and legal and regulatory bodies. Cultural/Relational Circumstances includes the culture and group-think of the work environment. Environmental Circumstances include the work unit, hospital, or physical work ecosystem.

Morally Injurious Experiences. MIEs are laid out by category and prevalence in **Table 7.** The most common MIE sub-category was falls. RNs repeatedly told stories of patient falls and the injuries that the patient and/or staff sustained from the fall, and the impressionable memories created by these events. Oftentimes the falls were catastrophic, leading to significant morbidity and mortality, and the RN's carry vivid memories of details for each fall, many of the incidents occurring even 20 or more years ago.

The next most prevalent sub-category was wrong medication/dose/patient. Medication error stories were filled with shock, anger, shame, self-deprecation, and feelings of "responsibility" even when other clinicians and systems were involved or of primary responsibility for the mistakes.

Next, RNs talked about the impact death in the context of PSIs, and the toll it had taken on them during their nursing career. Death may have been directly related to a PSI, what the nurse perceived as a "miscommunication" or a "failure to escalate," or there may have been a technology-failure. Whatever the event, bearing witness to the gruesome reality of the human condition, especially for RNs who worked in trauma and intensive care areas, shone through in the narratives as demanding and impactful. Death was frequently discussed in the context of interference with work and home lives, and impacting personal relationships.

Nurses then talk about their MIE with lawsuits, even if they were not personally sued. If they were called to testify in a case or give a deposition, the fear and perseveration over the centrality of the events, whether they were still a "good nurse," and whether they would still be able to practice nursing were paramount.

Next, another MIE were experiences as new nurses. A frequent storyline involved the RN in the first few years of practice being subjected to MIEs from organizational letdowns that

failed to anticipate the needs of budding professionals to preceptors or most often lateral colleagues that failed to protect or ultimately betrayed the early career RN. Many of the PSIs for the RNs occurred in their first few years of nursing practice, and continued to be vivid memories even if the events occurred 10 or even 20 years ago.

The next MIE, situations where there was a "failure to escalate," can be best characterized by a scenario where the RN felt that he/she/they *should* have acted in some way, but failed to do so, and this failure to act led to an incident, accident, or event of significance that stays prominent in the mind of the RN. This "failure to escalate" considerably imprinted in the memories of the RNs. The events, accidents, or incidents frequently involved interpersonal conflicts laterally and horizontally, chain of command disagreements, or environmental circumstances where there was a lack of adequate or properly functioning technology or the skills and/or time to operate the technology.

Next, MIE situations of miscommunications frequently were described. The miscommunications happened between RNs and leadership, physicians and other collaborative disciplines, between colleagues, and even between patients and their family/friends. The stories RNs told of miscommunications frequently led to different and various types of PSIs.

Not surprisingly, a frequent MIE was staffing issues or failures. RNs repeatedly told stories of staffing shortcomings, and efforts to advocate to correct the issue, feeling their pleas fell on deaf ears.

Incivility in the workplace was a common MIE, from peers, administration and leadership, and even patients and their family/friends.

The death of persons by suicide was another MIE, unique from "death" as a MIE. RNs affected by a suicide recall detailed minutiae of the circumstances surrounding the events leading

up to each suicide. Several of the narratives described by RNs were of patient suicides that occurred on an outpatient basis in psychiatric care. Fewer stories were of inpatient suicides or suicide-attempts. These experiences profoundly imprinted on the RNs.

RNs describe another MIE as involvement with the process of root cause analysis. Their experiences were filled with anxiety, fear, shame and blame, but also fraught with uncertainty when involved with this process.

Another MIE, was lack of a *Just Culture* environment, and RNs articulated stories of betrayal by their peers, their leaders, and their institutions in these situations. This is especially problematic in the aftermath of a PSI.

Several RN's narratives describe MIEs of feeling betrayed because different rules applied to different professional groups [different physician/APN or MD/RN standards/regulations].

Lastly, a MIE described by RN's occurred when individuals' dignity was compromised in the environment and the RN felt no power to intervene.

Morally injurious outcomes. Morally injurious outcomes are laid out by category and prevalence in **Table 7.** Of note, however, is that morally injurious outcomes will always be internal to the RN as a psychological circumstance (second column/first row). The most common MIE sub-category was anxiety. The second most frequent outcome was depression, then "feeling responsible", fearful/afraid, "feeling bad" or remorseful. Many described feelings of guilt, blame, feeling angry with others. A full list of 25 morally injurious outcomes is listed in **Table 7**.

The following are quotes illustrating the morally injurious outcomes described by RNs:

> *RN1 – As an RN who has been an ICU nurse for almost 30 years, I have been involved in several PSI with negative outcomes. They have affected me heavily, in terms of the emotional fallout, and have contributed to at least one change in venue*

> *and specialty (away from trauma ICU). The emotional fallout: guilt, flashbacks, sadness, fear, and anxiety, have outweighed any actual condemnation or official negative consequences by my employers. Just knowing that I was part of the situation was enough to weigh heavily on me and has contributed significantly to my developing chronic depression and anxiety, which adds to the burdens of being an ICU nurse… It's nice to be part of the most trusted profession in the US, but it has just about killed me.*
>
> *RN2 – If I told you I haven't noticed anything wrong I would be lying. I have been more irritable. I have more trouble concentrating/multitasking, more frequently losing my train of thought while speaking, and my appetite is a wreck… often eating a muffin and handful of cookies during the course of a day, and that's it. It's worrying my wife, who I can tell is bending over backwards to make me happy. I love my job, but it's very very tough.*

Morally courageous outcomes. There were only two morally courageous sub-categories, the most common was finding a learning opportunity then becoming a better advocate.

The following quote illustrates the morally courageous outcome described by the RNs:

> *RN3 – This experience has made me realize the importance of delegation, working within my scope of practice/knowing my scope, and being aware of subtle signs of a reaction in order to begin the process of getting additional support immediately. I have learned to use my voice assertively, and have the confidence to be an advocate for the health and safety of my patients.*

Merging Quantitative and Qualitative Results.

In this stage of data analysis, we triangulated the data, looking for convergence, divergence, contradictions, and relationships (see **Table 8**). Anxiety was the symptom of highest prevalence in our qualitative data, and was the only symptom of significance in our quantitative data (changing a job ($p<0.01$)). PSIs are a highly anxiety producing event, and the significance of anxiety independently in both strands of data highlights the centrality anxiety plays in RNs lived experience in the aftermath of a PSI. Nurses who have higher anxiety after a PSI are more likely to change jobs and consider leaving the profession. Qualitative data show anxiety to be of a high symptom burden to the RNs in our sample, whereas the quantitative result of anxiety was mild (M=5).

Guilt and trust were not statistically significant in our changed job model. But they were very close in our leaving profession model (guilt (95%CI= 1.00–1.30) and trust (95%CI= 0.79–1.00) was close too. This is notable because these categories were also frequent in our qualitative narratives. The mean for trust was in our sample was very high (M=21.8), suggesting the RNs in our study have a loss of trust. This was a prominent sub-category in our qualitative data as well. The next exemplar highlights a betrayal that is a violation of trust in an advanced practice nurse.

Having a master's degree in nursing meant the RN was 3.32 times more likely (95%CI= 1.13 – 9.74) to change a job in the aftermath of a PSI compared to an RN with a baccalaureate degree in nursing. Several qualitative narratives cite MIEs of cultural/relational betrayals in clinical scenarios (**Table 7**). This exemplar was chosen to shine light on why education may be of particular significance in changing jobs and why loss of trust and a feeling of betrayal is profound. The following quote is from an advanced practice RN [details changed to protect patient/RN privacy]:

RN3 – A man with psychotic depression tried to tear his ear off, and ended up ripping it partly off causing severe tissue damage. The psychiatrists felt that because his medical treatment took so long, that the acute phase of his psych illness had passed and they cleared him for discharge. A second psych NP and I evaluated the patient and had strong misgivings about discharging this patient. Within days of his discharge, the patient died by suicide. Only myself and the other NP were reprimanded… the physicians were not…

[sub-category: Different MD/RN standards].

The RNs in our study were mildly depressed (*M*=5.6) and this was the second most frequent qualitative symptom described in the narratives. However, depression was not statistically significant in any of our quantitative models. Nurses also felt shame (*M*=9) in our study and reported this in the qualitative data as well, but again, this was not significant in any of our quantitative models. The relationship between guilt and shame makes it difficult to justly separate these constructs in this study. Of note is that guilt was statistically significant in our intention to leave the profession model ($p<0.05$). Considering we had more qualitative than quantitative data, and the qualitative narratives were so visceral and raw in many situations, divergence and contradictions between the "significant" findings in qualitative versus the "statistically significant" findings in quantitative data are more apparent.

What was surprising was the courage many RNs found in the aftermath to look for a learning opportunity in the PSI. These RNs found a voice in themselves in the aftermath that made them a better advocate for patients. Additionally, they described becoming a better advocate for their own needs and positions in the workplace.

ETHICAL CONSIDERATIONS

There were ethical implications to this research. For example, asking nurses to recount memories that may cause distress is a psychological risk. Because the completed questionnaires were completed on-line no provisions could be set up to provide RNs with a mental health referral if they became distressed by participating in the study, however nurses were alerted to the potential risks of distress. Information in the informed consent, as well as a prompt at the end of the survey, provided participants with national crisis web-based and telephone support services (a link to the National Suicide Prevention homepage (SuicidePreventionLifeline.org), and the Suicide Prevention Lifeline [1-800-273-TALK]). While there were risks, this line of inquiry was safer to the subject and to the researcher due to privacy concerns (Council for International Organizations of Medical Sciences (CIOMS), 2016; Mishara & Weisstub, 2005), and research participants were at no risk for public blame, shame, or litigation due to anonymity.

Participants could have become fatigued or distressed by certain survey questions. They could choose to skip any questions (except on the eConsent and three eligibility items). Participants could postpone survey completion and resume at another time. There was a minimal risk to loss of confidentiality if a participant provided identifying information in their free-text response to the open-ended question. If a participant did provide information that could potentially be identifying of the participant, their employer, or the patient, the identifying information was de-identified by the principal investigator (PI) to prevent any potential identifiers from being disclosed. Participant emails were deleted from completed surveys prior to exporting from REDCap so that no individual could be connected/identified with any single-survey. eGift card claims were not connected to survey results and only the PI obtained the participant emails and then distributed eGift cards to improve participant protection.

This line of research was of lower risk to the researchers than conducting personal interviews. The two authors who read the narrative data, met routinely to decompress given the traumatic descriptions and literature routinely encountered.

DISCUSSION

This mixed methods study set out to describe and quantify the potential morally injurious outcomes of RNs in the aftermath of a PSI. Using a mixed methods approach, the study aims to fill gaps by making empirical associations between morally injurious outcomes and changing a job or intentions to leave the profession in the aftermath of a PSI. We have demonstrated that anxiety is the strongest predictor to changing a job in the aftermath of a PSI ($p<0.01$), with level of education also being a strong predictor (**Table 5**). Anxiety was the most prevalent symptom in our qualitative data. Increased anxiety has been shown to last for many years after a PSI (Treiber & Jones, 2018b). In other *second victim* studies, increased anxiety has also been associated with expressing inadequacy in the workplace (Crigger & Meek, 2007; Delacroix, 2017; Karga et al., 2011; Meurier et al., 1997), and intention to leave the profession (Treiber & Jones, 2010). While years of nursing practice can matter in how a nurse responds in the aftermath of a PSI (Lewis, Baernholdt, et al., 2013), the only findings of significance in our leaving the profession model were guilt ($p<0.05$) and loss of trust ($p<0.05$). Our quantitative data revealed our RN sample was mildly depressed (**Table 5**). Prior nurse *second victim* works have found depression ranged from 31-67% in quantitative studies (Chard, 2010; Karga et al., 2011; Taifoori & Valiee, 2015), and was clearly articulated in mixed method (Jones & Treiber, 2010) and qualitative studies (Kable et al., 2018), with depressed nurses even verbalizing suicidal ideations (Schelbred & Nord, 2007). Guilt and shame were also elevated above the reference values in our RN sample (**Table**

5). In other nurse *second victim* literature, guilt was present in 44-85% of nurses quantitatively surveyed (Chard, 2010; Karga et al., 2011; Meurier et al., 1997; Taifoori & Valiee, 2015). Guilt is explicitly described in qualitative studies (Arndt, 1994; Crigger & Meek, 2007; de Freitas et al., 2011; Delacroix, 2017; Kable et al., 2018; Rassin et al., 2005; Santos et al., 2007; Schelbred & Nord, 2007) but less explicit in the mixed method studies (Jones & Treiber, 2010; Treiber & Jones, 2010). For example, rather than stating the nurse felt "guilt", researchers summarize nurses' expressions as "emotional devastation." (Treiber & Jones, 2010, p. 1338). Shame has not specifically quantitatively surveyed in any prior study, although related symptoms such as "not accepting sympathy and understanding from someone" has been reported by 49% of participants in one study (Chard, 2010), 31% of individuals had feelings of humiliation when talking to senior staff in another study (Meurier et al., 1997), and 34-67% of nurses felt "embarrassed" in the aftermath (Karga et al., 2011; Taifoori & Valiee, 2015). Shame is commonly reported by nurses in qualitative studies (Arndt, 1994; Kable et al., 2018; Rassin et al., 2005; Santos et al., 2007; Schelbred & Nord, 2007), and is also captured in the qualitative (Crigger & Meek, 2007; Delacroix, 2017) and mixed methods (Jones & Treiber, 2010; Treiber & Jones, 2010) shame-related symptomatology (Maiden et al., 2011).

An interesting finding from our study that has not previously been reported in any prior nurse *second victim* literature, is that RNs who changed jobs in the aftermath of a PSI are not necessarily the same RNs who expressed considering leaving the profession, which was unanticipated. This suggests that these two groups of RNs (those that change jobs and those that consider leaving the profession) may respond differently in the aftermath of a PSI.

Similar to prior *second victim* work (Crigger & Meek, 2007), a common narrative statement in our qualitative data was "*am I still a 'good nurse'?"* Historically, the concept of

being a "good" nurse is informed by literature, legend, and local peers (Fowler, 2019). Our study also echoed these historical concepts of nursing virtue. Prior evidence also demonstrates nurses involved with a PSI feel less able to perform at work safely and effectively and with less confidence (Crigger & Meek, 2007; Joesten et al., 2015; Laurent et al., 2014). Our study's quantitative and qualitative results further support this evidence.

The exemplar from the advanced practice nurse highlights the institutional betrayal (an organizational circumstance) and moral injury nurses experience when RNs are held to different standards than their physician colleagues (a cultural/relational circumstance). This MIE fosters a lack of trust in and amongst their colleagues, in their institution, and in the systems in which they practice, and leaves the RN feeling like they are left alone on an island to deal with the aftermath of a PSI. Without a culture of trust, the RN cannot optimally or joyfully practice, and thus is likely to seek employment elsewhere.

Implications. This work is timely and significant to nursing science. We carefully chose our language intentionally avoiding the term, *second victim (Wu et al.)*, when possible. Our study is novel in that we introduce MIEs into the nursing nomenclature. Historically, MIEs and moral injury have been empirically grounded in a military context, however this study observes these phenomena in the nursing environment and creates the empirical footing to build future nursing studies from this work. The matrix of qualitative categories and sub-categories (**Table 8**) blends the military MIE framework (Currier et al., 2015) with an existing nursing moral distress framework (Hamric et al., 2012) to create a novel matrix for this mixed methods study. While these frameworks did not guide this study, we combined these two existing frameworks in order to present our data in a coherent manner. The contribution of this framework, of MIEs, and of moral injury to nursing is a crucial foundation to build future nursing research. More research

needs to be done, including intervention studies, to discover more MIEs in nursing work that lead to moral injury, with both qualitative and quantitative methods. However, by measuring MIEs and moral injury, we can also begin to design intervention programs to treat moral injury. Knowing clinician well-being directly correlates to patient satisfaction and patient safety (Hayhurst et al., 2005; Kash et al., 2010), organizations have a vested interest in understanding and improving MIEs and moral injury in nurses to improve outcomes and retain our highly qualified workforce.

Limitations. Our study has limitations. First, the major limitation of this study is the low response rate (RR). We achieved a 2.55% RR. Having a low RR in random recruited *second victim* research is not unexpected [4, 6, 10], although one oversight from the study team may have influenced this low RR, which was our failure to disclose in our consent form how the participant e-mails were obtained (purchased through open public-records request (OR); free research use (NY)). This simple oversight likely created a lack of trust in our potential participant pool and a high non-response rate. Other reasons for a low RR can include perceptions of bias, issues of confidentiality, poor perceived value, or time constraints [71]. Mode of data collection (i.e., mail, web-based, mixed modes) is significantly related to survey RR [73, 80], with pen-paper often yielding higher RR in nurse *second victim* research than electronic [4, 10, 60]. In nurse *second victim* research samples, nurses may be less willing to participate and disclose PSI or other potentially negligent information for fear of self-incrimination, blame, shame, or exposure to painful memories [75-79].

Considering our measures, we recognize our Trustworthiness and Goodness in People Scale has only fair reliability (performed at 0.79 out of a target of 0.8) and with high inter-rater variability, but this may not be an unexpected performance for this in-the-moment (state)

construct (Kaler, 2009). Nonetheless, our scale performed as expected. A limitation of this study is that it cannot determine cause and effect, nor can the timing of the snapshot in time we measured guarantee to represent the effects of these phenomena.

CONCLUSION

This is the first empirical nursing work to ground moral injury in the nursing nomenclature both qualitatively and quantitatively. This study confirms that anxiety is the strongest predictor for nurses changing a job in the aftermath of a PSI, but that the nurses that suffer anxiety may not be the ones at greatest risk for leaving the profession. Level of education is also a strong predictor for changing a job in the aftermath of a PSI. Guilt and loss of trust predict intention to leave the profession in the aftermath of a PSI. Results from this study informs future research, assessment, intervention, and prevention efforts in MIEs and moral injury in nurses after involvement with PSIs. We need to design programs to assess and intervene to recover from moral injury so as to keep our highly skilled RNs in the workforce after they have been involved with a PSI. PSI will undoubtedly occur in the day-to-day practice of nursing (Kohn, 2000; Makary & Daniel, 2016). Intervening and targeting RNs at risk of dropping out in the aftermath of a PSI should be our standard practice because these nurses are our greatest resources.

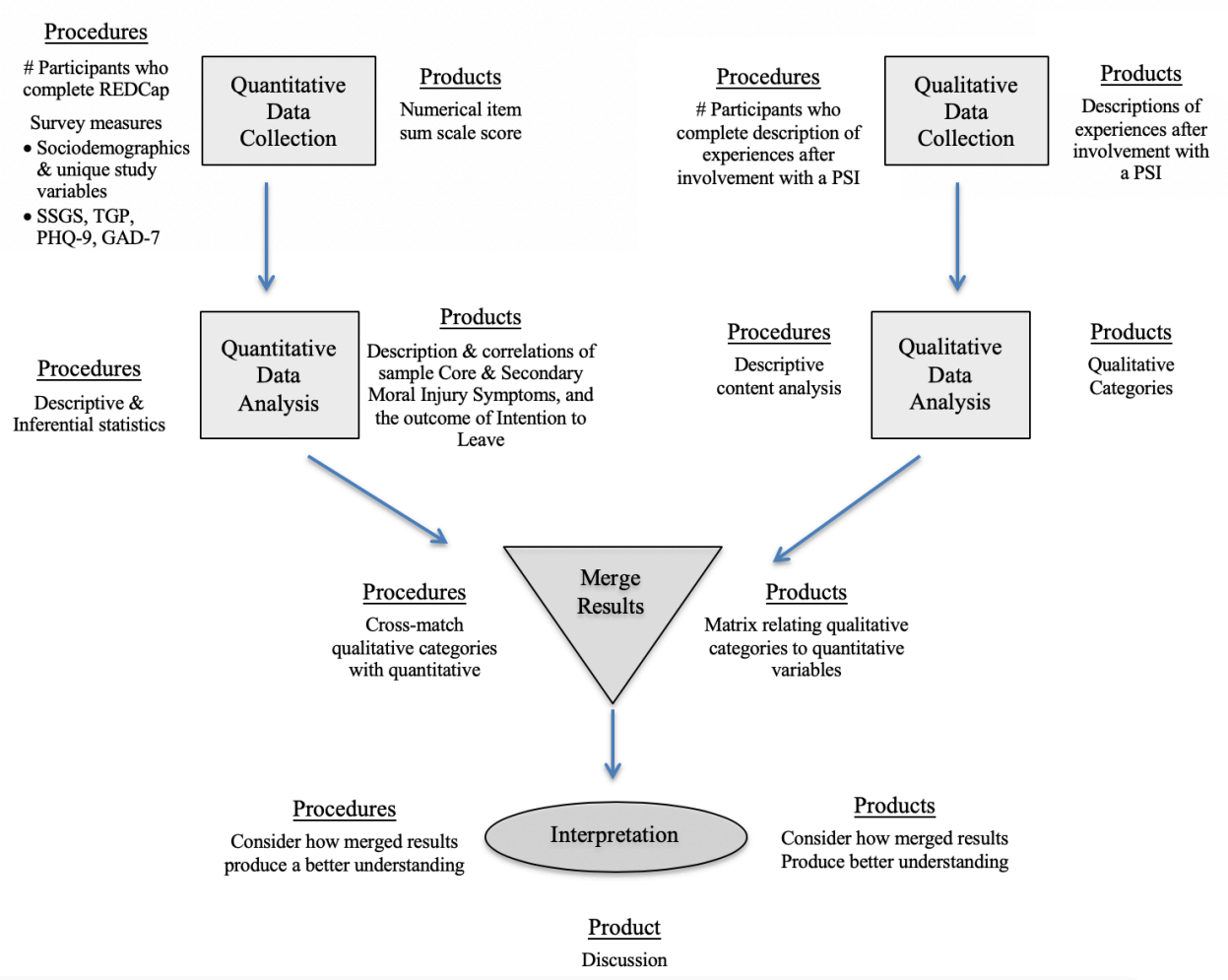
Table 1. Review of symptoms in *second victim* literature

	Quantitative	Qualitative	Mixed Methods
Core Moral Injury Symptom			
Guilt	Chard (Chard, 2010), Karga (Karga et al., 2011), Meurier (Meurier et al., 1997), Taifoori (Taifoori & Valiee, 2015)	Arndt (Arndt, 1994), Crigger (Crigger & Meek, 2007), de Freitas (de Freitas et al., 2011), Delacroix (Delacroix, 2017), Kable (Kable et al., 2018), Rassin (Rassin et al., 2005), Santos (Santos et al., 2007), Schelbred (Schelbred & Nord, 2007), Treiber (Treiber & Jones, 2010)	Jones (Jones & Treiber, 2010)
Shame	Chard (Chard, 2010), Karga (Karga et al., 2011), Meurier (Meurier et al., 1997), Taifoori (Taifoori & Valiee, 2015)	Arndt (Arndt, 1994), Crigger (Crigger & Meek, 2007), de Freitas (de Freitas et al., 2011), Delacroix (Delacroix, 2017), Kable (Kable et al., 2018), Rassin (Rassin et al., 2005), Santos (Santos et al., 2007), Schelbred (Schelbred & Nord, 2007)	Jones (Jones & Treiber, 2010), Maiden (Maiden et al., 2011), Treiber[1] (Treiber & Jones, 2018a),
Loss of Trust	Karga (Karga et al., 2011), Meurier (Meurier et al., 1997), Taifoori (Taifoori & Valiee, 2015)	Arndt (Arndt, 1994), Crigger (Crigger & Meek, 2007), de Freitas (de Freitas et al., 2011), Delacroix (Delacroix, 2017), Kable (Kable et al., 2018), Rassin (Rassin et al., 2005), Schelbred (Schelbred & Nord, 2007),	Jones (Jones & Treiber, 2010)
Spiritual / Existential Crisis	none	de Freitas (de Freitas et al., 2011)	Maiden (Maiden et al., 2011)
Secondary Moral Injury Symptom			
Anxiety	Chard (Chard, 2010), Kao (Kao et al., 2015), Karga (Karga et al., 2011), Meurier (Meurier et al., 1997)	Crigger (Crigger & Meek, 2007), de Freitas (de Freitas et al., 2011), Delacroix (Delacroix, 2017), Kable (Kable et al., 2018), Rassin (Rassin et al., 2005), Santos (Santos et al., 2007), Treiber (Treiber & Jones, 2010)	Maiden (Maiden et al., 2011), Treiber[1] (Treiber & Jones, 2018a), Treiber[2] (Treiber & Jones, 2018b)
Depression	Chard (Chard, 2010), Karga (Karga et al., 2011), Taifoori (Taifoori & Valiee, 2015)	de Freitas (de Freitas et al., 2011), Kable (Kable et al., 2018), Schelbred (Schelbred & Nord, 2007)	Jones (Jones & Treiber, 2010)
Anger	Chard (Chard, 2010), Karga (Karga et al., 2011), Meurier (Meurier et al., 1997), Taifoori (Taifoori & Valiee, 2015)	Coli (Coli et al., 2010), Crigger (Crigger & Meek, 2007), de Freitas (de Freitas et al., 2011), Delacroix (Delacroix, 2017), Kable (Kable et al., 2018), Rassin (Rassin et al., 2005), Santos (Santos et al., 2007), Treiber (Treiber & Jones, 2010)	Jones (Jones & Treiber, 2010), Treiber[1] (Treiber & Jones, 2018a), Treiber[2] (Treiber & Jones, 2018b)
Re-Experiencing	Chard (Chard, 2010), Meurier (Meurier et al., 1997)	Crigger (Crigger & Meek, 2007), de Freitas (de Freitas et al., 2011), Kable (Kable et al., 2018), Rassin (Rassin et al., 2005), Santos (Santos et al., 2007), Schelbred (Schelbred & Nord, 2007), Treiber (Treiber & Jones, 2010)	Treiber[2] (Treiber & Jones, 2018b)
Self-harm	Meurier (Meurier et al., 1997)	de Freitas (de Freitas et al., 2011), Rassin (Rassin et al., 2005), Schelbred (Schelbred & Nord, 2007)	none
Social Problems	Chard (Chard, 2010), Kao (Kao et al., 2015), Karga (Karga et al., 2011), Lewis (Lewis et al., 2015), Meurier (Meurier et al., 1997)	de Freitas (de Freitas et al., 2011), Delacroix (Delacroix, 2017), Kable (Kable et al., 2018), Rassin (Rassin et al., 2005), Schelbred (Schelbred & Nord, 2007)	none

Dropping out			
Changing a job	Joesten (Joesten et al., 2015), Kao (Kao et al., 2015), Van Gerven (Van Gerven, Vander Elst, et al., 2016)	Schelbred (Schelbred & Nord, 2007), Martens (Martens et al., 2016)	Maiden (Maiden et al., 2011)
Leaving the profession	Joesten (Joesten et al., 2015), Kao (Kao et al., 2015), Karga (Karga et al., 2011)	Crigger (Crigger & Meek, 2007), Schelbred (Schelbred & Nord, 2007), Mira (Mira et al., 2015)	none

Table 2. Review of Dropping Out Literature						
Changing Job	Turnover intentions after involvement with a PSI – Beta= 0.22 ($p < 0.001$) 95%CI(0.14-0.29); Turnover intentions with degree of harm with a PSI – Beta = 0.07 (not significant) 95%CI(-0.01-0.14). Harm was not related to turnover intentions. (total n=5788) (Van Gerven, Vander Elst, et al., 2016)	Nurses seriously considered moving to another institution because of the event or what happened afterwards – frequency=15 (12.5%) (agree), frequency=9 (7.5%) strongly agree (of 120 respondents). The study simply asked this question but did not make any associations or discuss this question in the body of the manuscript. (total n=120) (Joesten et al., 2015)	About one in eight considered quitting their job because of the adverse event. Twenty-one (21) mental health workers (12.3%) left their job after the adverse event. Four were still considering leaving. (total n=280) (Martens et al., 2016)	Quantitative: Pearson product-moment coefficients for reasons medication errors occur by selected nurse characteristics (years practice (-0.09), unit tenure (-0.08), age(-0.08)) with Intent to Resign were not significant at all. Physician communication (-0.02), medication packaging (-0.04), transcription related (-0.002), pharmacy process (0.006), moral distress (0.10), and compassion fatigue (0.18, p=0.05), nurse staffing (0.18, p=0.01) were the only factors of significance. Qualitative: ‘‘Some participants described nurses who felt so badly about a medication error, they considered leaving nursing. These themes of strong negative emotions and the intent to resign resonate with the quantitative data from this study and suggest a previously unexplored dimension to the experience of critical care nursing. (total n=205) (Maiden et al., 2011)		
Leaving Profession	Nurses seriously considered leaving the profession because of the event or what happened afterwards – frequency=17 (14.2%) (agree), frequency=6 (5%) strongly agree (of 120 respondents). The study simply asked this question but did not make any associations or discuss this question in the body of the manuscript. (total n=120) (Joesten et al., 2015)	Factor 4: Quitting the profession. Mean=4.95, SD=2.67, Factor loading-0.52. (all factor loadings > 0.50, 95%CI (0.59-0.89), $p < 0.001$). Cronbach’s alpha was 0.83. There is the risk that nurses who commit a MAE (medication administration error) who do not receive appropriate support may face unresolved negative emotions that undermine work confidence over the long term, with the potential for resignation from the job (*Crigger & Meek, 2007; Schelbred & Nord, 2007*). This helps explain why segregation behavior (self-isolation, more alert about drugs, and leaving the profession) is the IPMAE (Inventory of Perceptions of MAE) subscale with the lowest variance and the lowest score. (total n=618) (Kao et al., 2015)	For some of the nurses, their self-confidence was so shattered, that they felt unfit to continue working as a nurse and struggled to regain their professional and personal confidence. (total n=10) (Page 323). (Schelbred & Nord, 2007)	3.9% considered leaving the profession (total n=536) (Karga et al., 2011)	Emotional response commonly observed in second victims: Questioning whether to leave the profession: primary care (doctors (n=332), M=1.8,SD=0.8, nurses (n=265), M=1.5, SD=0.7($p=0.000$)); hospitals (doctors (n=209), M1.5 SD=0.6, nurses (n=230), M=1.6, SD=0.8 ($p=0.456$)). (total n=1087) (Mira et al., 2015)	Researcher asked the question: Did you consider leaving your practice because of this experience? The majority of 10 grounded theory participants “did not consider leaving the profession because of the mistake; however, many of them suffered a loss of self-esteem afterward.” (total n=14) (Crigger & Meek, 2007)

Figure 1. Diagram for Convergent, Parallel Mixed-Methods Design



Note: REDCap = Research Electronic Data Capture; SSGS= State Shame and Guilt Scale; TGP = Trustworthiness and Goodness of People Scale; PHQ-9 = Patient Health Questionnaire – 9; GAD-7 = Generalized Anxiety Disorder Questionnaire – 7

Figure 2. Measures: SSGS, TGP

		Not feeling this way at all		Feeling this way somewhat		Feeling this way very strongly
		1	2	3	4	5
State Shame and Guilt Scale (SSGS) (Marschall, 1996; Marschall et al., 1994)						
Guilt						
Item 2	I feel remorse, regret.					
Item 4	I feel tension about something I have done.					
Item 6	I cannot stop thinking about something I have done.					
Item 8	I feel like apologizing, confessing.					
Item 10	I feel bad about something I have done.					
Shame						
Item 1	I want to sink into the floor and disappear.					
Item 3	I feel small.					
Item 5	I feel like I am a bad person.					
Item 7	I feel humiliated, disgraced.					
Item 9	I feel worthless, powerless.					

		Strongly Agree	Agree	Slightly Agree	Slightly Disagree	Disagree	Strongly Disagree
		1	2	3	4	5	6
Trustworthiness & Goodness of People subscale of World Assumptions Questionnaire (Kaler, 2009)							
TGP							
Item 1*	Most people can be trusted.						
Item 2	It is difficult for me to take most of what people say at face-value.						
Item 3	For the most part, I believe people are good.						
Item 4*	Other people are usually trustworthy.						
Item 5	Most people cannot be trusted.						
Item 6	What people say and what they do are often very different things.						

* denotes reverse code item

Table 3: Demographic Data		
	Range (*Mean*)	Total n (%)
Years in Current Job	0 – 41 (*6.29*)	215 (100)
Highest Earned Nursing Degree	Associates Degree Nursing Bachelor Science Nursing Masters Science Nursing Doctorate Nursing Practice Doctorate of Philosophy	40 (18.43) 131 (61.29) 37 (17.05) 5 (2.3) 2 (0.92)
Highest Earned Non-Nursing Degree	Associates Bachelors Masters Doctorate Not applicable	40 (19.32) 50 (24.15) 13 (6.28) 2 (0.97) 100 (49.28)
Current Primary Professional Practice Role	Clinical RN – Hospital Clinical RN – outpatient RN – Community based Nurse Practitioner Clinical Nurse Specialist Nurse Administrator – Hospital Nurse Administrator – Outpatient Clinic Certified Registered Nurse Anesthetist Nurse educator Other, not listed	116 (54.21) 27 (12.62) 20 (9.35) 9 (4.21) 1 (0.47) 5 (2.34) 6 (2.8) 3 (1.4) 6 (2.8) 21 (9.81)
What is your primary area of specialty practice? May select more than one specialty area, thus sum is great than 100%.	Primary Care Critical Care Oncology Mental Health Women's Health Pediatrics Orthopedics Gerontology Research Administration Operating Room Emergency Department Education Medical / Surgical Not listed	9.4% 15.7% 6% 7.2% 9.8% 6% 2.1% 3.8% 0.4% 2.1% 8.1% 11.1% 4.26% 21.3% 25.5%

Table 4: Patient Safety Incident Variables		
Stem	Item	n (%)
Have your direct actions or inactions led to a PSI during your career?	No Yes	79 (36.57%) 137 (63.43%)
Have you been involved w/ PSI as part of a team during your career?	No Yes	10 (4.63%) 206 (95.37%)
Have your direct actions or inactions led to a PSI during the past 12 months?	No Yes	172 (79.26%) 45 (20.74%)
Have you been involved w/ PSI as part of a team during the past 12 months?	No Yes	99 (45.62%) 118 (54.38%)
Have you ever changed jobs because of your experiences in the aftermath of a PSI?	No Yes	178 (82.03%) 39 (17.97%)
Have you considered leaving the nursing profession because of your experiences in the aftermath of a PSI?	No Yes	157 (72.69%) 59 (27.31%)

Table 5. Potential Morally Injurious Outcome Variables				
Phenomenon	Reference *M*	Sample Range	Sample *M* ± SD	Sample α
Guilt (SGSS)	8.37 = positive (Marschall et al., 1994); 3.84 = positive (Lancaster, 2018)	5 – 25	11.1 ± 5.9	0.93
Shame (SGSS)	7.81 = positive (Marschall et al., 1994); 4.01 = positive (Lancaster, 2018)	5 – 25	9.0 ± 5.2	0.92
Trust (TGP)	3.8 = positive (Kaler, 2009, pp. 41, Table 42)	11 – 30	21.8 ± 3.6	0.79
Depression (PHQ-9)	0-4 = none/minimal, 5-9 mild, 10-14 = moderate, 15-19 = mod-severe, 20-27 = severe (Kroenke et al., 2001)	0 – 22	5.6 ± 5.1	0.89
Anxiety (GAD-7)	0-4 = minimal, 5-9 = mild, 10-14 = moderate, 15-21 = severe (Spitzer et al., 2006)	0 – 21	5.0 ± 4.7	0.92

Note: SSGS= State Shame and Guilt Scale; TGP = Trustworthiness and Goodness of People Scale; PHQ-9 = Patient Health Questionnaire – 9; GAD-7 = Generalized Anxiety Disorder Questionnaire – 7

Table 6. Logistic Regression Models of Variables Among Registered Nurses in the Aftermath of a PSI				
Variable	**Outcome 1: Changed Jobs**		**Outcome 2: Intention to Leave the Profession**	
Demographic	**OR**	**95% Conf. Interval**	**OR**	**95% Conf. Interval**
Age	0.98	0.90 – 1.06	1.00	0.94 – 1.07
Years Licensed as RN	1.04	0.95 – 1.14	1.00	0.94 – 1.08
Years at Current Job	0.99	0.91 – 1.06	1.00	0.94 – 1.06
Highest Earned Nursing Degree				
Associates - 1	0.81	0.20 – 3.26	1.95	0.69 – 5.49
Bachelors – 2 (referent value)	-	-	-	-
Masters - 3	3.32*	1.13 – 9.74	1.27	0.47 – 3.44
Doctorate - 4	13.13*	1.22 – 141.22	7.00	0.76 – 64.32
Highest Earned Non-Nursing Degree				
Associates - 1	3.51	0.95 – 13.02	0.69	0.22 – 2.14
Bachelors - 2	0.99	0.32 – 3.05	1.24	0.53 – 2.92
Masters - 3	5.26*	1.20 – 23.18	0.82	0.18 – 3.74
No Other Degree – 5 (referent value)	-	-	-	-
Potential Morally Injurious Outcome				
Guilt	1.11	0.97 – 1.28	1.15*	1.02 – 1.30
Shame	0.93	0.80 – 1.08	0.94	0.83 – 1.07
Loss of Trust	0.95	0.83 – 1.09	0.89*	0.80 – 1.00
Depression	0.97	0.86 – 1.09	1.06	0.96 – 1.17
Anxiety	1.17**	1.03 – 1.33	1.01	0.91 – 1.13

OR = Odds Ratio; RN = Registered Nurse; *p<0.05, **p<0.01, ***p<0.001

Table 7. Matrix of Qualitative Categories and Sub-categories

	Clinical situations	Internal to RN	External to situation or environment
Psychological Circumstances	MIE sub-categories: 3) Deaths 10) Suicides 13) RN/APN feeling betrayed by physician/organization 13) Different physician/APN or MD/RN standards	MIE sub-categories: 6) Failure to escalate Morally Injurious Outcome sub-categories: 1) Anxiety 2) Depression 3) "Feel responsible" 4) Fear/Afraid 5) "Feel bad"/Remorseful 6) Guilt 7) Blame 8) Angry with others 9) Incompetent/Inadequate/ Knowledge deficit 10) Loss of confidence/self-doubt/Second guessing 11) Considered leaving profession 12) Changed job 13) Sleep disruption 14) Embarrassed 15) Shamed 16) Appetite change 17) Trust violated 18 Work-home-interaction 19) Re-experiencing 20) Hypervigilance 21) Not able to perform job duties 22) Avoidance 23) Angry with self 24) Trouble concentrating 25) Feel like whistleblower Morally Courageous sub-categories: 1) Learning opportunity 2) Better advocate	MIE sub-categories: 9) Incivility 14) Dignity compromised
Organizational Circumstances	MIE sub-categories: 5) New nurse 7) Miscommunication 8) Staffing	MIE sub-categories: 6) Failure to escalate	MIE sub-categories: 4) Lawsuits 9) Incivility 11) Involvement with root cause analysis (RCA)
Cultural / Relational Circumstances	MIE sub-categories: 3) Deaths 5) New nurse 10) Suicides 13) Different physician/APN or MD/RN standards 12) Lack of *Just Culture*	MIE sub-categories: 3) Deaths 5) New nurse 6) Failure to escalate 10) Suicides	MIE sub-categories: 9) Incivility 11) Involvement w/ RCA 14) Dignity compromised
Environmental Circumstances	MIE sub-categories: 1) Falls 2) Wrong med/dose/patient	MIE sub-categories: 6) Failure to escalate	

Note: MIEs are numbered by the prevalence of the category in the narrative data.

Table 8. Triangulation of Quantitative/Qualitative Data

Quantitative	Qualitative: Morally Injurious Experiences	Qualitative: Morally Injurious Outcomes	Qualitative: Morally Courageous Outcomes	Comparison	Exemplar
Anxiety	Y	Y	n/a	In both	RN 4 - *It filled me with fear: the "what ifs," what could have been the result if the occurrence had turned-out worst-case scenario. Filled me with doubt in my competence; what other mistakes have I made that I wasn't even aware of, what about the next mistake… It caused me concern for how my coworkers, superiors would think of me: Would they trust the care I gave? Would they still be willing to work with me (or groan when they saw my name on the schedule?) Double and triple checking my work, with almost paralysis to complete my work.*
Depression	Y	Y	n/a	In both	RN 5 - *Was there something I had missed? Was there something else I should've done? Why didn't I make the midwife come in? Why hadn't I done more assessments and longer? The baby was DEAD and gone, a week before her scheduled c-section. Guilt, disappointment, shame, anxiety, grief, disappointment in myself… all these feelings I had in me for weeks… I questioned my skills, my reliability, my worthiness as an RN, and ability to care for others. I have felt depressed since this PSI. I worked in L&D for another 2 years, but I never fully trusted myself and always doubted everything. Though I never contemplated suicide, there were mornings before work where I'd wish I was so ill that I couldn't work. I'd wish a deer would run in front of my car on my drive to work. Anything to get me out of the day ahead. I was incredibly tense with waves of depression and anxiety for about 16 months. I recently took an outpatient position in reproductive health, after moving across the country, instead of continuing in L&D.*
Guilt	Y	Y	n/a	In both	
Shame	Y	Y	n/a	In both	
Loss of Trust	Y	Y	n/a	In both	See RN 4 above
Changed job	Y	Y	n/a	In both	RN 6 – *I made a medication error that affected a patient and her newborn. I have never forgotten it. I went to part time and then left working in OB after 27 years. I now work in a prep clinic.*
Intention to leave nursing profession	Y	Y	n/a	In both	RN 7 – *As a result of this event, I will never treat another child as long as I am a nurse – not in any form or fashion. I also avoid practice where I have any medical-legal exposure. And, if my current job ever goes away, I will probably never work as a clinician again.*
Nursing degree	Y	Y	n/a	In both	See RN 3 in text

Chapter V

Discussion, Summary, and Implications

Discussion

The overall aim of this Dissertation was to philosophically, conceptually, and empirically explore potential MIEs and subsequent moral injury potentially experienced by RNs involved with a PSI. This was addressed by 1) creating a unique framework in which to examine MIEs and moral injury in nurses involved with a PSI, 2) reviewing the nurse *second victim* literature to understand the experiences of nurses involved with PSIs, 3) and empirically evaluating the quantitative and qualitative data generated by nurses involved with a PSI. My literature review validated the phenomenon of moral injury in nurses. This is significant, because I am the first to demonstrate moral injury theoretically and empirically in nursing.

Relationships between findings and previous research literature

Nurses involved with PSI are exposed to MIEs such as staffing letdowns, technology failures, and condemning or non-supportive *Just Culture* environments (i.e., in which individual clinicians are held accountable for system failings over which they have no control). In my literature review, core moral injury symptoms were prevalent, including guilt, shame, spiritual/existential crisis, and loss of trust. Secondary and other potential symptoms were also documented, including depression, anxiety, anger, self-harm, social problems, leaving a job/the profession, and change in worldview. While neither moral injury nor potential MIEs have been explored theoretically or empirically elsewhere in literature of nurses in the aftermath of a PSI,

my literature review validated the phenomenon, and was the cornerstone for this Dissertation study of MIEs and moral injury of RNs in the aftermath of a PSI.

Summary and Implications

Three manuscripts were included in this Dissertation. The manuscripts consist of one literature review (Chapter II and two data-based manuscripts (Chapter III and Chapter IV). Various methodological approaches and statistical analyses were used in these manuscripts. Refer to Table 1 for an Overview of the Dissertation Aims and Findings.

Table 1. *Chapter Aims and Findings*

	Aims	Findings
Creating a Framework	**Chapter I** Background and Significance	**Theory.** This Dissertation was initially guided by the Nurse Wounded Healer middle range theory of Dr. Conti-O'Hare (2002). However, this theory proved to be inadequate. No other adequate model existed. Thus, concepts from military psychiatry (MIEs, moral injury) (Litz et al., 2009; Shay, 2014), nursing (moral residue, moral distress) (Epstein & Hamric, 2009), and psychology (post-traumatic growth) (Tedeschi, 1998), and the Nurse Wounded Healer model was modified to create the Revised Nurse Model of Trauma to meet the needs of the RN involved with a PSI (see Figure 2, page 31).
Reviewing Literature	**Chapter II** Aim 1: The aim of this review of nurse *second victim* literature was to describe symptoms of moral injury empirically observed in nurses in the aftermath of a PSI.	**MIEs.** Chapter II operationalized MIEs and moral injury in RNs in the aftermath of a PSI. The review of nurse *second victim* literature advanced the state of the science by framing the language of MIEs and empirically grounding the primary (guilt, shame, loss of trust, and spiritual/existential crises) and secondary symptoms (anxiety, depression, self-harm, re-experiencing, social problems, anger) of moral injury observed in existing *second victim* literature.

Chapter III Aim 2: Was to investigate the relationship between the personality traits, perfectionism and neuroticism, and the traumatic outcomes of re-experiencing, avoidance, and alcohol abuse severity of RNs who have been involved with a PSI.	**Perfectionism and neuroticism.** It is known perfectionism and neuroticism are prevalent in nurses and may be associated with the experiences *second victims*, but these specific traits had not yet been evaluated in nurse *second victims*. This Dissertation study specifically evaluated the personality traits of perfectionism and neuroticism in RNs in the aftermath of a PSI (Chapter III). I discovered that RNs with perfectionist-discrepancy traits ($p<0.01$) were the most significant contributors to predicting re-experiencing symptoms (R^2= 18.94%, 19, 181) when controlling for sociodemographics and experience variables, which explained 4% of the variance in the model (eta-squared 0.04, df=1, 95% CI= 0.002-0.115). Furthermore, RNs higher neuroticism ($p<0.05$) would have more avoidance, explaining 4% of the variance in the model (R^2= 13.50%, 19, 178) when controlling for sociodemographics and experience variables (eta-squared 0.04, df=1, 95% CI= 0.002-0.111). Unexpectedly, the personality trait of perfectionism–order ($p<0.01$) had a protective effect against alcohol abuse severity symptoms (R^2= 13.56%, 19, 183), when controlling for sociodemographics and experience variables, which explained 5% of the variance in the model (eta-squared 0.051, df=1, 95% CI= 0.006-0.128). This study is the first to offer a protective factor against alcohol abuse severity, however increasing evidence shows the perfectionist-order subscale (APS-R Order) does not offer empirical predictive benefit over perfectionist-high standards or perfectionist-discrepancy subscales, and use of this sub-scale has even been recommended against (Rice & Richardson, 2014; Stoeber & Otto, 2006). These findings are unique and important contributions in advancing the nurse *second victim* state of the science. Historically, a nursing culture perfectionism-imperative exists such that *good* nurses must not make mistakes (Mason, 2006). My study confirms this perfectionism-imperative persists in today's workforce because the narratives from RNs in my study mixed methods study (Chapter IV) frequently described anxiety and fear of no longer being a "good nurse" in the aftermath of a PSI.
Chapter IV Aim 3a was to explore the guilt, shame, loss of trust, anxiety, depression, changing a job, and intention to leave the profession of RNs in the aftermath of a PSI. Aim 3b was to explore the experiences of RNs in the aftermath of a PSI. Aim 3c was to merge and compare the qualitative and quantitative data and make empirical associations between the morally injurious outcomes for RNs who actually changed a job, or who had intentions to leave the profession, in the aftermath of a PSI.	**Level of education.** There is conflicting evidence in nurse *second victim* research regarding the impact of years of practice on outcomes, with the *nurse experience of medical error* model showing novice nurses having more difficulty after a PSI (Lewis, Baernholdt, et al., 2013), but Van Gerven, Deweer, et al. (2016) reporting that years of practice is not a factor. My mixed methods study (Chapter IV) showed level of education mattered, both nursing and non-nursing education. Having an MSN meant the RN was 3.95 times more likely (95%CI= 1.92–83.38) to change a job in the aftermath of a PSI compared to an RN with a BSN. Also, RNs with a non-nursing master's degree were 12.64 times more likely (95% CI=1.92–83.38) to change jobs compared to those with no other college degree (95% CI= 0.01–0.52). Perhaps these nurses have different types of jobs than clinical nurses (i.e., MBA). There were no descriptions in the narrative data to explain this phenomenon. However, the changing job observations are interesting, especially when put into the context of fear of differential reprimand and betrayal trauma previously described in the context of institutional and systems betrayals, and I might add individual betrayals that occur with MIEs and moral injury in the aftermath of a PSI.

	Fear of differential discipline and punishment. Interestingly, Wolf et al. (2000, p. 7) reported in their seminal study that nurses feared disciplinary action more and punishment more compared to physicians and pharmacists. My mixed methods study confirms this fear is warranted, and the APN exemplar presented in Chapter IV highlights this very real fear for nurses compared to their physician and pharmacist counterparts, which is a MIE and a betrayal by institutions and systems in which RNs practice. **MIEs.** The mixed methods manuscript (Chapter IV) described empirical findings from my Dissertation study consistent with the previously described MIEs (from Chapter II), the first contribution to nursing science in MIEs and moral injury, and in nurse *second victim* science. While this Dissertation did not specifically did not measure *centrality of events*, we do capture meaning making in the nursing narratives and report the outcomes in Chapter IV, which also is a unique contribution to the literature. In reflecting upon the Revised Nurse Model of Trauma, several pieces of this model were addressed throughout this Dissertation work, although not with direct intention and there is still significant work to be done in empirically building, revising, and testing this model. However, with this initial Dissertation work, the Revised Nurse Model of Trauma is promising, especially based upon the mixed methods (Chapter IV) study which provided glimpses of the entire model at work. In Chapter III, I hypothesized, and it was confirmed that, that personality traits, would shape the reaction to MIEs. In the Revised Nurse Model of Trauma, this concept is addressed in the nurses' personal characteristics. Also, in Chapter III, I hypothesized and it was confirmed, that personality traits would predict symptoms of PTSD, with is a concept that has been expanded in the Revised Nurse Model of Trauma. In Chapter IV, the concepts in the Revised Nurse Model of Trauma that are expanded include MIEs and meaning making. These concepts are addressed through in the qualitative narrative content analysis in Chapter IV. Also, the concept of Moral Injury in the Revised Nurse Model of Trauma is addressed both quantitatively and qualitatively in this same chapter. **Moral injury.** While Chapter II operationalized moral injury, Chapter IV empirically advanced moral injury into a working construct. With the mixed methods study, I was able to demonstrate RNs experience moral injury operationalized as anxiety, guilt, shame, depression, loss of trust, changing jobs, and intention to leave the profession. RNs in my study expressed mild anxiety. RNs in the study measured mildly anxious (M=5), but self-reported in their narratives as highly anxious (symptom of highest frequency) in the aftermath of a PSI. Guilt and shame were highly correlated, but RNs also experienced these higher than average (M=11.1, M=9, respectively). My sample was mild to moderately depressed (M=5.6+/-5.1), which is not unanticipated for a middle-aged mostly female sample. Lastly, the mean for trust was remarkably high (M=21.8) for my sample compared to the referent value (M=3.8), however I recognize the scale has poor reliability and high variability, which is not unforeseen for this construct (Kaler, 2009). Nonetheless, the wide range (11-30) and high mean for trust is interesting. Loss of trust was not statistically significant in my regression models for considering leaving the profession (p = .06), or changing a job (p= .97) in the aftermath of a PSI.

	Root cause analysis. Interestingly, my literature review showed that participating post-PSI error analysis was important for recovery and resilience (Burlison et al., 2014; Edrees et al., 2011; Sattler et al., 2014). However, RN study participants reported very clearly in my qualitative data that participation in root cause analysis was a highly MIE.

Methodological Relevance

This work demonstrates the literature mastery, review and synthesis ability, quantitative statistical methodologies and qualitative narrative analysis of M. Stovall-Culverhouse. The SALSA literature review offered a unique reframing of *second victim* literature which has already been "reviewed" many times by other authors. By offering a fresh lens through which to view the same data, a new opportunity was provided for MIEs and moral injury, which is potentially emancipating compared to the betrayals of victim-language.

Having introduced psychology into the Revised Nurse Model of Trauma (with post-traumatic growth), this led me to psychology literature. The interest in perfectionism and neuroticism grew out of my *Just Culture* reading and from the psychology reading. There were numerous studies of nurses or student nurses and perfectionism or even of personality traits, but none specific to those involved with PSIs. Yet, I had read a single small study of medical errors and neuroticism (Babaei et al., 2018), that suggested screening employees for this personality trait. My course was set when I read that paper because I knew this was not the right recommendation to make – neuroticism is not all bad! I would do a quantitative study, and it would use perfectionism and neuroticism measures. The quantitative study uses simple logistic regression analysis, and addresses a unique question in the literature.

Lastly, speaking about methodology, when I was early in my PhD program, I read a mixed methods paper by Dr. Cheryl Tatano Beck and modeled an early research proposal after

her paper. I am proud to say that my mixed methods paper and my model of study design has grown from that very early production (see Figure 1 on page 110). The mixed methods paper will be a strong contribution to the nursing literature as it empirically introduces MIEs and moral injury into the nursing nomenclature. The sound study design and rigor of analysis are of paramount importance to ensure this work is accepted in the scientific community. This paper creates a unique framework, built from military psychiatry and nursing moral distress, wherein MIEs, moral injurious outcomes, and morally courageous outcomes are housed.

Strengths and Limitations

First, this Dissertation data was collected with self-reported questionnaires, which may have resulted in underreporting, especially troublesome given the sensitive nature of our subject data. Second, all of the personal experiences and characteristics of the nurses may influence the answers on the questionnaires, which may create bias, especially recall and social desirability.

While I randomly selected RNs from the lists of available email addresses, the recruitment method led to an element of self-selection. Those who did not respond to the survey may be different than those who ultimately did respond to surveys. Also, participants were asked to recall emotions and narratives relating to previous PSIs, but the ability to retrieve this episodic information regarding a discreet event declines quickly over time, rendering these reports subject to inaccuracies, particularly the details. Current emotional state may also influence the reporting of emotions.

Despite these limitations, there is consistent, powerful evidence that suggests emotionally charged memories are likely to be subject to vivid recall, and this may be applicable to the experience of a PSI. A paradox of traumatic memory, is that these are both the *least* forgettable

of all memories (causing intrusive detailed recollections) and the *most* forgettable of all memories (causing memory failure (Freyd, 2008, p. 29)).

My failure to disclose to participants how their email address came to be in the potential participant pool likely led to a large non-response bias. Nonetheless, having over 200 respondents to such a sensitive subject study proved exciting even if the response rate was only 2.55%. Also, the timing of recruitment was difficult for a nursing study in that the first wave of recruitment went out in early July, which is a time for many nurses to be on vacation with their children (e.g, I received many out-of-office auto-responses). I believe having the $20 eGift cards to motivate potential participants was critical to recruitment.

Another limitation was my trust scale. Prior to commencing my study, I recognized the Trustworthiness and Goodness in People scale had poor reliability and high variability (α=0.8) (Janoff-Bulman, 1992; Kaler, 2009), and for my study (Chapter IV) the α=0.79. Trust is a high variable construct to begin with, and difficult to capture with reliability and consistency. While my reliability is low, it is consistent with two other empirical studies that have used the measure. Other trust scales do exist, however are plagued by the same problems as this scale.

Research Implications

Results from this Dissertation inform future research, assessment, intervention, and prevention efforts before and after RNs are involved with PSIs to help keep our highly skilled RNs in the workforce.

With this Dissertation, the language of MIEs, moral injury, and betrayal trauma has been introduced so as to build future work from this Dissertation. There is still data remaining from this Dissertation from which more studies can, and will, be brought to fruition. If I desire, my

entire program of research as a budding academic can be seeded from this Dissertation. Other researchers interested in MIEs and moral injury can also replicate the work produced in this Dissertation as I have provided significant transparency in my methods and limitations.

Advancing nursing science regarding personal, institutional, and systems betrayals is of paramount importance so that we may begin to deconstruct the hegemony that keeps RNs from fully practicing to our full scope and potential. Furthermore, advancing the science to understand why RNs change jobs and leave the profession is of utmost importance to keep these highly trained and skilled experts in the workforce, but also feeling safe, trusting, and content given their fears of disproportionate punishment and discipline appear to be warranted based upon our findings from the mixed methods study (Chapter IV).

Future studies are needed to clarify the difference between participation in error analysis and participation in root cause analysis. Root cause analysis compared to error analysis seems to be a legal or more formalized procedure that involves more uncertainty and thus more anxiety and fear for the RNs in our mixed methods study (Chapter IV).

Importantly, the Revised Nurse Model of Trauma needs to be tested in empirical studies, to ensure the theoretical model is sustainable. While several pieces of the model were assessed at different points of this Dissertation, relationships in the model were not tested with intention.

Future studies inspired from this Dissertation should investigate the relationship of RNs changing jobs and intention to leave with anxiety, depression, suicidal behaviors, and alcohol abuse severity in the aftermath of a PSI. Additionally, a purely qualitative study exploring the narratives from the RNs of this Dissertation study should be explored to give them justice. Other work might explore the relationships between neuroticism and perfectionism, social functioning, depression, meaning in life, and suicidal behaviors of RNs in the aftermath of a PSI. There is a

plethora of data remaining to be explored with this Dissertation, and the state of the science has so much to glean from these questions being explored.

Clinical Relevance

The implications are of this work are critical in the broad context of the retention of our nursing workforce. First, through advancing potential MIEs and MI associated with a PSI and/or the aftermath in RNs, clinicians and organizations can be empowered to advance training and intervention programs aimed at holistically caring for healthcare clinicians in the aftermath of a PSI. I hope we can stop using the name "*second victim"* so as to stop the subtle betrayals victim-language creates, so that new opportunities for healing can be explored. Only once we name these moral betrayal traumas, we can begin to reframe them, and rebuild our moral community with an aim towards healing and retaining our highly qualified workforce. Second, the theoretical model derived from this dissertation will make significant contributions to multiple areas of inquiry, including theory, measurement, research, and practice. Third, the mixed method cross-sectional study is the first to consider MIEs after a PSI, in addition the quantitative manuscript is the first to explore personality traits as influencing potential morally injurious outcomes in RNs after a PSI. The implications of advancing knowledge of perfectionistic imperatives, MIEs, and moral injury after a traumatic experience are crucial as nursing education and practice settings develop and implement programs aimed at improving research methods, safety, resilience, and retention of the nursing workforce. Creating and advancing nursing knowledge in moral injury research is urgent for building safe, resilient, and thriving moral nursing communities.

References

Aiken, L., Sloane, D., Barnes, H., Cimiotti, J., Jarrin, O., & McHugh, M. (2018). Nurses' and patients' appraisals show patient safety in hospitals remains a concern. *Health Affairs, 37*(11), 1744-1751. doi:10.1377/hlthaff.2018.0711

Alderson, M., Parent-Rocheleau, X., & Mishara, B. (2015). Critical review on suicide among nurses: What about work-related factors? *Crisis: Journal of Crisis Intervention & Suicide, 36*(2), 91-101. doi:10.1027/0227-5910/a000305

American Nurses Association. (2010). *Just Culture: New position statement*. Retrieved from https://www.nursingworld.org/globalassets/practiceandpolicy/nursing-excellence/ana-position-statements-secure/workplace-advocacy/just_culture.pdf

American Psychiatric Association. Diagnostic and Statistical Manual Task Force. (2013). *Diagnostic and statistical manual of mental disorders: DSM-5* (5th ed. ed.). Arlington, VA: American Psychiatric Association.

Anonymous. (1990). The mistake I'll never forget. *Nursing, 20*, 50-51.

Arndt, M. (1994). Nurses' medication errors. *Journal of Advanced Nursing, 19*(3), 519-526. doi:10.1111/j.1365-2648.1994.tb01116.x

Babaei, M., Mohammadian, M., Abdollahi, M., & Hatami, A. (2018). Relationship between big five personality factors, problem solving and medical errors. *Heliyon, 4*(9), e00789. doi:10.1016/j.heliyon.2018.e00789

Balevre, P. (2001). Professional nursing burnout and irrational thinking. *Journal for Nurses Staff Development, 17*(5), 264-271.

Benet-Martinez, V., & John, O. (1998). Los Cinco Grandes across cultures and ethnic groups: Multitrait multimethod analyses of the Big Five in Spanish and English. *Journal of Personality and Social Psychology, 75*, 729–750.

Berlinger, N. (2005). *After harm: Medical error and the ethics of forgiveness*. Baltimore, MD: Johns Hopkins University Press.

Blendon, R., DesRoches, C.M., Brodie, M., et al. (2002). Views of practicing physicians and the public on medical errors. *New England Journal of Medicine, 347*(24), 1933-1940.

Blevins, C., Weathers, F., Davis, M., Witte, T., & Domino, J. (2015). The Posttraumatic Stress Disorder Checklist for DSM-5 (PCL-5): Development and initial psychometric evaluation. *Journal of Traumatic Stress, 28*, 489-498. doi:10.1002/jts.22059

Bolger, N. (1990). Coping as personality process: A prospective study. *Journal of Personality and Social Psychology, 59*, 525–537.

Borja, S., Callahan, J., & Rambo, P. (2009). Understanding negative outcomes following traumatic exposure: The roles of neuroticism and social support. *Psychological Trauma : Theory, Research, Practice and Policy, 1*(2), 118-129. doi:10.1037/cou0000036

Bovin, M., Marx, B., Weathers, F., Gallagher, M., Rodriguez, P., Schnurr, P., & Keane, T. (2016). Psychometric properties of the PTSD Checklist for Diagnostic and Statistical Manual of Mental Disorders-Fifth Edition (PCL-5) in Veterans. *Psychological Assessment, 28*, 1379-1391. doi:10.1037/pas0000254

Bradley, K., DeBenedetti, A., Volk, R., Williams, E., Frank, D., & Kivlahan, D. (2007). AUDIT-C as a brief screen for alcohol misuse in primary care. *Alcoholism: Clinical and Experimental Research, 31*(7), 1208-1217.

Brown, J., & Kocovski, N. (2014). Perfectionism as a predictor of post-even rumination in a socially anxious sample. *Journal of Rational-Emotive & Cognitive-Behavior Therapy, 32*, 150-163. doi:10.1007/s10942-013-0175-y

Broyles, L., Rodriguez, K., Proce, P., Bayliss, N., & Sevick, M. (2011). Overcoming barriers to the recruitment of nurses as participants in health care research. *Qualitative Health Research, 21*(2), 1705-1718. doi:10.1177/1049732311417727

Bunkers, S. (2018). With a kiss: Betrayal. *Nursing Science Quarterly, 31*(1), 6-10. doi:10.1177/0894318417741092

Bureau of Labor Statistics. U.S. Department of Labor. (2016). Hospital workers suffered 294,000 nonfatal workplace injuries and illnesses in 2014. *The Economics Daily.* Retrieved from https://www.bls.gov/opub/ted/2016/hospital-workers-suffered-294000-nonfatal-workplace-injuries-and-illnesses-in-2014.htm

Burlison, J., Scott, S., Browne, E., Thompson, S., & Hoffman, J. (2014). The second victim experience and support tool: Validation of an organizational resource for assessing second victim effects and the quality of support resources. *Journal of Patient Safety*. doi:10.1097/PTS.0000000000000129

Bush, K., Kivlahan, D. R., McDonell, M. B., Fihn, S. D., & Bradley, K. A. (1998). The AUDIT alcohol consumption questions (AUDIT-C): An effective brief screening test for problem drinking. *Archives of Internal Medicine, 158*, 1789-1795. doi:10.1001/archinte.158.16.1789

Chan, S., Khong, P., & Wang, W. (2017). Psychological responses, coping and supporting needs of healthcare professionals as second victims. *International Nursing Review, 64*(2), 242-262. doi:10.1111/inr.12317

Chang, Y. (2012). The relationship between maladaptive perfectionism with burnout: Testing mediating effect of emotion-focused coping. *Personality and Individual Differences, 53*(5), 635-639. doi:10.1016/j.paid.2012.05.002

Chard, R. (2010). How perioperative nurses define, attribute causes of, and react to intraoperative nursing errors. *AORN Journal, 91*(1), 132-145. doi:10.1016/j.aorn.2009.06.028

Charles, S., Warnecke, R., Wilbert, J., Lichtenberg, R., & DeJesus, C. (1987). Sued and nonsued physicians. Satisfaction, dissatisfactions, and sources of stress. *Psychosomatics, 28*(9), 462-468.

Cho, Y., Johnson, T., & Van Geest, J. (2013). Enhancing surveys of health care professionals: A meta-analysis of techniques to improve response. *Evaluation & the Health Professions, 36*(3), 382-407. doi:10.1177/0163278713496425

Christensen, J., Levinson, W., & Dunn, P. (1992). The heart of darkness: The impact of perceived mistakes on physicians. *Journal of General Internal Medicine, 7*(4), 424-431.

Christie, W., & Jones, S. (2013). Lateral violence in nursing and the theory of the Nurse as Wounded Healer. *OJIN: The Online Journal of Issues in Nursing, 19*(1). doi:10.3912/OJIN.Vol19No01PPT01

Cohen, J. (1988). *Statistical Power Analysis for the Behavioral Sciences* (Second Edition ed.): Lawrence Erlbaum Associates.

Cohen, J. (1992). A power primer. *Psychological Bulletin, 112*, 155-159. doi:10.1037/0033-2909.112.1.155

Coli, R., dos Anjos, M., & Pereira, L. (2010). The attitudes of nurses from an intensive care unit in the face of errors: An approach in light of bioethics. *Revista Latino-Americana de Enfermagem, 18*(3), 324-330.

Conti-O'Hare, M. (2002). *The nurse as wounded healer: From trauma to transcendence*. Sudbury, MA: Jones and Bartlett.

Conway, J., Federico, F., Stewart, K., & Campbell, M. (2011). *Respectful Management of Serious Clinical Adverse Events, 2nd Ed.* Cambridge, MA: Institute for Healthcare Improvement.

Costa, P., & McCrae, R. (1992). Four ways five factors are basic. *Personality and Individual Differences, 13*, 653-665.

Council for International Organizations of Medical Sciences (CIOMS). (2016). International Ethical Guidelines for Health-related Research involving Humans, Fourth edition. In. Geneva.

Crespi, B. (2014). An evolutionary framework for psychological maladaptations. *Psychological Inquiry, 25*, 322-324. doi:10.1080/1047840X.2014.912560

Creswell, J., & Plano Clark, V. (2011). *Designing and Conducting Mixed Methods Research*. Thousand Oaks, CA: Sage Publications.

Crigger, N. (2005). Two models of mistake-making in professional practice: Moving out of the closet. *Nursing Philosophy, 6*(1), 11-18. doi:10.1111/j.1466-769X.2004.00203.x

Crigger, N., & Meek, V. (2007). Toward a theory of self-reconciliation following mistakes in nursing practice. *Journal of Nursing Scholarship, 39*(2), 177-183.

Currier, J., McCormick, W., & Drescher, K. (2015). How do morally injurious events occur? A qualitative analysis of perspectives of veterans with PTSD. *Traumatology, 21*(2), 106-116. doi:10.1037/trm0000027

Curtis, L., Ostbye, T., Sendersky, V., Hutchison, S., Dan, P., Wright, A., Woosley, R., Shulman, K. (2004). Inappropriate prescribing for elderly Americans in a large outpatient population. *Archives of Internal Medicine, 164*, 1621-1625.

D'Llima, D., Murray, E., & Brett, S. (2018). Perceptions of risk and safety in the ICU: A qualitative study of cognitive processes relating to staffing. *Critical Care Medicine, 46*(1), 60.

Davidson, J., Agan, D., & Chakedis, S. (2016). Exploring distress caused by blame for a negative patient outcome. *The Journal of Nursing Administration, 46*(1), 18-24. doi:10.1097/NNA.0000000000000288

Davidson, J., Proudfoot, J., Lee, K., & Zisook, S. (2019). Nurse suicide in the United States: Analysis of the Center for Disease Control 2014 National Violent Death Reporting System dataset. *Archives of Psychiatric Nursing*. doi:10.1016/j.apnu.2019.04.006

de Freitas, G., Hoga, L., Fernandes, M., González, J., Ruiz, M., & Bonini, B. (2011). Brazilian registered nurses' perceptions and attitudes towards adverse events in nursing care: A phenomenological study. *Journal of Nursing Management, 19*(3), 331-338. doi:10.1111/j.1365-2834.2011.01208.x

Dekker, S. (2013). *Second Victim: Error, Guilt, Trauma, and Resilience*. Boca Raton, FL: CRC Press.

Delacroix, R. (2017). Exploring the experience of nurse practitioners who have committed medical errors: A phenomenological approach. *Journal of the American Association of Nurse Practitioners., 29*(7), 403-409. doi:10.1002/2327-6924.12468

Deppoliti, D. (2008). Exploring how new registered nurses construct professional identity in hospital settings. *The Journal of Continuing Education in Nursing, 39*(6), 255-262.

Dillman, D. (2014). *Internet, phone, mail, and mixed-mode surveys : The Tailored Design Method* (Fourth edition. ed.). Hoboken, NJ: Wiley.

Dinndorf-Hogenson, G. (2015). Moral courage in practice: Implications for patient safety. *Journal of Nursing Regulation, 6*(2), 10-16. doi:10.1016/S2155-8256(15)30381-1

Duffield, C., Roche, M., Homer, C., Buchan, J., & Dimitrelis, S. (2014). A comparative review of nurse turnover rates and costs across countries. *Journal of Advanced Nursing, 70*(12), 2703-2712. doi:10.1111/jan.12483

Dunkley, D., Mandel, T., & Ma, D. (2014). Perfectionism, neuroticism, and daily stress reactivity and coping effectiveness 6 months and 3 years later. *Journal of Counseling Psychology, 61*(4), 616-633. doi:10.1037/cou0000036

Dzau, V. J., Kirch, D. G., & Nasca, T. J. (2018). To Care Is Human — Collectively Confronting the Clinician-Burnout Crisis. *New England Journal of Medicine, 378*(4), 312-314. doi:10.1056/NEJMp1715127

Edrees, H., Paine, L., Feroli, E., & Wu, A. (2011). Health care workers as second victims of medical errors. *Polskie Archiwum Medycyny Wewnętrznej, 121*(4), 101-108.

Edwards, D., & Burnard, P. (2003). A systematic review of stress and stress management interventions for mental health nurses. *Journal of Advanced Nursing, 42*, 169-200. doi:10.1046/j.1365-2648.2003.02600.x

Engel, K., Rosenthal, M., & Sutcliffe, K. (2006). Residents' responses to medical error: Coping, learning, and change. *Academic Medicine, 81*(1), 86-93.

Epstein, E., & Hamric, A. (2009). Moral distress, moral residue, and the crescendo effect. *Journal of Clinical Ethics, 20*(4), 330-342.

Epstein, E., Whitehead, P., Prompahakul, C., Thacker, L., & Hamric, A. (2019). Enhancing understanding of moral distress: The measure of moral distress for health care professionals. *AJOB Empirical Bioethics*. doi:10.1080/23294515.2019.1586008

Epstein, S. (1991). The self-concept, the traumatic neurosis, and the structure of personality. In J. H. H. D. Ozer, & A.H. Stewart (Ed.), *Perspectives in Personalty* (Vol. 3, pp. 63-98). London: Kingsley.

Epstein, S. (1994). Integration of the cognitive and the psychodynamic unconscious. *American Psychologist, 49*(8), 709-724.

Erbea, D., Eicherta, H., Rietza, C., & Ebert, D. (2016). Interformat reliability of the patient health questionnaire: Validation of the computerized version of the PHQ-9. *Internet Interventions, 5*, 1-4. doi:10.1016/j.invent.2016.06.006

Fowler, M. D. (2019). Literature, gossip, lore: On being a Good Nurse. *Journal of Christian Nursing, 36*(2), 77. doi:10.1097/CNJ.0000000000000589

Freyd, J. (2008). Betrayal Trauma. In J. D. E. Gilbert Reyes, Julian D. Ford (Ed.), *The Encyclopedia of Psychological Trauma* (pp. 76). Hoboken, NJ: John Wiley & Sons, Inc.

Frost, R., Marten, E., Lahart, C., & Rosenblate, R. (1990). The dimensions of perfectionism. *Cognitive Therapy and Research, 14*, 449-468.

Gagnon, L. (2004). Medical error affects nearly 25% of Canadians. *Canadian Medical Association Journal, 172*, 173.

Gallagher, T., Waterman, A., Ebers, A., & al., e. (2003). Patients' and physicians' attitudes regarding the disclosure of medical errors. *JAMA, 289*, 1001-1007.

Gazoni, F. M., Amato, P. E., Malik, Z. M., & Durieux, M. E. (2012). The impact of perioperative catastrophes on anesthesiologists: Results of a national survey. *Anaesthesia & Analgesia, 114*(3), 596-603. doi:10.1213/ANE.0b013e318227524e

Geuens, N., Van Bogaert, P., & Franck, E. (2017). Vulnerability to burnout within the nursing workforce—The role of personality and interpersonal behaviour. *Journal of Clinical Nursing, 26*(23-24), 4622-4633. doi:10.1111/jocn.13808

Goldberg, L. (1993). The structure of phenotypic personality traits. *American Psychologist, 48*, 26-34.

Goldberg, R., Kuhn, G., Andrew, L., & Thomas, H. J. (2002). Coping with medical mistakes and errors in judgment. *Annals of Emergency Medicine, 39*(3), 287-292.

Grant, M., & Booth, A. (2009). A typology of reviews: An analysis of 14 review types and associated methodologies. *Health Information & Libraries Journal, 26*(2), 91-108. doi:10.1111/j.1471-1842.2009.00848.x

Greshtensky, I. (2004). Wrongful medications. In T. H. S. M. Feigin, & A. Kaplan (Ed.), *Risk Management in Medicine* (pp. 321-325). Tel Aviv.

Groleau, J., Calhoun, L., Cann, A., & Tedeschi, R. (2013). The role of centrality of events in posttraumatic distress and posttraumatic growth. *Psychological Trauma: Theory, Research, Practice, and Policy, 5*(5), 477-483.

Gunty, A., Frazier, P., Tennen, H., Tomich, P., Tashiro, T., & Park, C. (2011). Moderators of the relation between perceived and actual posttraumatic growth. *Psychological Trauma : Theory, Research, Practice and Policy, 3*(1), 61-66. doi:10.1037/a0020485

Hajloo, N., Garamaleki, N., Tamarasi, M., & Haghighatgoo, M. (2011). Survey the relationship between perfectionism and job burn-out. *Journal of Guilan University Medical Sciences, 20*(77), 23-30.

Hamric, A., Borchers, C., & Epstein, E. (2012). Development and Testing of an Instrument to Measure Moral Distress in Healthcare Professionals. *AJOB Primary Research, 3*(2), 1-9. doi:10.1080/21507716.2011.652337

Harris, P., Taylor, R., Minor, B., al., e., & The REDCap Consortium. (2019). The REDCap consortium: Building an international community of software partners. *Journal of Biomedical Informatics, 95*(103208). doi:10.1016/j.jbi.2019.103208

Harris, P., Taylor, R., Thielke, R., Payne, J., Gonzalez, N., & Conde, J. (2009). Research electronic data capture (REDCap) – A metadata-driven methodology and workflow process for providing translational research informatics support. *Journal of Biomedical Informatics, 42*(2), 377-381.

Harrison, R., Lawton, R., Perlo, J., Gardner, P., Armitage, G., & Shapiro, J. (2015). Emotion and coping in the aftermath of medical error: A cross-country exploration. *Journal of Patient Safety, 11*(1), 28-35. doi:10.1097/PTS.0b013e3182979b6f

Hawton, K., Simkin, S., Rus, J., Haw, C., Barbour, F., Clements, A., . . . Deeks, J. (2002). Suicide in female nurses in England and Wales. *Psychological Medicine, 32*, 239-250. doi:10.1017/S0033291701005165

Hayashino, Y., Utsugi-Ozaki, M., Feldman, M. D., & Fukuhara, S. (2012). Hope modified the association between distress and incidence of self-perceived medical errors among practicing physicians: Prospective cohort study. *PLoS One, 7*(4), e35585. doi:10.1371/journal.pone.0035585

Hayhurst, A., Saylor, C., & Stuenkel, D. (2005). Work environment factors and retention of nurses. *Journal of Nursing Care Quality, 20*(3), 283-288.

Henning, K., Ey, S., & Shaw, D. (1998). Perfectionism, the impostor phenomenon and psychological adjustment in medical, dental, nursing and pharmacy students. *Medical Education, 32*(5), 456-464. doi:10.1046/j.1365-2923.1998.00234.x

Hilfiker, D. (1984). Facing our mistakes. *New England Journal of Medicine, 310*(2), 118-122. doi:10.1056/NEJM198401123100211

Hu, Y., Fix, M., Hevelone, N., Lipsitz, S., Greenberg, C., Weissman, J., & Shapiro, J. (2012). Physicians' needs in coping with emotional stressors: The case for peer support. *JAMA Archives of Surgery, 147*(3), 212-217. doi:10.1001/archsurg.2011.312

James, J. (2013). A new, evidence-based estimate of patient harms associated with hospital care. *Journal of Patient Safety, 9*(3), 122-128. doi:10.1097/PTS.0b013e3182948a69

Jameton, A. (1984). *Nursing Practice: The Ethical Issues*: Prentice Hall.

Janoff-Bulman, R. (1992). *Shattered assumptions: Towards a new psychology of trauma*. New York, NY: Free Press.

Jinkerson, J. (2016). Defining and assessing moral injury: A syndrome perspective. *Traumatology, 22*(2), 122-130. doi:10.1037/trm0000069

Joesten, L., Cipparrone, N., Okuno-Jones, S., & DuBose, E. R. (2015). Assessing the perceived level of institutional support for the second victim after a patient safety event. *Journal of Patient Safety, 11*(2), 73-78. doi:10.1097/PTS.0000000000000060

John, O., Donahue, E., & Kentle, R. (1991). *The Big Five Inventory--Versions 4a and 54*. Retrieved from Berkeley, CA: https://www.ocf.berkeley.edu/~johnlab/bfiscale.php

John, O., Naumann, L., & Soto, C. (2008). Paradigm Shift to the Integrative Big-Five Trait Taxonomy: History, Measurement, and Conceptual Issues. In O. P. John, R. W. Robbins, & L. A. Pervin (Eds.), *Handbook of personality: Theory and research* (pp. 114-158). New York: Guilford Press.

Jones, J., & Treiber, L. (2010). When the 5 rights go wrong: Medication errors from the nursing perspective. *Journal of Nursing Care Quality*. doi:10.1097/NCQ.0b013e3181d5b948

Jourdain, G., & Chenevert, D. (2010). Job demands-resources, burnout and intention to leave the nursing profession: A questionnaire survey. *International Journal of Nursing Studies, 47*(6), 709-722. doi:10.1016/j.ijnurstu.2009.11.007

Kable, A., Kelly, B., & Adams, J. (2018). Effects of adverse events in health care on acute care nurses in an Australian context: A qualitative study. *Nursing & Health Sciences, 20*(2), 238-246. doi:10.1111/nhs.12409

Kaler, M. (2009). *The World Assumptions Questionnaire: Development of a measure of the assumptive world (Doctoral dissertation).* (PhD). University of Minnesota, Minneapolis, MN.

Kao, C., Lin, Y., Lee, I., Sun, F., Chang, T., & Li, H. (2015). Development and validation of the inventory of perceptions of medication administration errors for nurses in Taiwan. *Journal of Nursing Research, 23*(1), 41-46. doi:10.1097/jnr.0000000000000048

Karga, M., Kiekkas, P., Aretha, D., & Lemonidou, C. (2011). Changes in nursing practice: Associations with responses to and coping with errors. *Journal of Clinical Nursing, 20*(21-22), 3246-3255. doi:10.1111/j.1365-2702.2011.03772.x

Kash, B., Naufal, G., Dagher, R., & Johnson, C. (2010). Individual factors associated with intentions to leave among directors of nursing in nursing homes. *Health Care Management Review, 35*(3), 246-255. doi:10.1097/HMR.0b013e3181dc826d

Keers, R., Williams, S., Cooke, J., & Ashcroft, D. (2013). Prevalence and nature of medication administration errors in health care settings: A systematic review of direct observational evidence. *Annals of Pharmacotherapy, 47*, 237-256. doi:10.1345/aph.1R147

Kelly, J., & Clark, H. (2017). Perfectionism among nursing students. *International Journal of Nursing and Clinical Practices, 4*, 237. doi:10.15344/2394-4978/2017/237

Khan, N., Jackson, D., Stayt, L., & Walthall, H. (2018). Factors influencing nurses' intentions to leave adult critical care settings. *Nursing in Critical Care*. doi:10.1111/nicc.12348

Kohn, L. T., Corrigan, J., & Donaldson, M. S. (2000). *To err is human: Building a safer health system* (The Institutes of Medicine Ed.). Washington, D.C.: National Academy Press.

Kopera, M., Jakubczyk, A., Klimkiewicz, A., Suszek, H., Krasowska, A., Brower, K. J., & Wojnar, M. (2018). Relationships between components of emotional intelligence and suicidal behavior in alcohol-dependent patients. *Journal of Addiction Medicine, 12*(1), 24-30. doi:10.1097/ADM.0000000000000358

Kovner, C., Brewer, C., Fatehi, F., & Jun, J. (2014). What does nurse turnover rate mean and what is the rate? *Policy, Politics, & Nursing Practice, 15*(3-4), 64-71. doi:10.1177/1527154414547953

Kroenke, K., Spitzer, R. L., & Williams, J. B. (2001). The PHQ-9: Validity of a brief depression severity measure. *Journal of General Internal Medicine, 16*, 606-613. doi:10.1046/j.1525-1497.2001

Kubany, E. S., Haynes, S. N., Abueg, F. R., Manke, F. P., Brennan, J. M., & Stahura, C. (1996). Development and validation of the Trauma-Related Guilt Inventory (TRGI). *Psychological Assessment, 8*(4), 428-444. doi:10.1037/1040-3590.8.4.428

Lachman, V. (2010). Strategies necessary for moral courage. *OJIN: The Online Journal of Issues in Nursing, 15*(3). doi:10.3912/OJIN.Vol15No03Man03

LaFauci Schutt, J. M., & Marotta, S. A. (2011). Personal and environmental predictors of posttraumatic stress in emergency management professionals. *Psychological Trauma : Theory, Research, Practice and Policy, 3*(1), 8-15. doi:10.1037/a0020588

Lagoe, C., & Atkin, D. (2015). Health anxiety in the digital age: An exploration of psychological determinants of online health information seeking. *Computers in Human Behavior,, 52*, 484-491. doi:10.1016/j.chb.2015.06.003

Lahey, B. (2009). Public health significance of neuroticism. *American Psychologist, 64*(4), 241-256. doi:10.1037/a0015309

Lamiani, G., Borghi, L., & Argentero, P. (2017). When healthcare professionals cannot do the right thing: A systematic review of moral distress and its correlates. *Journal of Health Psychology, 22*(1), 51-67. doi:10.1177/1359105315595120

Lancaster, S. (2018). Negative outcomes after morally injurious experiences: A replication and extension. *Psychological Trauma: Theory, Research, Practice, and Policy, 10*(4), 456-462. doi:10.1037/tra0000341

Lander, L., Connor, J., & Shah, R. (2006). Otolaryngologists' responses to errors and adverse events. *Laryngoscope, 116*.

Laurent, A., Aubert, L., Chahraoui, K., Bioy, A., Mariage, A., Quenot, J., & Capellier, G. (2014). Error in intensive care: Psychological repercussions and defense mechanisms among

health professionals. *Critical Care Medicine, 42*(11), 2370-2378. doi:10.1097/CCM.0000000000000508

Lauterbach, D., & Vrana, S. (2001). The relationship among personality variables, exposure to traumatic events, and severity of posttraumatic stress symptoms. *Journal of Traumatic Stress, 14*(1). doi:10.1023/A:1007831430706

Laville, S., & Davies, C. (2012). Jacintha Saldanha suicide note criticised hospital staff. *The Guardian*. Retrieved from https://www.theguardian.com/world/2012/dec/13/jacintha-saldanha-suicide-notes

Leape, L. (1994). Error in medicine. *Journal of the American Medical Association, 272*(23), 1851-1857.

Lee, H., Lee, S., Lee, H., & Kim, Y. (2012). State effect of traumatic experience on personality structure. *Psychiatry Investigation, 9*(4), 361-367. doi:10.4306/pi.2012.9.4.361

Lewis, E., Baernholdt, M., Guofen, Y., & Guterbock, T. (2015). Relationship of adverse events and support to RN burnout. *Journal of Nursing Care Quality, 30*(2), 144-152. doi:10.1097/NCQ.0000000000000084

Lewis, E., Baernholdt, M., & Hamric, A. (2013). Nurses' experience of medical errors: An integrative literature review. *Journal of Nursing Care Quality, 28*(2), 153-161. doi:10.1097/NCQ.0b013e31827e05d1

Lewis, E., Hardy, M., & Snaith, B. (2013). Estimating the effect of nonresponse bias in a survey of hospital organizations. *Evaluation and the Health Professions, 36*(3), 330-351. doi:10.1177/0163278713496565

Li, Y., & Jones, C. (2012). A literature review of nursing turnover costs. *Journal of Nursing Management, 21*(3), 405-418. doi:10.1111/j.1365-2834.2012.01411.x

Litz, B., Stein, N., Delaney, E., Lebowitz, L., Nash, W., Silva, C., & Maguen, S. (2009). Moral injury and moral repair in war veterans: A preliminary model and intervention strategy. *Clinical Psychology Review, 29*(8), 695-706. doi:10.1016/j.cpr.2009.07.003

Lowe, B., Decker, O., Muller, S., Brahler, E., Schellberg, D., Herzog, W., & Herzberg, P. Y. (2008). Validation and standardization of the Generalized Anxiety Disorder Screener (GAD-7) in the general population. *Medical Care, 46*(3), 266-274. doi:10.1097/MLR.0b013e318160d093

Luu, S., Patel, P., St-Martin, L., Leung, A., Regehr, G., Murnaghan, M., . . . Moulton, C. (2012). Waking up the next morning: Surgeons' emotional reactions to adverse events. *Medical Eduction, 46*(12), 1179-1188. doi:10.1111/medu.12058

Mackinnon, S., Ray, C., Firth, S., & O'Connor, R. (2019). Perfectionism, negative motives for drinking, and alcohol-related problems: A 21-day diary study. *Journal of Research in Personality, 78*, 177-188. doi:10.1016/j.jrp.2018.12.003

Mackinnon, S., Sherry, S., Graham, A., Stewart, S., Sherry, D., Allen, S., . . . McGrath, D. (2011). Reformulating and testing the perfectionism model of binge eating among undergraduate women: A short-term, three-wave longitudinal study. *Journal of Counseling Psychology, 58*(4), 630. doi:10.1037/a0025068

Maiden, J., Georges, J. M., & Connelly, C. D. (2011). Moral distress, compassion fatigue, and perceptions about medication errors in certified critical care nurses. *DCCN - Dimensions of Critical Care Nursing, 30*(6), 339-345. doi:10.1097/DCC.0b013e31822fab2a

Makary, M., & Daniel, M. (2016). Medical error-the third leading cause of death in the US. *BMJ British medical journal, 353*, i2139-i2139. doi:10.1136/bmj.i2139

Marschall, D. (1996). *Effects of induced shame on susequent empathy and altruistic behavior. Unpublished master's thesis.* . Fairfax, VA: George Mason University.

Marschall, D., Sanftner, J., & Tangney, J. P. (1994). *The state shame and guilt scale*. Fairfax, VA: George Mason University.

Martens, J., Van Gerven, E., Lannoy, K., Panella, M., Euwema, M., Sermeus, W., . . . Vanhaecht, K. (2016). Serious reportable events within the inpatient mental health care: Impact on physicians and nurses. *Revista de Calidad Asistencial, 31*, 26-33. doi:10.1016/j.cali.2016.04.004

Mason, D. (2006). Pride and prejudice: Nurses' struggle with reasoned debate. In S. Nelson & S. Gordon (Eds.), *The Complexities of Care: Nursing Reconsidered* (pp. 44-49). Ithaca, NY: Cornell University Press.

Mattox, E. (2012). Strategies for improving patient safety: Linking task type to error type. *Critical Care Nurse, 32*(1), 52-57. doi:10.4037/ccn2012303

Maxfield, D., Grenny, J., Lavandero, R., & Groah, L. (2011). The silent treatment: Why safety tools and checklist aren't enough. *Patient Safety and Quality Healthcare*.

Maxfield, D., Grenny, J., McMillan, R., Patterson, K., & Switzler, A. (2005). *Silence kills: The seven crucial conversations for healthcare*. Retrieved from https://www.aacn.org/nursing-excellence/healthy-work-environments/~/media/aacn-website/nursing-excellence/healthy-work-environment/silencekills.pdf?la=en

May, M., & Plews-Ogan, M. (2012). The role of talking (and keeping silent) in physician coping with medical error: A qualitative study. *Patient Education and Counseling, 88*, 449-454.

Mayo, A., & Duncan, D. (2004). Nurse perceptions of medication errors: What we need to know for patient safety. *Journal of nursing care quality., 19*(3), 209-217.

McCrae, R., & Costa, P. (2003). *Personality in adulthood: A five-factor theory perspective*. New York, NY: Guilford Press.

McCrae, R., & Costa, P. (2008). The five-factor theory of personality. In O. P. J. R. W. R. L. A. Pervin (Ed.), *Handbook of Personality: Theory and Research* (3rd ed., pp. 159-181). New York: Guilford Press.

McHugh, M., Rochman, M., Sloane, D., Berg, R., Mancini, M., Nadkarni, V., . . . Aiken, L. (2016). Better nurse staffing and nurse work environments associated with increased survival of in-hospital cardiac arrest patients. *Medical Care, 54*(1), 74-80. doi:10.1097/mlr.0000000000000456

Mealer, M., & Jones, J. (2013). Posttraumatic stress disorder in the nursing population: A concept analysis. *Nursing Forum, 48*(4), 279-288.

Melrose, S. (2011). Perfectionism and depression: Vulnerabilities nurses need to understand. *Nursing Research and Practice, 2011*, 858497-858497. doi:10.1155/2011/858497

Meurier, C., Vincent, C., & Parmar, D. (1997). Learning from errors in nursing practice. *Journal of Advanced Nursing, 26*(1), 111-119. doi:10.1046/j.1365-2648.1997.1997026111.x

Mira, J., Carrillo, I., Lorenzo, S., Ferrus, L., Silvestre, C., Perez-Perez, P., . . . Third, V. (2015). The aftermath of adverse events in Spanish primary care and hospital health professionals. *BMC Health Services Research, 151-160*, 9. doi:10.1186/s12913-015-0790-7

Mishara, B., & Weisstub, D. (2005). Ethical and legal issues in suicide research. *International Journal of Law and Psychiatry, 28*, 23-41. doi:10.1016/j.ijlp.2004.12.006

Moss, M. (2018, November 27, 2018). *Moral distress, burnout, resilience among healthcare professionals.* Paper presented at the The National Academies of Sciences, Engineering,

and Medicine second committee meeting on Systems Approaches to Improve Patient Care by Supporting Clinician Well-Being, Washington, D.C.

National Center for PTSD. (2016). PTSD Checklist for DSM-5 (PCL-5). Retrieved from www.ptsd.va.gov/professional/assessment/adult-sr/ptsd-checklist.asp

National Priorities Partnership (NPP). (2010). *Preventing medication errors: A $21 billion opportunity*. Retrieved from Washington, DC: https://psnet.ahrq.gov/resources/resource/20529

National Quality Forum. (2010). *Safe practices for better healthcare - 2010 update: A consensus report*. Washington, D.C.: NQF.

Newman, M. (1996). The emotional impact of mistakes on family physicians. *Archives of Family Medicine, 5*(2), 71-75.

O'Beirne, M., Sterline, P., Palacios-Derflinger, L., Hohman, S., & Zwicker, K. (2012). Emotional impact of patient safety incidents on family physicians and their office staff. *Journal of the American Board of Family Medicine: JABFM, 25*(2), 177-183. doi:10.3122/jabfm.2012.02.110166

Olson, M., & Kwon, P. (2008). Brooding perfectionism: Refining the roles of rumination and perfectionism in the etiology of depression. *Cognitive Therapy and Research, 32*(6), 788-802. doi:10.1007/s10608-007-9173-7

Ostrom, C. (2011, April 20, 2011). Nurse's suicide follows tragedy. *The Seattle Times*. Retrieved from http://www.seattletimes.com/seattle-news/nurses-suicide-follows-tragedy/

Owens, G., Steger, M., Whitesell, A., & Herrera, C. (2009). Posttraumatic stress disorder, guilt, depression, and meaning in life among military veterans. *Journal of Traumatic Stress, 22*(6), 654-657. doi:10.1002/jts.20460

Park, C. (2010a). Making sense of the meaning literature: An integrative review of meaning making and its effects on adjustment to stressful life events. *Psychological Bulletin, 136*(2), 257-301. doi:10.1037/a0018301

Park, C. (2010b). Stress, coping, and meaning. In S. Folkman (Ed.), *Oxford Handbook of Stress, Health, and Coping* (pp. 227-241). New York: Oxford University Press.

Park, C. (2013). The Meaning Making Model: A framework for understanding meaning, spirituality, and stress-related growth in health psychology. *The European Health Psychologist, 15*(2), 40-47.

Parse, R. (2014). *The humanbecoming paradigm: A transformative worldview*. Pittsburgh, PA: Discovery International Publication.

Patient Safety Network. (2018, August 2018). Patient Safety Primer. Retrieved from https://psnet.ahrq.gov/glossary/error

Pepper, G. (1995). Errors in drug administration by nurses. *American Journal of Health-System Pharmacy, 52*, 390-395.

Perrin, M., Vandeleur, C. L., Castelao, E., Rothen, S., Glaus, J., Vollenweider, P., & Preisig, M. (2014). Determinants of the development of post-traumatic stress disorder, in the general population. *Social Psychiatry & Psychiatric Epidemiology, 49*(3), 447-457. doi:10.1007/s00127-013-0762-3

Pietrzak, R., Goldstein, R., Southwick, S., & Grant, B. (2011). Prevalence and Axis I comorbidity of full and partial posttraumatic stress disorder in the United States: Results from Wave 2 of the National Epidemiologic Survey on Alcohol and Related Conditions. *J Anxiety Disord, 25*(3), 456-465. doi:10.1016/j.janxdis.2010.11.010

Pinto, A., Faiz, O., Bicknell, C., & Vincent, C. (2013). Surgical complications and their implications for surgeons' well-being. *British Journal of Surgery, 100*, 1748-1755. doi:10.1002/bjs.9308

Pombo, S., Luísa Figueira, M., Walter, H., & Lesch, O. (2016). Motivational factors and negative affectivity as predictors of alcohol craving. *Psychiatry Research, 243*, 53-60. doi:10.1016/j.psychres.2016.02.064

Quillivan, R., Burlison, J., Browne, E., Scott, S., & Hoffman, J. (2016). Patient safety culture and the second victim phenomenon: Connecting culture to staff distress in nurses. *The Joint Commission Journal on Quality and Patient Safety, 42*(8), 377-384, AP371-AP372.

Rassin, M., Kanti, T., & Silner, D. (2005). Chronology of medication errors by nurses: Accumulation of stresses and PTSD symptoms. *Issues in Mental Health Nursing, 26*(8), 873-886.

Reason, J. (1990). *Human Error*. New York: Cambridge University Press.

Reason, J. (1997). *Managing the risks of organisational accidents*. London: Ashgate Publishing.

Reason, J. (2000). Human error: Models and management. *British Medical Journal, 320*, 768-770.

Reason, J. (2004). Beyond the organisational accident: The need for "error wisdom" on the frontline. *Quality and Safety in Health Care, 13*(suppl_2), ii28-ii33. doi:10.1136/qshc.2003.009548

Rees, C., Eley, R., Osseiran-Moisson, R., Francis, K., Cusack, L., Heritage, B., & Hegney, D. (2019). Individual and environmental determinants of burnout among nurses. *Journal of Health Services Research & Policy, 24*(3), 191-200. doi:10.1177/1355819619840373

Rice, K., & Aldea, M. (2006). State dependence and trait stability of perfectionism: A short-term longitudinal study. *Journal of Counseling Psychology, 53*, 205-212.

Rice, K., & Richardson, C. (2014). Classification challenges in perfectionism. *Journal of Counseling Psycholology, 61*(4), 641-648. doi:10.1037/cou0000040

Rice, K., Richardson, C., & Tueller, S. (2014). The short form of the Revised Almost Perfect Scale. *Journal of Personality Assessment, 96*(3), 368-379. doi:10.1080/00223891.2013.838172

Rinaldi, C., Leigheb, F., Vanhaecht, K., Donnarumma, C., & Panella, M. (2016). Becoming a "second victim" in health care: Pathway of recovery after adverse event. *Revista de Calidad Asistencial, 31*, 11-19. doi:10.1016/j.cali.2016.05.001

Roberts, B., Wood, D., & Caspi, A. (2008). The development of personality traits in adulthood. In O. P. J. R. W. R. L. A. Pervin (Ed.), *Handbook of Personality: Theory and Research* (3rd ed., pp. 375-398). New York: Guilford Press.

Roberts, R., Grubb, P.L., & Grosch, J.W. (2012). Alleviating job stress in nurses: Approaches to reducing job stress in nurses. *Medscape.com*. Retrieved from http://www.medscape.com/viewarticle/765974

Sandelowski, M. (2000). Whatever happened to qualitative description? *Research in Nursing & Health, 23*, 334-340.

Santos, J., Silva, A., Munari, D., & Miasso, A. (2007). Feelings of nursing professionals after the occurrence of medication errors. *Acta Paulista de Enfermagem, 20*(4), 483-488.

Sattler, D., Boyd, B., & Kirsch, J. (2014). Trauma-exposed firefighters: Relationships among posttraumatic growth, posttraumatic stress, resource Availability, coping and critical

incident stress debriefing experience. *Stress & Health, 30*(5), 356-365. doi:10.1002/smi.2608

Schelbred, A., & Nord, R. (2007). Nurses' experiences of drug administration errors. *Journal of Advanced Nursing, 60*(3), 317-324. doi:10.1111/j.1365-2648.2007.04437.x

Schifano, P., Borgia, P., Wu, A. W., Spadea, T., Milanese, G., & Perucci, C. A. (2003). Validity and reliability of the Italian translation of the MOS-HIV health survey in persons with AIDS. *Quality of Life Research, 12*(8), 1137-1146. doi:10.1023/A:1026151931248

Schok, M., Kleber, R., Elands, M., & Weerts, J. (2008). Meaning as a mission: A review of empirical studies on appraisals of war and peacekeeping experiences. *Clinical Psychology Review, 28*, 357-365. doi:10.1016/j.cpr.2007.04.005

Schulte, F., & Fry, E. (2019, March 18, 2019). Death by 1,000 clicks: Where electronic health records went wrong. *Kaiser Health News*. Retrieved from https://khn.org/news/death-by-a-thousand-clicks/

Scott, S. (2015). The second victim experience: Mitigating the harm. *American Nurse Today, 10*(9), 8-11 13p.

Scott, S., Hirschinger, L., & Cox, K. (2008). Sharing the load. Rescuing the healer after trauma. *RN, 71*(12), 38-40, 42-33.

Scott, S., Hirschinger, L., Cox, K., McCoig, M., Brandt, J., & Hall, L. (2009). The natural history of recovery for the healthcare provider 'second victim' after adverse patient events. *Quality & Safety in Health Care, 18*(5), 325-330. doi:10.1136/qshc.2009.032870

Scott, S., Hirschinger, L., Cox, K., McCoig, M., Hahn-Cover, K., Epperly, K., . . . Hall, L. (2010). Caring for our own: Deploying a systemwide second victim rapid response team. *Joint Commission Journal on Quality and Patient Safety, 36*(5), 233-240.

Sells, J., Waters, A., Schwandt, M., Kwako, L., Heilig, M., George, D., & Ramchandani, V. (2016). Characterization of comorbid PTSD in treatment-seeking alcohol dependent inpatients: Severity and personality trait differences. *Drug and Alcohol Dependence, 163*, 242-246. doi:10.1016/j.drugalcdep.2016.03.016

Serembus, J., Wolf, Z., & Youngblood, N. (2001). Consequences of fatal medication errors for healthcare providers: A secondary analysis study. *MEDSURG Nursing, 10*(4), 193-201.

Seys, D., Wu, A. W., Van Gerven, E., Vleugels, A., Euwema, M., Panella, M., . . . Vanhaecht, K. (2013). Health care professionals as second victims after adverse events: A systematic review. *Evaluation & the Health Professions, 36*(2), 135-162. doi:10.1177/0163278712458918

Shanafelt, T., Balch, C., Dyrbye, L., Bechamps, G., Russell, T., Satele, D., . . . Oreskovich, M. (2011). Suicidal ideation among American surgeons. *JAMA Archives of Surgery, 46*(1), 54-62. doi:10.1001/archsurg.2010.292

Shay, J. (1991). Learning about combat stress from Homer's Iliad. *Journal of Traumatic Stress, 4*(4), 561-579.

Shay, J. (2010). From an unlicensed philosopher: Reflections on brain, mind, society, culture - Each others environments with equal "ontologic standing". In *Psychiatric and Neurologic Aspects of War* (pp. 32-37). Malden: Blackwell Publishing.

Shay, J. (2014). Moral injury. *Psychoanalytic Psychology, 31*(2), 182-191. doi:10.1037/a0036090

Sherry, S., Hewitt, P., Stewart, S., Mackinnon, A., Mushquash, A., Flett, G., & Sherry, D. (2012). Social disconnection and hazardous drinking mediate the link between

perfectionistic attitudes and depressive symptoms. *Journal of Psychopathology and Behavioral Assessment, 34*(3), 370-381. doi:10.1007/s10862-012-9291-8

Shikatani, B., Antony, M., Cassin, S., & Juo, J. (2015). Examining the role of perfectionism and intolerance of uncertainty in post-event processing in social anxiety disorder. *Journal of Psychopathology Behavioral Assessment*(38).

Shimizutani, M., Odagiri, Y., Ohya, Y., Shimomitsu, T., Kristensen, T. S., Maruta, T., & Ilmori, M. (2008). Relationship of nurse burnout with personality characteristics and coping behaviors. *Industrial Health, 46*, 326-335. doi:10.2486/indhealth.46.326

Silver, D. (2011, September 1, 2011). Beyond PTSD: Soldiers have injured souls. *Pacific Standard*. Retrieved from https://psmag.com/books-and-culture/beyond-ptsd-soldiers-have-injured-souls-34293

Simpson, R. (2002). Winning the "blame game". *Nursing Management, 33*(1), 14-16.

Sirriyeh, R., Lawton, R., Gardner, P., & Armitage, G. (2010). Coping with medical error: A systematic review of papers to assess the effects of involvement in medical errors on healthcare professionals' psychological well-being. *Quality & Safety in Health Care, 19*(6), e43. doi:10.1136/qshc.2009.035253

Skaggs, B., & Barron, C. (2006). Searching for meaning in negative events: Concept analysis. *Journal of Advanced Nursing, 53*(5), 559-570.

Slaney, R., Rice, K., Mobley, M., Trippi, J., & Ashby, J. (2001). The Almost Perfect Scale—Revised. *Measurement and Evaluation in Counseling and Development, 34*, 130-145.

Smith, C. (2017). First, do no harm: Institutional betrayal and trust in health care organizations. *Journal of multidisciplinary healthcare, 10*, 133-144. doi:10.2147/JMDH.S125885

Smith, M., & Forster, H. (2000). Morally managing medical mistakes. *Cambridge Quarterly of Healthcare Ethics, 9*, 38-53.

Smith, M., Sherry, S., Vidovic, V., Saklofske, D., Stoeber, J., & Benoit, A. (2019). Perfectionism and the five-factor model of personality: A meta-analytic review. *Personality and Social Psychology Review, 23*(4), 367-390. doi:10.1177/1088868318814973

Spence Laschinger, H., & Nosko, A. (2015). Exposure to workplace bullying and post-traumatic stress disorder symptomology: The role of protective psychological resources. *Journal of Nursing Management, 23*(2), 252-262. doi:10.1111/jonm.12122

Spitzer, R. L., Kroenke, K., Williams, J. B., & Lowe, B. (2006). A brief measure for assessing generalized anxiety disorder: The GAD-7. *Archives of Internal Medicine, 166*(10), 1092-1097. doi:10.1001/archinte.166.10.1092

Stangierski, A., Warmuz-Stangierska, I., Ruchała, M., Zdanowska, J., Głowacka, M., Sowiński, J., & Ruchała, P. (2012). Medical errors – not only patients' problem. *Archives of Medical Science: AMS, 8*(3), 596-574. doi:10.5114/aoms.2012.29413

Stimpfel, A., Sloane, D., McHugh, M., & Aiken, L. (2015). Hospitals known for nursing excellence associated with better hospital experience for patients. *Health Services Research, 51*(3), 1120-1134.

Stoeber, J., & Otto, K. (2006). Positive conceptions of perfectionism: Approaches, evidence, challenges. *Personality and Social Psychology Review, 10*, 295-319.

Stovall, M., Hansen, L., & van Ryn, M. (2020). A Critical Review: Moral Injury in Nurses in the Aftermath of a Patient Safety Incident. *Journal of Nursing Scholarship, 52*(3), 320-328. doi:10.1111/jnu.12551

Sudman, S. (1985). Mail surveys of reluctant professionals. *Evaluation Review, 9*(3), 349-360.

Suls, J., & Martin, R. (2005). The daily life of the garden-variety neurotic: Reactivity, stressor exposure, mood spillover, and maladaptive coping. *Journal of Personality, 73*(6), 1-25. doi:10.1111/j.1467-6494.2005.00356.x

Sutin, A., Costa, P., Wethington, E., & Eaton, W. (2010). Turning points and lessons learned: Stressful life events and personality trait development across middle adulthood. *Psychology and Aging, 25*, 524-533.

Taifoori, L., & Valiee, S. (2015). Understanding OR nurses' reactions to errors and using this understanding to improve patient safety. *ORNAC Journal,, 33*(3), 13-22, 32-42.

Tangney, J. (2019, April 29, 2019). [Personal Communication RE: SGSS Permissions request].

Tedeschi, R. (1998). *Posttraumatic growth: Positive change in the aftermath of crisis*. Mahwah, N.J.: Lawrence Erlbaum Associates.

Treiber, L., & Jones, J. (2010). Devastatingly human: An analysis of registered nurses' medication error accounts. *Qualitative Health Research, 20*(10), 1327-1342. doi:10.1177/1049732310372228

Treiber, L., & Jones, J. (2018a). After the medication error: Recent nursing graduates' reflections on adequacy of education. *Journal of Nursing Education, 57*(5), 275-280. doi:10.3928/01484834-20180420-04

Treiber, L., & Jones, J. (2018b). Making an infusion error: The second victims of infusion therapy-related medication errors. *Journal of Infusion Nursing, 41*(3), 156-163. doi:10.1097/NAN.0000000000000273

Ullstrom, S., Andreen Sachs, M., Hansson, J., Ovretveit, J., & Brommels, M. (2014). Suffering in silence: A qualitative study of second victims of adverse events. *BMJ Quality & Safety, 23*(4), 325-331. doi:10.1136/bmjqs-2013-002035

Unruh, L. Y., & Zhang, N. J. (2014). Newly Licensed Registered Nurse Job Turnover and Turnover Intent. *Journal for Nurses in Professional Development, 30*(5). doi:10.1097/NND.0000000000000079

Valenstein, M., Adler, D. A., Berlant, J., Dixon, L. B., Dulit, R. A., Goldman, B., . . . Sonis, W. A. (2009). Implementing standardized assessments in clinical care: Now's the time. *Psychiatric Services, 60*, 1372-1375. doi:10.1176/ps.2009.60.10.1372

Van Gerven, E., Bruyneel, L., Panella, M., Euqema, M., Sermeus, W., & Vanhaecht, K. (2016). Psychological impact and recovery after involvement in a patient safety incident: A repeated measures analysis. *BMJ Open, 6*(8), e011403. doi:10.1136/bmjopen-2016-011403

Van Gerven, E., Deweer, Scott, S., Panella, M., Euwema, M., Sermeus, W., & Vanhaecht, K. (2016). Personal, situational and organizational aspects that influence the impact of patient safety incidents: A qualitative study. *Revista de Calidad Asistencial*. doi:10.1016/j.cali.2016.02.003

Van Gerven, E., Vander Elst, T., Vandenbroeck, S., Dierickx, S., Euwema, M., Sermeus, W., . . . Vanhaecht, K. (2016). Increased risk of burnout for physicians and nurses involved in a patient safety incident. *Medical Care, 54*(10), 937-943. doi:10.1097/MLR.0000000000000582

VanGeest, J., & Johnson, T. P. (2011). Surveying nurses: Identifying strategies to improve participation. *Evaluation and the Health Professions, 34*(4), 487-511. doi:10.1177/0163278711399572

Venus, E., Galam, E., Aubert, J., & Nougairede, M. (2012). Medical errors reported by French general practitioners in training: Results of a survey and individual interviews. *BMJ Quality & Safety, 21*(4), 279-286. doi:10.1136/bmjqs-2011-000359

Vincent, C. (2010). The Emergence of Patient Safety. In *Patient Saefty* (Second ed.): Wiley-Blackwell.

Waterman, A., Garbutt, J., Hazel, E., Dunagan, W., Levinson, W., Fraser, V., & Gallagher, T. (2007). The emotional impact of medical errors on practicing physicians in the United States and Canada. *Joint Commission Journal on Quality and Patient Safety, 33*(8), 467-476.

Watson, R., Gardiner, E., Hogston, R., Gibson, H., Stimpson, A., Wrate, R., & Deary, I. (2008). A longitudinal study of stress and psychological distress in nurses and nursing students. *Journal of Clinical Nursing, 18*, 270-278. doi:10.1111/j.1365-2702.2008.02555.x

Weathers, F., & Keane, T. (2007). The Criterion A problem revisited: Controversies and challenges in defining and measuring psychological trauma. *Journal of Traumatic Stress, 20*(2), 107-121. doi:10.1002/jts.20210

Weathers, F., Litz, B., Keane, T., Palmieri, P., Marx, B., & Schnurr, P. (2013). *The PTSD Checklist for DSM-5 (PCL-5) – Standard [Measurement instrument]*. The United States Veterans Association Retrieved from http://www.ptsd.va.gov/professional/assessment/adult-sr/ptsd-checklist.asp

Weeks, K., Sabin, M., Pontin, D., & Woolley, N. (2013). Safety in numbers: An introduction to the nurse education in practice series. *Nurse Education in Practice, 13*(2), e4-e10. doi:10.1016/j.nepr.2012.06.006

White, A., Waterman, A., McCotter, P., & Others, A. (2008). Supporting health care workers after medical error: Considerations for health care leaders. *Journal of Scientific Communication, 15*, 240-247.

Williams, E., Konrad, T., Scheckler, W., Pathman, D., Linzer, M., McMurray, J., . . . Schwartz, M. (2010). Understanding physicians' intentions to withdraw from practice: The role of job satisfaction, job stress, mental and physical health. *Health Care Management Review, 35*(2). doi:10.1097/01.HMR.0000304509.58297.6f

Williamson, V., Stevelink, S., & Greenberg, N. (2018). Occupational moral injury and mental health: Systematic review and meta-analysis. *The British Journal of Psychiatry, 212*(6), 339-346. doi:10.1192/bjp.2018.55

Windsor-Shellar, B. (2017). *Suicide by occupation, England: 2011 to 2015*. Retrieved from https://www.ons.gov.uk/peoplepopulationandcommunity/birthsdeathsandmarriages/deaths/articles/suicidebyoccupation/england2011to2015

Wolf, Z., Serembus, J., Smetzer, J., Cohen, H., & Cohen, M. (2000). Responses and concerns of healthcare providers to medication errors. *Clinical Nurse Specialist, 14*(6), 278-290. doi:10.1097/00002800-200011000-00011

World Health Organization. (2009). *The Conceptual Framework for the International Classification for Patient Safety. Version 1.1. Final Technical Report*. Retrieved from Geneva: http://www.who.int/patientsafety/taxonomy/icps_full_report.pdf

Wu, A. (2000). Medical error: The second victim. *British Medical Journal, 18*(320), 726-727.

Wu, A., Shapiro, J., Harrison, R., Scott, S. D., Connors, C., Kenney, L., & Vanhaecht, K. (2017). The impact of adverse events on clinicians: What's in a name? *Journal of Patient Safety, 00*(00), 1-8. doi:10.1097/PTS.0000000000000256

Wu, A. W. M. D. M. P. H., Shapiro, J. M. D., Harrison, R. P., Scott, S. D. P., Connors, C. R. N. M. S., Kenney, L., & Vanhaecht, K. P. The Impact of Adverse Events on Clinicians: What's in a Name? *Journal of Patient Safety*. doi:10.1097/PTS.0000000000000256

Wu, H., Ge, C., Sun, W., Wang, J., & Wang, L. (2011a). Depressive symptoms and occupational stress among Chinese female nurses: The mediating effects of social support and rational coping. *Research in Nursing & Health, 34*, 401-407. doi:10.1002/nur.20449

Wu, H., Ge, C. X., Sun, W., Wang, J. N., & Wang, L. (2011b). Depressive symptoms and occupational stress among Chinese female nurses: The mediating effects of social support and rational coping. *Research in Nursing & Health, 34*, 401-407. doi:10.1002/nur.20449

Zilberman, N., Yadid, G., Efrati, Y., Neumark, Y., & Rassovsky, Y. (2018). Personality profiles of substance and behavioral addictions. *Addictive Behaviors, 82*, 174-181. doi:10.1016/j.addbeh.2018.03.007

Zimmerman, D., & House, P. (2016). Medication safety: Simulation education for new RNs promises an excellent return on investment. *Nursing Economic$, 34*(1), 49-51.