THE FEASIBILITY OF VIRTUAL TAI CHI EASY™ TRAINING FOR REGISTERED NURSES

by

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As members of the Dissertation Committee, we certify that we have read the dissertation prepared by Carlie Michelle Felion, titled The Feasibility of Virtual Tai Chi Easy™ Training for Registered Nurses and recommend that it be accepted as fulfilling the dissertation requirement for the Degree of Doctor of Philosophy.

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Final approval and acceptance of this dissertation are contingent upon the candidate's submission of the final copies of the dissertation to the Graduate College.

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We respectfully acknowledge the University of Arizona is on the land and territories of Indigenous peoples. Today, Arizona is home to 22 federally recognized tribes, with Tucson being home to the O'odham and the Yaqui. Committed to diversity and inclusion, the University strives to build sustainable relationships with sovereign Native Nations and Indigenous communities through education offerings, partnerships, and community service

DEDICATION

I dedicate this dissertation to my late parents, Charles and Paula Fredette, and to my beloved grandmother, Hilda Brink. I pray that you are all smiling down on me from Heaven and know that I am doing my best to use the talents and gifts I was given to make the world a better place. I hope I have made you proud.

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ABSTRACT

Background: Registered nurses (RNs) are at risk of experiencing elevated levels of stress and burnout and are leaving the profession in droves. Considering the ever-expanding nursing shortage and the aging of the population in the United States (US), high turnover rates and nurses leaving the profession are highly problematic. Nurses experience numerous barriers to self-care or attending wellness classes due to work schedules, working off-shifts, and competing demands. Tai Chi Easy™ (TCE) is a safe, adaptable, and low-barrier form of mind-body exercise that can be delivered virtually, which increases accessibility.

Aims: This dissertation study aimed to determine whether a virtual TCE exercise program was feasible, acceptable, and appropriate self-care intervention for RNs and to describe within-group changes in occupational stress, posttraumatic stress, somatic symptoms, burnout, transition shock, and intention to quit.

Methods: Several nursing and non-nursing theories and concepts underpinned the single-group pre-post-intervention study design. RNs were recruited via postcards and emailed study flyers. Participants engaged in an asynchronous, virtual 1-hour TCE class twice a week for six weeks and practiced 10 minutes four days per week for six weeks. Study measures were collected using REDCap and included recruitment, retention, intervention adherence and safety, demographics, Life Events Checklist for DSM-5 (LEC-5), Adverse Childhood Experiences Questionnaire (ACE-Q), PTSD Checklist for DSM-V (PCL-5), Somatic Symptom Questionnaire (SSQ-8), Maslach Burnout Inventory-Health Services Survey (MBI-HSS), and the English version of the Nurses' Intention to Quit Scale (NITQ). Data analysis using Microsoft Excel software included descriptive statistics and paired t-tests.

Results: A total of 18 RNs enrolled, and 14 RNs (mean age=51±16, 86% female, 71% employed full-time) completed the study. Participants reported that the TCE intervention was acceptable (75%), appropriate (75%) and feasible (73%). However, intervention adherence was inadequate (65% TCE classes, 74% independent practice). No safety issues were reported during the study. Pre-post intervention changes in symptoms for PCL-5 ($p=0.32$), SSQ-8 ($p=0.22$), MBI ($p>0.50$, all domains), and NITQ ($p=0.49$) were not statistically significant. Study attrition was 22% (n=4) due to participant-reported time constraints.

Conclusion: With some modifications, virtual TCE training may be a feasible mind-body self-care intervention for RNs.

CHAPTER 1: INTRODUCTION

High nurse turnover is a significant problem impacting patients, staff, and healthcare organizations. Nurse turnover, defined as the rate at which nurses leave an organization and must be replaced (Cambridge Dictionary, 2023), has dire implications for healthcare consumers and organizations and the health and well-being of healthcare professionals. The problem of high turnover among nurses has inspired the design, implementation, and study of numerous organization/system-driven interventions over at least the past sixty years, yet the problem persists. Despite the gravity of this problem and the significant human and financial resources invested in mitigating it, there is surprisingly little evidence in the published literature regarding integrative mind-body interventions that may help individual nurses cope with occupational stress and burnout that prompts nurses to leave their jobs and the profession.

Stress is ubiquitous among healthcare workers, and new graduate nurses (NGNs) transitioning from nursing school to independent professional nursing practice are particularly affected (Chesak, 2021). Numerous researchers have identified the first year of practice as the most stressful time in a nurse's career (Chesak, 2019), with the highest levels occurring between four and eight months of employment (Fang, 2022). However, this phenomenon can also occur with job or role changes in experienced nurses. Some stressors are comparable to those encountered in other professions, such as learning and adapting to the work setting, workplace dynamics, co-workers, and company policies and procedures (Rainbow, 2019). The cognitive, psychological, and emotional stress experienced by novice nurses during this period is known as 'transition shock' (Duchscher, 2009).

Nurses experiencing transition shock may experience distress or feel overwhelmed by the stark and unanticipated reality of nursing practice, especially if it conflicts with previously held ideals, beliefs, and expectations. Specific stressors that can also contribute to the development of transition shock include a) adjusting to a new role, b) greater responsibilities, c) their relationships with coworkers, d) perceived or actual knowledge and skill deficits, and e) sociocultural and environmental factors in the workplace (McNulty, 2022).

In addition to experiencing stress and transition shock, exposure to healthcare-related psychological traumatic stressors has prompted new and seasoned nurses to leave their positions and the profession in droves (Foli, 2019). Healthcare-related psychological trauma (HRPT) is a term used to describe a set of subjective cognitive, psychological, emotional, physiological, and behavioral responses to having experienced or been exposed to a distressing or frightening event or circumstance while receiving or delivering healthcare services.

Considering the far-reaching implications of the nursing shortage (Caldwell, 2019), novel approaches that are cost-effective, evidence-based, and sustainable to help nurses reduce stress and cope with the challenges of transitioning from nursing school to independent professional practice are more important than ever.

Thus, this study explored the feasibility and possible changes in symptoms of stress, transition shock, somatic symptoms, posttraumatic stress, and intention to leave associated with a six-week virtual Tai Chi Easy™ (TCE) training intervention for RNs.

The primary goals of this study were to a) gain a deeper understanding of factors contributing to high turnover among RNs, b) determine whether virtual TCE training is a feasible, acceptable, safe, and appropriate mind-body self-care intervention for RNs, and c)

explore whether changes in stress, transition shock, posttraumatic stress symptoms, and transition shock occur after participation in a six-week asynchronous virtual TCE training intervention.

In this chapter, the author discusses the background and significance of the problem of high turnover among RNs and the contributing factors cited in the nursing literature. Then, a more detailed description of the proposed study was provided, along with an explanation of the theoretical perspectives underpinning the study. Lastly, a formal problem statement, declaration of purpose, and specific aims were presented. The chapter ends with a brief overview and summary.

Background and Significance

Nurses are the backbone of the healthcare system, comprising 59% of the healthcare workforce (Salmond, 2021). However, the United States (US) is projected to have a shortage of nurses as the 'Baby Boomers' (born between 1946 and 1964) age and the need for healthcare services expands (American Association of Colleges of Nursing [AACN], 2022). This shortage is expected to spread across the country through 2030 (Juraschek, 2019) and carries significant implications for patients, nurses, and the healthcare industry now and in the future.

The Nursing Shortage

According to Haddad et al. (2023), the consequences and factors contributing to the nursing shortage are far-reaching and diverse. They include an insufficient number of nurse educators that limits enrollment in nurse training programs, high turnover among nurses due to work strain from caring for higher acuity patients with unsafe staffing ratios, increases in errors, lower patient satisfaction, higher morbidity and mortality rates, and an unbalanced distribution of

the nursing workforce across the country (Haddad, 2023). Additionally, the nursing workforce is comprised mostly of females who, as they enter their childbearing years, may cut back on their hours or leave their job or the profession altogether (Haddad, 2023). Furthermore, as in the general population of the US, the nursing workforce is also aging, with about one-third of nurses set to reach retirement age within the next 10-15 years (American Association of Colleges of Nursing [AACN], 2022).

Presently, there are two ways to address the nursing shortage: increase the number of nurses entering the profession and/or retain the nurses currently in the workforce (Drennan & Ross, 2019). Although the number of nurses entering the workforce has increased recently, retention has lagged due to complex factors related to healthcare systems and organizations and nurses as individuals (Efendi et al., 2019).

Nurse Turnover

Compounding the problem of attrition (nurses who left the workforce but were not replaced), over the past five years, the average hospital in the United States experienced a registered nurse (RN) turnover rate of 101.4% (NSI Nursing Services, 2023). Certain specialty units, including telemetry, critical care, medical-surgical units (med-surg), emergency departments (EDs), and step-down units, had higher turnover rates than average (NSI Nursing Services, 2023).

Researchers also found that 32.8% of newly hired RNs voluntarily terminated their positions within the first year, outpacing all other tenure categories (NSI Nursing Services, 2023). The RN vacancy rate in the US is low at 15.1%, and recruiting experienced RNs is time-consuming (typically over three months) and costly (NSI Nursing Services, 2023). NSI

Nursing Services (2023) surveyed hospitals across the US, demonstrating that the typical cost associated with bedside RN ranges between $11,000 and $90,000 per nurse, with up to $8.5 million in associated expenses related to unfilled positions, the need to defer patients and the costs associated with recruitment and training of new staff (Halter, 2017). Importantly, each percentage of improvement in turnover would save an average hospital $380,600 annually (NSI Nursing Services, 2023).

Psychological Stress and Burnout Among Nurses

One well-known cause of turnover and attrition is burnout, an occupational phenomenon that results from exposure to prolonged or severe psychological stress at work (Edú-Valsania, 2022). According to Maslach and Leiter (2016), burnout comprises three classic symptoms: exhaustion, depersonalization (cynicism), and a sense of reduced personal accomplishment. Recent research indicates that over half (54%) of all nurses report experiencing at least moderate levels of burnout, which has a significant and deleterious impact on the safety and quality of patient care and organizational and position turnover (Kelly, 2021). From an individual perspective, burnout increases the risk of developing depression, anxiety, sleep problems and accompanying fatigue, substance misuse, marital discord, and, in the worst case, suicide (Kumar, 2016). From patient-care and organizational perspectives, healthcare workers experiencing burnout are at greater risk of impaired decision-making, poor communication, hostility toward patients, medical errors, and acrimonious co-worker relationships (Kumar, 2016; Kelly, 2021).

Key contributors to the development of burnout among nurses include exposure to traumatic events, death and suffering, the psychological and physical demands of the job, shift work, low autonomy, inadequate social support, incivility in the workplace, low staffing, and

poor communication and collaborative relationships with other healthcare professionals (Chesak, 2019).

Healthcare-Related Psychological Trauma (HRPT)

Healthcare-related psychological trauma (HRPT) is a less appreciated factor contributing to psychological distress among nurses and other healthcare professionals. HRPT can contribute to turnover and many physical, mental, and behavioral health conditions among nurses (Foli, 2019), including healthcare-related posttraumatic stress disorder (HRPTSD). Table 1 explains several healthcare-specific traumatic stressors that nurses may encounter in their work, including secondary trauma, second-victim trauma, workplace violence, horizontal and lateral violence, primary or secondary system-induced trauma, historical trauma, disasters from disasters, and insufficient resource trauma.

Healthcare-Related Posttraumatic Stress Disorder (HRPTSD)

Like other forms of posttraumatic stress disorder, HRPTSD can develop soon or years after a person experiences or witnesses a shocking, frightening, or dangerous event (National Institute of Mental Health [NIMH], 2022). These symptoms may occur even when a person is not in danger and include 1) re-experiencing (flashbacks); 2) distressing dreams or nightmares leading to sleep difficulties; 3) frightening thoughts; 4) avoidance of places or situations that remind the person of the traumatic event; 5) feeling tense, irritable, and/or having angry outbursts; 6) loss of enjoyment of activities once found pleasurable; and 7) having feelings of guilt or blaming self or others for the traumatic event (NIMH, 2022).

Table 1

Healthcare-Related Psychological Traumas

Secondary (Vicarious) Trauma	Occurs due to an individual's exposure to people who are in pain, suffering, or who have experienced trauma. It can also occur through gaining awareness of the experience of a traumatic event from a survivor or a witness (Cieslak, 2014).
Second-Victim Trauma	Occurs after involvement in an adverse event involving a patient, such as a medication error. As a second victim (the affected patient is the first victim), healthcare professionals may blame themselves for the sequelae of the event, question their own clinical acumen, and subsequently experience various health and career-related ramifications (Sun, 2022). Second-victim trauma also impacts the healthcare organization (third victim) and subsequent patients who receive care from the traumatized professional (fourth victims) (Ozeke, 2019).
Workplace Violence	Includes abusive behavior (physical, verbal, or written) directed toward a healthcare professional from patients, families, or visitors (Foli, 2021).
Horizontal/Lateral Violence	Lateral (nurse-to-nurse) violence includes bullying and incivility among those on the same hierarchy level in an organization. Vertical violence includes intimidating behaviors, undermining, or an abuse of authority and can occur between individuals at different levels of power within an organization. Vertical violence can be directed downward (e.g., supervisor to staff nurse) or upward (e.g., staff nurse to nurse manager) (Vessey, 2009).
System-Induced Trauma	Otherwise known as medical trauma, system-induced trauma occurs when a person receives a sudden or life-altering diagnosis or has a traumatic healthcare encounter (Foli, 2021). Examples include traumatic childbirth or gynecological procedures, intensive care unit stays, heart attacks and strokes, cancer diagnosis, or human immunodeficiency virus infection (Hall, 2013). System-induced trauma can also be caused by features of the environments or institutions where trauma can occur, which maintain traumatic experiences and impact posttraumatic responses (University of Iowa, 2023).
Historical Trauma	Trauma passed down from generation to generation increases the offspring's (or new nurses') vulnerability to the index trauma through epigenetic alterations of the genes or exposure to behavioral traits associated with maladaptive coping (van der Kolk, 2004). This type of trauma can also occur in marginalized groups or even between nurses, who may pass on trauma associated with oppression through bullying or uncivil behaviors (Foli, 2021).
Trauma from Disasters	Trauma can occur through a healthcare professional's involvement in caring for people during or after natural disasters, manufactured disasters (ex., the September 11 terrorist attack), or the COVID-19 pandemic (Foli, 2021).
Insufficient Resource Trauma	Psychological trauma can occur when healthcare professionals lack the training, knowledge, or expertise required to perform a task or do not have the staff, equipment, supplies, or other resources to fulfill their responsibilities (Foli, 2021).

Among nurses, HRPTSD can manifest as declining work performance or developing social and organizational problems in the workplace (White, 2022). The personal health consequences of HRPTSD can be significant. In addition to the somatic symptoms associated with stress, which may include arthralgia, myalgia, anergia, dyspnea, and non-cardiac chest pain (Theocharis, 2023), epidemiologic studies of adults have found that PTSD is linked to other health problems, such as cardiovascular disease, arthritis, asthma, chronic pain, diabetes, and gastrointestinal conditions (Pietrzak, 2012), as well as health-risk behaviors. Specific health-risk behaviors common among those with PTSD include physical inactivity and poor sleep quality (Mason, 2019).

Other Psychiatric Morbidity Among Nurses

Unfortunately, HRPTSD is not the only mental health problem experienced by nurses. Pearman et al. (2022) found that among healthcare professionals across thirty-five states, depressive symptoms, health worries, exhaustion, general anxiety, the effects of stress related to the COVID-19 pandemic, and lower levels of proactive coping were widely reported.

Psychiatric morbidity has been strongly correlated with burnout, reduced quality of life, and increased rates of chronic diseases (Kumar, 2016) and can have far-reaching and serious implications for healthcare workers, patients, organizations, and the healthcare system. For example, nurses experiencing toxic stress levels may engage in behaviors that adversely affect an organization and provide lower-quality care, and the costs associated with turnover create an additional financial burden for organizations and the healthcare system (Kelly, 2021). Furthermore, the issue of suicide among nurses, which occurs more frequently in this group than

in the general population (Hofstetter & Mayer, 2023), can be a devastating consequence of psychiatric morbidity and deserves further exploration and attention.

The Impact of the COVID-19 Pandemic

The complex sociopolitical, environmental, logistical, and economic factors associated with the COVID-19 pandemic increased nurses' job strain and turnover intention (Tolksdorf, 2022). Factors such as insufficient pay and suboptimal working conditions during the global COVID-19 pandemic greatly increased nurses' stress levels, decreased job satisfaction, and prompted turnover and attrition among nurses (AACN, 2022). Ineffective leadership (Moran, 2012), increased volume and acuity of patients, shortages of personal protective equipment and medical supplies, and policies that restricted family presence during critical or end-of-life situations led to moral injury and secondary trauma among nurses, further contributing to high turnover rates (Fortier, 2020).

The Influence and Impact of Adverse Childhood Experiences (ACEs) and Adverse Life Events (ALEs)

While the prevalence of adverse childhood experiences (ACEs) and adverse life events (ALEs) among nurses has not been extensively researched, several studies suggest ACEs may be more common among healthcare professionals than in the general population (Girouard, 2017). A recent study by Clark et al. (2021) found that nursing students in the US had a significantly higher baseline of ACEs as compared to the general population, with over 40% having experienced four or more ACEs (the national average is 12.5%-13.3% with four or more ACEs). Hendrick et al. (2021) noted that nursing students with ACE scores of '4' or higher tended to have higher rates of depression, anxiety, and stress.

ALEs, which can generally be understood as those that deviate from typical or expectable stressors (e.g., moving, the death of a grandparent, or daily hassles and stressors), have an enduring and meaningful impact on a person's cognitive, emotional, social, and neurobiological development (McLaughlin, 2018). Studies have shown that healthcare workers who have experienced personal traumas may be more affected when exposed to the specific stressors inherent in healthcare environments (Girouard, 2017). This increased propensity to stress can negatively impact mental health and emotional well-being, which, in turn, may inform nurses' intention to quit their jobs or the profession (Tabur, 2022).

The Impact of Stressful Events on Health

A landmark study conducted by Felitti et al. (1998) demonstrated a relationship between experiencing ACEs (such as psychological, physical, and sexual abuse; violence against the mother; living with people who had a mental illness or a substance use disorder; living with a person who was suicidal, or having a parent in prison) and more health-risk behaviors, worse health status, and more disease later in life. A positive correlation was seen between the magnitude and/or duration of the stressor(s) and the risk for developing physical or mental health disorders, as well as similarities between different racial and ethnic groups and sexes have been noted in numerous longitudinal studies (Mclaughlin, 2018).

HRPTSD related to witnessing distressing events in the context of healthcare delivery and other mental health problems that can lead to burnout and turnover, among other issues, especially in nurses who have previous exposure to ACEs and ALEs (Foli, 2022). Furthermore, young nurses seem particularly susceptible to burnout syndrome, as seen during the COVID-19 pandemic (Moya-Salazar, 2023).

Regardless of the source, toxic stress directly impacts the neuroendocrine system by altering the autonomic nervous system and activating the hypothalamic-pituitary-adrenal axis, which mediates the chemical and neural aspects of the human stress response and regulates inflammatory gene expression (Irwin, 2011). Exposure to stressful life events is both common and a significant risk factor for developing psychopathology and numerous chronic diseases across the lifespan (Cohen, 2016).

Patient and Organizational Outcomes of HRPTSD and Burnout Among Nurses

According to Fateminia et al. (2022), individual nurses may not possess the mental and physical resources needed to meet the demands of their roles and may experience problems with interpersonal interactions, thereby impacting the culture and climate of the workplace. The psychological stress and associated impairments occurring because of HRPTSD and burnout have been shown to result in pessimism and can impact outcomes such as medical errors, patient satisfaction, and patient mortality (Fateminia, 2022).

The Concept of the Nurse as a Wounded Healer

Interestingly**,** in 2002, Conti-O'Hare proposed that some people are led to work in the helping professions after experiencing or witnessing trauma in their own lives to relieve the suffering of others. However, if the effects of their own trauma experiences are not resolved, they become the 'Walking Wounded' (Conti-O'Hare, 2002). These nurses can experience job dissatisfaction, develop burnout, contribute to or perceive a negative work environment, experience anger or emotional difficulties, or engage in risky substance use behaviors (Conti-O'Hare, 2002). Conversely, if they can process, transform, and transcend the trauma, they become a 'Wounded Healer,' with the benefits of having become more empathetic, more able to

engage in the therapeutic use of self in a nurse-patient relationship, and to contribute to or perceive a positive work environment (Conti-O'Hare, 2002).

Self-Care Deficits Among Nurses

While qualities such as altruism, compassion, and a commitment to help others draw many people to a career in nursing, the desire to help others deal with their health problems can sometimes overshadow a nurse's motivation or ability to care for themselves (Crane, 2016). A 2017 survey by the American Nurses Association (ANA, 2017) found that 68% of nurses put their patients' safety, health, and wellness ahead of their own. Furthermore, although nurses are well-educated and can teach patients about the importance of health-promoting behaviors, this does not necessarily translate into engagement in healthy lifestyle behaviors among nurses themselves (Albert, 2014). Among nurses who engage in self-care behaviors, Udoudo and colleagues (2023) found that participants in their study did not perform activities that promoted psychological and social well-being. Instead, they opted to do those that improved physical health and well-being. In that study, while participation in self-care activities was common (93% engaged inconsistently), it was influenced by demographic factors, and numerous barriers to engaging consistently were cited, including fatigue, lack of time, an excessive workload, and insufficient funds (Uduodo, 2023).

Mind-Body Interventions Alleviate Stress and Improve Physical and Mental Health

To help nurses cope with stress and improve their overall health and well-being, incorporating mind-body psychoneuroimmunology-based interventions (e.g., tai chi, yoga, qigong, meditation, and mindfulness exercises) used for centuries by people around the world may be a feasible and acceptable intervention.

Mind-body therapies are defined as those that emphasize using the brain in conjunction with the body to harness innate healing powers and include multiple components, including breathing, focused attention, meditation, and physical movements (Bower, 2016). One example of a mind-body psychoneuroimmunology-based intervention incorporating those components is Tai Chi Easy™ (TCE). TCE is a simplified version of Tai Chi developed by Dr Roger Jahnke (2010) and incorporates mindful movements, breathing exercises, meditation, and self-applied massage to achieve various physical and psychological benefits. Breathing exercises, such as those practiced during TCE, induce relaxation by deactivating the sympathetic nervous system and restoring balance (Crane, 2016). Additionally, practicing nonjudgmental awareness through body scan meditation can teach generalizable mindfulness skills that help nurses attune to patients and clinical situations and identify their own negative thinking patterns that contribute to psychological distress (Crane, 2016).

Regularly practicing tai chi has been found to lower oxidative stress levels by increasing antioxidants and reducing free radicals, which are the byproducts of oxidative processes in the body (Rosado-Perez, 2021). Reducing oxidative stress can reduce inflammation, reduce pain, improve mood disorders, lower the risk of developing certain chronic disease states, and help prevent premature aging (Rosado-Pérez, 2021). Research shows that the mindfulness component of Tai Chi makes the body more sensitive to interoceptive signals by bringing awareness to somatic sensations and creating a sense of calm and well-being, representing a possible pathway by which mind-body interventions can improve mental health and foster resilience (Ardi, 2021). The primary mechanism by which mind-body therapies produce their effects is through self-regulation, which has a top-down effect on numerous physiological processes that impact

health and health behaviors (Bower, 2016). Furthermore, according to Zou and colleagues (2018), the impact of stress reduction and improvement in mood can be attributed to achieving a sympathetic-vagal balance. In summary, mind-body modalities can improve nurses' general health and well-being and may help prevent or reduce burnout by reducing psychological stress and alleviating somatic symptoms (Jung, 2021) through alterations in inflammatory processes (Irwin, 2015).

Tai Chi Easy™ as an Intervention

As described above, Tai Chi Easy™ (TCE) may represent a safe, cost-effective, non-pharmacological option for helping nurses cope with the effects of stress and improve their overall health and well-being. According to Jahnke (2003), the deliberate attention to breathing, movement, and meditation in tai chi integrates the nervous, endocrine, cardiovascular, digestive, and immune systems with the psyche. TCE practice comprises four ‘baskets’: Self-applied massage, mindful movement, breathing exercises, and meditation exercises (Ward, 2023). TCE is appropriate for people of all ages and health conditions because it is recognized as safe, easy to learn, and adaptable (Ward, 2023).

As TCE is less physically demanding and can be done anywhere, anytime, with no special equipment, it offers an attractive alternative to other forms of exercise for nurses (Zheng, 2018). Interestingly, as Chan and colleagues (2018) found, TC exercise is more effective than brisk walking in reducing cardiovascular risk factors among adults with hypertension, indicating this intervention may be particularly beneficial among nurses who may be at risk for hypertension and other forms of cardiovascular disease due to sedentary behavior, being overweight, or consuming alcohol (Khani, 2024). According to Rainbow and colleagues (2024),

interventions that can improve nurses' health, well-being, and safety may improve nurse retention and reduce the impact of the nursing shortage. Tai Chi may also be beneficial in terms of cognitive function and performance, as evidenced by a study conducted by Raingruber and colleagues (2007), which found that participation in tai chi, yoga, meditation, and reiki healing sessions was linked to increased feelings of relaxation, enhanced attention, and more robust problem-solving capacity among registered nurses.

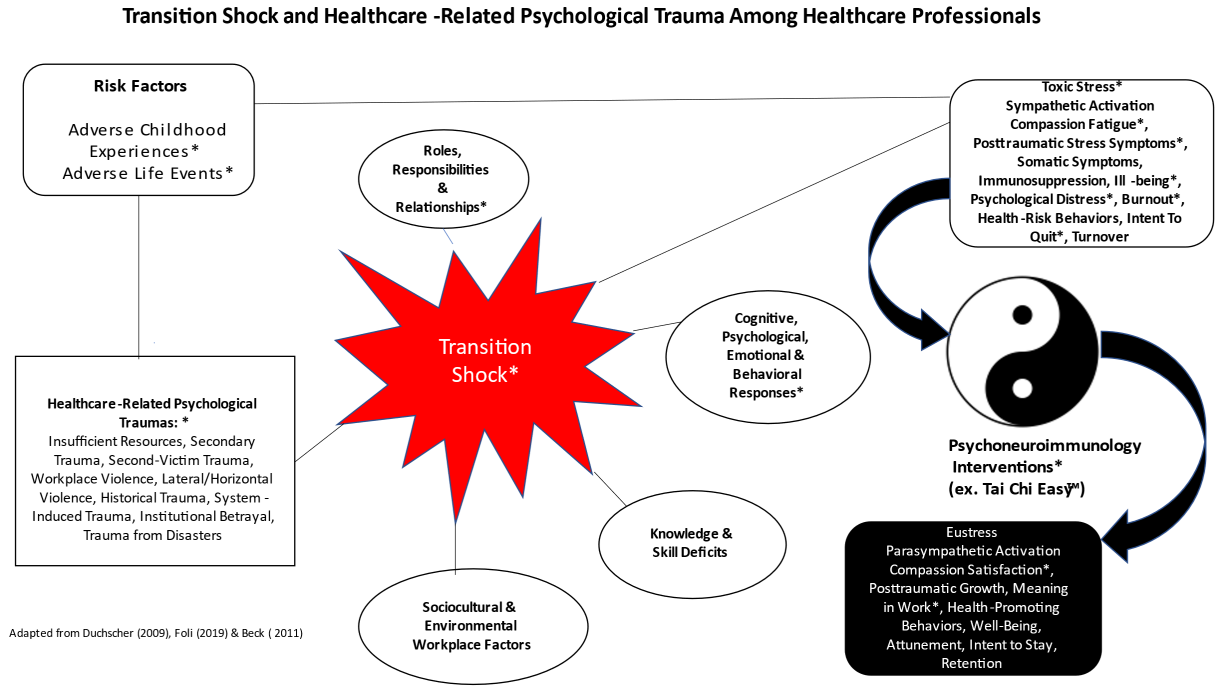
TCE is a cost-effective mind-body intervention that does not require any special clothing, footwear, or equipment and can be practiced virtually anywhere, at any time. Therefore, it is an excellent and practical intervention for this study. Offering TCE in an asynchronous, virtual format could allow RNs (who often work off shifts and may need to sleep when in-person classes are typically offered) greater flexibility and opportunities to access the intervention, which requires 160 minutes of active participation per week for six weeks.

Theoretical Perspectives Underpinning the Proposed Study

To support a longitudinal program of research, a novel conceptual framework (Figure 1) that integrates principles of psychoneuroimmunology and yin-yang theory, and the work of Foli (2019), Duchscher (2009), and psychologists Aaron and Judith Beck (Beck Institute for Cognitive Behavioral Therapy, 2022) was created. This conceptual framework encompasses the phenomena of transition shock and HRPT, including the key attributes, emphasizes the moderating effect of exposure to ACEs and ALEs, and demonstrates how psychoneuroimmunology-based interventions, such as TCE, may produce beneficial effects.

Figure 1

Conceptual Model of Transition Shock and Healthcare-Related Psychological Trauma Among Healthcare Professionals



Psychoneuroimmunology

Psychoneuroimmunology (PNI) is commonly understood as the study of the effect of the mind/psyche on a person's health and ability to resist disease (Yan, 2018). PNI examines the complex, bidirectional interactions among behaviors and the neuroendocrine and immunologic adaptation processes (Scott, 2020). Mind-body therapies, including tai chi, are considered psychoneuroimmunological interventions.

Yin and Yang Theory and Yin-Yang Dynamics

In TC philosophy, yin and yang are the two dynamic, interactive, opposite, equal energies in all things (Lam, 2007). Yin energy is found in the earth, femininity, darkness, coolness,

receptiveness, and nurturing, while Yang energy represents heaven, masculinity, light, warmth, activity, and invasion (Britannica, 2023).

It is commonly understood that these two equal yet opposing energies interact in an inversely proportional fashion; whereas one increases, the other simultaneously decreases in an ever-changing flow of energy. Yin and yang forces can only be thought of in relation to one another and, therefore, can never be separated. There is always some degree of yang within yin and vice versa (Cartwright, 2018). The waxing and waning nature of the yin and yang forces means that when one is more prominent, the other must change proportionally to achieve a new state of balance (Wu, 2017).

A disrupted state occurs if conditions exist where yin and yang forces can become unbalanced (Wu, 2017), resulting in worsened concentration, altered mood, decreased social awareness, and impaired judgment (National Heart, Lung, and Blood Institute, 2022). These effects could have critical implications for new nurses and their patients as they transition to independent practice. The dynamics of yin and yang forces in the stress response networks are key contributors to physical and mental health and disease processes (Yan, 2018). Research evidence from the field of PNI provides a framework for conceptualizing the dynamic balance of yin and yang in the networks involved in the stress response and adds to our knowledge regarding how yin-yang imbalances may affect mental and physical health (Yan, 2018).

Utility of Psychoneuroimmunology and Yin-Yang Dynamics in Research

Studies using PNI interventions are useful for gaining insight into the mind-body system and understanding how stress disrupts the balance of yin-yang dynamics and can influence sleep, inflammation, depression, anxiety, and other medical and psychiatric maladies (Yan, 2018). In

recent years, yin-yang dynamics have been more widely applied in scientific research to help understand the mechanisms and processes inherent in various health-related phenomena and disease states (Wang & Qu, 2021). Interactions between yin and yang components are bidirectional, dynamic, non-linear, and interdependent (Yang, 2018).

Adaption is thought to occur through balancing, self-adjustment, and feedback loops. Restoration of homeostasis and balance can then promote the repair and recovery of systems damaged by the effects of stress and promote whole-person health and well-being (Yang, 2018). yin-yang dynamic models are especially useful for framing nursing research because they are flexible and allow for both top-down (inductive) and bottom-up (deductive) reasoning (Zhang, 2008).

Transition Shock Theory

Transition shock is a term coined by Duchscher (2009) and described in her *Theory of Transition Shock*, which is based on Kramer's research from the 1960s on the concept of reality shock (Duchscher, 2009). The main premise is that transition shock occurs when new nurses move out of the student role and into their professional practice role. The differences between expectations of the nurse's knowledge and performance, roles, and responsibilities in the student role versus the practice setting can be dramatic, and newly licensed nurses who are not prepared for this can experience distress and begin to doubt their abilities, competence, and choice of career, especially if the work environment is less than ideal (Duchscher, 2009). Many of these new nurses reported feeling set up to fail, becoming frustrated and disillusioned, and eventually leaving the profession altogether (Duchscher, 2009).

During the pandemic, when critical staff shortages were prevalent, new nurses were often expected to provide patient care with extraordinarily little support, supervision, or guidance from more seasoned nurses (Matlhaba, 2022) in an incredibly stressful environment with inadequate resources. Additionally, nurses educated during the COVID-19 pandemic may have had less clinical exposure due to the use of simulations instead of in-person training due to the unavailability of clinical sites, such as hospitals (Kim, 2021).

Transition shock comprises a range of emotions that new nurses experience, which typically occurs in four phases: the honeymoon phase, the rejection/regression (shock) phase, the recovery phase, and the resolution phase (Stolzman, 2021). Job satisfaction and risk for leaving their current position or the profession are highest during the rejection/regression (or shock) phase when idealism, optimism, and excitement dissipate and nurses discover the reality of what nursing practice entails. Recognizing there may be stark differences between what they have been taught and expect to be doing versus what they now must do, nurses can experience fear, exhaustion, overwhelm, self-doubt, and begin to question their knowledge, abilities, and choice of career (Stolzman, 2021). If nurses have adequate support and mechanisms as they adapt to their new role, they can move into the recovery phase, begin to feel like they fit in, and better grasp their developing role, which decreases their stress (Wakefield, 2018). The resolution phase is when, based on their experiences during the previous stages, the nurse decides whether to stay in their current position, change positions or employers, or leave the nursing profession altogether (Wakefield, 2018).

The Middle Range Theory of Nurses' Psychological Trauma

Foli's *Middle-Range Theory of Nurses' Psychological Trauma* (Foli, 2019) primarily conceptualizes seven different types of trauma that nurses may encounter in their work as they care for patients: 1)secondary trauma, 2) historical trauma, 3) workplace violence, 4) system/treatment-induced trauma, 5) insufficient resource trauma, 6) second victim trauma, and 7) trauma from disasters (which was added to the theory in 2021). This theory is unique because it primarily focuses on nurse well-being through the lens of psychological trauma in its various forms, making it potentially helpful in understanding possible reasons why nurses may experience adverse outcomes (including posttraumatic stress disorder, compassion fatigue, and burnout), and subsequently leave either their current role or the nursing profession altogether (Foli, 2022).

Concepts surrounding Foli's *Middle-Range Theory of Nurses' Psychological Trauma* (Foli, 2021) include variations of psychological trauma that affect humans collectively, including acute trauma, chronic trauma, complex trauma, developmental trauma, and neglect, as well as those that are specific to nurses and nurse-patient dyads. Variables that could influence how a nurse processes trauma and neurobiological changes include genetic or biological, related to family, psychological, cultural, spiritual, or environmental (Foli, 2021). Some traumatic stressors nurses are exposed to are avoidable, and others are not, but all can influence the nurses at the individual, professional, or organizational/systemic levels. Ongoing or chronic exposure to repeated stress can increase the allostatic load, resulting in alterations in the nervous and neuroendocrine systems (Foli, 2021).

Fortunately, not all nurses experience posttraumatic stress after exposure to trauma, and some positive outcomes from trauma can occur, including increased resiliency and posttraumatic growth. Protective factors that can buffer the effects of trauma exposure include trauma-informed care practices and modifications of systemic factors by healthcare organizations (Foli, 2021). Negative consequences of traumatic stress exposure in nurses, according to Foli (2021), are mental health problems, substance use problems, staff turnover, and nurses leaving the profession.

Problem Statement

Considering the dire implications of the ongoing nursing shortage for the current and future of state healthcare in the US and around the world, research studies examining the phenomena of psychological stress/distress, transition shock, healthcare-related psychological trauma, burnout, and intention to quit among newly-licensed nurses are both critically important and timely. While much has been written about the etiology and consequences of these phenomena before and in the wake of the COVID-19 pandemic, there is a dearth of high-quality intervention studies that employed evidence-based mind-body approaches to relieve stress and improve coping among new nurses in the nursing literature. No published, peer-reviewed studies have explored whether TCE is a feasible, acceptable, and appropriate intervention for newly licensed nurses experiencing distress and transition shock and at risk of leaving their current position or the profession, indicating an important gap in nursing knowledge.

Purpose and Specific Aims

The purpose of the proposed study was to a) determine whether virtual TCE training is a feasible, acceptable, safe, and appropriate mind-body self-care intervention among RNs and b)

explore whether changes in stress, transition shock, posttraumatic stress symptoms, and transition shock occur after participation in a six-week asynchronous virtual TCE training intervention,

The results of this study filled important gaps in nursing knowledge and can inform future studies regarding the use of Tai Chi Easy™ as a safe, acceptable, cost-effective, evidence-based intervention for nurses experiencing transition shock, stress/posttraumatic stress, and burnout. Additionally, this study provided information useful to academic and healthcare organizations, as there is a demonstrated need to better prepare nurses for the tumultuous and highly stressful entry to professional practice and to guide the implementation of strategies to help new nurses adjust and remain in their roles.

Aim 1: Feasibility

Evaluate whether Tai Chi Easy™ is a feasible, acceptable, and appropriate self-care intervention for registered nurses. Recruitment, retention, intervention adherence, and safety data were also obtained.

Aim 2: Changes in Symptoms of Distress

Explore whether within-group changes in stress, posttraumatic stress, somatic symptoms, burnout, transition shock, and intention to quit occur post-intervention.

Summary

This researcher proposed a small-scale quasi-experimental pre-and post-intervention study investigating the feasibility, acceptability, and appropriateness of a six-week, virtual, evidence-based self-care intervention featuring Tai Chi Easy™ for RNs. Relevant variables were measured pre-and post-intervention to evaluate for changes. This study was timely, novel, and

innovative. The findings can inform the design and implementation of future, larger-scale randomized-control studies using virtual TCE as a psychoneuroimmunology-based intervention to alleviate stress, traumatic stress, burnout, and other negative symptoms among different groups of nurses and other healthcare professionals experiencing similar phenomena. The findings may also reveal other gaps in knowledge that provide opportunities for further research.

In the following two chapters, the literature review process that informed the development and design of the study (Chapter 2) and the details and justification for the methodological choices made by the researcher (Chapter 3) will be described.

CHAPTER 2: LITERATURE REVIEW

This literature review summarizes and critically reviews recently published studies that provide background and context for the turnover problem among RNs, with a focus on new-graduate RNs as they transition to independent practice, to support the research aims in the proposed quasi-experimental feasibility study.

To address nurse turnover, the author presents a chronological review of significant studies on interventions aimed at reducing this issue over the past 60 years. The review includes a summary and critical analysis of recent literature (2018-2023) on Tai Chi and other mind-body interventions. The author identifies gaps in the existing research and argues that these gaps highlight the need for further studies on mind-body interventions to enhance the health and well-being of nurses, who represent the largest workforce in healthcare (Wakefield, 2021).

Search Strategy

To conduct the literature search, the author queried multiple databases, including PubMed, CINAHL, Google Scholar, and the University of Arizona Health Sciences Library database. Limiters included full-text articles, and the dates were inclusive of 1960-2023. Search terms included “nurse,” “ turnover,” and “new graduate nurses.”

Research on Nurse Turnover in the United States

The topic of turnover among new nurses and how it affects outcomes for patients, organizations, and the healthcare industry has appeared in the published literature since at least the 1960s with Kramer’s (1966) research on the concept of reality shock among new graduate nurses.

1970-1979

Recognizing the impact of nurse turnover on healthcare economics and patient care, Marshall (1974) examined how hospitals could optimize bed usage according to staffing patterns. Kramer (1974) published a book on reality shock among new nurses, and Celentano (1978) examined the practice and employment patterns among new health professionals. Additionally, studies were conducted on the impact and costs associated with turnover in neonatal units (Consolvo, 1979) and the effects of bicultural training to ease the stress caused by the transition from academics to professional practice (Schmalenberg,1979).

1980-1989

Research continued on employment patterns comparing new graduate RNs to newly hired but experienced nurses (Weisman, 1981). Giles (1981) studied a new program to reduce nurse turnover, while Poyss (1982) posited that new graduate nurses should not be allowed to work in critical care units. Stryker (1982) explored whether increased attention from and interventions by administrators could reduce turnover in nursing homes (Stryker, 1982), reflecting a change from an emphasis on hospital settings. Ulschak's (1983) work highlighted the importance of proper socialization (Ulschak, 1983), and Anderson (1983) focused on the need for improved networking to support nurse retention.

In the mid-1980s, studies on what is now commonly known as nurse residency programs began to emerge. Weiss (1984) studied whether educational modules designed to assist new graduate nurses in adapting to their new work environment effectively achieved that purpose, and Schempp (1986) examined the effectiveness of transition programs for new graduate nurses.

A new focus in the literature on the costs associated with nurse turnover and affordable yet creative ways to reduce turnover began with studies by Hoffman (1985) and Shufer (1985). Later in the decade, Mooney (1988) introduced a preceptor program that was found to help provide a personalized orientation to inexperienced staff while offering seasoned nurses an opportunity to enhance their professional practice. A study by Kelly (1988) used exit interview data to ascertain why RNs were leaving their positions, which revealed that the primary contributors were heavy workloads and inflexible scheduling practices. Further research into comparing stress among intensive care unit nurses to nurses who worked in other areas and the effects of stress on nurse dissatisfaction and attrition was conducted by Harris (1989).

Germane to the issue of turnover and difficulty with transitioning to professional practice among new nurses, Benner (1984) developed a framework illustrating how nurses progress through several stages as they evolve from novices to experts, with new graduate nurses starting their practice in the advanced beginner stage. Benner (1984) proposed that while nurses at this stage may be familiar with some aspects of the patient-care setting, they are likely to experience high stress levels as they develop the required knowledge and skills while working in a fast-paced and under-resourced environment.

1990-1999

As more came to be known about the phenomenon and impact of nurse turnover, the creation of the Magnet Hospital Recognition Program for Excellence in Nursing Services was approved by the American Nurses Association (ANA) in 1990. This program was based on a 1983 American Academy of Nursing (AAN) study and was designed to identify characteristics of organizations that excelled in recruiting and retaining RNs (Wolters Kluwer, 2022). The

American Nurse Credentialing Center (ANCC) initiated the program as a pilot in 1994 and has expanded it to advance three primary goals within participating healthcare organizations: 1) promotion of nurse role development and retention through the support of the professional practice, 2) identify nursing excellence in the delivery of care to patients or residents, and 3) serve as a means for the dissemination of best practices in nursing services (Wolters Kluwer, 2022). Hospitals and nursing homes that achieve Magnet designation are more able to attract and retain talented nurses, improve patient care, safety, and satisfaction, promote a collaborative culture in the workplace, advance the standards of nursing care and evidence-based practice, and grow the success of the business (Wolters Kluwer, 2022).

Also, during this decade, Metzger (1990) and Trofino (1990) studied approaches to recruit new nurses while retaining those with experience, while Duffield (1991) offered strategies to help bridge the problematic theory-to-practice gap for new nurses. Singleton (1991) proposed that middle managers were the gatekeepers for nurse turnover, which offered a new perspective on how relationships between staff and managers can influence the climate and culture in the workplace. Kotecki (1992) continued evaluating the impact of nurse internships, and Evans (1992) suggested that nurse-physician collaboration was an important strategy for nurse retention and might mitigate the nursing shortage. Studies on recruiting and employing foreign nurses in US hospitals began to appear in the literature as a possible solution to the nursing shortage (Pizer, 1994).

2000-2010

At the turn of the century, Shader et al. (2001) continued studying the phenomenon of nurse turnover by examining the relationships between work satisfaction, stress, age, cohesion

among coworkers, work schedule, and anticipated turnover in an academic medical center. Olson et al. (2001) described a 900-hour residency program for senior baccalaureate nursing students designed to help pre-emptively smooth their transition into the role of a bedside nurse, which was a novel approach. Two years later, a study conducted by Isaac (2003) found that RN support of new graduate nurses helps improve retention, while Sofield (2003) examined the effects of workplace violence and verbal abuse toward nurses related to nurses' intention to leave the organization.

Sumner (2003) took an insightful and novel approach to the analysis of why nurses leave the profession, looking not only at bureaucratic/organizational factors but also at intrinsic factors specific to the needs of the nurse. Examples of nurse-specific needs included their expectations of patients, themselves, and the organization, their need to summon emotions necessary for the act of caring while remaining detached enough to perform tasks that require a great deal of knowledge and technical skill, the experiences of being viewed as a commodity rather than an asset by their employing organization and of being dominated by or perceived as inferior to medical professionals (Sumner, 2003). Other key issues raised by Sumner (2003) centered around nurses having incredibly intimate encounters with patients and touching people's lives in many ways that few other professions do. The nurse's expectations of patients' acceptance of care and their need/desire to express caring behaviors can be thwarted by patients who resist or do not appreciate the nurse's efforts (Sumner, 2003), which may affect their experience of compassion satisfaction, which can be understood as the good feelings that come from helping others (Lightbody-Warner, 2020).

There is an interesting paradox in that while the nursing profession has historically embraced the notion that duty, obligation, and self-abnegation are inherent in nursing's role, there can also be the conscious or unconscious need among nurses that others (e.g., patients, other healthcare professionals, organizations, & society) acknowledge of the distinctiveness of the nursing role (Sumner, 2001) and the unique contribution nurses make to the health and well-being of humankind. Whether that deep psychological need is fulfilled may be a factor in determining whether a nurse remains in their role and possibly in the profession.

Around the middle of the decade, it became more apparent in the literature that new graduate nurses needed extra support and mentoring after completing orientation and tended to leave for what they perceived as greener pastures if unavailable. Almada et al. (2004) reported that implementing an education-based preceptor program by a community hospital improved new nurse satisfaction by 29% and reduced vacancies by nearly 10%. In further support of understanding the underlying causes of new nurses leaving, Duchscher and Cowin (2004) introduced the concept of marginalization as a framework for understanding the causes of new nurse attrition from the profession and suggested that feelings of vulnerability due to being inadequately prepared for practice by their undergraduate programs and oppression and alienation from their colleagues were contributing factors. New graduate nurses had started to realize that the concept of the ideal nurse (who simultaneously possesses a vast amount of theoretical and practical knowledge, is technically proficient, remains cool under pressure, and is task-oriented yet remains constantly attuned and emotionally available to patients and their families), is a rarity in today's healthcare environment. While much of nursing education and training is focused on acquiring skills and knowledge, it is essential to acknowledge that the

satisfaction derived from the emotional connection inherent in the nurse-patient relationship is often what makes the other negative aspects of nursing practice bearable and fulfills the need to help others that calls many to the profession (Sumner, 2003). If nurses feel they cannot engage in the act of caring or that this caring work is not valued, they can experience deep frustration and existential distress, which may prompt them to leave their role or the profession (Sumner, 2003).

The impact of the nursing shortage, downsizing of staff, and working long shifts on nurses' ability to deliver quality patient care was highlighted in a qualitative study by Geiger-Brown et al. (2004), who also found that elevated levels of job-related neck, shoulder, and back injuries or disorders were prompting nurses to leave the workplace. Recognition of the need for occupational safety, ergonomics, and the effects of somatic symptoms on nurses' health and well-being began to emerge. The Nurses' Health Study 3, led by Chavarro, began in 2010 and started recruiting male nurses for the first time in 2015 (Bao, 2016). It examined various dimensions of nurses' health and behavior.

Later in the decade, researchers, including Duchscher (2008) and Etheridge (2007), discovered that specific challenges encountered by new nurses during the first year of practice include insufficient clinical knowledge, low confidence in their skills and abilities, difficulties forming positive relationships with co-workers, managing their workload, navigating the organization or system and interacting with physician colleagues. The fear among new nurses that they would be unable to fully understand what was happening with their patients and appropriately intervene as they encountered more responsibility and accountability for patient care was elicited in the research, as were the fortunate findings that toward the end of their first year, they developed more self-confidence and trust in their judgment and abilities (Etheridge,

2007; Duchscher, 2008). Lavoie-Tremblay et al. (2010) began to explore the needs and expectations of nurses from a generational perspective, with a study focusing on Generation Y nurses who were entering into practice. Lavoie-Tremblay's study (2010) found that recognition was a key motivator for these nurses, followed by the need for flexible work schedules, stability, professional development opportunities, and adequate supervision and support.

2011-2019

In the early part of this decade, Bolden et al. (2011) reported that new nurses were feeling inadequate and dependent on others, had low coping skills, and were not feeling accepted by staff on their assigned units, as seen in their study of a reflective journaling intervention conducted during a nurse residency program in a Magnet designated hospital designed to improve coping and retention. Unruh and Zhang (2014) found that turnover rates remained high among new nurses; within 1.5-2.5 years after graduation, one-third of nurse respondents had left their first job. The reasons cited by nurses for leaving were primarily for work-related reasons, including inadequate orientation, lack of information, perceiving they could not do a respectable job, not being rewarded fairly, and low job satisfaction (Unruh, 2014).

Taking a more positive approach to the problem of turnover among new nurses, Djukic and colleagues (2011) conducted a study to discover what newly licensed RNs liked best about being a nurse, which revealed five major themes: being able to care for patients holistically, experiencing autonomy and collaboration in their practice, being able to impact patient outcomes through the use of diverse skills and knowledge, the importance of meaningful recognition, and having a secure and mentally-stimulating job. Vardaman (2014) examined the role of physical conditions in the workplace as a contributor to turnover and found that perceived noisy work

conditions significantly increased turnover intentions, whereas conditions conducive to making tasks easier significantly reduced turnover intention. Continuing to investigate the impact of the work environment, Spence, Laschinger, Zhue, and Read (2016) noted in their study that new nurses' perceptions of factors in the work environment that supported their professional practice and promoted high-quality patient care increased job satisfaction and retention. Liu and colleagues (2016) found that fatigue due to heavy workloads and long shifts was a major determinant of intention to leave among new nurses.

An interesting study by Dames (2019) explored why, despite working in similar practice environments and experiencing similar independent stressors, some nurses experience exhaustion and burnout in their first two years of practice while others thrive and experience self-actualization. Dames (2019) found that factors related to previous life experience and developmental assets affected nurses' perceptions of stimuli in the workplace, which impacted whether the stimuli were perceived as stressful. This has implications for the role of adverse childhood experiences and adverse life events in nurses' responses to stress and exposure to the triggers and traumas frequently encountered by those in the helping professions. Ambra (2014), Hickson (2015), and Read (2015) began to explore in greater depth the phenomenon of incivility, mistreatment, and bullying behaviors toward new graduate nurses in the workplace. Skarbek and colleagues (2015) conducted a phenomenological study of how nurse managers intervened when these behaviors were identified. Also emerging during this time were studies on the impact of aggression and violence toward healthcare workers, which were associated with low job satisfaction, high turnover rates, and professional attrition (Searby, 2019).

2020-2023

In the 2020s, sparked by the increased emphasis on diversity, equity, and inclusion in research and accelerated by the global impact of the COVID-19 pandemic, research on burnout and turnover rates among male nurses began to emerge (Xian, 2020). Favaro and colleagues (2021) found that while newly licensed male nurses experienced significantly higher workplace bullying rates than newly licensed females, they also had lower job turnover intention, although the explanation remains unclear. The focus on retaining young nurses continued, with a study by Çamveren (2020) revealing yet again that the three main drivers for this group leaving their organization were a negative work environment, the nursing shortage, and a discrepancy between their expectations and reality. The lack of support from their managers, an ineffective preceptorship process, and horizontal violence among co-workers contributed to the negative work environment (Çamveren, 2020). Heavy workloads and long shifts caused by low staffing were attributed to the nursing shortage, and work-life imbalance, lack of options, and family-related factors comprised the unsatisfied individual expectations category (Çamveren, 2020). Reinhardt (2020) found that the main factors contributing to nurses' intention to stay included a sense of belonging and supportive workplace characteristics, highlighting the importance of a positive and inclusive culture and adequate support for NLNs as they transition to practice. Studies on interventions incorporating technology to meet the needs of new graduate nurses, such as online interactive case simulations designed to narrow the ever-widening practice gap, were noted in the literature at this time. Alarmingly, researchers indicated that fewer than one-third of new graduate nurses demonstrated entry-level competencies, contributing to

turnover and increased expenditures by hospitals that have been forced to create and maintain nurse residency programs to bridge the skills gap (Chan, 2021).

Research on the impact of fatigue (Austin, 2020) on turnover, absenteeism, work motivation, low engagement, and the development of somatic symptoms, such as headaches (Chang, 2020), revealed that these factors contributed to turnover among new nurses. As previously mentioned, the COVID-19 pandemic was a defining characteristic of the early part of this decade. Not only did a deadly airborne virus sweep across the globe, infecting 676,609,955 people and killing 6,881,955 of them (Johns Hopkins Coronavirus Resource Center, 2023), there was enormous strain placed on the healthcare system and healthcare workers.

Uncertainty and numerous sociopolitical factors shaped the public's behaviors and acceptance of and adherence to infection control prevention measures and vaccinations, leading to a host of other problems that adversely impacted healthcare workers. Violence toward healthcare workers dramatically escalated during the pandemic, worsening occupational stress and posing a risk to nurses and other healthcare workers; physical and mental health (Kuhlmann, 2023). Supply chain shortages, which have affected the availability of personal protective equipment, drugs, and devices, led to significant consequences for patients and healthcare professionals, such as medication errors, delays in treatment, and, in some cases, healthcare rationing (Phuong, 2019; Kacik, 2023).

According to a survey published by the National Council of State Boards of Nursing (2023), nearly 100,000 nurses left their jobs as a direct result of the stress they experienced during the COVID-19 pandemic, and another 610,388 experienced nurses with an average age of 57 indicated their intent to leave the profession by 2027 due to stress, burnout, or reaching the

age of retirement. To make matters worse, 189,000 newer and younger nurses with fewer than ten years of experience indicated they had the same intention due to increased workloads and feeling emotionally drained by work (Russell, 2023). Around half of the surveyed nurses reported feeling burned out and fatigued, with the largest impact seen among younger nurses (Russell, 2023).

Important work by Karen Foli (2020, 2021, 2022) highlighted the causes and effects of psychological trauma among nurses before, during, and after the COVID-19 pandemic. Beyond commonly known occupational hazards, such as exposure to bloodborne pathogens, hazardous chemicals and drugs, and musculoskeletal injuries, numerous types of psychological traumas unique to healthcare can have enduring neurobiological and physiological consequences on nurses and other health professionals. In her *Middle-Range Theory of Nurses' Psychological Trauma*, Foli (2022) describes several traumatic stressors nurses may experience, including workplace and lateral violence, second-victim trauma, insufficient resource trauma, and secondary/vicarious trauma (Table 1).

Much research has been done on the turnover phenomenon among nurses and the factors that have contributed to the problem over at least the past sixty years. Numerous interventions, including those at the interpersonal, unit, and organizational levels, have been studied, yet the problem persists, suggesting that more is needed. With many of the factors that lead to new nurse turnover unlikely to change in a meaningful way, it is apparent that individual-level interventions targeted toward helping new nurses cope with the effects of prolonged or toxic stress, healthcare-related psychological trauma, and the somatic symptoms that they can cause are necessary, supporting the need for the proposed study.

Tai Chi as an Intervention

Despite tai chi being viewed as a safe, cost-effective, and accessible mind-body exercise with physical, psychological, and quality-of-life benefits (Yang, 2022), there is a dearth of published literature on tai chi as an intervention for nurses experiencing HRPT, transition shock, somatic symptoms, and/ or burnout. This highlights a significant gap in the body of nursing and clinical knowledge.

Search Strategy

During the summer of 2023, major databases were queried using MeSH terms and the following search strategy: “Tai Ji” OR “Qigong” AND “Nurses.” Limited to full-text, peer-reviewed articles written in English published since 2005 yielded the following results: PubMed (10 results, four involving nurses, zero studies involving the variables of interest), CINAHL Plus with Full Text (0 results), and PsycINFO (0 results).

Guided by the understanding that published nursing literature does not necessarily refer to the phenomenon of HRPT as such, Mealer and Jones (2013) faced the same dilemma as they tried to analyze the concept of PTSD in the nursing population. The databases were re-searched using more inclusive MeSH terms: (“Qigong”[MeSH]) OR “Tai Ji”[MeSH]) AND (“Stress Disorders, Traumatic, Acute”[MeSH] OR “Stress Disorders, Traumatic”[MeSH] OR “Stress Disorders, Post-Traumatic”[MeSH] OR “Compassion Fatigue”[MeSH] OR “Trauma and Stressor Related Disorders”[MeSH] OR “Psychological Trauma”[MeSH])with no limits. This effort yielded four results on PubMed, with none about nurses. No results were obtained using the same search on CINAHL and PsycINFO.

At that point, a new search focused on the intervention and population of interest was employed to capture conditions similar to or inclusive of the phenomenon of interest. The University of Arizona Libraries database was searched for full-text, peer-reviewed articles written in English within the past ten years using the terms “tai chi AND nurses” OR “tai chi AND healthcare workers.” This strategy returned 112 results, and a title review identified six for preliminary inclusion.

Results

Two of the studies found (Palumbo, 2012; Steinberg, 2017) were conducted as pilot studies of workplace wellness programs and did not explore the intervention in the context of PTSD, transition shock, somatic symptoms, or burnout. Another described the study of a researcher in Australia who is currently evaluating the effects of participation in a 12-week tai chi training program (45-minute sessions at least two times per week) in which nurses who are members of a specific gym can participate (Wang, 2022).

One study (Zhan, 2022) examined the effects of 30 minutes of Tai Chi training versus 30 minutes of relaxation training/free exercise (control group) on sleep quality among fifty frontline healthcare workers for a two-week intervention that showed Tai Chi training could improve sleep and reduce anxiety symptoms. This study was of moderate quality. The sample consisted of 93% women and no follow-up was performed, so the duration of the effect cannot be known. Additionally, only one style of Tai Chi was used for the study.

Two systematic reviews of Tai Chi and workplace wellness written in the same year (Cocchiara, 2020; Dorelli, 2020) were found. The systematic review by Cocchiara (2020) evaluated three clinical trials, one observational study, one systematic review, and one case

report published in English after 1995. Overall, the quality of the literature was poor to medium (Cocchiara, 2020). The systematic review performed by Dorelli et al. (2020) included Cocchiara as an author, used the same studies, and came to the same conclusions. Both studies included Steinberg's (2017) and Palumbo's (2012) articles.

As evidenced by the lack of high-quality studies in the published literature, there is a significant gap in the knowledge regarding whether TC in general, and specifically Tai Chi Easy™, is a feasible and acceptable intervention for nurses experiencing symptoms or sequelae of healthcare-related psychological trauma, transition shock, somatic symptoms, or burnout.

Mindfulness and Meditation Intervention Studies

Studies regarding mindfulness and meditation are trending in the current literature. In 1991, Peddicord emphasized the impact of stress on modern society. Using Roy's adaptation model as a framework, Peddicord (1991) advocated stress reduction as a nursing intervention, but interestingly, not as an intervention for stressed nurses. Cook and Buck (1999) advocated engaging in self-care practices to cope with organizational change's challenges and stressors. The idea of staff and managers signing self-care contracts was floated by Ellis (2000), once again emphasizing the role of nursing leaders in setting the tone for the culture of their units.

A randomized control trial examining the effects of two hours of passage meditation per week for eight weeks among health professionals experiencing perceived stress showed improvements in perceived stress, burnout, and mental health and well-being with effects that persisted for up to 19 weeks (Oman, 2006). A 2008 literature review by Praissman provided nurse practitioners (NPs) with an overview of clinical research findings published between

2000-2006 related to mindfulness-based stress reduction techniques, indicating they are a safe, effective approach for reducing stress among patients and healthcare professionals.

Qigong and Mind-Body Exercise Intervention Studies

Qigong is a centuries-old Chinese self-healing exercise system involving various gentle movements, postures, sounds, breathing exercises, and meditation (National Center for Complementary and Integrative Health, 2022). Some studies have used qigong as an intervention to help participants with burnout, including a 12-week bi-weekly qigong intervention that showed no effect on burnout beyond that which occurred with the passage of time (Stenlund, 2009). Conversely, a study by Seiça et al. (2023) showed that 70% of the participants in the intervention group had significantly decreased emotional exhaustion levels after the experimental phase, and the effects persisted after four weeks of self-practice, so there may be conflicting data. The main issue seems to be the low quality of previous studies involving tai chi and/or qigong.

A useful study by Kemper et al. (2011) explored nurses' preferences, expectations, and experiences regarding using mind-body interventions to reduce stress. Kemper (2011) found that 34% of the respondents were interested in tai chi, qigong, or yoga, 49% had an interest in breathwork meditation, 39% used healing or therapeutic touch, and 18% were practicing mindfulness-based meditation, which are all components of the Tai Chi Easy™ training intervention for the proposed study. This study (Kemper, 2011) also reported that most nurses who were interested in mind-body interventions were already participating in these practices, which could influence the ability to recruit nurses naïve to the intervention. However, Kemper et al. (2011) also found that they were willing to participate in research studies and to allow the collection of biomarker data.

Summary

As described above, the implications of these findings suggest there is a clear and present danger to the state of healthcare in the US as the population ages. The demand for healthcare services may exceed the ability of the system to deliver and further stress the healthcare workforce (Kahana & Kahana, 2014). Stress, healthcare-related traumatic stress, somatic symptoms, and burnout are widespread and pose a severe problem.

The turnover problem among registered nurses in general, and new nurses in particular, has been recognized and studied extensively from various angles for at least half a century. The research has identified and explained many personal, organizational, cultural, social, and systemic factors contributing to nurse turnover. Numerous small- and large-scale interventions have been implemented and studied. However, despite these efforts, the problem of new nurse turnover and attrition persists. While systemic, organizational, and sociocultural changes to support nurse retention are needed, interventions focusing on alleviating stress and easing the transition to independent practice for the individual nurse as a possible mitigator have not been well-explored. In fact, until recently, there has been extraordinarily little research regarding the use of mind-body exercise as a self-care intervention for nurses in the US who are experiencing stress, somatic symptoms, burnout, or healthcare-related posttraumatic stress in published literature, highlighting an important gap in the body of knowledge.

Novel interventions to support nurse health, well-being, and retention, which can have a positive ripple effect on patient care, the climate and culture of the workplace, patient-related outcomes, and healthcare economics, are desperately needed. Mind-body PNI-based interventions, such as Tai Chi Easy™, are a safe, cost-effective, accessible, and

non-pharmacological option that promotes health and well-being and may help RNs cope with the effects of stress, reduce somatic symptoms, and influence their intention to quit. However, as promising as Tai Chi interventions are, there is a significant gap in the literature regarding whether Tai Chi in general and Tai Chi Easy™ specifically is a feasible, acceptable intervention for nurses experiencing these phenomena. Therefore, the proposed study was both innovative and significant and adds to the body of knowledge that can support future interventions designed to reduce the problem of turnover among registered nurses.

CHAPTER 3: METHODOLOGY

The following pages contain a detailed description of the study methods selected to address the purpose and aims. In particular, the study design, information about the sample (including sample size and the sampling and recruitment strategies), a description of the planned intervention, the selected measures, the data collection and analysis procedures, and the human subject protection procedures were discussed.

Methods

Approach

This multimethod study used inductive and deductive approaches to determine the intervention's feasibility, acceptability, and appropriateness and to test select elements of the *Transition Shock Theory* (Duchscher, 2009), the *Theory of Nurses' Psychological Trauma* (Foli, 2022), the *Cognitive-Behavioral Theory* (Beck, 2011), and the *Yin-Yang Theory* (see the starred items in Figure 1).

Design

A pre-and post-intervention feasibility study design was chosen because it is a widely used method for evaluating participants' attitudes and perceptions relative to an event or an intervention (Stratton, 2019) and whether an intervention should be followed by efficacy testing in settings where resources may be limited (Bowen, 2009). A feasibility study is especially useful when there are few published studies on the intervention in a certain population or where the quality of those studies is poor (Bowen, 2009). Feasibility and acceptability studies can also help researchers understand whether adjustments are required in the study's methodology or the

intervention itself and what changes may occur because of participation in the intervention (Bowen, 2009).

Sample

A purposive sample of 18 study participants was recruited through flyers shared via email and postcards mailed to licensed RNs using addresses obtained from the Vermont Board of Nursing and the Arizona Board of Nursing.

Although no specific sample size or power calculations were necessary for this feasibility study, a sample of 24-50 participants was the minimum recommended by Lancaster (2004), Sim (2012), and Julious (2005). This number of participants could allow for estimating a parameter, such as standard deviation, which can be used for power calculations needed for future, larger-scale studies (Hooper, 2019). A recruitment goal of forty participants was set to allow for a 20-30% attrition rate, which was noted in other recent tai chi intervention studies (Martin, 2019; Ng, 2011; Chan, 2018).

Inclusion and Exclusion Criteria

As the original plan for this study was to explore the feasibility of virtual Tai Chi Easy™ for New Graduate Registered Nurses, the inclusion criteria specified that participants needed to be newly licensed registered nurses between the ages of 22-30 within the first six months of professional practice. The rationale for the inclusion criteria selected (Table 2) was to 1) ensure diversity and geographic homogeneity of the sample, 2) ensure that the participants are at risk for the phenomena of interest, and 3) ensure that they were able and willing to fulfill the study protocol requirements. The exclusion criteria were chosen to identify participants with characteristics that could interfere with the outcome of the study, such as sensitization to

treatment effects, a physical, psychological, or cognitive inability to participate in the intervention or respond to questionnaires accurately, or who may not have the time to commit to the study protocol. However, due to difficulties recruiting new graduate nurses, the inclusion criteria were first modified to include all new graduate registered nurses within one year of practice, then further modified to include any licensed registered nurse.

Table 2

Inclusion and Exclusion Criteria

Inclusion Criteria	Exclusion Criteria
1) Licensed registered nurses from all sex/gender, racial/ethnic, and socioeconomic groups. 2) Access to a computer, tablet, or smartphone, and reliable internet access 3) No significant physical or cognitive impairments 4) Ability to read and write in English	1) Refusal to provide informed consent 2) Regularly participating in Tai Chi or other mind-body exercise more than once per week 3) Refusal or inability to fully participate in virtual, asynchronous Tai Chi Easy™ classes for 120 minutes per week and to practice independently for 40 minutes weekly. 4) Self reported history of previously diagnosed posttraumatic stress disorder from a non-healthcare-related event. 5) Any self-reported acute or chronic mental health or medical condition that would otherwise limit the participant's ability to participate in study activities.

Enrollment

Enrollment for this study occurred on a rolling basis over five months. Once eligibility was confirmed and online informed consent was on file, the participant was granted access to the online intervention content. Rolling enrollment was chosen to help ensure successful recruitment, engagement, and retention of the sample by preventing delays that may occur with waning enthusiasm and would require additional time or costs to complete the study (Gupta, 2015).

Intervention

The TCE training intervention was delivered asynchronously online using pre-recorded lessons via a private YouTube channel. The virtual format was chosen as it leveraged existing technology and resources to allow broader access to the intervention and accommodate RNs' varying work schedules. The dose for the intervention was 160 minutes weekly, yielding a total dose of 1280 minutes, which was within the range of doses used in other tai chi intervention studies (Chen, 2021). A summary of the Tai Chi Easy™ class content is listed in Table 2, and a more detailed version can be found in Appendix A.

60-Minute Virtual TCE Classes

After a brief orientation from the principal investigator, study participants completed two pre-recorded 60-minute Tai Chi Easy™ (TCE) classes each week for six weeks, which they could do at their convenience via the private YouTube channel. A Certified Tai Chi Easy™ Practice Leader taught all sessions. The Tai Chi Easy™ program that was the foundation for the classes is a simplified, standard qigong that can be used for medical or therapeutic purposes and includes the four essential methods for cultivating qi (Jahnke, 2019): postural alignment and gentle movement, breath practice, self-applied massage, and meditation exercises that focus on visualization and relaxation (Jahnke, 2019). TCE uses five traditional tai chi movements, which participants can do from a seated or stationary standing position. Once mastered, the upper body movements can be performed along with tai chi walking to create a set known as tai chi qigong (Jahnke, 2019). Table 3 contains an outline of the TCE program content, which the instructor used to create the virtual lessons.

Table 3

Outline of Tai Chi Easy™ Program Content

The Three Intentful Corrections of Body, Breath, and Mind *Adjust Posture and Movement Focus on the Breath Clear the Mind*			
Mindful Movements	**Breathing Exercises**	**Self-Applied Massage**	**Meditation Practice**
1) Sitting Qigong 2) Standing Qigong 3) Walking Qigong 4) Tai Chi Walking in Place 5) Harmonizing Yin and Yang 6) Brush Knee, Send Qi 7) Cut Through to Clarity 8) Watch Clouds Pass **9)** Gathering Heaven and Earth	1) Essential Breath 2) Sigh of Relief 3) Remembering Breath 4) Gathering Breath 5) Xi, Xi Hu Breathing with Walking Qigong	1) Hands 2) Feet 3) Ears 4) Face and Eyes 5) Scalp 6) Neck and Shoulders 7) Tracing Acupuncture Channels 8) Energizing the Organs 9) Abdomen	1) Progressive Relaxation 2) Progressive Relaxation with Affirmation 3) Marrow Washing Visualization 4) Mindfulness Meditation 5) Standing Meditation

Adapted from the Tai Chi Easy™ *Practice Leader Training Guide (Jahnke, 2019)*

Independent Practice Sessions

For the independent practice sessions, participants were asked to create their own unique practice session based on the elements of one or more of the four Tai Chi Easy™ modalities (e.g., mindful movements, breathing exercises, self-applied massage, or meditation practices) they had learned (Jahnke, 2019). Participants engaged in 10 minutes of independent practice four days weekly for six weeks, allowing one rest day per week (Appendix A).

Measures

In addition to a researcher-generated questionnaire that collected demographic information, the participants completed online questionnaires (Table 5) to measure the variables of interest (Table 4). The selected instruments have acceptable reliability and validity, do not require specialized training to administer, score, or interpret the findings, and are within

budgetary constraints. Indirect measures of intervention fidelity by participants were used due to pragmatic constraints on time, funding, and study personnel. These measures included weekly self-reports and rating scales (to measure satisfaction and compliance with the lessons and independent practice) and the opportunity to provide feedback for the researcher and the TCE leader. Self-reported quantitative intervention fidelity data were collected via REDCap. Participants attested whether they completed the virtual TCE classes and the independent practice requirement once per week, rated their satisfaction with the week's lessons and the self-practice sessions, and described their adherence to the intervention and any barriers they encountered. A conceptual model illustrating how the variables of interest relate to the phenomenon of transition shock among RNs and how the psychoneurological intervention of Tai Chi Easy™ mind-body exercise may influence nurse well-being is shown in (Figure 1).

Table 4

Variables of Interest and Measurement Strategy

Variable of Interest	Measurement Strategy	Rationale
Demographic Information	Age Gender Marital Status Number of children living at home Educational Level State(s) of licensure	Describes sample Provides information on the roles of participants Provides information on the work settings of participants
Role	Work Setting: Unit/ Population Focus Shift Desired work unit/ population focus Desired shift # months since licensure Whether in a nurse residency program	Provides information on time working in the role of participants Provides information on whether they are currently working their desired unit and shift

Table 4 - Continued

Variable of Interest	Measurement Strategy	Rationale
Adverse Childhood Event Exposure	Adverse Childhood Events Questionnaire (ACE-Q)	Measures ten categories of adverse childhood experiences that can cause enduring neurobiological changes, adversely impact physical and mental health, and contribute to the development of posttraumatic stress disorder (Herzog, 2018)
Adverse Life Event Exposure, including Healthcare-Related Psychological Traumatic Stressors	Life Events Checklist for DSM-5 (LEC-5)	Adverse events are inevitable in healthcare and can involve nurses, patients/ families, organizations, and communities (Liukka, 2020). LEC-5 captures events that could have occurred in a nurse's personal life and work and provides information on how it was experienced (Weathers, 2013).
Responsibilities	Nurses' Intention to Quit Scale Items 6,9 and 21	The workload may be more than can be reasonably expected of a new graduate nurse (Duchscher, 2009). Nurses with family or academic obligations may experience stress due to competing demands.
Relationships	Nurses' Intention to Quit Scale Items 5,8,10,13, 14,15, and 18	Relationships and interactions within the clinical environment can be energy-consuming and may be perceived as intimidating and devaluing to new nurses if the behavior of colleagues, managers, or physicians is not collegial (Duchscher, 2009).
Perceived Knowledge and Skill Deficits	Nurses' Intention to Quit Scale Items 2, 12, 17, and 23	In the first few months of practice, gaps in theory to practice and knowledge and skill deficits become apparent to new nurses as they transition to professional practice (Duchscher, 2009).
Sociocultural and Environmental Workplace Factors	Nurses' Intention to Quit Scale Items 7, 8,9,10,11,13, 14, 15, 16, 18, 19, 21, and 22	Organizational factors and conditions in the workplace can contribute to transition shock (Duchscher, 2009) and Nurses' Intention To Quit (Vicklund, 2017).
Transition Shock Symptoms	Nurses' Intention to Quit Scale Items 20, 25, and 26	Transition shock' is a concept that describes the experience of moving from the comfortable and familiar role of the nursing student to the professional registered nurse (RN) within the first few months of practice (Wakefield, 2018).
Occupational Stress	Nurses' Intention to Quit Scale Items 1,6,13,15,16, 20,21,and 22	New nurses have higher levels of occupational stress during their first year of employment due to lofty expectations, excessive responsibilities, and minimal autonomy and empowerment (Fang, 2022).
Posttraumatic Stress Symptoms	PTSD Checklist for DSM-5	The healthcare environment puts nurses at risk for developing PTSD, with nearly 1 in 4 nurses being affected during their career. PTSD among nurses contributes to turnover and poor mental health (Herleth, 2019)
Somatic Symptoms	Somatic Symptom Scale-8	Somatic symptoms are characteristic of various medical conditions and they are also present in psychiatric conditions such as depressive disorders, anxiety disorders (Gierk, 2009) and PTSD (Gupta, 2013)

Table 4 – Continued

Variable of Interest	Measurement Strategy	Rationale
Burnout	Maslach Burnout Inventory- Human Services Survey	New nurse burnout can occur due to numerous factors, including a perceived inability to accomplish tasks, inadequate training, a lack of preparation, long work shifts, inadequate support from colleagues, and a lack of clarity regarding duties. The effects of nurse burnout contribute to high turnover, reduced productivity, and decreased patient safety (Well-Being Index, 2023)
Intention to Quit	Nurses' Intention to Quit Scale items 24, 27, 28, 29, and 30	Over the past several decades, researchers have studied nurse turnover. Studies have shown that 17-54% of all nurses have an intention of leaving their workplace and that there is a significant relationship between intention to quit and nurse turnover (Vicklund, 2017).
Recruitment and retention rates	Descriptive Statistics	This data will help the researcher decide whether to proceed with a larger-scale study in the future and to make any necessary modifications or refinements to the methodology or intervention. A goal of 80% recruitment and retention rate and 80% adherence rate will be used to make the feasibility determination (Cassidy, 2019)
Intervention Adherence	Yes/No Question: "Did you complete both weekly classes?" and "Did you complete the 40 minutes of independent practice this week?"	
Safety	Number of adverse events/injuries reported	
Barriers and facilitators for intervention adherence	Free-text response to the prompt "If you did not complete this week's activities, what kept you from doing so?"	
Satisfaction with Intervention	5-point Likert Scale response to the prompt: "How satisfied were you with class x?")	
Feedback on Classes	Free-text response to the prompt "Please provide feedback regarding this week's classes for the Tai Chi Easy™ instructor."	
Acceptability	Acceptability of Intervention Measure	
Appropriateness	Appropriateness of Intervention Measure	
Feasibility	Feasibility of Intervention Measure	

Table 5

Validated Instruments

Instrument	Variable(s) Measured	Number of Items	Estimated Time to Complete	Reliability and Validity
AIM	Acceptability of intervention	4	5 minutes	Cronbach's α=0.85 (Weiner, 2017)
IAM	Appropriateness of intervention	4	5 minutes	Cronbach's α=0.91 (Weiner, 2017)
FIM	Feasibility of intervention	4	5 minutes	Cronbach's α=0.89 (Weiner, 2017)
Adverse Childhood Events Scale	Ten categories of adverse childhood events	10	5 minutes	Cronbach's α=0.88 (Felitti, 1998)
PCL-5 with Life Events Checklist – Version 5	Posttraumatic stress symptoms and exposure to adverse life events	37 items	5-10 minutes	Cronbach's α=.94, test-retest reliability r=.82 (Blevins, 2015)
Maslach Burnout Inventory	Emotional exhaustion depersonalization. Low sense of personal accomplishment	22	15 minutes	Cronbach's α=0.90 for emotional exhaustion, 0.79 for depersonalization, and 0.76 for personal accomplishment (Statistics Solutions, 2023)
Somatic Symptom Scale	Gastrointestinal, pain, fatigue, and cardiopulmonary aspects of somatic symptom burden	8	5 minutes	Cronbach's α=0.81 (Gierk, 2014)
Modified Nurses Intent to Quit Scale	Ten subscales that influence a nurse's intent to quit, including demographics/working hours, manager, organization, work environment, work climate, health, and intention to quit (Vicklund, 2017)	30	15 minutes	Cronbach's α=.82-.85 (Vicklund, 2017)

Data Collection Plan

Demographic information was collected via self-report and included each participant's age, sex/gender, race, ethnicity, living situation, highest degree obtained, length of time in their current role, the shift worked, number of days worked per week, the average number of overtime

hours worked per pay period, their work area or population/specialty, whether this is their *desired* work area or specialty, and past exposure to adverse childhood events and adverse life event. Questionnaires (Table 5) were administered via REDCap (Harris, 2009) before the participant accessed the intervention. The estimated time to complete all questionnaires in the pre-and post-intervention surveys was 110 minutes.

REDCap is a secure web application for building and managing online surveys and forms. REDCap provides audit trails for tracking data manipulation and user activity and automated export procedures for seamless data downloads to Excel, PDF, and common statistical packages (SPSS, SAS, Stata, R). REDCap through the University of Arizona was developed specifically around HIPAA-Security guidelines and is recommended to researchers by both the Privacy Office and Institutional Review Board (Center for Biomedical Informatics & Biostatistics, 2021). Users across the globe can input data with secure web authentication, data logging, and Secure Sockets Layer encryption. REDCap users can collect or submit their data using a mobile app installed on an iPhone, iPad, or Android phone or tablet.

Table 6

Data Collection Plan

	Pre-Intervention	During Intervention	Post-Intervention
Questionnaires	Demographic Questionnaire Adverse Childhood Experiences Questionnaire (ACE-Q) Life Events Checklist for DSM-5 (LEC-5) The PTSD Checklist for DSM-V (PCL-5) Modified Nurses' Intention to Quit Scale (NITQ) Maslach Burnout Inventory (MBI) Somatic Symptom Questionnaire	Self-reports regarding intervention effects, adherence, satisfaction, and safety.	The Acceptability of Intervention Measure (AIM) The Intervention Appropriateness Measure (IAM) The Feasibility of Intervention Measure (FIM) The PTSD Checklist for DSM-V (PCL-5) Modified Nurses' Intention to Quit Scale (NITQ) Maslach Burnout Inventory (MBI) Somatic Symptom Questionnaire
Total Number of	7	One per week x 6	7

Questionnaires

Data Analysis Plan

Quantitative data was prepared by removing duplicates and identifying incomplete responses. When appropriate, hot deck imputation was employed to manage missing item responses. Hot deck imputation uses a value selected randomly from another sample member with comparable values on other variables in the same survey. Hot deck imputation can limit values to feasible ones, and the random element introduces variation (Andridge, 2010).

Descriptive statistics were calculated for all variables to ensure data quality (i.e., check distributions and identify outliers) and to describe sample characteristics. Descriptive statistics reported as frequencies, percentages, and means determined recruitment and retention rates, intervention adherence, safety, acceptability, and feasibility. Paired t-tests on means were used to evaluate differences in symptoms from pre-intervention to post-intervention using the latest version of Microsoft Excel software. This analysis approach was appropriate for the data that included paired sets of continuous variables (JMP, 2023). The qualitative data on barriers and facilitators to intervention adherence and satisfaction with the individual classes obtained via free-text responses on the researcher-generated questionnaires collected via REDCap were de-identified, entered into a Microsoft Excel (Microsoft 365 version) spreadsheet, and then analyzed using rapid data analysis. Rapid data analysis is used to extract general themes quickly, categorize data, and organize supporting quotes to illustrate findings (Gale, 2019).

Participant Protection Plan

Approval to conduct the study was obtained from the Human Subject Protection Program at the University of Arizona (Appendix B). Before participation, respondents had to review and

electronically sign an informed consent form containing the elements required by the University of Arizona Institutional Review Board (IRB) in REDCap. Measures were taken to protect the participants from threats associated with this type of research, including their psychological status. This strategy assured participants that their responses were confidential and that their privacy would be maintained. Any injuries or adverse effects experienced by participants were to be reported by the participant to the researcher. Procedures to reduce the minimal risk of loss of confidentiality to the participants included collecting the minimum data necessary for the research, using REDCap to collect and store the data, and obtaining only data required to achieve the study objectives. REDCap at the University of Arizona was developed specifically around HIPAA-Security guidelines and is recommended to researchers by both the Privacy Office and Institutional Review Board.

The principal investigator and her committee chair handled personally identifying data collected from participants. Participants were assured that no information they provided would be disclosed to a third party, such as their employer or the board of nursing, without their awareness and consent, which helped alleviate concerns about stigmatization or professional repercussions. No information that would require the researcher to function in their capacity as a mandated reporter was collected (Kazdin, 2022).

Other data collected during the study was handled by the principal investigator and her committee members only. It was stored and accessed on a password-protected laptop computer in a secure area of the principal investigator’s residence. Data was backed up on a password-protected storage device and kept under double lock also located in a safe area of the principal investigator's residence.

Participant Safety

Tai Chi exercise is generally considered safe, and the level of exertion required to perform it is within that expected during activities of daily living. The participants were asked to immediately report any injuries or adverse effects they experienced to the researcher.

Limitations

Self-report scales were used for this study, which does carry the risk of response bias. The phenomena of interest for this study are dynamic, and a longitudinal design would be superior to the pre-post-intervention design chosen for pragmatic reasons. However, since the primary aim of this study was to evaluate whether TCE is a feasible, acceptable, appropriate, and safe mind-body self-care intervention for RNs at risk for stress, post-traumatic stress related to healthcare exposure, transition shock, and turnover or attrition, generalizability is not the goal. Any changes seen in posttraumatic stress, transition shock, or burnout post-intervention may be due to other factors not examined in this study. Furthermore, the temporary psychological state of the participant at the time the surveys were completed may have influenced the results.

Summary

In summary, this chapter discussed the methodology chosen to complete the proposed pre-and post-intervention study examining the feasibility of TCE as an intervention for registered nurses at risk for stress, somatic symptoms, burnout, healthcare-related psychological trauma, and transition shock. Specifically, the study design with rationale, information about the sample and setting, the intervention, plans for data collection, data analysis, and participant protection were discussed in detail in this chapter.

CHAPTER 4: RESULTS

This study was a multimethod pre-and-post intervention quasi-experimental feasibility study that used inductive and deductive approaches to a) determine the feasibility, acceptability, and appropriateness of a six-week asynchronous virtual Tai Chi Easy™ (TCE) self-care training intervention for registered nurses, and b) to test select elements of the *Transition Shock Theory* (Duchscher, 2009), the *Theory of Nurses' Psychological Trauma* (Foli, 2022), the *Cognitive-Behavioral Theory* (Beck, 2011), and the *Yin-Yang Theory* (see the starred items in Figure 1). Data on feasibility, recruitment, retention, intervention adherence, and safety were also obtained for the overall evaluation.

During this study, participants were asked to: a) complete two 60-minute TCE classes along with the instructor, which were pre-recorded and accessed via a private YouTube channel, b) practice their skills (breathing exercises, mindful movements, self-applied massage, or meditation exercises) on their own for 10 minutes four other days per week, and c) fill out confidential online questionnaires via REDCap pre-intervention, once weekly during the intervention, and post-intervention.

Recruitment

Recruitment efforts for this study originally started on December 5, 2023, and continued intermittently through May 24, 2024. The recruitment goal was forty participants. To determine the feasibility of recruitment strategies, a benchmark of 80% was set (Cassidy, 2019). Initial attempts to recruit new graduate RNs (see Chapter 5- Discussion) were made via social media, flyers, and postcards mailed to their home addresses. Recruitment efforts were intermittent, as the lack of participants meeting the initial inclusion criteria required the PI to submit

modifications to the study protocol to the Institutional Review Board at the University of Arizona for approval three separate times (See Chapter 5-Discussion for further details). The inclusion criteria were modified to include any licensed RN, and recruitment via an online flyer mailed to potential participants by colleagues of the PI ultimately yielded eighteen potential participants who met inclusion criteria and subsequently enrolled in the study. Of the eighteen enrolled, only 17 (42.5% of the recruitment goal) completed the pre-intervention questionnaires and proceeded with the study.

Retention

By the third week, three out of the seventeen participants (17.6%) had dropped out of the study. The remaining fourteen participants (82.3%) completed the study. The reason cited by the participants (n=3) who dropped out of the study was lack of time to complete the study activities. The retention goal for this feasibility study was 80% (Cassidy, 2019), which was met.

Description of Sample

The sample who completed the study (n=14) was comprised primarily of white (78.6%), middle-aged (mean age 51 ± 16.1), females (85.7%) who held a Baccalaureate degree or higher (85.7%). The majority of participants (71.4%) worked full-time. All participants (100%) reported a total household income greater than $50,000 per year, and 64.3% had no children living at home. The range of RN tenure spanned 50 years (from 1973 to 2023). The earliest year of initial RN licensure was 1973; the latest was 2023. Participants were recruited from a diverse geographic Arizona (42.8%), Vermont (28.5%), California(21.4%), Illinois (7.1%), Texas (7.1%), and New Mexico (7.1%). Most participants (53.8%) worked in hospitals, but their specialty focus varied widely.

The participants who enrolled but did not complete the study (n=4) were similar to the sample who completed the study. These participants were between the ages of 27-63 (mean age 44 ± 21.9), female (100%), and white (100%). All participants (100%) worked full-time. The four participants who did not start or dropped out of the study were licensed in Arizona (50%), California (25%) and Montana (25%). Three of these nurses (75%) worked in a hospital setting. One participant (25%) worked as a home health nurse, one (25%) worked as a medical-surgical nurse, and one (25%) worked as a nurse informaticist. The remaining RN (25%) did not specify a work setting or specialty. The demographics survey results are displayed in greater detail below (Table 7).

Table 7

Descriptive Characteristics of Participants

Characteristics of Participants	Completed Study (n=14)	Did Not Complete Study (n=4)
Age (years)		
- Minimum	22	27
- Maximum	73	63
- Mean	51	44
- Standard Deviation	16.1	21.9
Gender		
- % Female	85.7	100
Marital Status		
- % Single	28.6	50
- % Married	64.3	50
- % Divorced	7.1	0
Ethnicity		
- % Hispanic/Latinx	14.3	0
- % Native American/American Indian	7.1	0
- % White	78.6	100
Educational Attainment		
- % Associate's Degree	14.3	25
- % Baccalaureate Degree	50	50
- % Master's Degree	7.1	0
- % Doctoral Degree	28.6	25
Employment Status		
- % full-time (40 hours/week)	71.4	100
- % part-time (< 40 hours/week)	21.4	0
- Not Applicable	7.1	0

Table 7 – Continued

Characteristics of Participants	Completed Study (n=14)	Did Not Complete Study (n=4)
Total Annual Household Income		
- % $50,000-99,999	57.1	75
- % $100,000-149,999	21.4	0
- % > $150,000	21.4	25
Number of Children Living in Home		
- % 0 children	64.3	100
- % 1 child	7.1	0
- % 2 children	21.4	0
- % 3 children	7.1	0
Year of Initial RN Licensure	1973-2023	1981-2024
State(s) RN License Held	Arizona (6), California (3), Illinois (1), New Mexico (1), Texas (1) Vermont (4), Multistate (1)	Arizona (2), California (1), Montana (1)
Work Setting		
- % Hospital	53.8	75
- % Home Health	7.7	25
- % School of Nursing	7.7	0
- % Community Health	7.7	0
- % Ambulatory Care	7.7	0
- % Integrative Health	7.7	0
- % Retired	7.7	0
- % Other	7.7	0
Specialty Focus		
- % Acute/Critical Care	15.4	0
- % Adult Health	7.7	0
- % Anesthesia	7.7	0
- % Community Health	7.7	0
- % Emergency	7.7	0
- % Gerontology	7.7	0
- % Home Health	7.7	25
- % Information Technology	0	25
- % Medical-Surgical	7.7	25
- % Oncology/Palliative Care	7.7	0
- % Pediatrics	7.7	0
- % Primary Care	7.7	0
- % Nursing Education	7.7	0
- % Other Clinical Specialty	0	25
% Working in Desired Specialty (n=13)	76.9	75
% Providing Direct Patient Care	46.2	50
Shift Worked (n=13)		
- % Day	61.5	75
- % Night	15.4	25
- % Other	15.4	0
- % Not Applicable	7.7	0
% Working Desired Shift (n=13)	92.3	100
% In New Graduate Nurse Residency Program	7.1	25

To further characterize the sample and to determine if they were exposed to adverse or traumatic experiences during childhood or adulthood that may have predisposed them to stress, somatic symptoms, burnout, healthcare-related posttraumatic stress disorder, and influence their intention to quit, participants were asked to complete the Life Events Checklist for DSM-5 (LEC-5) and the Adverse Childhood Experiences Questionnaire (ACE-Q). These questionnaires were chosen to measure these variables because they are both reliable and valid and have good psychometric properties (Weathers, 2013; Felitti, 1998). Of note, the results in this chapter include only the data from the fourteen participants who completed the study.

Adverse Life Events

As hypothesized, the prevalence of exposure to adverse life events was relatively high among participants and represented a wide range of experiences they encountered first-hand, witnessed, learned about, and/or perceived as part of their job as an RN.

Participants completed the LEC-5 pre- and post-intervention to capture interval adverse life events that may have affected their post-intervention scores. The results are detailed below (Table 8). Results in which participants indicated they were ‘not sure’ or ‘did not apply’ were not included in the table or the analysis as they were not relevant to the aims of the study.

Table 8

Life Events Checklist for DSM-5 (LEC-5)

Event and Type of Exposure (n=14)	Pre-Intervention	Post-Intervention
Natural Disaster		
- Happened to me	42.9%	57.1%
- Witnessed it	28.6%	42.9%
- Learned about it	28.6%	28.6%
- Part of my job	7.1%	14.3%
Fire or Explosion		
- Happened to me	0%	0%
- Witnessed it	21.4%	35.7%
- Learned about it	35.7%	42.9%
- Part of my job	21.4%	21.4%
Transportation Accident		
- Happened to me	42.9%	64.3%
- Witnessed it	28.6%	28.6%
- Learned about it	28.6%	35.7%
- Part of my job	21.4%	28.6%
Serious Accident at Home, Work, or During Recreation		
- Happened to me	7.1%	14.3%
- Witnessed it	14.3%	21.4%
- Learned about it	42.9%	64.3%
- Part of my job	21.4%	28.6%
Exposure to toxic or dangerous substance, bloodborne pathogens		
- Happened to me	14.3%	42.9%
- Witnessed it	14.3%	7.1%
- Learned about it	28.6%	35.7%
- Part of my job	50%	64.3%
Physical Assault		
- Happened to me	28.6%	28.6%
- Witnessed it	7.1%	7.1%
- Learned about it	21.4%	42.9%
- Part of my job	35.7%	35.7%
Assault with a Weapon		
- Happened to me	14.3%	21.4%
- Witnessed it	14.3%	7.1%
- Learned about it	0%	14.3%
- Part of my job	35.7%	42.9%
Sexual Assault		
- Happened to me	7.1%	21.4%
- Witnessed it	7.1%	0%
- Learned about it	28.6%	57.1%
- Part of my job	28.6%	35.7%
Other Unwanted Sexual Experience		
- Happened to me	35.7%	42.9%
- Witnessed it	0%	0%
- Learned about it	14.3%	50%
- Part of my job	14.3%	35.7%

Table 8 - Continued

Event And Type of Exposure (n=14)	Pre-Intervention	Post-Intervention
Combat or War Zone Exposure		
- Happened to me	7.1%	7.1%
- Witnessed it	7.1%	7.1%
- Learned about it	42.9%	42.9%
- Part of my job	0%	7.1%
Being Held in Captivity		
- Happened to me	7.1%	0%
- Witnessed it	0%	0%
- Learned about it	14.3%	14.3%
- Part of my job	0%	0%
Life-Threatening Illness or Injury		
- Happened to me	14.3%	0%
- Witnessed it	64.3%	57.1%
- Learned about it	7.1%	35.7%
- Part of my job	28.6%	57.1%
Severe Human Suffering		
- Happened to me	7.1%	7.1%
- Witnessed it	64.3%	42.9%
- Learned about it	21.4%	35.7%
- Part of my job	21.4%	42.9%
Sudden Violent Death		
- Happened to me	7.1%	0%
- Witnessed it	21.4%	21.4%
- Learned about it	28.6%	50%
- Part of my job	14.3%	21.4%
Serious Harm, Injury. or Death You Caused to Someone Else		
- Happened to me	0%	14.3%
- Witnessed it	0%	7.1%
- Learned about it	21.4%	0%
- Part of my job	14.3%	7.1%
Other Very Stressful or Traumatic Events		
- Happened to me	15.4%	21.4%
- Witnessed it	0%	7.1%
- Learned about it	7.7%	7.1%
- Part of my job	15.4%	7.1%

Qualitative Responses – Adverse Life Events

On the LEC-5 questionnaire, participants also had the opportunity to characterize any other adverse life events they had experienced, which included 1) being subjected to emotional and verbal abuse, 2) suicide attempts by family members, 3) performing cardiopulmonary resuscitation on a parent, 4) severe workload and financial stress, 5) death of family members, 6)

witnessing extreme suffering and death during the COVID-19 pandemic, 6) learning about very sick or seriously injured people from patients, family members, or other nurses, 7) effects from growing up in a dysfunctional household and having a parent with serious mental illness, and 8) experiencing the end of a long-term relationship.

Adverse Childhood Experiences

The adverse childhood experiences reported by participants included a) living with a parent or adult who abused alcohol or other substances (35.7%), b) living with a parent or other adult who suffered from depression, another mental illness, or who attempted/completed suicide (28.6%), experienced the death or otherwise lost a biological parent (21.4%), experienced inappropriate sexual contact/sexual abuse (7.1%), and not feeling loved or looked out for by their family (7.1%). Results are further described in Table 9 and Table 10.

Table 9

Adverse Childhood Experiences Questionnaire (ACE-Q)

Questions	Positive Responses (n=14)
Prior to the age of eighteen…	
Did a parent or other adult in the household often or very often swear at you, insult you, put you down or humiliate you? Or did they act in a way that made you feel afraid you may be physically hurt?	0%
Did a parent or other adult in the household often or very often push, grab, slap, or throw something at you? Or did they ever hit you so hard you were injured?	0%
Did an adult or other person at least five years older than you ever touch or fondle you, or have you touch their body in a sexual way, or attempt or actually have oral, anal, or vaginal intercourse with you?	7.1%
Did you feel or often feel that no one in your family loved you or thought you were important or special? Or did your family not look out for each other, feel close to each other, or support each other?	7.1%
Did you often or very often feel you did not have enough to eat, had to wear dirty clothes, or had no one to protect you? Or were your parents too drunk or high to take care of you or to bring you to the doctor if you needed it?	0%

Table 9 – Continued

Questions	Positive Responses (n=14)
Prior to the age of eighteen…	
Was a biological parent ever lost to you due to death, divorce, abandonment, or other reason?	21.4%
Was your mother or stepmother often or very often pushed, grabbed, slapped, or had something thrown at her? Or was she often or very often kicked, bitten, hit with a fist, or hit with a hard object, or ever hit repeatedly over at least a few minutes or threatened with a gun or knife?	0%
Did you live with anyone who was a problem drinker/alcoholic or who used street drugs?	35.7%
Was a household member depressed or mentally ill, or did a household member attempt suicide?	28.6%
Did a household member go to prison?	0%

Table 10

ACE-Q Results

	Result
Mean Score/SD	1 (SD=0.784)
Maximum Score	2
Minimum Score	0
Range	0-2
Mode	1

Results by Aim

Aim 1: Feasibility

The primary aim of this study was to evaluate whether virtual Tai Chi Easy™ (TCE) is an acceptable, appropriate, and feasible self-care intervention for registered nurses. Recruitment, retention, intervention adherence, and safety data were also obtained to evaluate other aspects of intervention feasibility.

Measures (AIM, IAM, FIM)

Overall, the scores on these measures (75.3% acceptability, 75.3% appropriateness, and 72.8% feasibility), as reported by participants, did not meet the benchmark of 80% set before the

study and provide evidence that there is room for improvement and refinement of the intervention. Full results are summarized below in Table 11, Table 12, and Table 13.

Qualitative Feedback

The qualitative feedback via free responses varied (see Table 4 for the specific questions participants were asked regarding the acceptability, appropriateness, and feasibility of the virtual TCE intervention, barriers and facilitators to intervention adherence, and satisfaction with classes). The most common themes were that the classes were too long, the pace needed to be faster, and more variety would have been preferred. Some participants felt that two one-hour-long weekly classes were too much to manage. However, participants also reported they enjoyed the flexibility of the asynchronous virtual delivery, found the instructor helpful and knowledgeable, enjoyed the content, and reported that they learned new and useful self-care skills. Many participants said they were glad they had the opportunity to experience TCE and voiced their intention to continue this practice.

Table 11

Acceptability of Intervention Measure (AIM) Results

Item (n=14 unless otherwise indicated)	**Total Score** ***70 points possible***	**Average Score** ***5 points possible***	**Acceptability Percentage**
Intervention met participant's approval	51/65	3.92	78.4%
Intervention was appealing to participants	50	3.57	71.4%
Participants liked the intervention	49	3.5	70%
Participants welcomed the intervention	57	4.07	81.4%
Mean/Standard Deviation	**51.75 (SD=3.594)**	**3.76 (SD=0.274)**	**75.3 (SD= 5.578)**

Note: There was one missing response to question 1 on the AIM.

Table 12

Intervention Appropriateness Measure (IAM) Results

Item (n=14)	Total Score *70 points possible*	Average Score *5 points possible*	Appropriateness Percentage
Intervention seemed fitting	54	3.86	77.20%
Intervention seemed suitable	55	3.93	78.60%
Intervention seemed like a good match	49	3.50	70.00%
Mean/Standard Deviation	**52.66 (SD= 3.21)**	**3.76 (SD=0.23)**	**75.26 (SD=4.61)**

Note: The question about whether the intervention was applicable was erroneously not provided to participants on the questionnaire in REDCap.

Table 13

Feasibility of Intervention Measure (FIM) Results

Item (n=14)	Total Score *70 points possible*	Average Score *5 points possible*	Feasibility Percentage
Intervention seemed implementable	54	3.86	77.20%
Intervention seemed possible to do in the context of participants' life and schedule	48	3.43	68.60%
Intervention seemed doable	48	3.43	68.60%
Intervention seemed easy to use	54	3.85	77.00%
Mean/Standard Deviation	**51 (SD=3.46)**	**3.64 (SD= 0.24)**	**72.85 (SD=4.90)**

Intervention Adherence

Adherence to the intervention was measured using a researcher-generated questionnaire that participants filled out once per week via REDCap (see Table 4). To promote adherence, the PI sent weekly e-mail reminders to all participants asking them to complete the study activities and questionnaires.

The first week of the study had the highest level of adherence (88.24%) for both class participation and engagement with independent practice. The lowest engagement for class attendance was week 5 (50%). The lowest engagement with independent practice occurred in week 4 (57.1%). The mean adherence for class participation was 64.6% ± 13.36. The mean adherence for independent practice was 73.7% ± 12.50. Adherence fell short of the 80% goal

Cassidy (2019) suggested, which would have ensured participants received an adequate dose of the intervention.

Barriers to Intervention Adherence

The participants provided qualitative data via free text responses collected via REDCAP and analyzed using rapid data analysis (see Chapter 3- Methods). The primary barrier cited for completing the study but not participating fully was lack of time. Some RNs perceived that the one-hour classes needed to be shorter. Others cited competing demands, such as family responsibilities, as a barrier. Certain RNs admitted they did not feel the classes were engaging. Lastly, most participants were enrolled during the summer, and vacations and travel were cited for not completing the assigned activities. The portability and asynchronous, virtual nature of the intervention were not taken advantage of by participants in the way it was anticipated it would by the PI.

Participants did adhere more closely to the self-practice, which was only 10 minutes per day and could be done anywhere and at any time. They especially felt that the breathing exercises and meditation helped manage stress and feeling overwhelmed. Data on when they practiced the breathing exercises and meditation was not collected, but would have been helpful.

Facilitators to Intervention Adherence

Participants reported that, in general, they enjoyed the content of the virtual classes and liked the instructor. They expressed appreciation for the opportunity to learn TCE and perceived it as helpful in managing stress, promoting relaxation, and improving balance.

The participants also shared that learning TCE helped them forget about worries and appreciated that the techniques could be integrated into their everyday lives. They enjoyed the

virtual format, which made it easier because they did not need to travel to a different location for class and could do it on their own schedule.

Table 14

Intervention Adherence Results

Week	Completed Both Classes	Completed 40 Minutes Practice
1 (n=17)	88.24%	88.24%
2 (n=17)	64.71%	82.35%
3 (n=12)	66.70%	81.80%
4 (n=14)	64.3%	57.1%
5 (n=14)	50%	71.4%
6 (n=13)	53.8%	61.5%
Mean Adherence	**64.63% ± 13.36**	**73.73% ± 12.50**

Satisfaction with Classes

Satisfaction with the virtual pre-recorded TCE classes ranged from 63.4% (class 2) to 80% (classes 9 and 11), with a mean satisfaction score of 76.6% ± 4.42. The participants provided comments via free text responses each week that were captured in REDCap. Participants generally said they would appreciate shorter classes, more variety, a faster pace, and less talking by the instructor. However, they did enjoy the instructor's expertise, the content of the lessons, and how breathing exercises, self-massage, and meditation practice were integrated into each class. The satisfaction data is presented in greater detail in Table 15—S*atisfaction with Individual Classes.* The classes with the highest satisfaction score were Class 9, which focused on breathing exercises, and Class 11, which recapped previous content and concentrated on the Tai Chi Easy™ forms.

Table 15

Satisfaction with Individual Classes

Class Number	Average Score (Max score 5)	% Satisfaction	Participant Comments
1 (n=17)	3.88	77.6%	- Great classes - Pace too slow - 1 hour too long
2 (n=17)	3.71	63.4%	- 30 minutes would be better - Would like more variety
3 (n=17)	3.82	76.4%	- Difficult to finish sessions - Hard to slow down - Pace is calming
4 (n=17)	3.94	78.8%	- Participants liked instructor - TCE helping them feel grounded and calm - Would appreciate less talking
5 (n=12)	3.92	78.4%	- Enjoyed both classes - Classes are great - Very relaxing - Enjoy content - Slow pace tiring and boring
6 (n=12)	3.92	78.4%	- Less verbal repetition - Shorter classes would be better - Less talking from instructor when participants just standing still or sitting
7 (n=14)	3.78	75.6%	- Hard to slow down sometimes - Messages positive and helpful - Nice to incorporate into daily routine - Liked instructor's story about how became interested in TCE
8 (n=14)	3.78	75.6%	- Loved concepts learned this week - Relaxing and enjoyable - Awesome instructor - Lessons feel longer than necessary
9 (n=14)	4.0	80%	- Beginning to enjoy flow of TCE more - Enjoy learning something new every class - Class 9 was a favorite - Relaxing - Enjoyable - A portable app would be great - Would like written instructions
10 (n=14)	3.83	76.6%	- Great pace - Might be helpful for young adults learning to manage stress - Class 10 slow moving- got distracted - Will use what I learned when feel stressed or overwhelmed - Like how mindfulness, breathing exercises, and massage integrated into classes

Table 15 – Continued

Class Number	Average Score (Max score 5)	% Satisfaction	-	Participant Comments
11 (n=13)	4.0	80.0%	-	Definitely a great program I enjoyed all the classes Thank you to the instructor for sharing her skills and expertise
12 (n=13)	3.92	78.4%	-	I do better with in-person classes The most valuable aspect was a focus on mindfulness and slow, deliberate movements that help with balance
Mean	**3.85 ± 9.14**	**76.6% ± % 4.42**		

Safety

During orientation to the study, participants were asked to report any injuries immediately, falls, or other adverse events to the PI by phone and to seek medical attention as appropriate. No adverse events or injuries were reported during this study.

Recommendations from Participants for Improving Intervention

The participants in this study offered several suggestions for improving the intervention. The most common suggestion was to make the sessions shorter with less repetition. One participant proposed dividing the hour class into three 20-minute sessions in each video. They suggested one section to instruct them on how to do the Tai Chi movements, another featuring breathing exercises, self-applied massage, or meditations, and a third section just for practice. Another participant thought a portable intervention, such as a smartphone application, featuring 10–15-minute lessons that nurses could do on their breaks would be more palatable. It was also suggested that they had access to a printed guide outlining and describing the course content to accompany the videos.

Aim 2 – Exploring Changes in Symptoms

The secondary aim of this study was to explore whether changes in stress, posttraumatic stress symptoms, somatic symptoms, burnout, transition shock, and intention to quit could occur post-intervention. The PI hypothesized that participation in a six-week virtual TCE intervention would reduce symptoms of stress, transition shock, somatic symptoms, burnout, and intention to quit among RNs.

Stress (including post-traumatic stress symptoms) was assessed along with select components of transition shock using a modified (with permission) version of the Nurses Intention to Quit scale (NITQ) (Vicklund, 2017) and the PTSD Checklist for DSM-5 (Blevins, 2015). Somatic symptoms were further evaluated using the Somatic Symptom Scale-Version 8 (SSS-8) (Gierk, 2009). Nurse burnout was measured using the Maslach Burnout Inventory-Health Services Survey (MBI-HSS) (Maslach et al., 1997). Intention to quit was evaluated using the NITQ (Vicklund, 2017). All questionnaires were administered via REDCap pre- and post-intervention.

Stress

A total of 13 (n=13) participants (92.8%) completed the NITQ, pre-and post-intervention. Interestingly, all (100%) participants perceived their job as stressful, at least to a small degree, with a mean score of 2.15 ±1.14 pre-intervention and a post-intervention mean score of 1.92 ± 0.76. The median score pre- and post-intervention median for the stress variable was two, indicating moderate stress. For further details on the results of other items on this questionnaire, reference Table 16 and the sections in this chapter on transition shock and intention to quit, which describe them in greater detail.

Posttraumatic Stress Symptoms

The presence of posttraumatic stress disorder (PTSD) symptoms among participants pre- and post-intervention was examined using the widely-used, validated, and reliable PTSD Checklist for DSM-5 (PCL-5). Participants were allowed to describe the event that precipitated the traumatic stress symptoms they were experiencing. These responses were work and non-work-related and included: a) inappropriate sexual contact at work, b) violation of trust by a member of a religious institution, c) being the victim of emotional and verbal abuse, d) experiencing suicidal ideation, e) being affected by the suicide of a family member, f) death of a parent or family member, g) performing cardiopulmonary resuscitation on a parent who subsequently died, h) natural disasters (earthquake, Hurricane Harvey), i) having to pronounce multiple patients dead during the COVID-19 pandemic, j) a shooting at work that killed three colleagues, k) getting arrested for driving under the influence, l) experiencing prolonged isolation and loneliness, m) co-parenting with a partner affected by alcohol use disorder and who abused the participant, n) having their child get injured, and o) deployment to Afghanistan and being required to care for people during a mass casualty incident.

Although individual scores are not displayed in this section, post-intervention data analysis indicated that two RNs (14.3%) did not experience any change in the severity of posttraumatic stress symptoms, four (28.5%) had an increase in symptoms (2-15 points) from baseline, and six (42.8%) experienced a decrease in PTSD symptoms (2-17 points). The total sum of the scores for the PCL-5 decreased from 218 pre-intervention to 184 post-intervention, demonstrating an improvement in symptom severity among participants.

The most commonly experienced symptoms were a) having strong upset feelings when reminded of the traumatic event, b) hypervigilance, c) blaming themselves or others for the stressful experience or what happened afterward, d) avoiding memories, thoughts, or feelings related to the stressful experience, and e) repeated, disturbing, and unwanted memories of the stressful experience.

Because the sample size for this study was small (n=14), a paired two-sample t-test for means was performed (Table 11). The mean of the pre-intervention sample scores was 15.57 ±12.82, and the mean of the post-intervention sample scores was 13.14 ±15.67. The t Stat was 1.0231. The P(T<=t) two-tail = 0.32, indicating the difference between the means is not statistically significant. However, three participants had clinically significant decreases in scores (ranging from 9-17 points), likely reflecting a real change in symptoms (Blanchard, 2023).

Somatic Symptoms

The Somatic Symptom Scale-Version 8 (Gierk, 2014) was used to assess somatic symptoms. While not displayed in Table 12, the participant's pre-intervention individual scores ranged from 2-13. Post-intervention, the individual scores ranged from 0-15. Most participants (64.2%) experienced an improvement in somatic symptoms. However, 21.4% reported increased severity of somatic symptoms, and the remaining 14.2% experienced no change.

Overall, the average somatic symptom severity level reduced from a pre-intervention mean score from 6.7 ± 3.61 to 5 ± 4.48, with a median pre-intervention score of 5 (low severity) and a median post-intervention score of 3 (minimal severity). As the sample size was small (n-14), a t-test evaluating for differences in participants' mean scores did not indicate statistically significant results (p=0.22).

Table 16

PTSD Checklist for DSM-5 (PCL-5) Results

PCL-5 Results (n=14)	**Pre-Intervention**	**Post-Intervention**
Items- Symptom Detail	Sum of Participants Scores (n=14)	Sum of Participants Scores (n=14)
Item 1- Distressing memories and thoughts	15	9
Item 2- Distressing dreams	8	4
Item 3- Re-experiencing	8	7
Item 4- Feeling very upset by reminders	17	15
Item 5- Sympathetic activation symptoms	9	10
Item 6- Internal Avoidance Behaviors	17	8
Item 7- External Avoidance Behaviors	12	11
Item 8- Difficulty recalling details of event	10	7
Item 9- Strong negative beliefs	12	10
Item 11- Blaming self or others	16	15
Item 10- Strong negative feelings	13	14
Item 12- Anhedonia	8	6
Item 13- Feeling difficult or cut off from others	8	9
Item 14- Difficulty experiencing loving or positive feelings	8	5
Item 15- Irritability or anger outbursts	6	5
Item 16- Taking risks	2	4
Item 17- Hypervigilance	15	12
Item 18- Being easily startled	11	11
Item 19- Difficulty concentrating	12	9
Item 20- Sleep disturbances	11	13
Total Sum of Scores	**218**	**184**
Analysis		
Minimum Score	0	0
Maximum Score	40	52
Median Score	14.5	7.5
Mean Score ±SD	15.57 ±12.82	13.14 ±15.67
Variance	164.571	245.516
Pearson Correlation	0.823861698	
Hypothesized Mean Difference	0	
df	13	
t Stat	1.023137184	
P (T<=t) two-tail	0.324905953	

Table 17

Somatic Symptom Scale-8 Results

SS-8 Results (n=14)	Pre-Intervention	Post-Intervention
Symptom	Sum of Participants' Scores (n=14)	Sum of Participants' Scores (n=14)
- Stomach or bowel problems	16	10
- Back pain	11	11
- Limb or joint pain	10	8
- Headaches	8	3
- Chest pain or feeling short of breath	4	3
- Feeling Tired	23	18
- Trouble Sleeping	22	18
Total	**94**	**71**
Analysis		
Minimum Score	2 (minimal)	0 (none)
Maximum Score	13 (high)	15 (high)
Median Score	5 (low)	3 (minimal)
Mean Score/SD	6.7 (SD=3.61)	5 (SD=4.48)
Variance	13.104	20.15
Hypothesized Mean Difference	0	
df	13	
t Stat	1.28	
P (T<=t) two-tail	0.22	

Burnout

Burnout among RN participants was assessed using the valid and reliable Maslach Burnout Inventory-Health Services Scale (MBI-HSS) (Maslach et al., 1997). A total of 13 participants (n=13) completed the MBI-HSS pre- and post-intervention. There was a modest improvement in the pre-and-post intervention scores in all domains (Table 13), but it was not statistically significant (p=0.54 for EE, p=0.78 for DP, and p=0.93 for PA). On the EE subscale, scores ranged from 3 to 48 pre-intervention and 2 to 43 post-intervention. The median score changed from thirteen pre-intervention to 14 post-intervention. On the DP subscale, the scores ranged from 0 to 19, with a median score of 1. Post-intervention, the DP subscale scores ranged

from 0 to 12, with a median score of 0. On the PA subscale, scores ranged from 29 to 48 pre-intervention, with a median score of 43. Post-intervention PA scores ranged from 21 to 47, with a median score of 42.5%.

Pre-intervention, six participants (46.1%) had a high-risk score for EE, 2 (15.4%) had a high-risk score for DP, and 3 (21%) had a high-risk score for PA. Post-intervention, high-risk scores decreased on the EE subscale to 21% (3 participants), 0% on the DP subscale, and 14.3% (2 participants) on the PA subscale. Paired t-tests on the pre-and-post intervention means were p=0.54 for EE, 0.78 for DP, and 0.93 for PA, indicating a non-statistically significant difference.

Table 18

Maslach Burnout Inventory-Health Services Survey (MBI-HSS) Results

(n=13) Pre-Intervention (n-13) Post-Intervention	**Emotional Exhaustion**	**Depersonalization**	**Personal Achievement**
Items	9	5	8
Cutoff Scores			
- High risk	≥27	≥13	0-31
- Moderate risk	17-26	7-12	32-38
- Low risk	0-16	0-6	≥39
Minimum-Maximum Score Pre-Intervention	3-48	0-19	29-48
Minimum-Maximum Score Post-Intervention	2-43	0-12	21-47
Median Score Pre-Intervention	13	1	43
Median Score Post-Intervention	14	0	42.5
Participant Risk Pre-Intervention (n=13)			
- high	6 (46.1%)	2 (15.4%)	3 (23.1%)
- moderate	0 (0%)	0 (0%)	0 (0%)
- low	7 (53.8%)	11 (84.6%)	10 (76.9%)
Participant Risk Post-Intervention (n=14)			
- high	3 (21.4%)	0 (0%)	2 (14.3%)
- moderate	0 (0%)	3 (21.4%)	1 (7.1%)
- low	10 (76.9%)	11 (78.6%)	12 (85.7%)
Mean ± SD Pre-Intervention	20.85 ±15.5	3.46 ±6.02	40.38 ±9.71
Mean ± SD Post-Intervention	17.38 ± 13.43	3 ± 4.53	40.64 ±8.11

Table 18 – Continued

(n=13) Pre-Intervention (n-13) Post-Intervention	Emotional Exhaustion	Depersonalization	Personal Achievement
Variance Pre-intervention	240.30	36.27	94.42
Variance Post-Intervention	180.42	20.50	66.41
df	12	12	12
t-Stat	0.63	0.27	0.09
P(T<=t) two-tail	0.54	0.78	0.93

Transition Shock

The NITQ tool was also used to measure factors that comprise transition shock, including responsibilities, relationships, knowledge and skill deficits or development needs, sociocultural and environmental workplace factors, and somatic symptoms (stress, exhaustion, and low mood/depression related to work) (Duchscher, 2009). The demographics section captured role-specific information to help describe the sample (Table 7).

One participant offered a quote to describe their experience with transition shock that illustrates the impact of the discrepancy between their expectations of what nursing will be like and the reality that can be distressing and disillusioning for nurses: “The transition shock is real! I came into nursing with no previous healthcare experience and it was sooooo hard. Nursing school is incredibly idealized, and real life just slapped me in the face once I got out.” (Participant A).

Responsibilities

One challenge faced by RNs was the perception that their work schedule was difficult to manage due to competing demands, such as family, school, or other responsibilities. A total of 61.5% of participants experienced this difficulty pre-intervention, with an interval increase post-intervention to 76.9%.

RNs reported varying levels of involvement in decisions related to their work environment or organization. In pre-intervention, 15.3% of RNs perceived they were not involved in these decisions, which increased to 23.1% post-intervention. However, most participants (92.4% pre-intervention) indicated they felt they had some control over demands placed on them at work, compared to the post-intervention finding where all participants (100%) perceived they had at least a small degree of control.

Relationships

Pre-participation perception that work did not interfere with their social life decreased significantly over time. Pre-intervention, 46.1% of participants felt that there was no impact on their social life, compared with only 23.1% feeling that way six weeks later. Data regarding the reason for the change should have been collected on this survey.

All (100%) participants perceived that the social environments on their units were good to at least a small degree both pre- and post-intervention, with 46.1% feeling that this occurred to a high degree. A visible and engaged manager was appreciated by 92.4% of participants pre-intervention, although this markedly decreased to 76.9% post-intervention. A total of 61.5% of RN participants felt they lacked support from their manager to varying degrees, but this fortunately did decrease to 38.5% post-intervention.

The perception of transparency in management's attitude toward employees was indicated by 84.7% pre-intervention versus 76.9% post-intervention. The participants (87% pre-intervention, 76.9% post-intervention) reported frustration with unresolved conflicts in the workplace that their managers were not addressing to some degree. In contrast, numerous (100% pre-intervention, 84.7% post-intervention) participants believed that their manager addressed

negative incidents and conflicts, and feedback was provided that helped them learn or make changes.

Knowledge and Skill Deficits or Development Needs

In the first few months of practice or after transitioning to a new role, gaps in theory to practice and knowledge and skill deficits become apparent, and this realization can lead to distress that contributes to the experience of transition shock (Duchscher, 2009).

Pre-intervention data indicated that all participants (100%) believed that their nursing education adequately prepared them for practice to at least some extent, which decreased slightly to 92.3% post-intervention. Most participants (84.7% pre-intervention, 76.9% post-intervention) felt confident, to varying degrees, that their manager had a plan to ensure they developed professionally. Participants also appreciated that they continued to learn and develop the skills they needed to be successful in their work, which increased to 100% post-intervention from a baseline of 92.4%. To that end, 46.2% of the RNs in this study endorsed actively seeking a job that would improve their skills or otherwise advance their career at the beginning of the study, which increased to 53.9% at the conclusion.

Sociocultural and Environmental Workplace Factors

All nurses (100%) surveyed during this study believed to varying degrees that the physical condition of their workplace was good and they had adequate equipment and supplies available to complete their work. In comparison, 76.9% of participants felt that the staffing on their units was appropriate considering the acuity of the patients they were caring for, which increased by 23.1% over the six-week study period. Changing their career path due to their work schedule was a consideration for 38.5% of participants at baseline, compared to 46.2% when

post-intervention data was collected. Another important finding during this study was the perception that management communicated instructions, tasks, goals, and feedback clearly (92.4% pre-intervention, 100% post-intervention) in most cases.

Somatic Symptoms of Transition Shock

Pre-intervention, 69.2% of participants reported experiencing low moods/depression to at least a small degree, compared with 59.3% post-intervention. Additionally, 84% of participants experienced some degree of exhaustion after completing their shift, which did not change post-intervention. For further details on results, reference Table 19.

Nurses' Intention to Quit

The mean score on the main part of the survey (Questions 1-26) decreased slightly from pre-intervention (52.15 ± 8.98) to post-intervention (50.23 ±7.25), but this result was not statistically significant (p=0.49). Intention to quit their current job increased from 15.3% to 46.1% in the six weeks the study ran. Intention to leave the organization decreased slightly from 61.5% to 53.8%, while intent to quit nursing increased somewhat from 15.3% (n=2) to 23.1% (n=3). This increase was explained by one of the participants in the following passage: "I think being a new grad is incredibly difficult when you feel you cannot trust your manager, or your charge, or your leadership to help support you when things go awry. I experienced a very traumatic patient error during this study and was almost fired by my manager. The way it was handled was totally unprofessional and almost made me leave the nursing profession. New grad growth is impossible without a positive unit and management" (Participant A).

During this study, findings indicated that 23.1% of the RN participants did not perceive their salary was fair considering the demands of their jobs before the intervention, which

decreased to 7.6% over the following weeks when post-intervention data was collected. Most nurses (76.9%) also held a static belief that they needed to zig-zag their way up to reach a higher salary by getting a new job or finding a new employer. The paired t-test of the means yielded a p= 0.49, which was not statistically significant.

Table 19

Nurses' Intention to Quit Scale Results

Subcategory/Item (n=13)	Pre-Intervention n (%)	Post-Intervention n (%)	Sum of Scores Pre-Intervention (n=13)	Sum of Scores Post-Intervention (n=13)
Career				
(Q1) (Stress)			6	10
- Not at all	8 (61.5%)	8(61.5%)		
- To a small degree	4(30.8%)	2 (15.3%)		
- To some extent	1(7.6%)	1(7.6%)		
- To a fairly high degree	0 (0%)	2 (15.3%)		
- To a very high degree	0(0%)	0(0%)		
(Q2)(Knowledge and Skill Deficits or Development Needs)			13	17
- Not at all	7 (53.8%)	6(46.1%)		
- To a small degree	3(23.1%)	3(23.1%)		
- To some extent	0(0%)	1(7.6%)		
- To a fairly high degree	2 (15.3%)	0(0%)		
- To a very high degree	1(7.6%)	3 (23.1%)		
Wages				
(Q3) Fair salary			22	25
- Not at all	3(23.1%)	1(7.6%)		
- To a small degree	2 (15.3%)	4(30.8%)		
- To some extent	3(23.1%)	4(30.8%)		
- To a fairly high degree	2 (15.3%)	3(23.1%)		
- To a very high degree	2 (15.3%)	1(7.6%)		
- Prefer not to answer	1(7.6%)	-		
(Q4) Feel need to change jobs/employer in order to get a higher salary			25	27
- Not at all	3(23.1%)	3(23.1%)		
- To a small degree	2 (15.3%)	3(23.1%)		
- To some extent	2 (15.3%)	2 (15.3%)		
- To a fairly high degree	1(7.6%)	0 (0%)		
- To a very high degree	4(30.8%)	5 (38.5%)		
- Prefer not to answer	1(7.6%)	-		

Table 19 – Continued

Subcategory/Item (n=13)	Pre-Intervention n (%)	Post-Intervention n (%)	Sum of Scores Pre-Intervention (n=13)	Sum of Scores Post-Intervention (n=13)
Schedule/Working Hours				
(Q5) Work affecting social life (Relationships)			14	24
- Not at all	6(46.1%)	3(23.1%)		
- To a small degree	2 (15.3%)	3(23.1%)		
- To some extent	4(30.8%)	3(23.1%)		
- To a fairly high degree	0(0%)	1(7.6%)		
- To a very high degree	1(7.6%)	3(23.1%)		
(Q6)Work schedule difficult to manage due to competing demands (Responsibilities) (Stress)			13	19
- Not at all	5(38.5%)	3(23.1%)		
- To a small degree	3(23.1%)	3(23.1%)		
- To some extent	5(38.5%)	6(46.1%)		
- To a fairly high degree	0(0%)	0 (0%)		
- To a very high degree	0(0%)	1(7.6%)		
Schedule/Working Hours – Continued				
(Q7)Considering alternate career path due to work schedule (Sociocultural and Environmental Workplace Factors)			11	11
- Not at all	8(61.5%)	7 (53.8%)		
- To a small degree	1(7.6%)	2 (15.3%)		
- To some extent	3(23.1%)	3(23.1%)		
- To a fairly high degree	0(0%)	1(7.6%)		
- To a very high degree	1(7.6%)	0(0%)		
Organizational (Sociocultural and Environmental Workplace Factors)				
(Q8) Unsupportive manager (Relationships) (Sociocultural and Environmental Workplace Factors)			19	12
- Not at all	5(38.5%)	8 (61.5%)		
- To a small degree	2 (15.3%)	2 (15.3%)		
- To some extent	3(23.1%)	1(7.6%)		
- To a fairly high degree	1(7.6%)	0(0%)		
- To a very high degree	2 (15.3%)	2 (15.3%)		
(Q9) Involved in decisions affecting work environment or organization (Responsibilities) (Sociocultural and Environmental Workplace Factors) (Stress)			24	20
- Not at all	2 (15.3%)	3(23.1%)		
- To a small degree	3(23.1%)	3(23.1%)		
- To some extent	5(38.5%)	4(30.8%)		
- To a fairly high degree	3(23.1%)	3(23.1%)		
- To a very high degree	0(0%)	0(0%)		
(Q10) Management has transparent attitude toward staff (Relationships) (Sociocultural and Environmental Workplace Factors)			31	25
- Not at all	2 (15.3%)	3(23.1%)		
- To a small degree	3(23.1%)	2 (15.3%)		
- To some extent	5(38.5%)	2 (15.3%)		
- To a fairly high degree	1(7.6%)	5(38.5%)		
- To a very high degree	1(7.6%)	1(7.6%)		

Table 19 – Continued

Subcategory/Item (n=13)	Pre-Intervention n (%)	Post-Intervention n (%)	Sum of Scores Pre-Intervention (n=13)	Sum of Scores Post-Intervention (n=13)
Manager				
(Q11) Manager communicates clearly regarding expectations (Sociocultural and Environmental Workplace Factors)			36	32
- Not at all	1(7.6%)	0(0%)		
- To a small degree	1(7.6%)	4(30.8%)		
- To some extent	2 (15.3%)	3(23.1%)		
- To a fairly high degree	5(38.5%)	2 (15.3%)		
- To a very high degree	4(30.8%)	4(30.8%)		
(Q12) Manager has plans for nurses' growth and skill development (Knowledge or Skill Deficit or Development Needs)			30	31
- Not at all	2 (15.3%)	3(23.1%)		
- To a small degree	1(7.6%)	1(7.6%)		
- To some extent	5(38.5%)	1(7.6%)		
- To a fairly high degree	1(7.6%)	4(30.8%)		
- To a very high degree	4(30.8%)	4(30.8%)		
(Q13) Manager does not address conflicts in workplace (Relationships) (Sociocultural and Environmental Workplace Factors) (Stress)			31	26
- Not at all	2 (15.3%)	3(23.1%)		
- To a small degree	1(7.6%)	1(7.6%)		
- To some extent	4(30.8%)	5(38.5%)		
- To a fairly high degree	2 (15.3%)	1(7.6%)		
- To a very high degree	4(30.8%)	3(23.1%)		
(Q14) Visible and engaged manager (Relationships) (Sociocultural and Environmental Workplace Factors)			29	26
- Not at all	1(7.6%)	3(23.1%)		
- To a small degree	2 (15.3%)	1(7.6%)		
- To some extent	1(7.6%)	1(7.6%)		
- To a fairly high degree	3(23.1%)	5(38.5%)		
- To a very high degree	4(30.8%)	2 (15.3%)		
- Prefer not to answer	2 (15.3%)	1(7.6%)		
(Q15) Negative incidents or conflicts addressed by manager (Relationships) (Sociocultural and Environmental Workplace Factors) (Stress)			34	29
- Not at all	0(0%)	2 (15.3%)		
- To a small degree	4(30.8%)	2 (15.3%)		
- To some extent	1(7.6%)	2 (15.3%)		
- To a fairly high degree	4(30.8%)	5(38.5%)		
- To a very high degree	4(30.8%)	2 (15.3%)		
Work Environment				
(Q16) Staffing appropriate for acuity (Sociocultural and Environmental Workplace Factors) (Stress)			32	32
- Not at all	3(23.1%)	0(0%)		
- To a small degree	0(0%)	1(7.6%)		
- To some extent	1(7.6%)	5(38.5%)		
- To a fairly high degree	2 (15.3%)	3(23.1%)		
- To a very high degree	6(46.1%)	3(23.1%)		
- Prefer not to answer	1(7.6%)	1(7.6%)		

Table 19 – Continued

Subcategory/Item (n=13)	Pre-Intervention n (%)	Post-Intervention n (%)	Sum of Scores Pre-Intervention (n=13)	Sum of Scores Post-Intervention (n=13)
Work Environment – Continued				
(Q17) Nursing education adequately prepared RN for practice (Knowledge and Skill Deficits or Development Needs)			45	40
- Not at all	0(0%)	0(0%)		
- To a small degree	0(0%)	1(7.6%)		
- To some extent	2 (15.3%)	3(23.1%)		
- To a fairly high degree	3(23.1%)	3(23.1%)		
- To a very high degree	8(61.5%)	6(46.1%)		
(Q18) Social environment on unit is good (Relationships) (Sociocultural and Environmental Workplace Factors)			40	40
- Not at all	0(0%)	0(0%)		
- To a small degree	1(7.6%)	1(7.6%)		
- To some extent	0(0%)	3(23.1%)		
- To a fairly high degree	5(38.5%)	3(23.1%)		
- To a very high degree	6(46.1%)	6(46.1%)		
- Prefer not to answer	1(7.6%)	-		
(Q19) Physical condition of workplace is good, adequate supplies and equipment available (Sociocultural and Environmental Workplace Factors)			35	34
- Not at all	0(0%)	0(0%)		
- To a small degree	2 (15.3%)	1(7.6%)		
- To some extent	3(23.1%)	5(38.5%)		
- To a fairly high degree	1(7.6%)	5(38.5%)		
- To a very high degree	6(46.1%)	2 (15.3%)		
- Prefer not to answer	1(7.6%)	-		
(Q20) Current job perceived as stressful (Transition Shock Symptoms) (Stress)			28	25
- Not at all	0 (0%)	0 (0%)		
- To a small degree	5(38.5%)	4(30.8%)		
- To some extent	3(23.1%)	6(46.1%)		
- To a fairly high degree	3(23.1%)	3(23.1%)		
- To a very high degree	2 (15.3%)	0 (0%)		
(Q 21) RN has some control over demands on them at work (Responsibilities) (Sociocultural and Environmental Workplace Factors) (Stress)			26	24
- Not at all	1(7.6%)	0(0%)		
- To a small degree	3(23.1%)	5(38.5%)		
- To some extent	5(38.5%)	6(46.1%)		
- To a fairly high degree	3(23.1%)	1(7.6%)		
- To a very high degree	1(7.6%)	1(7.6%)		

Table 19 – Continued

Subcategory/Item (n=13)	Pre-Intervention n (%)	Post-Intervention n (%)	Sum of Scores Pre-Intervention (n=13)	Sum of Scores Post-Intervention (n=13)
Work Environment – Continued				
(Q22) Perception of low autonomy at work (Sociocultural and Environmental Workplace Factors) (Stress)			20	17
- Not at all	5(38.5%)	5(38.5%)		
- To a small degree	2 (15.3%)	2 (15.3%)		
- To some extent	2 (15.3%)	2 (15.3%)		
- To a fairly high degree	2 (15.3%)	1(7.6%)		
- To a very high degree	2 (15.3%)	1(7.6%)		
(Q23) RN learning and developing skills needed for success at work (Knowledge or Skill Deficit or Development Needs)			33	35
- Not at all	1(7.6%)	0(0%)		
- To a small degree	0(0%)	2 (15.3%)		
- To some extent	6(46.1%)	4(30.8%)		
- To a fairly high degree	3(23.1%)	3(23.1%)		
- To a very high degree	3(23.1%)	4(30.8%)		
(Q24) Satisfaction with current job (Intention to Quit)			32	31
- Not at all	0(0%)	1(7.6%)		
- To a small degree	3 (23.1%)	2 (15.3%)		
- To some extent	4(30.8%)	4(30.8%)		
- To a fairly high degree	3(23.1%)	3(23.1%)		
- To a very high degree	3(23.1%)	3(23.1%)		
Perceived Health (Transition Shock Symptoms)				
(Q25) RN experiences exhaustion after completing shift			29	27
- Not at all	2 (15.3%)	2 (15.3%)		
- To a small degree	3(23.1%)	2 (15.3%)		
- To some extent	3(23.1%)	5(38.5%)		
- To a fairly high degree	0(0%)	1(7.6%)		
- To a very high degree	5(38.5%)	3(23.1%)		
(Q26) Experiences low moods or depression due to work			20	14
- Not at all	4(30.8%)	6(46.1%)		
- To a small degree	2 (15.3%)	3(23.1%)		
- To some extent	3(23.1%)	1(7.6%)		
- To a fairly high degree	4(30.8%)	3(23.1%)		
- To a very high degree	0(0%)	0(0%)		
Sum of Scores Total			**678**	**653**
Analysis				
Minimum Score	36	41		
Maximum Score	69	61		
Median Score	52	51		
Mean ± SD	52.15 ± 8.98	50.23 ±7.25		
Variance	80.64	52.52		
df	12			
t-Stat	0.71			
P(T<=t) two-tail	0.49			

Table 19 – Continued

	Pre-Intervention n (%)	Post-Intervention n (%)
Intention to Quit		
Intention to Quit Current Job Reported (Q27) (Intention to Quit)	2 (15.3%)	6(46.1%)
Intention to Quit Organization Reported (Q28) (Intention to Quit)	8(61.5%)	7 (53.8%)
Intention to Quit Nursing Profession Reported (Q29) (Intention to Quit)	2 (15.3%)	3(23.1%)
Reasons for Intention to Quit (Q30) (Intention to Quit)		
- Social environment or culture	3(23.1%)	6 (46.1%)
- Physical environment	0(0%)	1 (15.3%)
- Salary or pay	6(46.1%)	4(30.8%)
- Work hours or schedule	1(7.6%)	3(23.1%)
- Current manager	3(23.1%)	3(23.1%)
- Organizational factors	6(46.1%)	5(38.5%)
- Career objectives	3(23.1%)	4(30.8%)
- Lack of professional opportunities	3(23.1%)	4(30.8%)
- Health reasons	0(0%)	1(7.6%)

Summary

In this chapter, the results of the feasibility evaluation were presented. Measures of acceptability, appropriateness, feasibility, intervention adherence, and overall satisfaction with the intervention were below the benchmark of 80%. Participants felt the classes were too long, the pace was too slow, and the content was not engaging enough. However, they did perceive that some of the skills they learned were beneficial, and several expressed intent to continue with Tai Chi practice. Changes in symptoms of stress, post-traumatic stress, somatic symptoms, burnout, transition shock, and intention to quit were not statistically significant; however, clinically significant changes were noted in somatic symptoms and posttraumatic stress symptoms. In the next chapter (Chapter 5), the author discusses these findings, interprets the

results, summarizes this study's strengths and limitations, and describes their implications for nursing research, practice, and education.

CHAPTER 5: DISCUSSION

This was the first study that examined the feasibility of a virtual, asynchronous TCE intervention among RNs. This multimethod pre-and-post intervention quasi-experimental feasibility study used inductive and deductive approaches to a) determine the feasibility, acceptability, and appropriateness of a six-week virtual Tai Chi Easy™ (TCE) self-care training intervention for registered nurses and b) test select elements of the Transition Shock Theory (Duchscher, 2009), the Theory of Nurses' Psychological Trauma (Foli, 2022), the Cognitive-Behavioral Theory (Beck, 2011), and the Yin-Yang Theory (Figure 1). Data on feasibility, recruitment, retention, intervention adherence, and safety were also obtained as part of the overall evaluation.

Discussion of Sample Characteristics

Demographics

While no comparable studies using virtual Tai Chi Easy™ as an intervention for RNs were found, the sample in this study was similar to that in a pilot study evaluating a Tai Chi intervention to promote well-being in healthcare staff (45% were nurses) in Ireland (Marshall et al., 2018). That study included 12 participants, of which 83% were females between the ages of 28-56 years old. Additionally, a pilot study evaluating Tai Chi as a workplace wellness pilot study for older nurses (Palumbo, 2012) used a convenience sample of eleven female nurses (mean age 54.4 years), which is comparable to the sample size and mean age of the RNs who participated in this study.

Exposure to Adverse Life Events

Adverse life events are common and inevitable in healthcare (Liukka, 2020). Adverse life events comprise any experience perceived as very stressful, frightening, or traumatic. Examples include events such as weather events, natural disasters, fires or explosions, worldwide pandemics, accidents, violence and incivility in the workplace, physical assault, unwanted sexual contact, severe human suffering, life-threatening illnesses or injuries, exposure to harmful substances or bloodborne pathogens, or errors that occur while delivering care that result in significant harm, disability, or death to the patient (Weathers, 2013). Healthcare workers may experience these adverse life events (on or off the job) firsthand, by witnessing them, by learning about them as they happened to others.

The prevalence of exposure to adverse life events was relatively high among participants, and means of exposure varied (Table 8). According to the fourteen respondents on the LEC-5, the three most frequently reported adverse life events (ALEs) that happened to them personally were natural disasters (42.9% pre-intervention, 57.1% post-intervention), transportation accidents (42.9% pre-intervention, 64.3% post-intervention), and other unwanted sexual experiences (35.7% at baseline compared to 42.9% post-intervention). Additionally, according to self-reports, 28.6% of RN participants reported being physically assaulted, up to 21.4% had been assaulted with a weapon, and up to 21.4% had been sexually assaulted. The percentage of RNs exposed to physical assault in this study is lower than some recent studies have indicated, which found that 44.4% of 373 RNs with demographic characteristics similar to the sample in this study reported experiencing physical violence during the COVID-19 pandemic (Byon, 2022). The findings from this study are more consistent with the results of a 2021 Press Ganey Survey

Report, which found that about 25% of nurses are assaulted at work (American Nurses Association, 2018). It is known that violence against nurses, which occurs worldwide (Liu et al., 2019), is vastly underreported due to numerous factors related to nurses themselves as well as to management and organizational factors (Byon, 2021).

Due to the nature of their work, nurses are frequently exposed to people who are seriously ill or who have been significantly injured. The majority of participants (up to 64.3%) reported witnessing both severe human suffering and life-threatening illnesses or injuries, and 21.4% had witnessed a sudden, violent death. Witnessing these events can lead to vicarious trauma, which is a term describing a cumulative and enduring impact on a healthcare professional's beliefs and worldview as a result of compassionate engagement with traumatized individuals (McCann, 1990) and a phenomenon that contributes to the development of burnout (Quitangon, 2019). The three most prevalent adverse life events participants reported learning about were sudden violent deaths (up to 50%), serious accidents (up to 64.3%), and both forms of sexual assault (up to 57.1%) and combat or war zone exposure (42.9%).

Most concerning was the perception among participants that exposure to these ALEs is part of the job. Unsurprisingly, most RNs (up to 64.3%) indicated that being exposed to toxic substances or bloodborne pathogens, dealing with people with life-threatening illnesses and injuries (57.1%), and severe human suffering (42.9%) went with the territory. It was less clear from the survey responses whether the numerous adverse life events participants reported perceiving as part of the job, including physical and sexual assault, were things that had actually happened to them while at work. This is an important detail to clarify since, according to the

World Health Organization (2021), violence directed at nurses, whether physical, psychological, or sexual, affects up to 38% of nurses at some point in their careers.

Exposure to Adverse Childhood Experiences

Some studies have suggested that ACEs are more prevalent among nurses and other types of healthcare workers than seen in the general population, including a study of nursing students by Clark and El-Makarim Aboueissa (2021), which revealed that 40% of the respondents had an ACE score of 4 or higher, as compared to the national average (12.5-13.3% with an ACE score of 4 or higher).

Among participants in this study, the average score was 2/10, consistent with that of 23.5% of adults in the United States (Swedo et al., 2023). The most frequent ACEs reported by participants were a) living with someone who abused drugs or alcohol (35.7%), b) living with a person who was depressed, suffered from mental illness (21.4%), or had attempted suicide (28.6%), and c) losing a biological parent due to death, divorce, abandonment, or other reason. Fortunately, none (0%) of the participants indicated they had experienced physical or verbal abuse, neglect, or domestic violence toward their mother or stepmother before the age of eighteen. Four participants (28.5%) had an ACE score of 0, six (42.8%) participants had one ACE exposure, and the remaining participants (28.7%) had two.

Because of an error in the setup of the REDCap questionnaires, the researcher was unable to compare ACE and ALE data with adherence, attrition, study completion, or the other measures, so the impact of ACEs and ALEs on those variables could not be measured in the way that was intended when the study was designed.

Interpretation of Results

Aim 1- Exploring Feasibility

The primary aim of this study was to evaluate whether virtual Tai Chi Easy™ (TCE) is an acceptable, appropriate, and feasible self-care intervention for registered nurses. Recruitment, retention, intervention adherence, and safety data were also obtained to evaluate other aspects of intervention feasibility.

Feasibility of the Intervention

From the participants' perspective, 72.8% of RNs felt that the virtual, asynchronous TCE intervention was feasible. A total of 77.2% of participants believed the intervention seemed implementable, 68.6% felt it was possible and doable in the context of their lives and their schedules, and 77% indicated the intervention was easy to use. The benchmark for feasibility, which had been set at 80% (Cassidy, 2019), was not met.

Feasibility from Researcher's Perspective

From a researcher's perspective, once the study questionnaires were entered into REDCap and the videos had been recorded by the instructor and uploaded to the private YouTube channel, minimal work was required. Once a week, the PI would send out an email reminder with a link to that week's activities and questionnaires. The email was checked daily, and participants' questions were answered as they arose.

Appropriateness of the Intervention

Participant perspectives on the appropriateness of the intervention were assessed using the Intervention Appropriate Measure (IAM) (Table 12). A total of 77.2% of the RNs in this study indicated that the intervention seemed fitting, 78.6% believed it was suitable, and 70% felt it was a good match. The fourth item on the questionnaire that inquired about applicability was

inadvertently omitted during the creation of the questionnaire in REDCap so that data point was not collected. Overall, 75.26% of the participants believed the virtual, asynchronous TCE intervention was appropriate for registered nurses, including new graduate RNs, which fell below the benchmark set at 80% (Cassidy, 2019).

Acceptability of the Intervention

Most RN participants (75.3%) believed that the virtual TCE intervention was acceptable. A total of 78.4% indicated they approved of it, 71.4% found it appealing, 70% reported they liked the intervention, and 81.4% welcomed the intervention. Acceptability fell below the benchmark set at 80% (Cassidy, 2019). Incorporating the suggestions made by the participants to improve the intervention would likely increase acceptability.

Feasibility, Acceptability, and Appropriateness in Other Tai Chi Studies

A search of the CINAHL database for studies that used each of the measures used (keywords used “intervention appropriateness measure” and ‘tai chi,” “feasibility of intervention measure” and “tai chi,” and “acceptability of intervention measure” and “tai chi”) revealed no results. However, a scoping review of other studies that investigated the feasibility and acceptability of online mind-body interventions for older adults did indicate higher feasibility and acceptability in this population (Gravesande, 2023) than what was seen in this study. Palumbo (2012) also had a better feasibility outcome in her study of tai chi for older nurses as part of a workplace wellness pilot study.

Participant Feedback

From their free-text responses, the most common factors that reduced feasibility, acceptability, and the perception that the intervention was appropriate were the long length (60

minutes per class, taken twice per week) and the slow pace of the classes. The length of these classes was the same as in many other Tai Chi intervention studies, according to a systematic review conducted by Yang and colleagues (2015). In those studies, most participants practiced Tai Chi for one hour two to three times per week for 12 weeks, but it is possible that RN participants may not be able or willing to engage in an intervention that long or that often. Participants in this study also found that repetitive content was unnecessary and bothersome, which likely contributed to the low intervention acceptability scores. Factors that influenced their perceptions of feasibility, acceptability, and appropriateness included the flexibility of the delivery method, picking the instructor, and feeling that most of the content was helpful and could be applied as part of their self-care regimen to reduce stress and improve their ability to engage in mindfulness, which was the main rationale for the use of that particular intervention.

Other Aspects of Feasibility

Recruitment and Retention

The biggest challenge encountered during this study by far was recruitment. As cited in the literature (Luck, 2017), nurses can be difficult to recruit, and various strategies must be used to succeed. Conceptually, using the Internet for recruitment and evaluating the intervention was attractive as a low-cost and potentially high-yield strategy (Surdam, 2020); however, this was less effective than anticipated. Originally, the PI sought to recruit new graduate nurses, as they were the ones most at risk of experiencing the phenomena of interest. The initial inclusion criteria were nurses between 22 and 30 years of age who were within their first six months of practice after graduating from nursing school. In early December 2023, recruitment ads were posted to multiple social media platforms and Facebook group pages, and five hundred custom

postcards were printed and mailed out to the home addresses of those new graduate RNs whose date of initial licensure met the inclusion criteria for this study. The PI received no responses to the postcards but got sixteen responses from the social media platforms. Interestingly, in a pilot study of recruitment and feasibility of remote Tai Chi among older adults with multisite pain, You and colleagues (2023) found that using mailed invitations was an effective strategy for recruiting an adequate and racially diverse sample. Regardless, it was clear that mailed invitations were not an effective strategy for recruiting the targeted population in this study.

The first group of potential participants who had responded to flyers posted on social media was screened over Zoom. During the screening, these individuals provided answers that matched the inclusion criteria and specifically stated that they were licensed RNs. However, it soon became apparent after reviewing their demographic information that many of their responses were illogical and inconsistent. For example, their reported specialty or population focus did not align with their reported work setting. There was also a recognizable pattern to the email addresses they provided, in which these respondents used two common American first names followed by three numbers and a Google email address. Further in-depth investigation, which included a license lookup using the Nursys database to verify whether they were licensed RNs by the PI, revealed that these participants were fraudulent. Recruitment was then halted, and the study protocol was modified and resubmitted to the Institutional Review Board at the University of Arizona. Subsequently, the first group of participants were unenrolled, as they did not meet the inclusion criteria (none were licensed RNs), and recruitment efforts resumed.

A second round of recruitment efforts used the same methods but with inclusion criteria that now allowed new graduate RNs of any age who had been in practice for a year and whose

RN licenses could be verified by the PI. Two participants (11.1% of total RNs recruited) responded to the second round of mailed postcards, and no RNs (0%) responded to the social media outreach. Of those two new graduate participants, both enrolled, one dropped out in week two, and one completed the study.

Recognizing that the current recruitment strategy was fruitless, the PI consulted with her committee, once again revised the study protocol to include any licensed RN, and this time asked colleagues to share the recruitment flyers in addition to posting them on social media sites. Fifteen participants (83.3%) were recruited using that strategy, and another participant (5.56%) enrolled after seeing the study posted on ClinicalTrials.gov. As the PI had hoped to enroll 40 RNs, recruitment efforts fell short of the goal, as only 45% of this number were enrolled. In contrast, researchers in a recent study using a remotely delivered Tai Chi Easy™ intervention among older people with human immunodeficiency virus (Ibanez, 2024) were able to recruit 62.3% of their target using social media.

Regarding retention, one RN (5.56%) did not complete the preintervention questionnaires or proceed with the study activities. Three RNs (16.6%) dropped out by week three, citing being too busy to participate. Of those who enrolled, 77.7% completed the study. The reasons for withdrawal in this study were similar to 20 Tai Chi studies cited by Yang and colleagues (2015), in which participants reported losing interest in the intervention, poor attendance, time conflicts, and travel, among other things.

Intervention Adherence

Another significant problem encountered during this study was low intervention adherence. Of the two activities, participants tended to adhere more to the independent practice (73.7%) than to class participation (64.6%). Overall, participation was highest (88.4%) for both activities in the early part of the study but dipped to between 50-53.8% for class participation and 61.5-71.4% for independent practice in the final two weeks of the study (Table 14). Although the classes were delivered in a way that ensured maximum portability (they could be accessed anytime and anywhere, using a tablet, smartphone, or computer), participants did not take advantage of that feature when they were on vacation or away from home. Overall, participants indicated they were moderately satisfied (76.6%) with the intervention, which may have affected adherence.

Reasons cited for low participation were, again, the perception that the classes were too long, the pace was too slow, and there was too much talking by the instructor. However, many participants verbalized that they genuinely enjoyed the classes and content, appreciated the instructor's expertise, and planned to continue integrating what they learned into their self-care regimens. Another aspect of adherence that has not previously been discussed is adherence to completing the weekly questionnaires. For the first two weeks, all (100%) participants completed the surveys, but the response rate dipped to 85.7% (n=12) during week three. The response rate bumped up to 100% (n=14) during weeks four and five, and dipped slightly to 92.8% during week six. Despite weekly reminders with the links to the REDCAP surveys provided in the emails and more frequent reminders toward the end of the study, all of the weekly data could not be obtained. Other studies, including one on recruiting older stroke survivors to a randomized

control trial using an exercise intervention (Taylor-Piliae, 2014) and another among advanced lung cancer patients (Cheung, 2021), reported significantly better intervention adherence rates (85% and 75-89%, respectively) than were found in this study.

Safety

Virtual TCE also appears to be a safe intervention, as no adverse effects or injuries were reported during the study period. Of note, the PI and the TCE instructor cautioned participants verbally and in writing not to exceed their comfort limits to reduce the risk of injury.

Summary of Study Feasibility

Overall, a virtual, asynchronous TCE intervention for RNs is at least somewhat feasible, but significant modifications to recruitment strategies and the structure, content, and delivery of the intervention need to be made before using it in larger studies with RNs as participants to improve satisfaction and adherence. Making the classes shorter (15-30 minutes), increasing the pace, offering a printed study guide with directions, and dividing the content into each of the four TCE baskets (self-applied massage, breathing exercises, mindful movements, and meditation) were both reasonable and actionable suggestions for improvement of the intervention as reported by the participants.

Regarding recruitment strategies, as described by Bethel, Rainbow, and Dudding (2021), nurses are notoriously difficult to recruit due to several factors, including gatekeeping behaviors by hospital structures and institutional review boards and survey fatigue among nurses. As was discovered during this study, new graduate nurse residency program staff are also very protective of their nurses and do not encourage them to participate in research, even if designed to benefit

them. Social media recruiting presents its own challenges and was not successful for this study, but Bethel and colleagues (2021) offered strategies that other researchers may find helpful.

Aim 2 – Exploring Changes in Symptoms

The secondary aim of this study was to explore whether changes in symptoms of stress, posttraumatic stress, somatic symptoms, burnout, transition shock, and intention to quit could occur after participating in a six-week virtual TCE intervention among RNs.

Stress Symptoms

Both pre-and post-intervention, all (100%, n=14) of the RN participants verbalized they perceived their job as stressful to at least a small degree. A total of 38.4% of RNs stated they felt they had chosen the wrong career, and the degree to which they felt this was true worsened over time for some (15.3%) of the participants. This finding was consistent with a study conducted by Dyrbye et al., (2020), which found that career regret was experienced commonly among nurses in the United States, affecting up to 15% of respondents. Difficulty managing work schedules due to competing demands was experienced by the majority of participants (61.5% at baseline, decreased to 46.2% post-intervention), prompting some participants (up to 41.2%) to consider alternate an alternate career path (Table 19). This finding was higher than noted in a recent research study on the relationship between work schedules and turnover indicated that working more hours each week increased nurse turnover, with 13.2% actually leaving their primary nursing position (Bae, 2023). Work-related social and relationship factors experienced by most participants (See Table 19 and discussion sections on transition shock and intention to quit) may have increased occupational stress levels, as could inadequate staffing, which was reported by up to 76.9% of participants on the pre-intervention survey, and 100% of participants

post-intervention. This intervention appears to have had less of an effect than was seen in a study that assessed the effectiveness of Tai Chi exercise among hospital nurses experiencing occupational stress, which did show statistically significant improvement in stress as evidenced by the Cohen Perceived Stress Scale after a 21 day intervention period where participants practiced Tai Chi for 25 minutes per day (Yazhini, 2024).

Posttraumatic Stress Symptoms

Although one of the exclusion criteria for this study was the presence of PTSD from a non-healthcare-related event and no participants reported having been diagnosed, the scores of two participants (14.2%) indicated an elevated risk for having PTSD using the recommended cutoff of 31-35 points for screening recommended by Weathers et al. (2013). It is possible that lack of insight, unawareness of the diagnostic criteria, concerns due to stigma, or other unknown factors prevented these participants from being diagnosed. Post-intervention data analysis revealed that most participants (42.8%) experienced a decrease in symptoms, while 14.3% experienced no change. Possibly due to interval events, the scores of four participants (28.5%) increased from their baseline score. However, the summed scores of participants decreased from 218 at baseline to 184 post-intervention. While this was statistically insignificant, it provided some evidence of improvement in symptoms, and more importantly, three participants had clinically significant decreases in their scores (ranging from 9-17 points), likely reflecting a real change in symptoms (Blanchard, 2023).

Findings from this study showed a lower prevalence of PTSD symptoms among participants than has been seen in other recent studies. According to findings by Rodney et al. (2022), 28% of nurses have a probable diagnosis of PTSD, while 15.4% experience severe

symptoms. Only 14.2% of participants in this study had a probable diagnosis of PTSD and were experiencing severe symptoms. Interestingly, the prevalence rate of PTSD among nurses cited by Rodney (2022) appears to be higher than Veterans who seek services at the Veterans Administration, who have an estimated 23.1% prevalence rate (Staff, 2016). A study of a tai chi intervention among 17 veterans suffering from PTSD also showed improvement in symptoms, especially intrusive thoughts, difficulty with concentration, and sympathetic stimulation (Niles, 2016).

Somatic Symptoms

Among the participants (n=14), all (100%) reported experiencing at least two somatic symptoms (stomach or bowel problems, back pain, limb/joint pain, headaches, chest pain/shortness of breath, feeling tired/having low energy, and trouble sleeping) pre-intervention. Post-intervention, two participants (14.2%) were symptom-free, and eight (57.1%) had an overall improvement in somatic symptoms based on their total scores. Three individual participants experienced clinically significant improvements in somatic symptoms (Gierk, 2017) post-intervention.

Among the group, the symptoms with the most improvement were gastrointestinal symptoms, headache, and fatigue. Overall, the sum of the participants' total scores for each item decreased from ninety-four pre-intervention to seventy-one post-intervention, with the greatest improvement noted in gastrointestinal symptoms and fatigue. A paired t-test of difference in means was performed, with results indicating this difference was not statistically significant ($p=0.22$).

While no recent comparison studies were found examining the effects of Tai Chi on somatic symptoms among RNs, a study done by Redwine (2012) using Tai Chi as an intervention for somatic symptoms among patients with heart failure also did not show improvements in physical fatigue but did show improvement in scores that were independently associated with changes in scores obtained using the Beck Depression Inventory. Whether this effect can be replicated using a Tai Chi intervention among nurses with depression symptoms may be an area for further exploration.

Burnout

A total of thirteen participants completed the pre-and post-intervention MBI-HSS surveys. Modest improvement was noted in all three domains of burnout (emotional exhaustion, depersonalization, and personal achievement), but this change did not rise to the level of statistical significance. However, the number of participants at elevated risk for burnout decreased from 69.2% pre-intervention to 38.5% post-intervention, indicating that clinical improvement may be possible and more research is needed to determine if it could be due to the intervention or other factors. While evidence in the published literature on mindfulness-based interventions for stress and burnout among nurses is scarce, other researchers have also found that these types of interventions can help improve psychological distress and some dimensions of burnout (especially PA) (Ramachandran, 2023). Multiple small-scale studies, as cited by van der Reit and Aquino-Russell (2018), showed that mindfulness-based approaches can improve symptoms of stress, burnout, and low moods among nurses and nursing students. A similar mind-body intervention, yoga, was also associated with significant improvements in all domains of burnout after an 8-week intervention, according to Alexander et al. (2015). While

individual-level interventions are important, it is also essential that interventions at the organizational and systemic levels also occur. Examples offered by Johnson and Rainbow (2023) included ensuring clear and consistent communication and expressions of appreciation for employees may help reduce burnout and improve well-being among certain groups of nurses.

Transition Shock

Among the participants, only one was a new graduate nurse, but that participant did endorse experiencing the phenomenon in a free-text response. This variable was still included because it was not known whether any of the other nurse participants had recently changed jobs or roles within the profession.

Details of the findings regarding changes in the variables of interest, including roles, relationships, responsibilities, knowledge and skill deficits or development needs, sociocultural and environmental workplace factors, and symptoms including stress, exhaustion, and low moods or depression related to work are outlined in Table 19. To summarize, there were only minor differences noted in the total scores for questions 20 (stress), 25 (exhaustion), and 26 (low or depressed mood), which comprise symptoms associated with transition shock. After this study was designed, Kim and Ko (2023) developed and validated a tool that assesses transition shock among Korean nursing students, which may have better assessed this variable. Studies specifically on the impact of tai chi interventions among nurses experiencing symptoms of transition shock were not found in the published literature.

Intention to Quit

Of interest, the sum of the total participant scores on Items 1-26 on the NITQ decreased from 678 pre-intervention to 653 post-intervention; however, a paired t-test examining the

difference in mean scores indicated this finding was not statistically significant (p=0.49). For reasons that are unclear, there was an increase in the number of participants who intended to quit their current job (15.3% increased to 46.1% post-intervention). Increases in reasons participants cited for intention to quit post-intervention were the social environment or culture (46.1%), the physical environment and resources (15.3%), work hours or schedule (23.1%), career objectives and lack of professional opportunities (30.8%,) and one participant cited health reasons (7.6%). Of concern, the number of nurses who indicated the intention to quit the profession increased from 15.3% to 23.1% during the six-week intervention. More information to help understand the events that prompted this change would have been helpful but was not obtained. These findings are consistent with what was found in a meta-analysis exploring the global prevalence of turnover intention among critical care nurses (Xu, 2023), where the pooled prevalence turnover intention rates among these nurses was 27.7%, but across the 18 studies evaluated, ranged from 3.0-75%.

Study Strengths and Limitations

Strengths

One strength of this study was the convenient and flexible asynchronous virtual delivery of the TCE intervention, which increased accessibility among nurses who worked off shifts. Additionally, TCE is a safe, low-barrier mind-body exercise intervention that is easy to learn and requires no special clothing or equipment. Using REDCap to collect data was an effective tool and was easy for the participants to use. Lastly, this study measured a wide range of variables that can influence the phenomena of interest as well as nurse turnover and attrition. Lastly, this study yielded a large amount of information useful for modifying the intervention and

recruitment approaches and revealed gaps in the literature that can be further explored, which will be described in more detail later in this chapter (see Implications for Nursing Research).

Limitations

Of note, this was a feasibility study, which often includes small sample sizes, and for which generalizability is not the main goal. However, a longitudinal randomized control study would have been superior to the pre-post-intervention design employed for this feasibility study. Other limitations included a short recruitment window and a small sample size due to the extreme difficulty of recruiting RN participants. The quasi-experimental design and the small sample size only allow for the results to be interpreted as associations, and causality cannot be determined. Further, using self-report measures may threaten the validity of outcomes due to recall or social desirability response bias. Lastly, the phenomena of interest for this study are dynamic, and the temporary psychological state of the participants at the time they took the surveys could have influenced the results in either direction.

Study Implications

The findings from this study have several important implications for nursing practice, education, and research.

Implications for Nursing Practice

First, as demonstrated in this study, exposure to adverse childhood experiences and adverse life events is prevalent among RNs. Screening nurses periodically for PTSD as part of workplace wellness programs and referring those who have positive scores to a mental health clinician may be helpful. Healthcare organizations can and should integrate proactive preventive and treatment approaches tailored to nurses' specific needs into wellness programs, especially

those that target posttraumatic stress symptoms among nurses exposed to adverse life events described in this study or other psychologically traumatic events on the job. This intervention by healthcare organizations can reduce the risk of nurses developing enduring psychological impairment (Rahane, 2022), which could further decrease the workforce and create more problems downstream. As this and other studies have demonstrated, exposure to traumatic stress or prolonged high stress levels can predispose people to develop a myriad of physical or mental health problems and increase their risk of engaging in unhealthy behaviors (such as substance use) to cope with the negative psychological and somatic symptoms of stress, posttraumatic stress, and burnout (Foli, 2019).

Nurses are also at risk of being victims of workplace violence, which unfortunately occurs so often that it is frequently accepted as an unpleasant aspect of the job and is tolerated rather than reported (Kafle, 2022). Encouraging nurses to report violence, aggression, or abusive behavior. Other types of trauma, including secondary trauma, second-victim trauma, insufficient resource trauma, trauma from disasters, and experiencing, witnessing, or learning about other very stressful, frightening, or dangerous incidents, are unavoidable due to the nature of nursing work (Foli, 2019), making nurses a vulnerable population. Healthcare organizations also have a moral, if not legal, obligation to protect staff from workplace violence and other dangers. Unfortunately, attempts at enacting legislation, such as the Workplace Violence Prevention for Health Care and Social Service Workers Act, were unsuccessful (GovTrack.us, n.d.).

Because work-related stress is such a prominent issue for nurses, providing a supportive work environment that is conducive to collaboration and which empowers nurses to provide high-quality patient care is essential (Alqahtani, 2019). Ensuring that nurses, especially those

who work the night shift, have the opportunity to take breaks may allow them time to participate in interventions that can reduce stress and burnout, which may lead to improved nurse retention and performance (Landis, 2021). Offering employee assistance programs and other resources for nurses may help mitigate some of the negative effects of experiencing traumatic stress or occupational stress and burnout and provide an opportunity to talk about their experiences and develop healthy coping skills and resilience. However, some research shows that employee assistance programs are not well understood or well utilized by nurses (Doran, 2022), indicating a need for better communication from leadership regarding what these programs entail and how healthcare workers can benefit from engaging with them.

Additionally, exceptional care needs to be taken regarding new nurses, who are especially vulnerable to experiencing transition shock and who are more likely to leave their jobs or the profession within the first year of practice (NSI Nursing Services, 2023). Integrating flexible and easy-to-learn psychoneuroimmunology-based interventions, such as Tai Chi Easy™, into new graduate residency programs instead of adding them on as a supplemental activity, may help ease the transition from school to professional practice (McNulty, 2022).

Implications for Nursing Education

The study findings also have some implications for schools of nursing, who could consider integrating self-care and communication training into their curricula. This may better prepare their students to deal with these adverse events once they enter practice and promote engagement in healthy coping strategies, such as mind-body interventions that can help reduce stress and promote well-being (An, 2022). As noted in the findings from administering the Nurses' Intention to Quit scale, the degree to which nurses felt their nursing education prepared

them to be successful in their jobs varied. Closing the theory-to-practice gap to ensure the nurses entering the workforce have the knowledge and skills they need to provide safe, quality, and effective patient care can help reduce turnover and attrition among these novice nurses (Martin, 2023).

Implications for Nursing Research

To date, very few studies have evaluated the use of mind-body exercise and other non-pharmacological interventions for managing stress, somatic symptoms, and posttraumatic stress among registered nurses, even though that need clearly exists. Virtual TCE interventions can be low-cost, easy to implement, and modified to better suit busy RNs. No special equipment or clothing is needed, and the various elements of TCE, including mindful meditation, breathing exercises, and self-applied massage, can easily be done on breaks or during a few minutes a nurse may have between caring for patients to reduce fatigue and occupational stress (Armas, 2021).

Additionally, because recruiting RNs is challenging, designing studies that align the research aims and objectives with nurses' symptoms, concerns, and preferences is recommended, as is having ready access to a large group of nurses from which to recruit. Online recruiting via social media and mailed postcards were strategies that did not work among RNs. More research is needed to qualify and quantify nurses' exposure to healthcare-related psychological trauma, which includes the development of validated measures that can assess for these events and experiences. Additionally, more investigation into the incidence, prevalence, and types of nurse-directed violence, as well as their perceptions and perspectives about the degree to which this should be tolerated or accepted as part of the job (Kafle, 2023).

Recommendations for Future Research

Recommendations for future studies that aim to investigate the use of virtual TCE as a self-care intervention among RNs are to ensure that the classes are short, move at a faster-than-typical pace, and do not contain unnecessary talking or repetitive content. Breaking the content into short 10–15-minute sections that focus on a particular skill (i.e., breathing exercises, self-applied massage, or meditation) is also recommended. Researchers can consider using a longitudinal design with a control group to increase the generalizability and reliability of study findings and allow for data to be collected on staff turnover and attrition.

During this study, the PI discovered multiple gaps in nursing knowledge that can be the target of her own future research efforts. At this time, the PI plans to conduct a larger-scale study that further explores nurses' exposure to benevolent childhood experiences (BCEs) (Narayan et al., 2018) and positive childhood experiences (PCEs) (Bethell et al., 2019) along with ACEs to determine which, if any, of those experiences might be protective. The PI also plans to conduct a study to qualify and quantify the various types of healthcare-related psychological traumatic stressors experienced by different groups of healthcare workers and describe how they were handled by individuals (with an emphasis on identifying adaptive and maladaptive coping strategies), as well as the systemic response by the organization.

Lessons Learned

Over the course of designing, implementing, and evaluating this study, the PI learned a variety of research-focused skills and gained experience with employing multimethod approaches. The PI had to be flexible and persistent, and use creative approaches to overcome the multiple issues that arose during the study. Examples of challenges encountered included

problems with recruitment and responding to the consequences of mistakes that were made at various points of the study, which affected data analysis and the results. The PI also learned a valuable lesson regarding how to identify and deal with fraudulent research participants, which is an ever-growing problem with online research and is yet another issue that deserves further attention and investigation from researchers.

Conclusion

The purpose of this study was to determine the feasibility, acceptability, and appropriateness of a virtual TCE intervention for RNs, as well as explore within-group changes in symptoms of stress, posttraumatic stress, somatic symptoms, burnout, transition shock, and intention to quit. The findings from this study show that the design and intervention of this study are at least somewhat feasible, but specific modifications are needed to ensure adequate recruitment, intervention adherence, and increase acceptability. Additionally, while not found to be statistically significant, there were many improvements in the target symptoms noted among participants post-intervention, although this is only an association, and causality cannot be determined. The findings of this study regarding barriers and facilitators to intervention adherence and the variables of interest can be used to guide future research.

The main findings were that certain elements of the study and intervention, such as the overall design, means of delivering the intervention, retention rate, and TCE itself as an intervention, were feasible, acceptable, and appropriate, but significant modifications are necessary in terms of recruitment strategy, and the length, frequency, and content of the virtual TCE classes to make it more suitable for RNs.

The adherence rate for class participation was low, as was adherence to the independent practice, which may have influenced the results. However, numerous barriers and facilitators to intervention adherence were identified, and specific and actionable recommendations for improving the intervention were obtained from participants. Additionally, small but statistically insignificant improvements were noted among participants in stress, posttraumatic stress, burnout, and select variables associated with transition shock.

In contrast, the study findings indicated that the intention to quit their current job and the profession increased over the six-week intervention period. Limitations included a short recruitment period, difficulty with recruitment that resulted in a small sample size, low intervention adherence, and lack of generalizability. The quasi-experimental design and lack of a control group limited the ability to establish causality, and findings could only be interpreted as associations. However, the knowledge gained from this study, including lessons learned, barriers, and facilitators, may help guide future research efforts.

APPENDIX A

DETAILED LIST OF TAI CHI EASY™ CONTENT

Three Intentful Corrections		
Body	**Breath**	**Mind**
Vitality Method (Bu Zheng Qigong)	**Tai Chi Easy**	**Walking Practices**
Gentle Movements 1. Flowing motion 2. Front and back bending of the spine 3. Right and left spine bending. 4. Reaching up and out 5. Spontaneous Qigong **Self-Massage Techniques** 1. Hands, ears, and feet 2. Shoulders and neck 3. Faces and eyes 4. Abdomen 5. Tracing the Energy Channels 6. Sending Qi to the organs **Breath Practices** 1. Essential (Abdominal) Breath 2. Blithering 3. Sigh of Relief 4. Remembering Breath 5. Deep Breath and hold briefly 6. Gathering Breath 7. Xi, Xi Hu (In, In, Out) Breathin **Meditation Techniques** 1. Progressive Relaxation 2. Gathering Nature's Healing Resources 3. Mindfulness and Insight	**Seated in Chair (Upper Body Only)** 1. Open 2. Harmonize Yin and Yang 3. Brush Knee, Send Qi 4. Cutting the Path to Clarity 5. Embrace Tiger Transition 6. Watching Clouds Pass 7. Embrace Tiger Transition 8. Gathering Heaven and Earth 9. Close **Stationary or Standing (Rooting)** 1. Open (step out) 2. Harmonize Yin and Yang 3. Brush Knee, Send Qi 4. Cutting the Path to Clarity 5. Embrace Tiger Transition 6. Watching Clouds Pass 7. Embrace Tiger Transition 8. Gathering Heaven and Earth 9. Close (feet together) **Walking or Stepping Version** 1. Open (step one foot out) 2. Harmonize Yin and Yang, left and right (two steps). 3. Brush Knee, Send Qi (left and right (two steps)	**Guo Lin Walking** 1. Guo Lin Walking in place 2. Guo Lin Walking in a circle 3. Guo Lin Walking in rows or straight lines **Tai Chi Walking** 1. Tai Chi Walking in a circle (spontaneous upper body movement) 2. Tai Chi Walking in a circle with some regular movement of upper body 3. Tai Chi Backwards Walking (spontaneous upper body movement) 4. Tai Chi Backwards Walking with Cutting the Path to Clarity upper body movement 5. Tai Chi side-stepping in place 6. Tai Chi side-stepping plus Watching Clouds Pass upper body movement 7. Walking or stepping in a circle with upper body Tai Chi Easy movements 8. Walking or stepping version in straight lines with upper body Tai Chi Easy movements 9. Walking or stepping with Tai Chi Easy upper body movements and Turns

APPENDIX B

THE UNIVERSITY OF ARIZONA INSTITUTIONAL REVIEW BOARD APPROVAL LETTER

THE UNIVERSITY OF ARIZONA
Research
Innovation & Impact

University of Arizona IRB
845 N Park Ave., Suite 537A
Tucson, AZ 85719
Fax: 520-621-9810
VPR-IRB@arizona.edu

MODIFICATION APPROVAL

May 7, 2024

Carlie Felion

Dear Carlie Felion:

On 5/7/2024, the IRB reviewed the following submission:

Type of Review:	Modification / Update
Title:	The Feasibility of Virtual Tai Chi Easy Training for Registered Nurses
Investigator:	Carlie Felion
IRB Submission ID:	MOD00006117
IRB Parent Protocol ID:	STUDY00003718
Sponsor:	None
Prime Sponsor:	None
IND, IDE, or HDE:	None
Documents Reviewed:	• Consent form Felion Dissertation Study Updated April 19 2024 (4)tracked (1).pdf, Category: Consent Form; • Demographic Questions Dissertation Study Felion Updated April 19 2024(2).docx, Category: Data Collection Tool; • Felion Dissertation Study Social Media Ad Updated April 19 2024 (7)tracked (2).docx, Category: Recruitment Materials; • IRB application Carlie Felion Dissertation Study UPDATED April 19 2024 (6)tracked (1) (2) .docx, Category: IRB Protocol; • Screening questions updated 01072024, Category: Other; • Tai Chi Easy Flyer Updated 04192024 (6)tracked (1) (1).docx, Category: Recruitment Materials;

THE UNIVERSITY OF ARIZONA
Research
Innovation & Impact

University of Arizona IRB
845 N Park Ave., Suite 537A
Tucson, AZ 85719
Fax: 520-621-9810
VPR-IRB@arizona.edu

The IRB reviewed the following modifications:

Due to significant difficulties with recruitment of new grad RNs, I would like to instead broaden the criteria to include all licensed registered nurses.

I would like to be able to share my flyers via email to nurses whose email addresses appear on state board of nursing mailing lists and others who may be interested in sharing it to increase the chances of recruiting enough participants to conduct the feasibility study.

I will not notify the current participants of the change to the inclusion criteria, as it is not relevant to their participation experience.

The IRB approved the protocol on 5/7/2024.

The consent form(s) were approved with this submission. Please make sure to download the stamped consent forms located on the main study workspace in the "Final" column of the Study Documents tab.

Regulatory determinations:

- **Risk Level:** No greater than minimal risk
- **Pediatric Risk Level:** None
- **Review Level:** Exempt; Minimal Risk 2018: The project is not federally funded or supported and has been deemed to be no more than minimal risk.
- **Special Determinations:** None

This study meets the definition of a clinical trial as it involves the assignment of one or more human subjects to one or more interventions (procedure, device, or drug, including use of placebo or control) to evaluate the effects of the interventions on biomedical or behavioral health outcomes. Please note that the approved IRB consent form template must be posted by the awardee to a federal website to be disclosed. This document must be posted after the research has been closed and no later than 60 days after the last study visit of any subject.

This project has been reviewed and approved by the IRB or designee. All documents referenced in this submission have been reviewed and approved. The University of Arizona maintains a Federalwide Assurance (FWA) with the Office for Human Research Protections (OHRP) (FWA #00004218). This Institution assures that all of its activities related to human subjects research, regardless of the source of support, will be guided by the Belmont Report and applicable regulations according to 45 CFR 46.111 and/or 21 CFR Part 50.

THE UNIVERSITY OF ARIZONA
Research
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University of Arizona IRB
845 N Park Ave., Suite 537A
Tucson, AZ 85719
Fax: 520-621-9810
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We value your feedback and would appreciate you taking the time to complete our survey about your experience with the IRB staff:
https://uarizona.co1.qualtrics.com/jfe/form/SV_ehQ04WxNA06b42i.

If questions arise at any time during your study, please email the general IRB inbox at VPR-IRB@arizona.edu.

APPENDIX C

PERMISSION TO USE NURSES' INTENTION TO QUIT SCALE

Morgan Wiklund <morgan.wiklund@gmail.com>
Mon, May 8, 2023, 9:13 AM
to me

External Email

Hi Carlie Felion.

Go ahead, you have my permission! I would be glad if you could give some general feedback on how you interpret the instrument. I would also be glad if you could send me a copy of your finished work.

Best regards
Morgan Viklund.

Skickat från min iPhone

> 8 maj 2023 kl. 04:04 skrev Carlie Felion <cmf41@arizona.edu>:
>
>
> Hello,
>
> I am a Ph.D. candidate at the University of Arizona and am studying whether a mind-body intervention can help reduce distress, improve well-being, and reduce intention to quit among newly-licensed nurses for my dissertation study. I was hoping I could get permission to use the English version of the NITQ in my study. Is that possible?
>
> Thank you for considering,
>
> Carlie Felion, MSN, APRN, FNP-BC, PMHNP-BC
> PhD candidate- University of Arizona College of Nursing

APPENDIX D

PERMISSION TO USE MASLACH BURNOUT INVENTORY

Permission for Carlie Felion to administer 50 copies within three years of October 7, 2023

Maslach Burnout Inventory™

MBI Forms and Scoring Keys:

Human Services - MBI-HSS
Medical Personnel - MBI-HSS (MP)
Educators - MBI-ES
General - MBI-GS
Students - MBI-GS (S)

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Citation of the instrument must include the applicable copyright statement listed below. Sample Items:

MBI - Human Services Survey - MBI-HSS:
I feel emotionally drained from my work.

I have accomplished many worthwhile things
in this job. I don't really care what happens to
some recipients.

MBI - Human Services Survey for Medical Personnel - MBI-HSS (MP):

I feel emotionally drained from my work.
I have accomplished many worthwhile things
in this job. I don't really care what happens to
some patients.

MBI - Educators Survey - MBI-ES:

I feel emotionally drained from my work.
I have accomplished many worthwhile things
in this job. I don't really care what happens to
some students.

Cont'd on next page

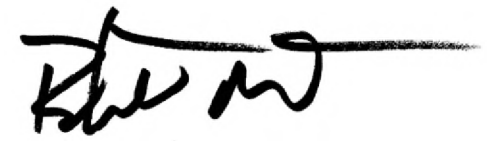
MBI - General Survey - MBI-GS:

I feel emotionally drained from my work.
In my opinion, I am good at my job.
I doubt the significance of my work.

MBI - General Survey for Students - MBI-GS (S):

I feel emotionally drained by my studies.
In my opinion, I am a good student.
I doubt the significance of my studies.

Sincerely,



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