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Decreasing nurses' stress in the emergency room utilizing mindfulness meditation

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DECREASING NURSES' STRESS IN THE EMERGENCY ROOM UTILIZING MINDFULNESS MEDITATION

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This project, written by Andrea L. Entus under direction of Dr. Marcia Derby-Davis, Project Chair, and approved by members of the project committee, has been presented and accepted in partial fulfillment of requirements for the degree of

DOCTOR OF NURSING PRACTICE

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Certification

We hereby certify that this project, submitted by Andrea L. Entus conforms to acceptable standards and is fully adequate in scope and quality to fulfill the project requirement for the Doctor of Nursing Practice degree.

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Abstract

Background: Emergency Room (ER) nurses are challenged both physically and emotionally, and are repeatedly exposed to severe occupational stress (d'Ettorre & Greco, 2016; Duffy et al., 2015). For example, some stressors are demands from patients and physicians, long hours, complex diagnoses, and a fast pace (Hunsaker et al., 2015). A considerable number of nurses experience work-related interpersonal conflict, secondary traumatic stress, and other stress disorders, which negatively affects the quality of patient care they deliver (Westphal et al., 2015).

Purpose: The purpose of this evidence-based practice project was to implement a mindfulness meditation intervention to decrease emergency room nurses' stress.

Theoretical Framework: Watson's theory of human caring (J. Watson, 2008) was utilized as the theoretical framework for this project, focusing on the nurse's self-care regarding stress.

Methods: This project used a pre-test post-test design to evaluate the effect of an evidence-based mindfulness meditation intervention by obtaining blood pressure and pulse measures as well as the Profile of Mood States Second Edition-Short Form (POMS2-SF) questionnaire.

Results: Using mindfulness meditation participants experienced a statistically significant lowering in stress levels: the mean post-POMS ($M = 39.4$) was statistically significantly lower ($p < 0.001$) than the mean pre-POMS ($M = 47.2$). The results also indicated that means of the post-systolic BP ($M = 115.7$) and the post-diastolic BP ($M = 69.4$) were statistically significantly lower ($p < 0.001$) than the means of pre-systolic BP

(*M*=126.7) and the pre-diastolic BP (75.6). The mean of post-intervention pulse (*M* = 65) was statistically significantly lower ($p = 0.005$) than the mean of pre-pulse (*M* = 68.7).

Conclusions: Mindfulness meditation should be considered as a modality to reduce nurses' stress levels in clinical settings. During the DNP project, 18 ER nurses, who are employed at the implementation site, listened to a 15-minute mindfulness meditation CD by Dr. Jean Watson. Before and after the intervention, the DNP student measured the blood pressure and heart rate and completed the POMS2-SF questionnaire to record the stress indicators of participants. Findings indicated that mindfulness meditation intervention reduced blood pressure, heart rate, and POMS2-SF stress indicators.

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To all the emergency room nurses, this project is dedicated to you! May you enjoy a rewarding and near stress free career in nursing. Be well and take care of yourself!

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"Our lives are not our own; from womb to tomb we are bound to others, past and present, and by each crime and every kindness we birth our future."
David Mitchell

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Chapter One: Nature of Project and Problem Identification

Emergency Room (ER) nurses are challenged both physically and emotionally and are repeatedly exposed to severe occupational stress (d'Ettorre & Greco, 2016; Duffy et al., 2015). Some of the occupational stressors ER nurses encounter are "complex patient loads, long shifts, demanding physicians, and the fast-paced ER environment" (Hunsaker et al., 2015, p.186). A considerable number of nurses experience work-related interpersonal conflict, secondary traumatic stress, and stress disorders that negatively affects the quality of patient care they deliver (Westphal et al., 2015).

Although having adequate levels of stress is part of growth and development, extreme and uncontrolled stress is harmful. Many nurses are stressed to the point where they are choosing to leave the profession (Halter et al., 2017). Fatigued and overly stressed nurses are more likely to make mistakes that could affect their patients and themselves with dire consequences (Golonka et al., 2017). One study suggested that as many as 80% of ED nurses reported suffering burnout (Bellagamba et al., 2015). Stress, stressful events, and burnout are the leading causes of depression, anxiety, weight gain, hypertension, and heart disease (S. Nejati et al., 2014; Razon et al., 2017). Researchers Roberts and Grubb (2013) found strong evidence for links between "job stress, safety and health in general and within different types of nursing population" (p. 1). In the end, they concluded their research, suggesting the importance of "person-focused" and "organization-focused" strategies to reduce and prevent job stress among the nurse professionals (Roberts & Grubb, 2013, p. 1). Stress may lead to burnout, and burnout is one of the most common factors cited by nurses leaving clinical practice (Halter et al., 2017). According to the research conducted by scientists from the Birjandi University of

Medical Research, cognitive-behavioral stress management is effective to significantly reduce the stress levels of nurses (Shariatkhah et al., 2017). However, implementing behavioral therapy in the nursing environment may pose a challenge because those support programs should be specifically designed to meet the needs of ER nurses. (Lavoie et al., 2011).

Problem Statement

Nurses who work in fast-paced, high acuity environments are at risk for occupational induced stress.

Purpose Statement

The purpose of this evidence-based practice project was to implement a mindfulness meditation intervention to decrease emergency room nurses' stress.

Project Objectives

The objectives of this evidence-based intervention project were:

1. To implement a mindfulness meditation intervention to decrease occupational stress in nurses who work in an emergency department.
2. To evaluate the impact of a mindfulness meditation intervention on measures of stress in nurses who work in an emergency department.

Theoretical Framework

A theoretical framework is a guide to show the direction of research and a foundation to establish credibility (Adom, Joe, & Hussein, 2018). In addition, it also helps to present research findings in a more meaningful way (Adom et al., 2018). A nursing theory expresses the beliefs and values of the discipline which are crucial to

structure the organized knowledge of nursing (Smith & Parker, 2015). This DNP Project will utilize Dr. Jean Watson's theory of caring as the theoretical framework.

Watson's Theory of Caring

Watson's theory of caring attempts to define the outcome of nursing activity regarding the humanistic aspects of life (Smith & Parker, 2015). The theory of human caring, developed by Dr. Jean Watson (2012), encompasses four major concepts: health, the human being, the environment/society, and the nursing profession.

Health

Health is defined as the absence of illness and a high level of social functioning, and mental and physical well-being. According to Watson, health is a concept that can be achieved by having a healthy connection between the mind, body, and soul (Watson, 2012). Efforts expended to obtaining health, thus the absence of illness, is also a form of health (Watson, 2012).

Human Being

The human concept refers to a valued individual who deserves care, respect, and understanding (Watson, 2012). Although not stated outright, this includes not just the patient, but the nurse as well. Dr. Jean Watson's theory posits how feelings can alter ones' behaviors and thoughts (Watson, 2012). Therefore, being aware of the behaviors that cause both negative and positive feelings can help patients and nurses to better understand each other (Watson, 2012). Dr. Jean Watson stated that "both self-care and caring for others are heart-centered practices that feed the human spirit and nourish the soul" (Watson, 2018, p. 1).

Environment/Society

The environment/society includes the external environment, such as one's family, culture, community and society, and the internal environment, such as one's mind, body and spirit, that all humans possess (Watson, 2012). According to Watson's theory, by engaging in a silent moment in a quiet environment and pausing when most hurried, nurses will be able to change negative patterns (Watson, 2018).

Profession of Nursing

The nursing profession concept is based on a mutual search for comfort that is structured on a moral commitment to protect the patient's dignity and humanity (Watson, 2012). In her theory, Watson's theoretical assumptions are an expansion of her four core concepts with the addition of time in which "the present is more subjectively real and the past is more objectively real" (McEwen & Wills, 2011, p. 176). The transpersonal assumption is based on the understanding that both the nurse and the patient are influenced and affected by the interactions they have with each other. This interaction then forms a thread of life experience for both parties, and, in the case of the nurse, it can include a learning experience that may be used to help others (Watson, 2012). The assumption of caring is based on the idea that the patient and other individuals involved join together, allowing for both to have the opportunity to decide how each wants to proceed at the moment, and to determine how they are engaged within the context of that relationship (Watson, 2012). This is the moment when each person decides how they wish to engage the other for a particular outcome.

Watson held that nursing is holistic and should focus on healing rather than illness. There are multiple ways of knowing: "through science, art aesthetic, ethical,

intuitive, personal, cultural [and] spiritual" (Wagner, 2010, p. 1). Using this theory, nurses can expand the types of knowing from the empirical quantitative data to qualitative constructs of the art and act of nursing that involves "the nurse's perception of what is significant in an individual patient's behavior" (Fawcett et al., 2001, p. 116). This type of knowing can be expanded to include the nurses' mental, physical, and emotional well-being and the nurses' perceptions of the environment. Watson argued that "diverse patterns of knowing constitute the ontological and epistemological foundations of the discipline of nursing" (as cited in Fawcett et al., 2001, p. 117).

Carative Factors

Watson's theory of caring includes 10 carative factors (Watson, 2012). The first carative factor involves the formation of a humanistic system of values that promotes kindness within a caring paradigm of nursing practice. Faith is the second carative factor, and is meant within the purview of this theory to encompass a willingness to sustain a belief system and be authentically present for the patient and for one's self. The cultivation of sensitivity to others and one's self and the ability to look beyond one's own ego and goals is the third carative factor. The fourth carative factor is the development of a trust-helping relationship. Through truth and a willingness to engage patients on their level a nurse develops a true bond with each patient that can be used to enhance their health and support clinical care.

The fifth carative factor is the acceptance and promotion of expression (both positive and negative) feelings. The ability to accept and to support emotions that are uncomfortable promotes a deeper level of compassion. The use of the scientific method for decision making and development of solutions is the sixth carative factor. The

willingness to go beyond the art of nursing and to continue to self-educate throughout one's career in the art of nursing is included in this factor. The seventh carative factor is the promotion of learning and teaching. Ensuring the existence of a protective supportive environment is the eighth carative factor. Through awareness during patient interaction, it is possible to see the impact that environmental factors can have on both the nurse's and patients' wellbeing. Excessive light, high decibel sound and a lack of privacy can all increase stress levels. The ninth carative factor is assisting with gratifying human needs. The willingness to provide time and care for basic human needs that support all aspects of patient care. The tenth and final carative factor is allowing for existential-phenomenological forces. The willingness to attend to spiritual dimensions and to care for one's own soul and the patient's soul is included here.

Watson's theory of human caring provides a generalized framework for nursing that can be applied as a holistic lens of caring for self and others. To incorporate all these 10 carative factors into the nursing practice, nurses should be mentally ready, and their stress level should be adequately balanced (Smith & Parker, 2015, p. 326).

Application of Theoretical Framework to Project

Time, safety, trust, compassion, being in the moment, and allowing for transpersonal caring that promotes health and kindness are the hallmarks of Watson's theory of human caring (Watson, 2012). The theory provides a clear and easily understood organizational context to the concepts of self-care for nurses. Watson's theory views a nurse as one who not only provides care but as a professional who receives care by engaging in a nurse-patient interaction (Watson, 2012). In other words, a bond and a warm interaction between a patient and a nurse also contribute to both a nurse's and

patient's well-being. In general, Watson's theory of human caring states that self-care is an integral part of a nurse's job (Watson, 2018). If nurses have a quiet time for themselves to regulate their working pace and relax their occupational tensions, they will be more focused on caring for their patients with more compassion (Watson, 2018).

Stress has the potential to progress to burnout and may reduce a nurse's ability to provide compassionate care (Wilkinson et al., 2017). Several studies have identified that a regular practice of mindfulness meditation has a positive impact on reducing stress and burnout, and also enhancing the resilience at work environment (Gauthier et al., 2015; Mahon et al., 2017; Song & Lindquist, 2015; van der Riet et al., 2018). An integrated literature review conducted by van der Riet et al. (2018) found that mindfulness meditation is an effective strategy to prevent and manage the stress and burnout caused by working conditions. Because the reflective/meditative approach is one of the core concepts of Watson's theory, this concept was utilized in the DNP project.

Watson (2012) stressed on the importance of practicing self-care to be consciously present for the needs of patients. Examples of self-care practices include practicing yoga, using music and poetry, writing a gratitude journal, and meditation (Costello & Barron, 2017). The effectiveness of these self-care practices was tested among nursing students, and was found that self-care practice helps to reduce stress and to increase the awareness of self-care among nursing students (Costello & Barron, 2017). Considering the findings regarding the positive effects of self-care, as well as mindfulness meditation, Watson's theory was used as the lens to guide the effects of this DNP project intervention.

Significance of the Project

Sleep deprivation, overwork, and high patient loads are the most common self-reported stress inducing factors that contribute to burnout (Li et al., 2018; Wilson et al., 2017). Adriaenssens et al. (2015) reported findings that, on average, more than 25% of emergency room nurses exceeded the cut-off for different dimensions of burnout, such as emotional exhaustion, depersonalization, and lack of personal accomplishment.

In contrast, Goyal et al. (2014) associated mindfulness interventions with decreases in anxiety, sensations of stress, and depression in the clinical population. Therefore, a mindfulness meditation session may reduce factors that contribute to emergency room nurse stress, potentially leading to better practice, improved healthcare outcomes, and enhanced healthcare delivery (van der Riet et al., 2018).

Nursing Practice

A connection exists between stress and job performance (Rajan, 2015). Positive pressure/stress boosts productivity, whereas negative stress contributes to distress and a decline in job performance (Rajan, 2015). Nurses face various stressors that contribute to job dissatisfaction that may ultimately cause many to abandon their career (Adriaenssens et al., 2015). To combat stress-induced nurse burnout and minimize its effects, this DNP project proposes an intervention that could support the profession of nursing by reducing stress among nurses. Health care personnel, especially nurses working in critical care setting such as the emergency room, are repeatedly exposed to severe occupational stress, including sudden death, violence, trauma, and overcrowding (d'Ettorre & Greco, 2016; Duffy et al., 2015). Stress may lead to burnout, and burnout is one of the most common factors cited by nurses leaving clinical practice (Halter et al., 2017; Tao et al., 2015). This

project considered the value of mindfulness meditation sessions for nurses that would be incorporated within their standard work breaks. Music has been shown to reduce emotional pressure as well as decrease physical exhaustion (Thoma et al., 2013). Music therapy that incorporates mindfulness techniques has already been applied in the treatment of mental health cases and could be promising if applied to nurses with unmanaged stress (Jiang et al., 2016; Lee et al., 2016; Solli et al., 2013; van Willenswaard et al., 2017).

Healthcare Outcomes

Nursing stress has a tremendous impact on healthcare outcomes in the clinical setting (Welp et al., 2015). The care emergency room nurses provide is increasing in intensity even as many are leaving this arena of practice (Abbaszadeh et al., 2017; Wilson et al., 2017; Wolf et al., 2017). As a result, those who remain in this practice are often predisposed to negative personal health outcomes such as high levels of stress that can influence their performance and the quality of care (Debucquoy-Dodley, 2013).

A study found that nurses' job satisfaction also plays a vital role in increasing the quality of patient care (Lu et al., 2019). The mindfulness meditation may be an effective intervention to release occupational stress from nurses who are working in the ER setting. Relaxed and mindful nurses may contribute to achieving better healthcare outcomes by caring for their patients with more compassion and energy. For instance, one study suggested that if health care professionals learn the true value of practicing healthy behaviors, they are more likely to share those health behaviors with their patients and recommend using those practices regularly (Costello & Barron, 2017).

Healthcare Delivery

According to Korol (2018), fatigued nurses have a high likelihood of making mistakes that may potentially compromise their own safety, as well as that of patients. The nursing profession comprises the largest healthcare workforce in the US (Smiley et al., 2018). Given the vast population of nurses working in the healthcare system, it is important to have a systematic approach aimed at reducing the mistakes made by nurses in work-setting. Because fatigued nurses are more likely to make mistakes (Korol, 2018), this mindfulness meditation intervention could alleviate the fatigue caused by stress (van der Riet et al., 2018), which, in turn, may contribute to an improved working environment for nurses. This includes potential contribution to improved healthcare delivery by reducing the stress and burnout among the nursing population. Research conducted on the relationship between self-reported stress, nurse burnout, and quality of nursing care highlighted that practice environment and dimensions are associated with job outcomes as well as nurse-assessed quality of care (Welp et al., 2015). The research detailed how burnout dimensions of emotional exhaustion, stress, personal accomplishment, and depersonalization had a deleterious effect on healthcare delivery. Therefore, this mindfulness meditation project could contribute to better healthcare delivery by reducing stress and burnout among the nursing population.

Healthcare Policy

If this evidence-based intervention of mindfulness meditation is effective in reducing the stress level of ER nurses, hospitals may develop and implement policies that adequately support break that could support a mindfulness meditation session. A. Nejati et al.'s (2015) study stressed the importance of healthcare policy regarding staff breaks.

The authors concluded that if healthcare organizations offered quality breaks and better-designed break areas for their staff, it would be beneficial for nurses and their patients. Generally, the results of this mindfulness meditation project may help healthcare organizations to understand the need for a new policy regarding staff breaks.

The policy's primary purpose will be to bring forth a change directed towards decreasing nurses' harmful stress levels by having hospitals and other healthcare facilities to offer a quiet room for nurses where they could benefit from mindfulness meditation. Nurses' job performance may improve, facilitating positive changes in hospital/organization operations. Additionally, the reduction of nurse stress may be an effective means of recruitment and retainment of new nurses in the nursing profession, which may help to reduce the shortage of nurse professionals.

Chapter Summary

Currently published research has not provided a satisfactory solution to the ever-growing shortage of highly skilled ER nurses (Adriaenssens et al., 2015). Over the past few decades, researchers have recognized and examined the variables that contribute to nurses' stress (Halter et al., 2017; Liu et al., 2016; Westphal et al., 2015) and suggest that healthcare employees "suffer more ill effects of stress than other workers" (Muncer et a as cited in Bost & Wallis, 2006). A considerable number of nurses experience work-related interpersonal conflict, secondary traumatic stress, and stress disorders that diminishes the quality of care (Westphal et al., 2015). Stress may lead to burnout, and burnout is one of the most common factors cited by nurses leaving clinical practice (Halter et al., 2017).

Watson's theory of human caring (Watson, 2008) was utilized as the theoretical framework for this project, focusing on the nurse's self-care regarding stress. The theory's core concept of caring, as pertaining to self, supports this evidence-based project. The intent of this evidence-based mindfulness meditation project is to help counter the impact of occupational stress experienced by emergency room nurses. Emergency room nurses were offered mindfulness meditation sessions during their work breaks. Nursing practice, healthcare outcomes, and healthcare delivery may be enhanced because of nurses' reduced stress levels.

Chapter Two: Review of the Literature

A nationwide shortage of skilled nurses in the United States exists (Alilu et al., 2017). Given the growing shortage of nurses, stress is a severe problem (Chen et al., 2013). A considerable number of nurses experience work-related interpersonal conflict, secondary traumatic stress, and stress disorders, which diminishes the quality of care (Westphal et al., 2015). Although having adequate levels of stress is part of growth and development, extreme and uncontrolled stress is harmful. Stress and burnout are the leading causes of depression, anxiety, and hypertension. According to S. Nejati et al. (2014), stress and stressful events contribute to heart diseases. Stress also contributes to weight gain, depression, and high blood pressure (Razon et al., 2017). Health care personnel, especially nurses working in critical care setting such as the emergency room, are repeatedly exposed to severe occupational stress, such as being short staffed, fast pace requiring quickly, yet accurately, and seeing trauma and death.. Stress may lead to burnout, and burnout is one of the most common factors cited by nurses leaving clinical practice (Halter et al., 2017). The phrase *burnout* was first used by Freudenberger (1975) to describe a condition consisting of emotionally exhaustion, a sense of depersonalization, and reduced feelings of satisfaction at work. Burnout is characterized by feeling ineffective, emotionally distant, overwhelmed, physically and emotionally fatigued, and disengaged from coworkers (Metlaine et al., 2017).

A systematic review of the relationship between healthcare staff wellbeing and patient safety revealed that the two variables are closely related (Hall et al., 2016). Therefore, with decreased nurse stress, patients will have the advantage of better treatment results, which may lead to an enhanced quality of life.

In the past few decades, different variables that contribute to nurse burnout have been studied, key among them being scheduling, shift work, overtime, family demands, gender, job location, skill level, stress level, and personality (Liu et al., 2016). All of these variables can factor into the generalized term of *stress* (Harkness et al., 2017). Various researchers have examined all these factors, but there has not been a satisfactory solution to the ever-growing shortage of highly skilled emergency room nurses nor has there been one definitive agreement on the definition of stress as it relates to burnout in the current published research (Adriaenssens et al., 2015).

Although several studies have been conducted on mindfulness and its impact on nurses' practice, only a few addresses this topic as applied to ER nurses (Bell, 2015). As a result, this proposed project intends to improve the work environment in the ER through nurse-driven changes that reduce stress and stress-induced burnout. Such changes could decrease the number of nurses leaving clinical practice. The purpose of this project is to implement a mindfulness meditation intervention to reduce nurses' stress in the ER setting.

This literature review examined the problem of emergency room nurses' stress and examined recent studies on the application of mindfulness techniques as a method of reducing physiological and psychological markers of stress. The contributing variables noted in background studies determined that it was possible to identify deeper insight into nurse stress and stress-related burnout. (Loera et al., 2014; Teixeira et al., 2013).

Search Methods

A review of the literature focusing on emergency room nurse stress, burnout and mindfulness were completed utilizing the Cumulative Index to Nursing and Allied Health

Literature Complete (CINAHL) database at Nova Southeastern University, available electronically through the Alvin Sherman Library: EBSCO Host. Additional searches were completed utilizing the U.S. National Library of Medicine Electronic Databases and Directories List. Qualifiers for specific search criteria were 5 years current and peer-reviewed academic journals.

Keywords used included *burnout*, *nurse stress*, *emergency room nurses*, *patient safety*, *nurse exhaustion*, *patient satisfaction*, *medical error* and *fatigue*, *mindfulness*, *effects mindfulness*, *physiological stress*, *stress*, and *stress reduction*.

Problem Background

The U. S. Department of Labor, Bureau of Labor Statistics estimated 176,000 vacancies for registered nurses every year from 2019-2029 (U. S. Department of Labor, 2019). As the aging American population requires more medical resources, the loss of highly skilled nurses becomes a national health concern. According to previous literature on nurse stress-related burnout, notable causes of burnout in nursing practice include long hours, lack of sleep, dysfunctional environments, poor communication, staffing shortages, organizational culture, lack of autonomy concerning decision-making, and personal resilience, all contributing to varying degrees of job dissatisfaction (Aiken et al., 2002). These variables can be related to, or cause stress, or both. Consequently, understaffed hospitals and a lack of support staff, have left nurses increasingly vulnerable to chronic fatigue, chronic stress, and systemic burnout (Trousselard et al., 2016; Wolf et al., 2017).

Emergency Room (ER) nurses are challenged both physically and emotionally, and are repeatedly exposed to severe occupational stress (d'Ettorre & Greco, 2016; Duffy

et al., 2015). Some of the occupational stressors ER nurses have encountered are "complex patient loads, long shifts, demanding physicians, and the fast-paced ER environment" (Hunsaker et al., p. 186). One study found that four out of five ER nurses reported suffering burnout (Bellagamba et al., 2015). Adriaenssens et al. (2015) reported findings that, on average, more than 25% of emergency room nurses exceeded the cut-off for different dimensions of burnout, such as emotional exhaustion, depersonalization, and lack of personal accomplishment. Another study demonstrated that over 13% of nurses who work in the critical care settings left their positions and 5% left their profession permanently (Rushton et al., 2015). One survey revealed that 1 in 5 US nurses is intending to leave the position within 1 year (Rushton et al., 2015).

In Taiwan, the turnover rate has become so severe for nurses with less than 2 years of service that a study was conducted, and determined that work-related fatigue was the primary factor that caused burnout, and contributed to the poor turnover rate (Liu et al., 2016).

Nurse Stress

Stress is a complex and dynamic transaction between individuals and their environment (Rajan, 2015). According to Rajan (2015), stressful situations are significant issues among occupational groups that force key role players in any sector to deviate from normal functioning due to psychological or physiological disruption. One such career is the nursing profession. Rajan's (2015) study focused on female nurses working in intensive care units, operating rooms, wards (floor nursing), and emergency departments. Suffering, grief, and death are some of the events nurses in critical care units experienced that caused the highest levels of stress amongst health care providers.

Stress and job performance are connected. Positive pressure/stress boosts productivity, whereas negative stress contributes to distress and a decline in job performance (Rajan, 2015). To determine the impact of policy-related, work shift, and interpersonal relationship stressors, Rajan conducted a descriptive survey of 360 nurses Indian and who worked in intensive care units, operating rooms, wards, and emergency departments in 45 private hospitals with 25 or more beds. Participants completed questionnaires comprised of four sections that included demographics, sources of stress, impacts of stress, and coping strategies. Additional data for the study were collected from thesis, books, dissertations, journals, and the Internet.

The findings indicated that strict, rigid rules and regulations; unclear objectives; and inequity in the allocation of work shifts were significant stressors for caregivers working in critical care units (Rajan, 2015). Inadequate support from superiors and administrative staff during emergencies and the lack of opportunities for meaningful interaction and relationships with superiors and co-workers were also significant contributors to nurse stress (Rajan, 2015). The article underscored the amount of ER nurses' stress and identified several causes of pressure that correlated with job performance.

Work-related stress is a primary cause of nurse burnout in the United States (Jordan et al., 2016). A qualitative study conducted by researchers at Ball State University, the University of Toledo, and Lock Haven University studied the relationship between stress and nurses' coping ability. The researchers evaluated surveys from 120 registered nurses who were working in a Midwestern community hospital. The results of the questionnaire indicated that about 92% of the nurses experienced moderate to very

high-stress levels. Out of 120 participants, only 8% of the sample population reported that they experience low or very low-stress levels in their work settings. Researchers also suggested that stress can lead to unhealthy behaviors and activities after they found that 78% of the study participants got less than 8 hours of sleep each night; 22 % of participants were considered binge drinkers, and 69% reported having no regular exercise. The study noted that primary causes of nurses' elevated stress levels are the following, but not limited to: high workload demands, lack of support from supervisors and coworkers, aggressive and violent patients death and dying, conflict with physicians, lack of resources, increased patient loads, constant noise, and interpersonal conflicts with other healthcare professions (Jordan et al., 2016).

Rushton et al. (2015) also conducted qualitative research where they focused on finding relationships between nursing burnout, general stress, moral stress, meaning, resilience, and hope. The study utilized a cross-sectional survey design. Researchers recruited 114 volunteers who came from 4 hospitals. Recruited nurses represented six high-stress units, such as two oncology, two adult critical care, and two pediatric/neonatal. First, the nurses completed a sociodemographic questionnaire, and then completed 6 survey tools. Data was analyzed using SPSS software and researchers used descriptive statistics to interpret all study measures. The results of the study indicated that nurses who work in the critical care units experience higher levels of moral stress compared to nurses came from the other two units. Additionally, researchers found that nurses 3 to 10 years of experience had the highest mean score of depersonalization and emotional exhaustion (Rushton et al., 2015). During the study, researchers also found that greater resilience prevented nurses from developing emotional exhaustion and it

contributed to nurses' accomplishments (Rushton et al., 2015.

On behalf of Kronos Incorporated (2017) Regina Corso Consulting conducted a national survey concerning employee engagement in nursing. The primary focus of the survey was to study the issue of fatigue in nursing and how nurses and hospitals deal with that stress. A total of 257 RNs participated in the survey and responded to questions based on their personal work experiences and emotional states. The results of the survey brought forth valuable information for hospitals and employers to take part in efforts to alleviate the nursing stress.

The results of the survey revealed that 93% of the United States based RNs are satisfied with their career choices, although 98% of the responders found their profession to be physically and mentally demanding. Additionally, four out of five RNs, or 85%, reported that they are having a difficult time balancing their mind, body, and spirit due to the work-related exhaustion (Kronos Corporation, 2017). Findings from the survey also revealed that some of the serious consequences of work-related nursing stress may harm not only the well-being of nurses, but those around them as well. The survey found that 56% of RNs and 70% of night shift nurses reported that they are driving home in drowsy condition after their shifts were over (Kronos Corporation, 2017). Of those RNs, 12 % reported that they pulled their vehicles off the road to get some rest (Kronos Corporation, 2017). The survey also indicated the negative impact of nurse stress on job performance. Forty percent of nurses responded to the survey respondents reported they were concerned that their patients would suffer because they are so tired. Unfortunately, 11% of RNs stated that they made a mistake at work because they were tired and fatigued (Kronos Corporation, 2017).

Parul et al.'s (2014) study of 100 nurses measured the degree of professional stress among the staff and nurses to design strategies for improving the quality of personal and professional life. The participants' attitudes toward fellow staff, salary, job condition, job satisfaction, optimism for life, and other variables were assessed. Findings indicated that nurses experienced stress because of poor doctor and patient attitudes, reduced co-worker relationships, verbal abuse from physicians, discrimination, and other forms of job-related stress. Job stress had hazardous effects on the nurses' health and their abilities to cope with job demands. The study also found stress interfered with job satisfaction and organizational effectiveness because of stress-related absenteeism and turnover, which consequently affected the quality of patient care (Parul et al., 2014). Occupational stress affected nurses' cognitive appraisal, perceptions, and interpretation of events (Parul et al., 2014).

Coping with stress for a short time was possible; however, chronic stress produced prolonged changes in the physiological states of participants (Parul et al., 2014). In nurses, the pressure was cited as a major source of anxiety, which inhibited effective patient care, decision-making, responsibility, and change (Parul et al., 2014). The literature supports the notion that work-related factors contribute to nursing stress.

Nurse Stress-Related Burnout

Wilson et al. (2017) noted that burnout is more common among nurses than generally believed. Also, it may affect every aspect of the individual's functioning and have a deleterious effect on interpersonal and family relationships. Eventually, those negative effects may lead to a negative attitude toward life in general. Burnout syndrome is a common occurrence in many professions, yet Shockey and Wheaton (2017) found

that healthcare practitioners and healthcare support personnel were among the highest major occupation groups who also had the least amount of sleep.

A study conducted by Canadas-De la Fuente et al. (2015) assessed 676 nurses for emotional exhaustion, personal accomplishment, and depersonalization. The goal of the study was to identify the prevalence of burnout and the related potential variables. They administered the Maslach Burnout Inventory (MBI) questionnaire and the revised Neuroticism-Extraversion-Openness Five-Factor Inventory (NEO-FFI) Personality Inventory. The authors reported that stressors leading to burnout levels were predicated by long hours, shift work, area of practice, and family obligations.

Nurse Stress Health Impact

Harkness et al. (2017) noted that prolonged stress was linked to anxiety, depression, weight gain, and physiological changes that can all be categorized as part of the *allostatic load.* This term described the body's physical breakdown due to its adaptive responses to stress. The ongoing exposure to stressors that activated the autonomic nervous system, resulting in elevated blood pressure, heart rate, lung and cardiac output, leads to the activation of the hypothalamic-pituitary-adrenocortical (HPA) axis that raises cortisol levels (Harkness et al, 2017). The authors conducted a longitudinal stratified randomized waitlist-controlled study. Forty-three adult women attended yoga classes for 8 weeks. Findings demonstrated participating in weekly yoga classes reduced participants' perceived psychological distress. Constant exposure to low levels of stress or chronic stress (such as that experienced by ER nurses) may lead to "cortisol/endocrine system imbalances, which cause psychological and physiological pathology: anxiety,

depression, cardiovascular phenomenon, immune system dysregulation, and metabolic syndromes such as central obesity" (Harkness et al., 2017, p. 38).

Duffy et al. (2015) examined secondary traumatic stress among emergency room nurses by measuring their self-reported levels of stress. The study found that ER nurses who experienced stress caused by emotional exhaustion get the feeling of distress or anger. Also, they are 3.5 times more likely to use illegal drugs such as cocaine or marijuana as a coping strategy when compared to nurses in any other specialty (Duffy et al., 2015, p. 53). At the end of their research, Duffy et al. suggested the needs of different types of interventions to properly address the ER nurses' elevated stress levels.

Impact of Nurse Stress on Patient Outcomes

Golonka et al. (2017) completed a study with 80 participants. The selection criteria for study inclusion was determined after participants completed the MBI and the Areas of Work Life Survey (AWS). Participants were divided into two groups: a burnout group and a control group. The researchers utilized error-related negativity (ERN), which is measured through electroencephalography (EEG), a method for determining cognitive impairment both reactive (aware) and unconscious. According to a vivid ERN component, the participants engaged in mistaken motor response. Participants were assessed as they moved either their left or right index finger in response to a visual cue. Findings showed participants in the burnout group reacted slowly. Fatigued and overly stressed nurses are more likely to make mistakes that could affect their patients and themselves (Golonka et al., 2017).

Teixeira et al.'s (2013) research results from a self-fulfillment questionnaire seeking the prevalence of burnout among physicians and nurses working in intensive care

units noted that nurses registering with the highest level of stress practiced significant burnout induced absenteeism. The lack of proper staffing levels affects nurses' stress levels because short staffing causes heavier workloads and encourages workarounds that may potentially decrease patient safety. The micro-burdens added to daily stressors that are part of the emergency room experience help form a stress cycle that can lead to negative health impacts for both nurses and patients.

Memory plays a vital role in the day to day lives of nurses and their patients. Lo et al. (2016) studied the misinformation effect to understand the formation of false memory in healthy young adults. To conduct this quantitative study, researchers recruited 60 young adults who did not suffer from sleep apnea. Lo et al. (2016) used two memory paradigms on participants to investigate false memory formation after one night of sleep deprivation. Participants completed three phases: event-encoding, misinformation, and a memory test. Their primary findings suggested that sleep deprivation increases the development of false memories. The results were as expected: the study participants failed to recover correct memory recognition because they incorporated misleading post-event information into original memories. As a result, young adults had difficulty in retrieving memories of the original event (Lo et al., 2016). Such findings supported the argument that weaker encoding increases one's susceptibility to retroactive interference (Lo et al., 2016). In other words, failure to properly develop the correct memory (in this case the correct dosage) can inhibit learning and long-term memory. The researchers stressed the importance of adequate sleep since it is important for the human mind to relax and get enough sleep to optimize memory processes.

Prospective memory is remembering to execute intended actions in the future. According to Grundgeiger et al. (2014), many nurses can relate to feeling fatigued and then realizing an important task had been forgotten. The researchers noted that although sleep deprivation may lead to cognitive dissolution and increased accident probability, there was no hard data in the literature regarding its impact on prospective memory. To measure the effects of sleep deprivation on perspective memory, Grundgeiger et al. conducted quantitative research recruiting 60 first-year students from a local university.

They chose their study participants based on strict criteria. They excluded people who had substance consumption in the recent past, shift work in the past 3 months, and were smokers, or had been diagnosed with sleep or mental disorder. The recruited participants were divided into the Sleep-deprived (SD) group and Non-sleep-deprived (no-SD) group. Individuals of those groups were given a computer to complete pre-designed tasks. Based on the results of the computer task, Grundgeiger et al. found that sleep deprivation has a negative impact on cognitive performance. Sleep deprivation leads to failures of brain functions, resulting in negative consequences in critical safety situations (Grundgeiger et al, 2014). They found a steady decrease over the course of time in sleep-deprived participants. Furthermore, there was a reduction in memory formation and target encoding.

Ohlmann et al. (2018) found a direct link between stress and sleep quality using the Trier Inventory for Assessment of Chronic Stress. Their research suggested a link between areas of concern that can be found in any emergency room: work overload, pressure to perform, work discontent, lack of social recognition, and chronic worrying

were areas that researchers found were highly weighted values by their study participants as areas that had negative effects on their sleep.

According to McKinney (2011), nurses who worked 12.5 or longer hours per shift are 3 times more likely to make an error in patient care (p. 3). It is not hard to find examples of medical errors causes by exhausted nurses in the literature and recent news headlines. For example, Cimiotti et al. (2012) found that nurse burnout was associated with urinary tract infection and surgical site infection (p. 486). Fatigued nurses are more likely to make mistakes that could affect their patients and themselves. For instance, reduced compliance in handwashing may contribute to suboptimal care by the nursing staff due to fatigue-induced burnout (Korol, 2018).

Welp et al. (2015) noted that 10% of hospitalized patients experience unexpected medical problems during treatment. About half of those adverse events could have been prevented (p. 1573). In that same cohort, 7% would die, while another 7% would suffer permanent damaging effects. Aiken et al. (2002) stated that surgical patients experienced higher risk-adjusted 30-day mortality and failure-to-rescue rates in hospitals with high patient-to-nurse ratios. In those medical facilities, nurses are more likely to experience job dissatisfaction, which may eventually lead to burnout syndrome (p. 1987). Shahriari et al. (2014) found a higher prevalence of self-reported stress related burnout among nurses who worked in a fixed schedule, and a greater chance of medical errors because the night shift has far fewer nurses.

A study published in 2011 by Needleman et al. also supported the link between nurse staffing and patient mortality. They examined 43 hospital units. In the end, they concluded that if the staffing of nurses is below target levels, then there is increased

mortality (p. 1037). In another study, Teixeira et al. (2013) noted that nurses registering with the highest level of burnout during the study also had the highest level of absenteeism. Therefore, the lack of proper staffing levels produced a negative impact on nurses who must shoulder the extra workload, thus encouraging workarounds. It also increases the cost to all financial stakeholders because traveling nurses must be called in. Already exhausted nurses are pushed to work extra hours, potentially risking their health and that of their patients. In contrast to the enormous stress on nurses in high-stress jobs, mindfulness practices show promise in mitigating some of the untoward effects of too much negative stress.

Mindfulness Meditation

Mindfulness refers to "paying attention on purpose, in the present moment, and non-judgmentally to the unfolding of experience moment by moment" (Chen et al., 2013, p.1166). The Buddhist philosophy of mindfulness meditation has been applied to enable individuals to cope with stress and improve their well-being. In addition to nurses, the therapy also reduces depression, anxiety, and psychological distress in patients (Chen et al., 2013). An individual develops the capacity to be in the present moment intentionally without judgment.

The two main mindfulness therapies are Mindfulness-Based Stress Reduction (MBSR) and Mindfulness-Based Cognitive Therapy (MBCT) (Bell, 2015). MBSR is structured with intent as a modality to reduce psychological morbidity associated with chronic illnesses (Abbott, et al., 2014). The approach is also applied to treat emotional and behavioral disorders. MBCT, on the other hand, is a sub-category of MBSR designed for individuals with a history of recurrent depression to help reduce future reoccurrences

(Abbott et al., 2014). When practiced regularly, mindfulness meditation has a wide range of beneficial physiological and psychological outcomes (Abbott et al., 2014; Bell, 2015).

van der Riet et al. (2018) completed an integrative review and have defined Mindfulness Meditation (MM) as a spiritual tradition that originated from India, Tibet, Japan, and China over 5000 years ago. The standard mindful meditation program comprises 30-minutes daily sessions for an 8-week period. After 4 weeks of therapy/training, participants have shown a significant reduction in symptoms associated with stress. Participants were encouraged to adopt a non-judgmental attitude of openness and acceptance to foster a sense of serenity and stillness. Additionally, the MM program may include several other types of meditation, such as transcendental meditation, Zen, Tibetan meditation, and a variant referred to as Vipassana (van der Riet et al., 2018). In other cases, a variant program, known as complementary therapy, is practiced ensuring that nurses are part of a holistic care approach for maintaining a high quality of life (Onishi et al., 2016). Meditation skills enable individuals to reconstruct unhealthy thinking patterns and change behaviors and reactions to situations (Bell, 2015). According to Bell (2015), if depression-related beliefs and perceptions can be modified by focusing on mindfulness, relationships between these thoughts as well as experiences and behaviors may also change.

McConville et al. (2017) found that mindfulness-based interventions have the potential to reduce stress, depression, and anxiety and improve mood, mindfulness, self-efficacy, and empathy. They conducted a review of mindfulness studies and programs using the Preferred Reporting Items for Systematic Reviews and Meta-analysis guidelines (PRISMA, p. 27). They examined two of the studies using CD-delivered programs where

participants followed in guided mindfulness. The timing of interventions ranged from 10 minutes to 28 minutes. They noted 11 studies that focused on stress reduction post-intervention. In the end, they found that all studies showed a significant effect of mindfulness has on reducing stress (p. 38).

Bell (2015) sought to determine the contribution of mindfulness meditation to general wellness and reduction of stress, depression, hypertension, and other stress-related health complications. Participants underwent blood pressure and heart rate monitoring, and completed The Anxiety Study Group Demographic Questionnaire (TASGDQ) and State Trait Anxiety Inventory (STAI). Each participant was guided to engage in mindfulness meditation, either eye-closed relaxation or silence, in a laboratory alone for 30 minutes, 4 times a week. The Kentucky Inventory of Mindfulness Skills (KIMS) results indicated that participants' level of mindfulness meditation increased with time. Participants experienced a reduction of blood pressure and pulse rate after 12 weeks of the therapy. Results suggested that mindfulness leads to decreased anxiety, depression, blood pressure, and heart rate. The collected evidence further suggested that mindfulness meditation lowered the blood pressure of persons diagnosed with moderate hypertension (Bell, 2015).

Stress has increasingly become a major concern in the workplace, particularly among health care professionals. Galantino et al. (2005) addressed occupational stress, burnout, and diminished empathy regarding health care professionals. This research explored the application of Mindful Meditation (MM) as a modality of preventing and/or alleviating stress. Galantino et al. (2005) assessed mood, burnout, and empathy through Profile of Mood States-Short Form (POMS-SF), Maslach Burnout Inventory (MBI), and

Interpersonal Reactivity Index (IRI) respectively. The Profile of Mood States-Short Form (POMS-SF) was extremely sensitive to changes. The POMS-SF proved to be a diverse tool because it consists of a variety of scales and subscales that consider and measure a wide range of signs that indicate stress, such as anger or hostility, tension/anxiety, confusion/bewilderment, depression/dejection, fatigue/inertia, and vigor/activity (Galantino et al., 2005). The profile of mood states (POMS) is a reliable tool for measuring mood and by extension the stress levels and revealed that MM brought about improvements in mood.

van der Riet et al. (2018) conducted a literature review examining the effectiveness of mindfulness meditation for nurses. Studies amplified the usefulness of mindfulness interventions for stress as they stated: "mindfulness meditation had a positive impact on nurses' and nursing students' stress, anxiety, depression, burnout, sense of well-being and empathy" (p. 201). The authors noted that although each study had varying foci, outcomes were similar regarding the following variables: stress reduction, reduced feelings of anxiety, a reduction in reported depressive sensations and, a reduction sevenfold of burnout. Although a wide range of tools and instruments were used in each study, it did not alter the outcome in that well-being and empathy were increased, whereas symptoms of stress, anxiety, and depression were reduced.

Wang et al., (2017) examined the effects of mindfulness training on stress reduction for clinical nurses. They conducted their study in a 1000 bed facility that employed 800 full-time nurses (with an average turnover rate of 120 nurses per year). The intervention involved 3 hours per week and a one-day retreat off site. The measurement tool was the Five Facet Mindfulness Questionnaire (FFMQ) that consists of

39 items on mindfulness and quality of life. They found a substantial decrease in measurable stress levels 6 months after the initial study and again 6 months after the follow-up.

Abbott et al. (2014) sought to establish the efficiency of mindfulness-based stress reduction (MBSR) and mindfulness-based cognitive therapy (MBCT) on mental and physical outcomes for individuals suffering from vascular disease. Participation was limited to people suffering from a vascular disease-heart disease, myocardial infarction, angina, peripheral vascular disease, and stroke. Other types of participants included people at high risk of developing a vascular disease resulting from diabetes, hypertension, and hypercholesterolemia. The intervention characteristics involved group-based therapies that ranged from 30 to 45 minutes for 6 days per week. Nine trials were conducted, Notably, the overall outcome noted that MBSR/MBCT participation resulted in significant small or moderate effects for psychological consequences across the clinical population involved in the majority of the nine trials (Abbot et al., 2014).

Positive effects were also witnessed in people with diabetes, heart disease, and pathological mental fatigue (Abbott et al., 2014). All participants recorded a moderate psychological and physical improvement on the perception of their health; thus, mindfulness therapy may be a promising stress reduction remedy for nurses working in the emergency room setting.

S. Nejati et al. (2014) explored the hypothesis that a healthy lifestyle and effective coping strategies are deemed significant variables among patients with hypertension. The primary objective of the study was to determine the status of these variables after using the mindfulness-based stress reduction program in patients with hypertension. The survey

consisted of 30 patients chosen through a randomized clinical trial. The participants were referred to the Hypertension Clinic of Imam Hossein Hospital, Tehran, Iran in 2013. Some were assigned MBSR or conscious yoga, whereas others were assigned a control group.

The participants also answered the Walker's Health Promoting Lifestyle Questionnaire designed to assess health-promoting behaviors, such as exercise, nutrition, health responsibility, stress management, interpersonal support, and self-actualization (S. Nejati et al., 2014). The intervention group received eight sessions of mindfulness meditation training for over 8 weeks. Their lifestyle and coping strategies as well as blood pressure were measured before the meditation intervention and immediately after sessions. The approach also involved 2 month follow-up and a comparison between results from the three groups. The results indicated significant differences in lifestyle coping strategies and blood pressure among the experimental groups. After the post-test and follow-up for both experimental and control groups, a positive effect was noted after improving the lifestyle of patients with hypertension. The results also concluded that training healthy lifestyle behavior through the MBSR model and yoga decreases blood pressure. Such strategies fostered problem-focused coping approaches, which were instrumental in decreasing the systolic and diastolic blood pressures in individuals diagnosed with hypertension (S. Nejati et al., 2014). In this study, patients did not rely on mindfulness meditation only as they also changed their lifestyle practices.

The literature also includes a study by O’Brien et al. (2019) completed in the United States. The primary focus of the study was to study relationships between mindfulness, training, and work-place injuries among nursing aides who are working in

long-term care settings. For this qualitative study, researchers recruited 152 (n = 152) nursing aides who were working in long-term care residential settings across Ohio. All of the nursing aides answered questionnaires as instructed. The measurement of work injuries, source of injuries, sociodemographic characteristics, musculoskeletal symptoms, job training, and mindfulness were obtained and analyzed to demonstrate correlations. The study found that nursing aides with higher levels of mindfulness are less susceptible to work-place injuries and musculoskeletal symptoms. Researchers suggested the importance of incorporating mindfulness into the nursing aide programs. Researchers also stressed the importance of further research to study the potential benefits of mindfulness training.

The effectiveness of mindfulness was also tested by international researchers. For instance, Westphal et al. (2015) carried out a study meant to establish the protective benefits of mindfulness in emergency room personnel. The participants included 50 emergency room nurses employed in the Accident and Emergency Department in an urban teaching hospital in Zurich, Switzerland. The nurses were assessed for anxiety and depression with the 14-item Hospital Anxiety and Depression Scale (HADS) and evaluated for work-related factors, such as shifts, the maximum number of patients during a shift, number of shock room experiences, as well as conflict with colleagues, patients, and medical doctors. The nurses were also evaluated for mindfulness practice through the Mindful Attention Awareness Scale.

The results indicated that mindfulness was a significant predictor of depression because nurses with more mindfulness reported less depression and better coping strategies with emotional exhaustion and conflicts with colleagues (Westphal et. al.,

2015). “Mindfulness-based stress reduction (MBSR) and other mindfulness-based interventions have also been shown to improve mental and physical health and improve patient care in health care professionals” (Westphal et al., 2015, p.80). A positive association was demonstrated between utilizing mindfulness and the effects on one’s personal well-being such as a reduction in the impact of stress.

A recent study conducted by Duarte and Pinto-Gouveia (2016) used stress and burnout as generalized nearly interchangeable terms. In this study, they used a mindfulness technique developed at the University of Massachusetts by Kabat-Zinn (1982). The invention was a 6-week long group session that was scheduled to work within the nursing schedules. Kabat-Zinn’s early work focused on breathing exercises and ignoring all thoughts and emotions to reduce stress and develop focus. The final intervention sessions encompassed communication, meditation practice and reflection. Although the post-treatment survey found a reduction in self-reported compassion fatigue, the authors noted that continued use was necessary for a reduction in self-reported burnout. The authors did not focus on stress as a singular term but rather a catch-all for the underlying factor contributing to burnout.

de Vibe et al. (2018) noted that any type of longitudinal research studying the impact of mindfulness interventions was scarce at best. Researchers attempted to add to the knowledge base by conducting a 6-year study that examined the impact over time. They conducted 7-week mindfulness course, and studied the effects it had in reducing stress, improving coping skills, and improving subjective well-being. Their results showed greater problem-focused coping and substantive increases in reported well-being

at the 6-year mark. The benefits were noted even in individuals who only continued to practice their mindfulness sessions 1-2 times per week.

Gauthier et al. (2015) conducted a study on the effect of 5-minute mindfulness meditation for Pediatric Intensive Care Unit nurses. The Maslach Burnout Inventory was used along with the Nursing Stress Scale as a baseline, then post intervention. They found that *stress* as a term was also used as a catch-all for variables that caused it: "time constraints, increased paperwork, long hours, lack of calm spaces, and physician-controlled work environments also contribute to high levels of stress" (p. 402). They used an On-the-Job Mindfulness-based Intervention they developed and the Kabat-Zinns (1982) stress reduction book. Their intervention required nurses to meet weekly for 30-minute group sessions then practice at home for 10 minutes. They found a significant decrease in stress at the end of the sessions. This finding suggested that a small investment yielded lasting results.

Chapter Summary

The literature confirms the presence of nurse stress brought about by work environment changes, stressful work-related events, and demanding and unpredictable work conditions (Adriaenssens et al., 2015; d'Ettorre & Greco, 2016; Parul et al., 2014; Rajan, 2015). Stress and burnout can lead to depression, anxiety, and hypertension. Various types of mindfulness meditation approaches and their effectiveness were examined as evidenced by physiological measurements.

In the last decade, a number several studies have been conducted that attributed a reduction in stress and anxiety to mindfulness meditation intervention therapy (Goyal et al., 2014, Westphal et al., 2015). This, combined with a growing body of evidence on

using music therapy interventions successfully for Post-Traumatic Stress Disorder (PTSD) (Landis-Schack et al., 2017), anxiety and pain therapy (Waterworth & Rickson, 2017), supports its consideration as a mechanism to reduce stress among ER nurses. Furthermore, different mindfulness approaches, such as Mindfulness-Based Stress Reduction and Mindfulness-Based Cognitive Therapy, allow for a wide range of therapies that can be used to help patients with vascular disease, diabetes, and hypertension (Chen et al., 2013; Razon et al., 2017; Westphal et al., 2015). "Randomized controlled studies have linked participation in mindfulness-based stress reduction (MBSR) program to increased mindfulness and reduced burnout in nurses" (Westphal et al. 2015, p. 2). The studies supported further evidence in utilizing mindfulness meditation as an effective tool for managing and reducing stress in emergency room nurses.

Chapter Three: Methodology

This chapter presents the methodological details and rationale of the proposed DNP project. More specifically, the chapter will discuss the purpose of the project as well as the budget and information technology (IT) that was utilized during the project. In addition, the chapter outlines the project management techniques such as organizational readiness for change, interprofessional collaboration, and risk management.

The Purpose of the Project

The purpose of the evidence-based practice project was to implement a mindfulness meditation intervention to decrease emergency room nurses' stress.

Project Management

Organizational Readiness for Change

The organizational approval process included speaking with practice site stakeholders to obtain buy-in for this EBP mindfulness meditation project for ER nurses. Primary stakeholders are the ER nurse manager and the project preceptor. Support included obtaining site manager approval in writing, obtaining approval from Nova Southeastern University's (NSU) Institutional Review Board (IRB), and obtaining approval from the project site's Research Committee. IRB approval was obtained from Nova Southeastern University on November 8, 2019. The practice site's Research Committee reviewed the proposed Doctor of Nursing practice (DNP) project as well as NSU's IRB approval and subsequently granted permission for project implementation on December 20, 2019.

According to Ritchie and Straus (2018), organizational readiness for change is defined as a necessary tool for implementation success. In general, organizational

readiness for change usually refers to the collective readiness of organizational members who are willing to contribute something to the implementation efforts. If the members of the organization are motivated to implement change at the organizational level, the commitment becomes strong (Ritchie & Straus, 2018). If mindfulness meditation is effective, the intervention may continue to be implemented at the medical facility because ER nurse manager is the primary stakeholder.

Interprofessional Collaboration

Interprofessional collaboration was important to implement the project as intended. The project preceptor and the ER nurse manager were integral parts of the collaboration efforts. The ER nurse manager sent out an informational recruitment email to all eligible ER nurses. The ER nurse manager helped to get staff buy-in by introducing the project at staff meetings and morning shift meetings. The student coordinated break times with the ER charge nurse on shift, under the direction of the ER nurse manager. In general, the interprofessional collaboration was an integral component in the planning and implementing of the proposed DNP project.

Risk Management Assessment

Risk management is used to describe complex activities where an organization identifies and assesses its risks and then creates a plan for addressing those risks (Grama, 2016). Strength, weakness, opportunities, and threat (SWOT) analysis was conducted to identify the areas that need to be addressed to identify areas that could affect the success of the project. The project has a high potential to address elevated stress levels of nurses because some researchers have already found mindfulness meditation as an effective

intervention to lower stress (Gauthier et al., 2015; Klatt et al., 2015; Mahon et al., 2017; Song & Lindquist, 2015; van der Riet et al., 2018).

Strengths

The primary strength of the proposed DNP project was that it used the mindfulness meditation, which is an evidence-based intervention (EBI). This intervention had already been proven effective (Gauthier et al., 2015; Klatt et al., 2015; Mahon et.al., 2017; Song & Lindquist, 2015; van der Riet et al, 2018). Other strengths of the DNP project include:

- The framework of the project is based on Jean Watson's well-known theory of human caring.
- The project was based on Evidence-Based Practice (EBP).
- The intervention had great potential to address nurses' stress. Many nurses are stressed due to intensive workload.
- Two Institutional Review Board (IRB) approvals to ensure that ethical principles are followed during the project.
- The project was conducted using volunteers.
- Only reliable technologies were utilized throughout the project to obtain accurate measurements.
- Confidentiality and other ethical principles were followed. For instance, protecting the participants' identity is one of the ethical components of the study. To ensure confidentiality, the participants were asked to provide their month and day of birth as well as the first two letters of their city of birth as unique identifiers.

Weaknesses

The primary weakness of the proposed DNP project was time restraint. Scheduling may have an impact on the implementation of the DNP project because ER nurses have a tight schedule and intensive workload. Therefore, schedules were adjusted to meet the preferences of the study participants. Because there was a limit of one participant receiving the mindfulness meditation intervention at a time, intervention times were discussed and agreed with each participant prior to the scheduling. Additionally, scheduled times were shared with the healthcare organization to ensure that each participating nurse may not be interrupted during their interventional sessions.

Opportunities

The proposed DNP project was an opportunity to reduce the stress levels of nurses and to ensure the well-being of nurses and the profession. The issue of stress should be addressed. Stress typically leads to burnout, and burnout is one of the most common factors cited by nurses leaving clinical practice (Halter et al., 2017). Reducing nurses' stress may improve the quality of care because fatigued and overly stressed nurses are more likely to make mistakes that could be detrimental their patients and themselves (Golonka et al., 2017). According to Wilkinson et al. (2017), stress has the potential to reduce a nurse's ability to provide compassionate care. Therefore, Watson (2012) stressed on the importance of practicing self-care to be consciously present for the needs of patients. Also, decreasing the stress levels of the nurses may lead to a better retention rate of ER nurses.

Threats

To eliminate the risks, which may hinder to meet the project goals, the pre-implementation phase of the DNP project involved two primary methods: Identifying risks and mitigating possible strategies for those risks. The proposed DNP project identified the following threats (a) scheduling, (b) disruptions, (c) privacy, and (d) elevated blood pressure before the intervention.

The nature of the ER schedule is unpredictable because emergency medical issues are not planned. The participants may be limited from participation due to understaffing or high patient load, or both. This is an unpredictable and an uncontrollable threat. Disruption is a threat which may negatively affect the project results. Unintentional noises or any other distractions need to be eliminated to ensure the accuracy of the results. Therefore, the project was held in a private ER administrative office with a closed door, and the DNP student stood at the closed door to further protect the participant from disruptions and to ensure privacy. In addition, the "Beats by Dre" headphones were used, which has a noise canceling technology for playing the mindfulness meditation compact disc (CD). This noise-canceling technology is intended to reduce unwanted external noise interference. If an elevated BP were discovered prior to the intervention, the result would be reported to the participant immediately. The participant would make the decision to obtain medical treatment/evaluation from the emergency room physician at the intervention site. The decision to continue with the intervention would be made by the participant.

Information Technology

Technology resources for the project included: (a) email correspondence, (b) laptop computer, (c) POMS2-SF developer's password-protected web site, (d) RStudio statistical computing software, (e) a USB drive, and (f) the university library database for research. Email correspondence for recruitment was completed using the inner-hospital server, which is protected by individual user passwords. The laptop computer used for all online work, software, and data entry is currently in possession of the student and is used solely for academia. The USB drive is password protected. The university library database was accessed by using the DNP student's password.

Additionally, a 15-minute mindfulness meditation CD and an audio player were used. Sound cancelling, over the ear headphones, made by Beats by Dre, were provided to each participant. After the usage, the headphones were cleaned with alcohol wipes. A password-protected computer and USB drive were used to store the collected data and other relevant information. The internet network of the implementation facility was also used to send out recruitment emails.

Project Budget

The total required budget for the project is $413. The budget included the following items: Watson's mindfulness CD, alcohol wipes for the cleaning the headphones after each participant completed the session, printed handouts and posters explaining this project, printed forms required for the IRB process, and the permission to use the POMS2-SF questionnaire including data analysis. No travel expenses were incurred, and the USB device was purchased new (see Table 1).

Table 1. *Budget*

Item	Description	Number	Cost
Jean Watson Mindfulness Meditation CD	15 Minute audio CD	1	$15.00
Alcohol Wipes	Utilized for cleansing headphones after each use	2 containers	($3.00 x 2) $6.00
Handouts/Posters	Explanation of study provided to participants	50 copies/3 Posters	($0.50 x 50) $25.00 ($10.00 x 3) $30.00
POMS2-SF Questionnaire/Permissions	Printed version of POMS2-SF Questionnaire/Permissions	200 copies	$265.00
POMS2-SF Manual	POMS2-SF Manual	1 copy	$68.00
USB 2.0 Flash/External Drive. 64 GB	Flash/External Drive for Data Storage	1	$13.00
Total Cost			$413.00

Design of Intervention

The purpose of this evidence-based practice (EBP) project was to implement a mindfulness meditation intervention to decrease emergency room nurses' stress. This project used a pre-test, post-test design to evaluate the effectiveness of the mindfulness meditation intervention that takes place over 3 months.

Blood pressure and pulse, as well as mood state assessed by the *Profiles of Mood States Second Edition-Short Form (POMS2-SF)* questionnaire were measured prior to,

and immediately following ER nurses' participation in a 15-minute mindfulness meditation intervention to assess for any changes in stress level.

Setting

The setting for this EBP mindfulness meditation intervention was the emergency room (ER) of a 400-bed hospital facility located in Florida. This ER employs approximately 50 registered nurses with 32 ER patient rooms, treats both pediatric and adult populations, and cares for approximately 50,000 patients per year.

Sample

The participant sample consisted of registered nurses (RN) working in the ER who voluntarily chose to participate in the 15-minute mindfulness meditation session(s) during their workday. All nursing staff members of the emergency room ($N = 50$) meeting the inclusion criteria were invited to participate in the mindfulness meditation sessions.

Inclusion Criteria

The inclusion criteria included RNs who are employed (full or part-time) in the ER of the project facility. There were not any limitations on the length of the employment history of RNs. Senior RNs, as well as new nurses, were accepted to participate in the project, but they had to meet other criteria as well. All RNs (full or part-time) regardless of assigned shift, had the opportunity to participate in the mindfulness meditation session during the regularly scheduled break in their workday. To be eligible for a regularly scheduled break, nurses must be assigned to work at least 8 consecutive hours during the assigned shifts.

Exclusion Criteria

ER staff, not employed as an RN or those unable to commit to a 15-minute intervention, were excluded from the project sample.

Recruitment Process

The department nurse manager sent an informational recruitment email (see Appendix D) to all eligible ER nurses and invite them to take part in the mindfulness intervention.

Posters providing detailed information were placed in the break area on two established emergency room bulletin boards (see Appendix G). The information, provided in both the informational email and on the posters, informed potential participants that participation was voluntary, and data collected would be kept confidential. An email address and personal phone number were provided for individuals who seek more information about the project. The email provided was the DNP student's academic email: ae563@mynsu.nova.edu.

Sample Size

Determining sample size is a crucial part of the planning phase of research (Malone et al., 2016). Although a larger sample size gives more accurate results (Smith, 2017), a minimum sample size provides the ability for appropriate resultant effects (Malone et al., 2016). Researchers may not detect the effects of an intervention with a sample size that is too small. (Smith, 2017). To determine the sample size, statistical calculations have been conducted. There are 50 nurses in the target population, and it was determined that having 30 participants in the project out of 50 available will equal 60% of the targeted population.

Data Collection Procedure

The participants' data were linked by collecting both pre/post POMS2-SF questionnaire and the demographic questionnaire and subsequently stapling this data together. The BP and HR data collected was initially handwritten by the student on the demographic form, and subsequently was inputted into a spreadsheet and uploaded to the RStudio software. The data was analyzed using RStudio software version 1.2. A mixed-model analysis of variance (ANOVA) was chosen to compare the physiological measurements of blood pressure and pulse, and the psychological measurement of the POMS-SF, to determine whether differences are found between measurements taken before and after the practices in two time points, pre/post-intervention. Demographic data collected included the participants' gender, age-range, and years of nursing experience. All information was obtained using a demographic survey as shown in Appendix J.

Instrumentation

The Profile of Mood States (POMS) questionnaire was utilized during the project. It was developed by McNair et al. in 1971. The original POMS questionnaire consisted of 65 self-report items rated on the five-point Likert Scale and the modified POMS 2nd edition short form (POMS2-SF) consists of 35 items. Questionnaire items include words or statements that describe feelings. The participant rates the appropriate mood at that time. Responses on POMS2-SF range from (0) *not at all*, to (4) *extremely*. The responses of the participants were entered by the DNP student into the POMS2-FS developers' website for interpretation of results provided in a numerical value. These responses indicated the impact of the intervention. The POMS2-SF questionnaire is attached as Appendix I. The collected information was stored in a locked file cabinet that meets

current fire/theft proof standards in the DNP students' private permanent residence. As part of the project process, all data was kept with the doctoral student.

Additionally, a manual blood pressure cuff and stethoscope, owned by the DNP student, were used to measure the vital signs before and after the intervention.

Validity and Reliability

A questionnaire's reliability describes if the tool gives consistent results each time it is used (Melnyk, & Fineout-Overholt, 2015). Validity refers to the obtainment of the study results that are grounded in sound scientific methods (Melnyk, & Fineout-Overholt, 2015). The reliability of the POMS-SF and its subscales were estimated by Cronbach's alpha values, which range from 0.57 to 0.88 ($p < 0.01$). The values indicate that POMS-SF is a reliable measure of mood (Onishi et al., 2016). The internal consistency of the estimates for this study was quite high across all samples and subscales. The Cronbach's alpha was 0.94 for the total mood disturbance score and ranged from 0.84 to 0.95 for each of the six subscales (Onishi et al., 2016).

Data Management and Storage

Original signed consent forms are kept in a locked file cabinet that meets current fire/theft proof standards in the DNP student's private, permanent residence. As part of the project process, data integrity has been maintained through careful data management. All data was collected, and entered into the DNP's laptop and into a secure, password-protected USB external drive to ensure privacy and confidentiality. The completed hardcopy of the POMS-SF has been maintained by the doctoral student in a locked file cabinet. The data have been and will be kept for at least 3 years for use in re-analysis or verification of research findings.

Data Analysis

Data analysis moderately mirrors Onishi et al.'s (2016) study. They used the POMS Questionnaire to measure mood, vital signs to measure stress relief. They used a variety of complementary therapies, whereas this project studied one complementary therapy: mindfulness meditation.

A mixed model analysis of variance (ANOVA) was planned to be used to analyze the data. This would have compared the differences between the two independent variables: the mindfulness meditation intervention and the BP and HR of participants by comparing associations within the variables. Unfortunately, the small sample size precluded conducting this analysis.

Expected Outcomes

Objective One

The first objective was to implement a mindfulness meditation intervention to decrease occupational stress in nurses who work in an emergency department. This objective was met by the delivery of a mindfulness meditation intervention to the ER nurses. Dr. Jean Watson's meditative CD was played for the participants.

Objective Two

The second objective was to evaluate the impact of a mindfulness meditation intervention on measures of stress in nurses who work in an ER. This objective was met by evaluating the physiological data, BP, and HR, obtained from the pre/post-intervention measures, and the qualitative data collected from the POMS2-SF questionnaire.

Ethical Considerations

Ethical research is crucial to generate evidence for nursing practice. To make the research ethical, researcher misconduct, also known as scientific misconduct, must be eliminated from a study. Researcher misconduct (lying, misrepresenting the data, disregarding the participants' safety) can lead to violation of human rights during a study and it may also lower the overall quality research (Gray, Grove, & Sutherland, 2017). To ensure the implementation of the ethical principles, risk assessments were conducted, and ethical components were considered in the planning phase of the project.

Institutional Review Board (IRB) Approval

In the United States, the Department of Health and Human Services (DHHS) uses Institutional Review Boards to protect human participants in scientific studies. Under this regulation, IRB must approve a research project, and then it must monitor the process to ensure all methods are used based on ethical principles without alteration (Gray et al., 2017). The DNP student obtained approval from the Nova Southeastern University (NSU) Institutional Review Board (IRB) on November 8, 2019 (see Appendix A). Additional research committee approval was obtained from the hospital where the DNP project occurred on December 20, 2019 (see Appendix E). A letter of support was obtained from the stakeholders of the practice site (see Appendix B).

Privacy and Confidentiality

To protect participant confidentiality, the participants were asked to provide their month and day of birth and the first two letters of their city of birth as unique identifiers. Then, the consent forms were stored separately in the possession of the DNP student.

Autonomy

According to Gray et al. (2017), to ensure ethics in a study, human participants need to be treated as autonomous agents. The term *autonomy* refers to freedom where study participants have the right to self-determination and they have a "freedom to conduct their lives as they choose without external controls" (Gray et al., 2017, p. 162). Considering the ethical importance of autonomy, each participant's autonomy was ensured during the study. Before the intervention, the ER nurses were informed about the proposed study fully and they could choose voluntarily to participate. To confirm their voluntary participation, study participants signed the Informed Consent Form (Appendix C).

Fidelity

Fidelity is one of the important aspects of conducting the research with precise accuracy. Fidelity is also referred to as integrity in the medical field, and it helps researchers to translate research into practice (Hilderbrand, 2018). During the project, participant fidelity was maintained because the EBP intervention was consistently applied each time to each participant without alteration. This ensured each data set was collected the same way and participants are informed each time to ensure fidelity.

Information Collection and Access

Throughout the DNP project, the data was handled only by the DNP student. This ensured that the privacy and confidentiality of the participants were maintained. After acquiring full consent from the ER nurses, the participants' blood pressure, heart rate, and mood states were measured before and after the mindfulness meditation intervention. This information was recorded manually, directly on the demographic questionnaire. The

POMS2-SF questionnaire was completed manually by the participants, then data entry was made by the DNP student into the developer's password-protected website for analysis. Both paper results were initially placed in the DNP student's attaché for security and confidentiality. Subsequently, these documents were placed in a locked file cabinet. The DNP student inputted all data.

The data were stored on a password protected encrypted USB drive, and on the DNP student's academic laptop computer that is also password protected. General data security in this project was ensured through password protection, whereas identifiable data was secured in the DNP student's possession.

Safeguards for Unintentional Complications

As discussed previously, unintentional complications may arise during the intervention. The following complications were identified as potential threats: disruptions during the intervention, scheduling obstacles, participant privacy, and elevated blood pressure prior to the intervention. To eliminate possible disruptions, the intervention was held in a private ER administrative office with a closed door with the DNP student guarding the door, and with noise cancelling headphones. Scheduling obstacles were uncontrollable. Participant privacy was protected by the closed door and the DNP student guarded the room.

If an elevated BP were discovered prior to the intervention, the result would be reported to the participant immediately. The participant made the decision to obtain medical treatment/evaluation from the emergency room physician in which this intervention takes place. The decision to continue with the intervention was also be made by the participant.

Chapter Summary

The proposed EBP intervention sought to reduce ER nurses' stress through a mindfulness meditation intervention using a 15-minute audio CD. This EBP project may offer an effective intervention to address ER nurse stress, thereby allowing evidence to be applied in practice in a way that can be replicated at other ERs. During the proposed project, the POMS2-SF form was utilized as a self-report instrument. According to Onishi et al., (2016), the POMS2-SF has achieved wide acceptance as a measurement instrument for assessing psychological distress in a variety of health populations. Psychological distress is a manifestation of psychological discomfort that may be experienced as various mood symptoms, such as stress that is experienced from anxiety, pressures, or emotions (Arvidsdotter et al., 2015). Participants in this intervention may provide evidence if a measurable reduction in self-perceived stress according to the POMS questionnaire, with corresponding data about systolic blood pressure (SBP), diastolic blood pressure (DBP), and heart rate (HR) was achieved.

The intervention/outcomes in this project's findings were not necessarily limited to this medical institution; they are likely applicable to other emergency rooms (ERs). The results may also be informative to nurses in other settings about stress and subsequent burnout. Focusing on ER nurses' stress could help address the problem of high nurse turnover, thereby addressing inadequate staffing levels, which is a major cause of nurse burnout (Adriaenssens, De Gucht, & Maes, 2013).

Chapter Four: Results and Discussion

This chapter provides the results and discussion from the mindfulness meditation session that was implemented to decrease the stress levels of nurses who work in the emergency room at a hospital. During the DNP project, Watson's theory of human caring was used as the theoretical framework. Additionally, the relevance of the project to the DNP essentials will also be discussed.

Participant Demographics

Eighteen participants received the mindfulness meditation intervention and completed the project as planned. Each participant completed the intervention once on average; one person took the intervention twice. Eighty-eight percent of participants (n = 16), were female and 12% (n = 2) were male. The mean age of the participants was 39.8 years (SD = 4.5) and their mean work experience in the ER department was 11.7 (11.3 %) years. All participants were employed by the project facility. Participants worked at the Emergency Room at the project facility for 7.8 years (SD =10.4) years.

Table 2. *Demographics*

Measure	*Mean*	*SD*	*Median*	*Inter Quartile Range (IQR)*
Age	39.8	14.5	33.5	28
Years as an ER Nurse	11.7	11.3	6.0	13.0
Years at Current Position	7.8	10.4	2.5	8.0
Number of Completed Interventions	1.1	.2	1.0	1.0

Expected Outcomes

Objective One

The first objective was to implement a mindfulness meditation intervention to decrease occupational stress in nurses who work in an emergency department.

Outcome

This objective was met by the delivery of a mindfulness meditation intervention to the ER nurses. Dr. Jean Watson's meditative CD was played to participants.

Objective Two

This objective was to evaluate the impact of a mindfulness meditation intervention on measures of stress in nurses who work in an ER.

Outcome

This objective was also met by evaluating the physiological data obtained from the pre/post-intervention BP and HR measures, as well as the qualitative subjective data collected from the POMS2-SF questionnaire.

Evaluation of Outcomes

The physiological, BP and HR, data was obtained from the pre/post-intervention measures to evaluate the impact of the mindfulness meditation intervention on measures of stress in nurses who work in an ER. In addition, the qualitative data was collected from the POMS2-SF questionnaire and were measured and evaluated.

The distribution and dispersion of data were examined first. Summary tables of continuous variables, the arithmetic mean, standard deviation, median, and interquartile range are presented to one decimal place (see Tables 3 and 4).

Table 3. *Summary of Data Collected*

Measure	Mean	*SD*	Median	*IQR*
		POMS Test		
Pre-test	47.2	8.7	45	11.0
Post-test	39.4	10.7	39.5	9.0
Percent Change	-15.2	20.3	10.8	8.8
		Systolic BP		
Pre-test	126.7	16.6	123.0	12.0
Post-test	115.7	13.8	110.0	10.0
Percent Change	-8.4	4.2	-8.2	4.9
		Diastolic BP		
Pre-test	75.6	8.4	74.0	10.0
Post-test	79.4	6.3	70.0	4.0
Percent Change	-7.6	8.4	-6.4	14.2
		Heart Rate (Pulse)		
Pre-test	68.7	9.3	68.0	16.0
Post-test	65.0	9.9	65	12.0
Percent Change	-5.3	7.2	-5.2	10.0

To look for differences between all measures individually, Wilcoxon signed rank-sum test was conducted, which is the non-parametric version of a paired samples t-test because the researcher did not assume the data were normally distributed. Next, the percentage change for all measurement results were calculated.

Then, regression models were created to see the impact of the participants' age, years as an ER nurse, years at Boca ER, and the number of times completing the intervention, on the percentage change in BP and HP. Measures of effect size, 95% CI and *p*-values of all covariates included in the model are presented in statistical analysis outputs. All hypothesis testing was carried out at the 5% (2-tailed) significance level. P-values are rounded to three decimal places. Stata (Version 16.1) was used for all

descriptive calculations, group comparisons, and conditional regression modeling. The results of each variable are outlined below and to support those statements, tables were created for each variable with descriptive statistics.

POMS2-SF Questionnaire

The results of the intervention indicated that nurses felt significantly relaxed after receiving mindfulness intervention. Their POMS2-SF questionnaire stress indicators decreased significantly once they completed a session of mindfulness meditation.
It was found that the mean post-POMS ($M = 39.4$) was statistically significantly lower than the mean pre-POMS ($M = 47.2$). The level of significance was $p < 0.001$. The datasets are illustrated in Table 4.

Table 4. *POMS Results*

Pre-Intervention		Post-Intervention		Percent Change		*p*	
Mean	Median	Mean	Median	Mean	Median	*Mean*	*Median*
47.2	45.0	39.4	39.5	-15.3	-10.8	< 0.001*	< 0.001*

Blood Pressure and Heart Rate

This project compared the blood pressure and pulse scores to determine whether differences are found between measurements taken before and after the practices in two time points, pre/post-intervention. The results indicated that mean of post-systolic BP ($M = 115.7$) was statistically significantly lower ($p < 0.001$) than the mean of pre-systolic BP ($M = 126.7$). Similarly, the mean of post-diastolic BP ($M = 69.4$) was statistically significantly lower ($p < 0.001$) than the mean of pre-diastolic BP (M=75.6).

Table 5. *Blood Pressure Results in mm Hg*

BP Measure	Pre-Intervention		Post-Intervention		Percentage change		Level of Significance
	Mean	Median	Mean	Median	Mean	Median	
Systolic	126.7	123.0	115.7	110.0	-8.4	-8.2	$p < 0.001$*
Diastolic	75.6	74.0	69.4	70.0	-7.6	-6.4	$p = 0.001$*

The results of Pre/Post-intervention HR measurements also indicated that participants' pulse was significantly reduced after a session of mindfulness meditation. The resultant measurements utilized Wilcoxon signed rank-sum test. More specifically, the mean of post-intervention pulse ($M = 65$) was statistically significantly lower ($p = 0.005$) than the mean of pre-pulse ($M = 68.7$). Also, refer to Table 6.

Table 6. *Heart Rate Results*

Pre-Intervention		Post-Intervention		Percentage change		Level of Significance of Percent Change	
Mean	Median	Mean	Median	Mean	Median	Mean	Median
68.7	68.0	65.0	65.0	-5.3	-10.8	$p = 0.005$	$p = 0.005$

Results of the regression models demonstrated no significant association between model-predictors (participants' age, years as an ER nurse, years at Boca ER and time-to-complete the program) and percentage change in POMS, diastolic BP or pulse. Gender was not included because the data set consisted of two men. A significant effect of age

was found for the percentage change in systolic BP. The average age of the participants was 39.8 years (SD = 14.5). For every one-unit increase in age, percentage change in systolic blood increased by 0.33 (Table 7).

Table 7. *Regression Parameter Estimates for Percent Change*

POMS Percent	Coef.	SE	t	*p* > t	Lower 95% CI	Upper 95% CI
Age	0.62	0.82	0.75	0.47	-1.16	2.39
Years as ER-Nurse	0.14	1.74	0.08	0.94	-3.62	3.91
Years at Boca ER	-0.72	1.43	-0.50	0.63	-3.81	2.38
Time Completing	1.23	25.16	0.05	0.96	-53.13	55.59
_cons	-37.27	26.98	-1.38	0.19	-95.55	21.02
Systolic BP	Coef.	SE	t	*p* > t	Lower 95% CI	Upper 95% CI
Age	0.33	0.15	2.30	0.04	0.02	0.65
Years as ER-Nurse	-0.45	0.31	-1.46	0.17	-1.12	0.22
Years at Boca ER	-0.00	0.25	0.00	1.00	-0.55	0.55
Time Completing	-1.67	4.46	-0.37	0.71	-11.30	7.97
_cons	-14.75	4.78	-3.09	0.01	-25.08	-4.42
Diastolic BP	Coef.	SE	t	P > t	Lower 95% CI	Upper 95% CI
Age	0.16	0.30	0.55	0.59	-0.48	0.80
Years as ER-Nurse	-0.33	0.63	-0.53	0.61	-1.69	1.03
Years at Boca ER	-0.01	0.52	-0.01	0.99	-1.12	1.11
Time Completing	6.82	9.09	0.75	0.47	-12.82	26.45
_cons	-17.41	9.75	-1.79	0.10	-38.47	3.65
Heart Rate	Coef.	SE	t	P>t	Lower 95% CI	Upper 95% CI
Age	0.14	0.29	0.47	0.64	-0.48	0.75
Years as ER-Nurse	0.08	0.60	0.13	0.90	-1.22	1.39
Years at Boca ER	-0.46	0.50	-0.93	0.37	-1.54	0.61
Time Completing	-1.59	8.73	-0.18	0.86	-20.46	17.27
_cons	-6.43	9.36	-0.69	0.50	-26.66	13.80

Figure 1: A visual comparison of the mean pre/post-intervention measurements.

Discussion

The participants in the project expressed great interest in the intervention. Once the relaxing benefit of mindfulness meditation was experienced by the participants, they referred their co-workers to do the same. Stress has the potential to reduce a nurse's ability to provide compassionate care (Wilkinson et al., 2017).

Limitations

Some limitations of this project included Covid-19, the use of a manual blood pressure cuff and time obstacles. The attempt to control the Covid-19 pandemic resulted in a statewide declaration of emergency that required a quarantine and clinical students were prohibited to attend their clinical sites. The timing of this pandemic occurred near the end of the implementation phase of the project, which resulted in the collecting data from fewer participants than desired. This affected the data analysis procedure because the ANOVA would no longer be feasible for the smaller data set.

The decision to use a manual blood pressure cuff was a limitation of the project because an automated blood pressure cuff may have provided a more accurate result. Although the DNP student was the only person obtaining the blood pressure readings, it

is recognized that this may have an innate bias. The concern with utilizing an automated blood pressure cuff was that of obtaining a biomedical instrumentation accuracy verification. As well as the ability to procure said automated blood pressure cuff consistently during the implementation of the project as the emergency room may have a patient need for the automated blood pressure cuff.

The availability of nursing staff was a limitation of the project because the interested nurses were not always available due to schedule constraints. Some nurses wanted to participate in the intervention; some even scheduled for it, but given the nature of work in the ER department, they could not leave their patients unattended. Nurses were unable to procure replacements to oversee their patients at high patient load times.

Additionally, there was a small logistical limitation. The limitations involved procuring the items needed from the ER, particularly a reclining chair that went missing at times. The project was designed under the assumption that some resources would be used from the facility's ER meeting room. As a solution, a sign was placed on the chair and the chair was left in the meeting room with permission from the ER manager.

Recommendations for future studies include having a control group and a larger sample size. A large sample size increases the confidence levels, whereas a control group helps to eliminate the biases. It is important to note that further research with a control group is needed to determine if the 15-minute Mindfulness Meditation is more effective in relieving the stress of ER nurses than the nursing having a regular 15-minute rest from their job.

Implications for Nursing Practice

Scientific Underpinning for Practice

According to AACN (2006), DNP graduates should be prepared to translate scientific knowledge into effective interventions that will benefit their patients and overall human well-being. In other words, DNP prepared nurses should know how to use science as a foundation to determine healthcare problems and effectively address them using evidence-based interventions. In the case of the DNP Project, nursing stress presents a serious healthcare issue in the US.

The majority of scientific literature supports the fact that ER nurses are experiencing constant stress (Bellagamba et al., 2015; d'Ettorre & Greco, 2016; Duffy et al, 2015; Halter et al., 2017), which negatively affects the nurses' well-being and the quality of care they deliver (Golonka et al., 2017; Westphal et al., 2015). One of the potential interventions for this issue is mindfulness meditation. Mindfulness intervention was already tested to be effective against stress during some of the scientific studies (Gauthier et al., 2015; Klatt et al., 2015; Mahon et al., 2017; Song & Lindquist, 2015; van der Riet et al., 2018).

Because the findings of the DNP project suggest that mindfulness meditation has a positive impact on stress symptoms, the intervention can be implemented in the medical organizations that are willing to allocate a break for their nurse to conduct mindfulness meditation. That way, their nurses and other healthcare workers, who are prone to stress, can receive a short session of the intervention regularly.

Strengths

The findings from the DNP project indicated that mindfulness meditation has the potential to reduce nursing stress. The pre-and-post intervention measurements indicated that mindfulness meditation dropped systolic and diastolic blood pressure score, heart rate, and lead to the statistically significant improvements in psychological stress indicators of POMS-2F Questionnaire.

Findings also revealed that the Evidence-Based Intervention (EBI), which used Watson's theory of human caring as a framework, was effective in reducing the ER nurses' stress. Additionally, some nurses who underwent a session of intervention referred others, which might have been an early indication that the nurses were experiencing a benefit of mindfulness meditation.

Organizational and System Leadership

DNP graduates should not only focus on delivering direct care to patients, but also be able to determine the needs of communities and a set of populations (AACN, 2006). Thus, DNP graduates must be proficient in quality improvement strategies and in creating and sustaining changes at the organizational and policy levels (AACN, 2006).

Because the finding of the DNP project indicates that mindfulness meditation can be used to reduce stress, leaders of the implementation facility can use it to address the on-going issue of nursing stress. For example, they can allocate breaks and break areas for nurses so the nurses could practice the intervention without disturbances. As a nursing leader, the DNP graduate can contribute to the systematic implementation by engaging in policy stages.

If the intervention works as intended and produces effective outcomes against stress in one facility, then it can be implemented in other healthcare organizations as well. Overall, having effective intervention to address nursing stress may benefit the whole healthcare organization. Because stress can be detrimental to the quality of healthcare and lead to medical errors (Golonka et al., 2017), it is logical to assume that healthcare organizations may use it to improve the quality of healthcare services while contributing to the well-being of nurses.

Clinical Scholarship and Analytic Methods

DNP graduates should be able to review scientific literature (AACN, 2006). Using this literature, they should be able to design safe and ethical evidence-based interventions and to evaluate its effectiveness against a certain issue by utilizing analytical methods (AACN, 2006). The essential is crucial and vague at the same time. However, the core of the DNP essential states that the graduates should be able to analyze already available scientific data and design a new evidence-based intervention that will fit a specific goal (AACN, 2006). Once the project is fully implemented, DNP graduates need to evaluate the accumulated data to generate evidence for nursing practice (AACN, 2006).

In the case of this mindfulness meditation, the DNP student used Watson's theory of human caring as a framework. Dr. Watson's 15-minute mindfulness CD was played to each participant and collected pre/post-intervention data to evaluate the intervention outcomes. At the end of the evaluation, the project produced statistically significant results that indicate mindfulness meditation has the potential to reduce stress. So, the

generated evidence can be used in the nursing practice, although the intervention needs to be tested in other healthcare facilities, using a larger sample and having a control group.

Information Systems/Patient Care Technology

DNP graduates should possess proficient skills in information technologies and systems to improve patient care and support healthcare systems (AACN, 2006). Also, the graduates need to claim leadership positions to choose and implement new technologies into the nursing practice and know-how to operate them properly (AACN, 2006). Additionally, the graduates should oversee the usage of healthcare technologies, so nurses and other healthcare professionals use it correctly and comply with ethical principles while using them.

During the DNP project, Stata (Version 16.1) statistical computing software, POMS-2F questionnaire website, library databases, and technologies such as CD player and headphones with noise-canceling capability were utilized. Additionally, the DNP student created Microsoft PowerPoint slides to outline and present the primary points of the project. A password-protected USB was also used to keep the accumulated data private to ensure the confidentiality of participants. Overall, technology played a crucial role during the literature review, design, recruitment, implementation, and analysis stages of the DNP project. Using all the mentioned technologies, the DNP student gained knowledge and experience on how to use them correctly. Now, the student can recommend those technologies to others, so they may implement mindfulness mediation in different healthcare organizations.

Healthcare Policy and Advocacy

AACN (2016) stresses the importance of advocacy for DNP graduates. The general definition of advocacy refers to finding a known issue, educating others about it, and influencing the public and policymakers by offering an effective solution (AACN, 2006). Advocacy requires active engagement in meetings, committees, boards, task forces at both local and international levels (AACN, 2006). When advocating, one should have a well-defined issue and a solid solution that is both scientifically and ethically viable.

The DNP project aimed at finding a solution to nursing stress. Because the project's statistical findings indicated that mindfulness meditation has a promising impact against stress, and the participants accepted the implementation well, the DNP student can promote it within the implementation site and in other healthcare facilities. For example, the primary focus of the advocacy is to get healthcare organizations to develop healthcare policies that may grant nurses special breaks and access to resources so they could practice mindfulness meditation as a self-care. According to a study conducted by A. Nejati et al. (2015), if healthcare organizations offered quality breaks and better-designed break areas for their staff, it would be beneficial for nurses and their patients. When nurses feel they are cared for by the organization, they may be satisfied with their job. Consequently, nurses' job satisfaction plays a vital role in increasing the quality of patient care (Lu et al., 2019).

Interprofessional Collaboration

Issues are typically better resolved through a collaborative effort. Interprofessional collaboration requires the coordinated participation of professionals

from multiple fields to tackle a specific issue (AACN, 2006). The DNP essentials state that graduates should not only participate in team-based activities, but they should also claim leadership roles in certain situations to establish those interprofessional teams (AACN, 2006). The interprofessional collaboration was essential during the planning and implementation of the DNP project as the project required approval and assistance from other professionals.

During the project, the DNP student worked in coordination with the management team of the implementation site to conduct the project as intended. Also, the DNP student utilized the assistance of the ER nurse manager to recruit nurses and worked with a professional statistician to evaluate the project outcomes. Because the project was mainly focused on improving quality, it was accepted well by the administration of the facility and received approval to hold the intervention in the facility's premises.

Generally, nursing stress is an issue that needs to be addressed through interprofessional collaboration. Therefore, the DNP student is going to engage in advocacy, creating informative PowerPoint slides, and presenting them at local and online meetings. All this effort is aimed at garnering support from colleagues, co-workers, management, and policy makers to implement the intervention into practice. For example, the DNP nurse must work with policy makers, hospital management, and healthcare leaders to develop strategies such as mindfulness that has the potential to decrease nurses' stress in the work environment.

Clinical Prevention and Population Health

Prevention measures are as important as medical treatments. According to Essential VII, clinical prevention measures include health promotion, illness prevention,

and risk reduction (AACN, 2006). The DNP graduates should have skills to analyze the data from populations, communities, and groups with various socio-economic backgrounds to determine the prevalence of certain health conditions. Accessing to available scientific data, DNP graduates should be able to promote effective measures that may prevent groups from developing health conditions.

The DNP project focused on implementing a mindfulness meditation intervention to decrease emergency room nurses' stress. The scientific literature agrees that nurses who work in fast-paced, high acuity environments are at risk for occupational induced stress (d'Ettorre & Greco, 2016; Duffy et al., 2015; Halter et al., 2017). Thus, the project was designed to find an effective solution that may alleviate nursing stress. The findings indicated mindfulness mediation can reduce the symptoms of stress such as blood pressure and heart rate. Therefore, the intervention can be used as a preventative measure against the symptoms of stress which when left unresolved may lead to burnout.

Advanced Nursing Practice

Addressing nursing stress can have a positive impact on the nursing profession. Nursing stress has an impact on healthcare outcomes in the clinical setting (Welp et al., 2015). Currently, the workload of emergency room nurses is increasing in intensity and some are even leaving this arena of practice because of stress-induced burnout (Abbaszadeh et al., 2017; Wilson et al., 2017; Wolf et al., 2017). As a result, those who remain in the profession are often predisposed to negative personal health outcomes such as high levels of stress, which may influence their performance and the quality of care (Debucquoy-Dodley, 2013).

The results of the mindfulness meditation showed that the intervention can be an effective measure to release occupational stress from nurses who are working in the ER setting. Relaxed and mindful nurses may contribute to achieving improved healthcare outcomes by caring for patients with more compassion and energy. For instance, a study indicated that if health care professionals learn the true value of practicing healthy behaviors, they are more likely to share those health behaviors with their patients and recommend using those practices regularly (Costello & Barron, 2017). Generally, nurses' job performance may improve. Additionally, the reduction of nurse stress may be an effective means of recruiting and retaining new nurses to the nursing profession, which may address the nation's on-going nursing shortage (Alilu et al., 2017).

Conclusions

The DNP project was designed to alleviate the stress experienced by ER nurses using a mindfulness meditation intervention. During the DNP project, 18 ER nurses, who were employed at the implementation site, listened to a 15-minute mindfulness meditation CD facilitated by Dr. Jean Watson. Before the intervention, the DNP student measured the blood pressure and heart rate and had the participants complete the POMS2-SF questionnaire to record the participants' stress indicators. After they received the intervention, the same measurements were conducted again to determine the impact of the intervention. Findings indicated that mindfulness meditation intervention reduced blood pressure, heart rate, and POMS2-SF stress indicators.

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Appendix A: NSU Institutional Review Board Approval

review date.

Changes: Any changes in the study (e.g., procedures, consent forms, investigators, etc.) must be approved by the IRB prior to implementation using the Amendment Form.

Post-Approval Monitoring: The IRB Office conducts post-approval review and monitoring of all studies involving human participants under the purview of the NSU IRB. The Post-Approval Monitor may randomly select any active study for a Not-for-Cause Evaluation.

Final Report: You are required to notify the IRB Office within 30 days of the conclusion of the research that the study has ended using the IRB Closing Report Form.

Your study was approved under the following criteria:

- Consent Participants according to criteria of 45 CFR 46.116 and 45 CFR 46.117

Translated Documents: No

Please retain this document in your IRB correspondence file.

CC: Marcia Derby-Davis

Marcia Derby-Davis

Appendix B: Signed Letter of Support

Appendix C: Informed Consent Form

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2. After the blood pressure and pulse are taken and recorded, the participants will be asked to complete the demographic questionnaire and the POMS2-SF tool before the mindfulness meditation session.

3. The participants will be asked to lay on a stretcher located near the administration offices in the emergency room with a closed door where they will listen to the mindfulness meditation CD for 15 minutes.

4. At the completion of the mindfulness meditation CD, the blood pressure and pulse will be obtained again by the DNP student and recorded on the demographic questionnaire.

5. The participants will then be asked to complete the post-intervention POMS-SF survey.

Are there possible risks and discomforts to me?

This research study involves minimal risk to you. To the best of our knowledge, the things you will be doing have no more risk of harm than you would have in everyday life. In the case of an elevated blood pressure or pulse reading you will be notified by the DNP student and you will decide what action you may need to take.

What happens if I do not want to be in this research study?
You are not required to participate, this is a completely voluntary intervention. You have the right to leave this research study at any time, or not be in it. If you do decide to leave or you decide not to be in the study anymore, you will not get any penalty or lose any services you have a right to get. If you choose to stop being in the study, any information collected about you **before** the date you leave the study will be kept in the research records for 36 months from the end of the study but you may request that it not be used.

What if there is new information learned during the study that may affect my decision to remain in the study?
If significant new information relating to the study becomes available, which may relate to whether you want to remain in this study, this information will be given to you by the investigators. You may be asked to sign a new Informed Consent Form, if the information is given to you after you have joined the study.

Are there any benefits for taking part in this research study?
It is hoped that emergency room nurses' experience a decrease in stress. There is no guarantee or promise that you will receive any benefit from this study. We hope the information learned from this research study will benefit other people with similar conditions in the future.

Will I be paid or be given compensation for being in the study?

You will not be given any payments or compensation for being in this research study.

Will it cost me anything?

There are no costs to you for being in this research study.

How will you keep my information private?

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Information we learn about you in this research study will be handled in a confidential manner, within the limits of the law and will be limited to people who have a need to review this information. The DNP student in the sole keeper of all confidential material. No names are collected, however unique identifiers will be collected. Although this information will be collected, every effort will be made to keep your information confidential. No information will be shared with your place of employment. This data will be available to the researcher, the Institutional Review Board and other representatives of this institution, and any regulatory and granting agencies (if applicable). If we publish the results of the study in a scientific journal or book, we will not identify you. All data will be kept for 36 months from the end of the study and destroyed after that time by shredding of hard copy papers and deletion of data entry.

Whom can I contact if I have questions, concerns, comments, or complaints?

If you have questions now, feel free to ask us. If you have more questions about the research, your research rights, or have a research-related injury, please contact:

Primary Investigator:

Andrea L. Entus
ae563@mynsu.nova.edu

Research Participants Rights
For questions/concerns regarding your research rights, please contact:

Institutional Review Board
Nova Southeastern University
(954) 262-5369 / Toll Free: 1-866-499-0790
IRB@nova.edu

You may also visit the NSU IRB website at www.nova.edu/irb/information-for-research-participants for further information regarding your rights as a research participant.

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Research Consent & Authorization Signature Section

Voluntary Participation - You are not required to participate in this study. In the event you do participate, you may leave this research study at any time. If you leave this research study before it is completed, there will be no penalty to you, and you will not lose any benefits to which you are entitled.

If you agree to participate in this research study, sign this section. You will be given a signed copy of this form to keep. You do not waive any of your legal rights by signing this form.

SIGN THIS FORM ONLY IF THE STATEMENTS LISTED BELOW ARE TRUE:

- You have read the above information.
- Your questions have been answered to your satisfaction about the research.

Adult Signature Section

I have voluntarily decided to take part in this research study.

Printed Name of Participant	Signature of Participant	Date
Printed Name of Person Obtaining Consent and Authorization	Signature of Person Obtaining Consent & Authorization	Date

Appendix D: Introductory Informational Email to Potential Participants

Research: Emergency Room Nurse Stress

Dear Possible Participant,

I am Andrea L. Entus, a Doctorate Nurse Practitioner (DNP) student at Nova Southeastern University. I will be requesting your participation in my evidence-based intervention, as I am conducting a project to alleviate nurse occupational stress in the emergency room setting. I will ask of you to complete a mindfulness meditation session utilizing Dr. Jean Watson's CD, which includes obtaining your blood pressure, pulse, and a stress survey before and after the session.

You are eligible to participate in this project as long as you are an emergency room nurse. Before you give your consent to participate, it is important that you read and fill the informed consent form that will be provided to you. You are encouraged to clarify information and ask all questions you need answered to be sure you understand what you will be asked to do. Note that your participation or withdrawal from this project has absolutely no repercussions, and your information is obtained with the highest regard for confidentiality.

I look forward to your cooperation and many thanks in helping to improve the profession of nursing.

In Scholarship,

Andrea L. Entus

ae563@mynsu.nova.edu

Appendix E: Research Committee Site Approval

Appendix F: Institutional Review Board Confirmation

Appendix G: Poster Detailed Information

Appendix H: Participant Cover Letter

Informed Consent Agreement

Research: Emergency Room Nurse Stress

Dear Participant,

I am Andrea L. Entus, a Doctorate Nurse Practitioner (DNP) student at Nova Southeastern University. I request your participation in my evidence-based intervention. You are eligible to participate in this project as long as you are an emergency room nurse, and you have served in the emergency room for at least six months. You were recruited because your nurse administrator permitted me to inform you of this opportunity. Before you give your consent to participate, it is important that you read and fill the informed consent form that will be provided to you. You can clarify information and ask all questions you need answered to be sure you understand what you will be asked to do. Note that your participation or withdrawal from this project has absolutely no repercussions.

I look forward to your cooperation and many thanks in helping to improve the profession of nursing.

In Scholarship,

Andrea L. Entus

Appendix I: Copy of the POMS2-SF Questionnaire

Appendix J: Demographic Questionnaire

Please respond to the following questions.

1. What is your age? _____(years)
2. What is your gender? Male _____ Female _____
3. How many years have you worked as an emergency room nurse?

   _____

4. How many years have you worked at this current location? _____
5. How many times have you participated in this mindfulness meditation session?

   _____

6. Please provide the day of the month of your birth (eg. June 27 = 27, June 6 = 06).

   _____

7. Please provide the first two letters of the city you were born in _____

<u>To be entered by DNP Student:</u>

Pre-intervention BP:_____systolic_____diastolic

Pre-intervention Pulse:_____

Post-intervention BP:_____systolic_____diastolic

Post-intervention Pulse:_____