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Stress Management Among Healthcare Workers During a Pandemic

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Stress Management Among Healthcare Workers During a Pandemic

A Scholarly Project Presented to the Faculty of the
Nicole Wertheim College of Nursing and Health Sciences

Florida International University

In partial fulfillment of the requirements
For the Degree of Doctor of Nursing Practice

By

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Approval Acknowledged: _____, DNP Program Director

Date: _____

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Abstract

Background: Approximately- 59 million healthcare workers worldwide provide healthcare at any given time. Many of these workers experienced increased stress and daily adversity during the COVID-19 pandemic.

Purpose: The purpose of this DNP project was to evaluate if the use of a newly developed, evidenced-based mindfulness meditation program could help front-line healthcare workers manage perceived stress. There were two specific DNP project aims. The first was to develop and implement an evidence-based mindfulness meditation program to help front-line healthcare workers manage pandemic-related stress during the pandemic. The second aim was to evaluate the use and impact of the web-based mindfulness meditation program on perceived stress among participants.

Methodology: One group of primary care healthcare providers at a south Florida clinic were assessed before, and two weeks after, the mindfulness meditation program. A survey was administered remotely. The Perceived Stress Scale (PSS), a psychological instrument, was used to measure perceived stress among participants. Additionally, survey items were developed to assess familiarity with mindfulness practice and the frequency of use of the mindfulness practice. Participant demographics included age, gender, and professional role.

Intervention: A 30-minute mindfulness program that focused on meditation techniques was available on YouTube for a two-week period.

Results: Eleven healthcare workers participated in the project. Data were available for 11 participants before the intervention and 8 participants post-intervention. The participants were

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primarily women (n = 10). The mean PSS score prior to the intervention was 21.90 (SD = 8.05), and after the intervention the PSS score was 17.37 (SD = 9.11). Both mean scores indicate moderate levels of stress. There were no statistically significant differences pre versus post-intervention in PSS mean scores or individual PSS items. Following exposure to the web-based intervention, most of the participants, 57% (n = 4), found the mindfulness program to be helpful “fairly often,” while 28% (n = 2) found it to be very helpful.

Conclusion: Web-based mindfulness meditation programs have been proven to be well-received, feasible, and effective in decreasing perceived stress among healthcare workers. Administrators should consider making mindfulness meditation programs available to employees to address stress, especially during a pandemic.

Keywords: stress, stress management, pandemic, mindfulness, meditation technique

The Problem

Frontline healthcare workers (HCWs) face an increased amount of both physical and mental stress as a result of working during a pandemic. It is estimated that “1 in 6 health care workers providing care to affected patients during a pandemic develop significant stress symptoms” (McAlonan et al., 2020, p. 244). Many factors, such as personal protective equipment (PPE) shortages, increased patient load, a high mortality rate among patients and colleagues, as well as fear of contracting the disease, have been cited as contributing factors to mental anguish (Gupta & Sahoo, 2020). Since the outbreak of COVID-19, over 500,000 HCWs have been infected and close to 7,000 have died (Center for Disease Control [CDC], 2020). Overall, HCWs were found to be 103 times more likely to be exposed to deadly pathogens during previous pandemics than non-HCWs (Li et al., 2018). During the Ebola outbreak, 8.07%

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of HCWs in Liberia and 6.85% in Sierra Leone died, compared to 0.11% and 0.06% of the general population (Evans et al., 2015).

Healthcare workers during the pandemic have higher levels of insomnia, anxiety, depression, somatization, and obsessive-compulsive symptoms (Zhang et al., 2020b). During the COVID-19 pandemic, 42.7% of HCWs have reported symptoms such as headaches, throat pain, and lethargy, which were linked to psychological outcomes (Wasim et al., 2020). In addition, 6.5% of HCWs admit to suicidal ideation as well as lower self-perceived health status (Hong et al., 2020). Fear among HCWs, particularly fear of the unknown, fear of dying, or fear of infecting a loved one, all create a higher level of stress.

Previous pandemics have highlighted how vulnerable frontline HCWs are to stress and stress-related mental illness. Gupta and Sahoo (2020) found 73% of frontline workers have reported post-traumatic stress disorder (PTSD), 27.5% to 50.7% exhibited depression symptoms, 36% experienced insomnia, and 45% experienced anxiety during a pandemic outbreak. Gupta and Sahoo (2020) found that concern of being exposed during an outbreak and exposing loved ones creates major stress among frontline workers. Such concern is valid since 30% of cases of COVID in HCWs are related to workplace exposure. Additionally, social isolation, fear of exposing loved ones, compassion fatigue and lack of an effective treatment all impact emotional health and well-being (Gupta & Sahoo, 2020). The American Psychological Association ([APA], 2020) identified the need to provide mental health support for frontline healthcare providers due to higher levels of stress associated with the pandemic.

Background

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During pandemics, life is altered due to the government implementing extraordinary measures, restricting movement, and imposing measures of social isolation in an effort to reduce the spread of the disease (Chen et al., 2020). During the COVID-19 pandemic, entire countries, including Italy, China, and several others, have been forced to completely shut down in order to limit transmission (Chen et al., 2020). Such drastic moves will no doubt psychologically affect all sectors of the population.

Preserving the mental well-being of frontline HCWs is an important component in combatting a pandemic. Those exposed to highly infectious patients during a pandemic are most likely to suffer from anxiety, depression, and PTSD (Ho et al., 2020). Ho et al. (2020) found that female nurses, nurses working in epicenters, and nurses with fewer years of experience were more likely to be affected.

In a previous pandemic, high levels of stress have been especially crushing to HCWs assigned to SARS wards. These healthcare providers were found to have two to three times higher levels of PTSD than their counterparts who did not have such experiences (Wu et al., 2020). High levels of stress can be dangerous and, if left untreated, may result in anxiety, depression, PTSD, and suicidal ideation (Ho et al., 2020). During the 2003 SARS pandemic, 20% of those affected globally were HCWs (Branswell, 2013). In a study conducted in East Taiwan Hospital during the SARS pandemic, 5% of the staff suffered from Acute Stress Disorder (ASD) (Bai et al., 2004). In another study, 20% of HCWs in Singapore showed signs of PTSD as early as two months after the start of the SARS pandemic, and 10% of HCWs at a Beijing hospital continued to suffer from PTSD associated with exposure to SARS three years later (Wu et al., 2009).

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The Spanish Flu of 1918 was one of the most lethal pandemics prior to COVID-19. An estimated 500 million people were affected, of which 50 million died worldwide (Cipriano, 2018). Many physicians and nurses died as a result. The virus took a physical as well as an emotional toll on frontline HCWs. Many experienced a sense of helplessness and hopelessness dealing with the massive and sudden loss of life. Many surviving frontline HCWs experienced mixed feelings of guilt, frustration, grief, and anxiousness even years after the pandemic (Cipriano, 2018).

Healthcare providers working during a pandemic tend to experience burnout, which is also known as a high level of physical and mental fatigue. Such fatigue has been attributed to longer work hours, higher patient load, fear, and stress. Burnout negatively affects workers, patients and the healthcare industry alike (Dyrbye et al., 2019). The cost of turnover per bedside registered nurse ranges from an estimated \$33,300 to \$56,000, which causes the average hospital to lose \$4.9 million per year (National Health Care Retention & RN Staff Report [NSI], 2020). Stress may lead to substandard care for patients, medication errors, increased level of healthcare-related infections, and higher mortality rates among patients (Dyrbye et al., 2019).

Incessant stress can cause workers to be less satisfied with their position and make them more likely to resign (Dyrbye et al., 2019). Having to resign can bring about great economic anxiety, which may worsen stress. High rates of absenteeism and turnover among HCWs have been known to cause irrecoverable consequences for the healthcare sector (Dyrbye et al., 2019). Such strain may lead to attrition and a worsening of the nursing shortage. Individuals exposed directly or indirectly to life-threatening situations have a higher risk of psychological morbidity. If left untreated, stress can evolve into serious mental problems for frontline HCWs, which may

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result in anxiety, panic attacks, depression, substance abuse, PTSD and suicidal ideation (Ho et al., 2020).

The current pandemic has increased the risk for a high level of anticipatory anxiety related to fear of contracting the virus or infecting a loved one, loneliness associated with quarantine, and a high number of deaths resulting from the disease. Methods for addressing these problems include proper assessment, early identification of high-risk groups, and early staff education on stress reduction techniques. Stress mitigation techniques such as cognitive-behavioral intervention, guided imagery, transcendental meditation, and relaxation have proven beneficial. Benhamou and Piedra (2020) reported that the use of these techniques has been proven beneficial in helping essential workers recognize signs of stress, such as elevated heart rate or muscle tension, and has allowed them to slow down, breathe, and effectively respond to such stress. Schechner et al. (2020) conducted a study among New York City HCWs to assess preferred ways to address stress that was acquired during the pandemic. The study concluded that 59% of HCWs preferred physical activity, while 33% preferred self-guided online counseling. Both of these stress-reduction approaches have been proven effective (Schechner et al., 2020). Promoting awareness and encouraging different approaches to address pandemic-related stress and its sequelae are needed.

Web-based stress management programs offer healthcare providers the convenience of accessing information and tools to manage their stress. These programs can help healthcare providers gain information and the skills needed to manage the many stressors they face in the workplace (Schechner et al., 2020).

Literature Search

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Relevant literature was systematically identified, screened, critiqued, and summarized in order to develop an evidence-based mindfulness meditation program to help frontline HCWs manage stress. CINAHL, Google Scholar, PubMed, and PsychInfo databases were searched to identify evidence focused on psychological issues faced by frontline HCWs during pandemics, as well as evidence-based education programs on stress management for HCWs. Keywords searched included frontline HCWs, pandemic, stress management, mental health, education, stress, and psychological. In order to optimize the search in all four databases, the “advance search” setting was used. The advance search limiters included pandemic HCWs, full text, English language, and publication between 2010 to 2020.

Literature Findings

A total of 17 articles were initially identified. Titles and abstracts of each article were screened for eligibility. Seven of the articles did not meet the criteria and were deemed irrelevant to the topic and therefore were excluded. After reviewing the remaining articles, eight were selected, as they were deemed relevant to this quality improvement project. One study was observational, two were randomized controlled trials, two were quasi-experimental studies, and two were qualitative studies. Additionally, two systematic reviews were included in the literature review. Table 1 displays the characteristics of the eight studies.

Systematic Reviews: The two systemic reviews were authored by Burton et al. (2017) and Fernandez et al. (2020). The Burton et al. (2017) systematic review and meta-analysis reviewed evidence on the effectiveness of mindfulness-based interventions (MBIs) for reducing stress in healthcare professionals (HCPs). A total of nine papers were included and were screened for suitability using inclusion criteria. The Quality Assessment Tool for Studies with Diverse

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Designs (QATSDD) was used to assess the methodologic study qualities. Sample sizes varied from 16 to 52 participants in the reviewed studies. Interviews and focus groups were conducted. A variety of measures were used to assess the impact of the interventions, including the Perceived Stress Scale (PSS), Mental Health Professionals Stress Scale (MHPSS), and Depression Anxiety Stress Scale (DASS). The review found that all forms of MBI, including Mindfulness Based Stress Reduction (MBSR), have the potential to reduce stress among HCWs (Burton et al., 2017).

Fernandez et al. (2020) conducted a systematic review to synthesize the best available evidence on the experience of nurses working in acute hospital settings during a pandemic. A total of 13 papers were included in the review. A total of 348 nurses—mostly female ranging in age from 20 to 50 years old—were included in the studies. Nursing experience ranged from 6 months to 43 years. Studies were conducted in various hospitals and emergency rooms in Asia. Overall, the systematic review findings suggested that nurses were willing and eager to work during a pandemic despite the high risk of infection. They felt a sense of duty and saw working as a way to manage stress and pressure. They felt compelled to care for their patients and colleagues. However, working during a pandemic created a sense of conflict between caring for patients and their own family members. Such conflict added a considerable amount of stress for nurses (Fernandez et al, 2020). Stress experienced by HCWs stemmed from several factors, such as the fear of contracting the disease and dying from it, contaminating loved ones (especially the immunocompromised), being isolated from family and friends, and the economic perception of the pandemic. Possible future litigation also heightened their fear and frustration (Fernandez et al., 2020). HCWs identified multiple causes of additional stressors, including a lack of

protection, rapid changes in communication, rapid changes in policies and guidelines, and inadequate training. Lack of preparedness planning at both the managerial and health department levels was also found to create additional confusion and distress among workers (Fernandez et al., 2020).

Observational Study

Liu et al. (2012) conducted a cross-sectional survey study three years after the 2006 SARS outbreak in Beijing in an attempt to evaluate depression-related factors among HCWs after a pandemic. The study aimed to examine the relationship between specific types of exposure of Beijing hospital employees to the city's SARS outbreak, and their subsequent levels of depressive symptoms. It also attempted to assess the role of perceived SARS-related risk and altruistic acceptance of risk in levels of depressive symptoms three years later, controlling for other factors including levels of PTSD symptoms (Liu et al., 2012). A stratified random sample was obtained. The sample was identified with hospital rosters, and stratified by age group and profession. Physicians and nurses were further stratified by level of exposure. Hospital employees answered questions about their SARS outbreak event exposures, including work exposure, any quarantining, and having had a friend or close relative contract SARS. Other exposure to traumatic events was also assessed. A Perceived SARS-related Risk Scale was used to evaluate perceived stress. Good internal consistency was determined by a Cronbach alpha of 0.71. The level of depressive symptoms was assessed using the Center for Epidemiology Studies Depression Scale, and the impact of Event Scale-Revised was used to assess subjective distress.

A total of 549 physicians and nurses between the ages of 35 to 55 years old participated. A multinomial regression analysis indicated that 77.2% of participants showed a low level of

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depression, 14% showed a moderate level of depression, and 8.8% showed a high level of depressive symptoms (Liu et al., 2012). The study also highlighted that being young and single put participants at higher risk for depression. The perceived SARS-related risk level during the outbreak, being quarantined, and exposure to pre-SARS traumatic events were strongly associated with depressive symptoms even three years later (Liu et al., 2012). On the other hand, participants with relatives or friends who contracted SARS did not display depressive symptoms, and altruistic acceptance decreased post-outbreak depression (Liu et al., 2012).

Randomized Control Trial (RCT)

Manotas et al. (2014) conducted a randomized controlled trial (RCT) that has significance and relevance for this quality improvement project. The study tested the use of an evidence-based intervention to decrease stress among Columbian HCWs (Manotas et al., 2014). The participants were randomly assigned to an intervention or a control group. The study took place at La Fundación Santa Fe de Bogota, a healthcare clinic in Bogota, Columbia over a period of 4 weeks. The study evaluated the impact of a brief, four-week mindfulness intervention program (Manotas et al., 2014). Manotas et al. (2014) indicated similar programs were available in the United States (US) and Europe; however, implementation of these programs was rare due to a lack of time on the part of HCWs. In an effort to maximize utilization among HCWs, Manotas et al. (2014) aimed to replicate previous programs with a time-efficient approach. The sample included 83 participants; 40 were assigned to an experimental group and 43 to the control group. The sample included women (n = 75) and men (n = 8) ranging from 25 to 59 years old. The sample included medical doctors, nurses, chief nurses, nursing assistants, and other support staff. A total of 13 scientists, which included bacteriologists, biologists, chemical pharmacists,

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and other helping professionals, also participated in the study. The study design included pre and post-assessments of depression, anxiety, somatization, global symptoms, perceived stress, and 5 facets of mindfulness (observing, describing, acting with awareness, non-reacting, and non-judging) (Manotas et al., 2014). The intervention included a 4-week adaptation of mindfulness-based stress reduction (MBSR). The course was taught in Spanish during a weekly 2-hour session. The time was divided as follows: mindfulness lecture (25 min.), yoga practice (15 min.), meditation practice (25-50 min.), experience discussions (25 min.), and homework instruction (5 min.). The study used Brief Symptom Inventory (BSI), a self-report scale, to measure psychological distress. The PSS was used to measure stress and the Five Facet Mindfulness Questionnaire (FFMQ) was used to measure mindfulness. The FFMQ assessed five factors of mindfulness: observing, describing, acting with awareness, non-reacting, and non-judging. The scales have been deemed valid and reliable, as evidenced by Cronbach's alpha value ranging from 0.75 to 0.91. The results showed that the group that received mindfulness training reported increases in the mindfulness facets of observing and non-judging, as well as reduced posttest anxiety, depression, somatization, and perceived stress (Manotas et al., 2014). The study concluded that 45% of the participants with mid to high-range-stress at pretest who received mindfulness training experienced reduced stress at posttest. Forty-seven percent of the participants reported decreased anxiety at posttest in the intervention group. Additionally, a reduction in depression, somatization and perceived stress was found in the intervention group but not the control group (Manotas et al., 2014).

A similar blinded, cluster randomized controlled trial study was conducted by Sampson et al. (2019). The study aimed to evaluate the long-term effects of a cognitive-behavioral

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skill-building program entitled “MINDBODYSTRONG for Healthcare Professionals” on perceived stress, anxiety, depressive symptoms, job satisfaction, and healthy lifestyle behaviors in new licensed registered nurses (NLRNs) participating in a nurse residency program (Sampson, 2019). The study took place at a Midwestern academic medical center. A total of 89 NLRNs hired between July and September 2018 participated. The intervention group received eight 30 to 35-minute weekly sessions as part of the MINDBODYSTRONG program, incorporating strategies to improve mental and physical health. The control group acted as an attention control group, receiving eight weekly 30 to 35-minute debriefing sessions as part of the normal nurse residency program. Thoughts and feelings about stress were assessed using the PSS. Anxiety was measured by the Generalized Anxiety Disorder Scale (GADS). The nine-item Personal Health Questionnaire-9 (PHQ-9) was used to measure depressive symptoms. The Job Satisfaction scale was used to measure job satisfaction and the Healthy Lifestyle Behaviors Scale was used to measure lifestyles.

Six months post-intervention, the study evaluated the effect of the MINDBODYSTRONG on mental health, healthy lifestyle behaviors, and job satisfaction among the NLRNs. The study found a significant difference in stress, anxiety, depressive symptoms, and healthy lifestyle behaviors following the intervention (Sampson et al., 2019).

Maunder et al. (2010) conducted a study examining the impact of a cost-effective, short (1.75hr.), medium (3hr.), and long (4.5 hr.) interactive, computer-assisted training course designed to build resilience during a pandemic. This study took place at a teaching hospital in Toronto, Canada from September 2008 to January 2009. Most the participants were women (86%, n = 229) and nurses (54%, n = 144). Participants accessed the course themselves using a

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flash drive rather than the internet to prevent technological challenges. A pretest and posttest were used to compare changes in the following three different areas of dose-finding training: Confidence in support and training, pandemic-related self-efficacy, and coping style and interpersonal problems (Maunder et al., 2010). Multimodality learning styles, such as audio, video, mini-lectures, onscreen notes, and printed facts sheets, were used. Quizzes and games were used to reinforce knowledge. Audio modules were used to teach relaxation skills diversion and breathing techniques. A questionnaire with a 5-point scale was used to measure confidence in training and support. Cronbach's alpha was 0.85. A Pandemic Self-Efficacy Scale was used to measure the perceived efficacy of adapting to pandemic conditions. Cronbach's alpha was 0.93. A 32-item inventory of Interpersonal Problems was used to measure interpersonal problems with adequate test reliability. Pre-course and post-course survey findings were compared for outcome variables. An intention-to-treat analysis was used. Improvements were observed in pandemic self-efficacy and confidence in training and support. The medium and long courses showed significant improvement in interpersonal problems, but this improvement was not found in the shorter course.

Qualitative Study

Munawar and Choudhry (2020) conducted a qualitative study using a thematic analysis framework approach to examine how COVID-19 psychologically impacted Pakistani HCWs. The study also explored how HCWs dealt with the pandemic and employed coping strategies or protective factors, as well as the challenges faced by HCWs while providing care for COVID-19 patients (Munawar & Chaudhry, 2020). This study is relevant to this DNP project because it provides evidence on how to adapt and execute appropriate interventions to help HCWs cope

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with an emergency situation like COVID-19. A convenient sample of 15 frontline emergency workers directly caring for COVID-19 patients participated. A 1-hour semi-structured interview either face to face or by telephone was conducted. All interviews were recorded. The sample included men, 28 years old to 38 years old, with a minimum work experience of 2 years.

Participants agreed that the main sources of stress included overexposure to news and social media. Psychological challenges faced by participants included fear, anxiety, and sleep disturbance due to uncertainty. The noncompliance of the public with following government-issued instructions to minimize spread, as well as the denial of the pandemic by religious scholars, were proven to be challenging for HCWs. Coping strategies proven to be effective included: limiting media exposure, limiting sharing of COVID-19 duty details, and using religion or altruism as coping mechanisms (Munawar & Choudhry, 2020).

Quasi-experimental Study

The Sallon et al. (2017) study evaluated the impact of a stress-reduction program “Caring for the Caregivers” (CCG). The purpose of the study was to implement a feasible program to decrease job-related tension, reduce stress, burnout, and somatic and mental health symptoms among HCWs, and increase productivity (Sallon et al., 2017). The program took place at a large tertiary care center in Jerusalem. Hospital workers were recruited through flyers, email, and word of mouth. The program consisted of 75 hours of instruction in weekly sessions with a full-day workshop. The program lasted 8 months. There were 97 participants and 67 controls in the quasi-experimental designed pre–post study. The intervention had five distinct components: cognitive (mindfulness), somatic (relaxation), emotive-expressive (drawing/journaling/listening circle), dynamic-interactive (movement/interactive dance), and hands-on (acupressure /shiatsu)

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(Sallon et al., 2017). Several scales were used in this study to assess the impact of the interventions. Mashlach Burnout Inventory (MBI) was used to measure three dimensions of occupational stress: emotional exhaustion, depersonalization, and personal accomplishment. The PSS was used to measure stressful life moments. The General Health Questionnaire (GHQ) was used to assess participants' health perceptions. The Job Related Tension Index (JRTI) measured how frequently "bothered" participants are by various aspects of their work. The Productivity Scale (PS) measured an individual's self-perceived performance at work on a simple scale ranging from 0–100. The Positive and Negative Affect Schedule (PANAS) measured positive and negative broad mood dimensions. The Visual Analogue Scales (VAS) measured symptom-focused outcomes, such as headache, anxiety, muscle tension, insomnia, overeating, tiredness, heartburn, low back pain, neck problems, stomach problems, depression, and irritability.

The results indicated that CCG was extremely helpful in helping hospital staff cope with the multidimensional nature of stress and is an acceptable and feasible intervention in this population (Sallon et al., 2017). In the CCG program, participants showed a significant improvement in job-related tension, work productivity, decreased symptoms of perceived stress and emotional exhaustion associated with burnout, and improved mood and somatic and mental health symptoms (Sallon et al., 2017).

In conclusion, research has shown that pandemic-related stress is rampant among HCWs and can be catastrophic if left untreated. Mindfulness meditation programs have been shown to be effective in combatting perceived stress among frontline HCWs. Incorporating mindfulness

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meditation, whether online or in-person, may lead to better health outcomes as well as an improved overall quality of life.

Purpose of the DNP Project

The purpose of this DNP project was to evaluate if the use of a newly developed evidence-based mindfulness meditation program helps frontline pandemic HCWs manage perceived stress.

Specific Aims of the DNP Project

- 1) To develop and implement an evidence-based mindfulness meditation program to help frontline pandemic HCWs manage pandemic-related stress.
- 2) To evaluate the use and impact of the web-based mindfulness meditation program on perceived stress among participants.

Definition of Terms

For the purpose of this project, the following terms are defined:

- **Frontline healthcare workers:** The frontline soldiers in the fight against diseases and ill health, with a proven record of reducing preventable deaths and hence the central pillars of effective health systems, a key to achieving universal health coverage (Mfinanga et al., 2017). Frontline workers include police officers, firefighters, waste management services, and grocery store workers, to name a few.
- **Pandemic:** An epidemic occurring worldwide, or over a very wide area, crossing international boundaries and usually affecting a large number of people (Kelly, 2011).
- **Stress management:** The use of specific techniques, strategies, or programs—such as relaxation training, the anticipation of stress reactions, and breathing techniques—for

dealing with stress-inducing situations and the state of being stressed (VandenBos & American Psychological Association [APA], 2007).

- **Mental health:** A state of mind characterized by emotional well-being, good behavioral adjustment, relative freedom from anxiety and disabling symptoms, and a capacity to establish constructive relationships and cope with the ordinary demands and stresses of life (VandenBos & APA, 2007).
- **Education:** The process of teaching or acquiring knowledge, skills, and values (VandenBos & APA, 2007).
- **Stress:** The non-specific response of the body to any demand for change (Selye, 1950).
- **Psychology:** A science of the mind and behavior (VandenBos & APA, 2007).
- **Mindfulness-based intervention:** Paying attention in a particular way, deliberately, in the present moment, and nonjudgmentally.
- **Compassion fatigue:** The convergence of secondary traumatic stress (STS) and cumulative burnout (BO). A state of physical and mental exhaustion caused by a depleted ability to cope with one's everyday environment (Cocker & Joss, 2016).
- **Mindfulness-based stress reduction:** Mindfulness-based stress reduction is a group program that was developed by Jon Kabat-Zinn in the 1970s to treat patients struggling with life's difficulties and physical and/or mental illness (Kabat-Zinn, 2013).

Theoretical Framework

Selye's theory of General Adaptation Syndrome (GAS) served as a framework for this quality improvement project. This theory was developed in 1936 and described different stages the body goes through in response to stress (Selye, 1950). Selye's stress model is based on both

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physiology and psychobiology. According to this theory, three bodily responses occur when an organism's well-being is threatened by a stressor: alarm, resistance and exhaustion (Selye, 1950). In the alarm stage, the flight-or-fight response, which is a psychological response, as well as the sympathetic nervous system are activated. Stress hormones such as cortisol and adrenaline are released into the bloodstream and the entire body's resources rally to address the threat (Selye, 1950). In this stage, heart rate and blood pressure elevate and the body gets a boost of energy to help defend and protect itself against the threat. In the resistance stage, the parasympathetic nervous system is activated (Selye, 1950). Many physiological functions return to normal, although the body's resources remain focused on the stressor. The individual may appear to be calm and things may seem normal, but the body remains on high alert internally. In the exhaustion stage, if the stress surpasses the body's capacity and the body loses its ability to fight stress, the body will inevitably become susceptible to fatigue, burnout, anxiety, depression, diseases, and death. Stress can be beneficial in some instances; however, prolonged exposure to stress can be mentally damaging. Exposure to chronic stress and a maladaptive response will lead to diseases and eventually death (Selye, 1950). Pandemic-related stresses on HCWs have proven to be physically and mentally injurious (Niks et al., 2018).

Selye's theory of General Adaptation Syndrome sets out to prove that chronic stress can negatively impact the body and the mind. Unless stress is dealt with promptly, the immune system can weaken and susceptibility to illness and death may occur (Selye, 1950). This theory clearly challenges the idea that illness can only occur due to bacteria, viruses or fungus. This theory rings true in the world of healthcare. Healthcare workers who work in high-stress areas like the intensive care unit (ICU) tend to have higher levels of stress (Vahedian-Azimi et al.,

2019). Although this theory has been proven to be pragmatic, some limitations exist, since it was only tested on rats and never on humans.

Selye used his rodent experiments to explain how the body reacts in the presence of stress. Three different stages were identified to clearly lay out the body's physiological response to stress. Selye's research concluded that a maladaptive response to stress will result in disease and eventually death (Selye, 1950). Seven decades after Selye's account of stress and its relation to disease, his work continues to be explored and refined in medicine and other fields.

Elsenbruch and Enck (2017) applied Selye's method to the field of gastroenterology and concluded that stress played a major part in the development of gastrointestinal disease.

Important conceptual developments, especially the concepts of allostasis and allostatic load, continue to provide a more refined psychoneurobiological framework to explain the mechanisms and clinical implications of chronic stress and stress-related conditions (Elsenbruch & Enck, 2017).

Selye's theory clearly relates to the clinical problem at hand. Decades of research have linked high job strain to anxiety and depression, increased blood pressure (BP), cardiovascular events, and metabolic syndrome (Landsbergis et al., 2013). The three stages of this theory support the claim that frontline HCWs may be exposed to chronic stress, may experience maladaptation to such stress, and may become physically and mentally affected if coping skills are inadequate. Scales such as the Perceived Stress Scale or Daily Hassles and Uplifts Scale may be used to measure stress (Cohen et al., 1983). Physiological variables such as blood pressure, heart rate, and measurement of cortisol may also be used to determine the stress level among workers.

Methodology

Setting and Participants

The DNP project took place at a primary care clinic located in Coconut Creek, Florida. The clinic serves clients 18 years old and older; on average, 150 client visits occur weekly. Office staff includes two physicians, four physician's assistants, five medical assistants, and four front-desk personnel. All staff were eligible for the QI project.

Protection of Human Subjects

All primary care providers and support staff at the clinic were invited to participate in the stress reduction program. Recruitment flyers were posted in the breakroom and the bathrooms to enhance staff interest in the program. Staff was reminded of the educational program by the office manager during morning meetings. An informational letter was provided that informed potential participants about the study (see Appendix C).

Intervention

Participants were able to access a 30-minute education session posted on YouTube for a two-week period. The focus of the interventions was a mindfulness meditation technique. The YouTube video covered the following topics: statistics on pandemic-related stress among HCWs, consequences of untreated stress, early stress recognition, early intervention, and the use of mindfulness-based programs. The benefits of mindfulness meditation and breathing techniques were also highlighted. An audio portion demonstrated mindfulness techniques and served to reinforce the topic. Participants were encouraged to practice the five-minute mindfulness meditation as much as they possibly could over the 2-week period.

Design

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A quasi-experimental pre-test versus post-test design was used. Data were collected before the intervention and 2 weeks later.

Measures

Participants provided demographics information (gender, age, professional role) and completed the Perceived Stress Scale (Cohen et al., 1983) before and after the intervention to assess the effectiveness of the intervention. The PSS measures the degree to which situations in one's life are appraised as stressful. The PSS has been established as valid and reliable among American adults (Cohen & Williamson, 1988) and Hispanic Americans with English or Spanish language preference (Baik et al, 2019). The measure was selected as it focuses on how unpredictable, uncontrollable, and overloaded respondents find their lives. The PSS is scored by reversing responses (e.g., 0 = 4, 1 = 3, 2 = 2, 3 = 1 & 4 = 0) to the four positively stated items (items 4, 5, 7, & 8) and then summing across all scale items. A score of 0-13 represents mild stress, 14-26 moderate stress, and 27- 40 a high score (Cohen et al., 1983). Additionally, the post-intervention survey included items about how frequently participants practiced mindfulness meditation during the two-week period and how beneficial the mindfulness meditation technique was in decreasing their stress.

Data Collection

Data were collected from each respondent before the intervention and 2 weeks after having access to the intervention (web-based stress-reduction program). See [Appendix D](#) for the pre and post-intervention surveys. All data was collected using Qualtrics software, an online survey tool.

Data Management and Analysis Plan

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Descriptive statistics were used to calculate values for all survey items. The PSS was scored as previously described. Bivariate analyses were conducted to assess differences before and after the intervention. Differences between observed mean PSS scores were calculated pre versus post-intervention. A chi-square test with a Yates correction was used to compare categorical variables. Item category responses compared pre-intervention “Fairly Often” and “Very Often” responses to post-intervention “Fairly Often” and “Very Often” responses. All analyses were performed at a significance level of 0.05. An online calculator was used to calculate standard deviations and bivariate analyses.

Results

Table 1 displays the demographic data of the eleven program participants at baseline. The participants included two physician assistants, one nurse practitioner, seven medical assistants, and one unspecified within healthcare. Ten of the eleven respondents were female. Table 2 displays the results of the pre-intervention survey and Table 3 provides the results of the post-intervention survey. The data reported includes the 11 surveys completed pre-intervention and 8 post-intervention. Post-surveys were completed by 3 physician assistants, 1 nurse practitioner, and 4 medical assistants. The results below are organized by 3 questions: What was the impact of the intervention on the perceived stress of the respondents? What was the impact of the intervention on a mindfulness meditation practice? How helpful did you find the mindfulness exercise in decreasing your stress level?

The impact of the intervention on the perceived stress of the respondents: The PSS scores indicate that one respondent (9%) experienced mild stress, seven (64%) had moderate stress, and three (27%) experienced severe stress prior to the intervention. The post-PSS score showed a

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decrease in the number of persons experiencing moderate and severe stress levels. Four respondents (50%) experienced mild stress, two (25%) experienced moderated stress, and two (25%) experienced severe stress. Although there was not a statistically significant difference observed (chi-square statistic with Yates correction is 0.1132. p -value is .73649). Table 2 and Table 3 provide the individual item survey responses. The 11 participants had a mean PSS score of 21.90 (SD = 8.05), and 2 weeks later the mean PSS score was 17.37 (SD = 9.11). There were no statistically significant differences in comparing the total PSS score or individual PSS item responses pre versus post-intervention.

The impact of the intervention on mindfulness meditation practice: Prior to the intervention, 25% ($n = 2$) of the respondents had practiced mindfulness meditation techniques “often” or “very often.” After the intervention, 85% ($n = 6$) of the respondents had practiced mindfulness meditation techniques in the past 2 weeks “often” or “very often” There was not a statistically significant difference observed (chi-square statistic with Yates correction is 3.359. p -value is .06684).

The helpfulness of mindfulness exercise in decreasing stress levels: Fifty-seven percent ($n = 4$) of respondents found the intervention to be helpful “fairly often,” while more than 28% ($n = 2$) found it very helpful.

Table 1: Demographics of Survey Respondents

Variable	Category	N	%
Age	20-30	3	27.27%
	31-40	4	36.36%
	41-50	3	27.27%
	51-60	1	9.09%
	61-older	0	0%
Gender	Female	10	90.90%
	Male	1	9.09%
Role	Medical doctor	0	0%
	Physician assistant	2	18.18%
	Nurse practitioner	1	9.09%
	Medical assistant	7	63.64%
	Other	1	9.09%

Table 2: Summary of survey responses for pre

Item	Description	Frequency (%) of Survey responses				
		1	2	3	4	5
Q1	upset	0	1(9.09)	5(45.45)	3(27.27)	2(18.18)
Q2	Control	0	2(18.18)	4(36.36)	2(18.18)	3(27.27)
Q3	Stressed	0	2(18.18)	3(27.27)	3(27.27)	3(27.27)
Q4	Confident	0	2(18.18)	6(54.55)	2(18.18)	1(9.09)
Q5	Going your	1(9.09)	3(27.27)	3(27.27)	2(18.18)	2(18.18)
Q6	Not cope	0	3(27.27)	4(36.36)	1(9.09)	3(27.27)
Q7	Control irritation	1(9.09)	0	8(72.73)	1(9.09)	1(9.09)
Q8	On top	0	1(10.0)	6(60.0)	1(10.0)	2(20.0)

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Q9	Anger	2(18.18)	1(9.09)	2(18.18)	3(27.27)	3(27.27)
Q10	Not overcome	1(9.09)	3(27.27)	1(9.09)	3(27.27)	3(27.27)
Q11	Familiar meditation	3(27.27)	4(36.36)	2(18.18)	2(18.18)	0
Q11	How often practice	2(18.18)	4(36.36)	2(18.18)	2(18.18)	0

Note. 1=Never 2= Almost never 3=Sometime 4=Fairly Often 5=Very Often.

Table 3: Summary of survey responses for post

Item	Description	Frequency (%) of Survey responses				
		1	2	3	4	5
Q1	upset	2(25.0)	1(12.50)	2(25.0)	2(25.0)	1(12.50)
Q2	Control	2(25.0)	3(37.50)	0	1(12.50)	2(25.0)
Q3	Stressed	0	4(50.0)	1(12.50)	0	3(37.50)
Q4	Confident	1(12.50)	1(12.50)	1(12.50)	3(37.50)	2(25.0)
Q5	Going your way	1(12.50)	1(12.50)	1(12.50)	4(50.0)	1(12.50)
Q6	Not cope	1(12.50)	3(37.50)	2(25.0)	1(12.50)	1(12.50)
Q7	Control irritation	0	1(12.50)	3(37.50)	1(12.50)	3(37.50)
Q8	On top of things	1(12.50)	0	2(25.0)	3(37.5)	2(25.0)
Q9	Anger	0	4(50.0)	1(12.5)	0	3(37.50)
Q10	Not overcome	2(25.0)	1(12.5)	3(37.5)	1(12.50)	1(12.50)
Q11	How often practice	0	1(14.29)	2(28.57)	2(28.57)	2(28.57)

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Q12	How helpful	0	1(14.29)	0	4(57.14)	2(28.57)
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Note. 1=Never 2= Almost never 3=Sometime 4=Fairly Often 5=Very Often. Several items were not responded to by all participants. Percentages were calculated based on the number of respondents.

Discussion

The primary aim of this DNP project was to assess if the availability of a web-based staff stress reduction program would decrease the perceived stress during a pandemic. Although there was a trend toward decreased levels of perceived stress, the results did not reach statistical significance. However, 85.71% of the participants found the intervention to be helpful either “often” or “fairly often.” These results support the acceptability of a web-based mindfulness meditation program to decrease stress among pandemic HCWs.

The overall level of moderate stress found among healthcare providers was consistent with Lui et al (2012) and Fernandez et al. (2020). The majority of participants were experiencing either moderate or severe stress; however, it appears medical assistants were the most stressed. Medical assistants have a great deal of direct patient contact while routinely taking vital signs, measuring weight, and blood drawing. Like other HCPs, contributing factors to their level of stress may include lack of experience working during a pandemic, fear of infecting their loved ones, and fear of contracting the disease and succumbing to it.

Chronic stress inevitably will lead to diseases and eventually death (Selye, 1950). Selye’s theory remains true today and reinforces the need to address perceived stress in a timely and effective manner to prevent the body from falling victim to sustain stress. Given the global prevalence of COVID-19, the associated stress among HCWs (Ho et al., 2020), and the physical

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and psychological damage that often ensues, it is imperative that early recognition of stress, anxiety, and depression symptoms occurs.

While several studies (Liu et al., 2012; Sallon et al., 2019; Sampson et al., 2020) have focused on the value of stress reduction intervention, many frontline HCWs remain ill-prepared to confront the magnitude of pandemic induced-stress. As a result, many will continue to suffer from anxiety, depression, and PTSD long after a pandemic (Lui et al., 2012); however health care facilities, healthcare providers, and professional organizations can provide methods for early detection, support, and education.

Limitations

This DNP QIP has several limitations. First, the small sample size limits the ability to detect small changes. Second, the project used a pre-post design. A weakness of a one group pre-post design is that other factors besides the intervention may impact the outcome. Third, although ample time was given for participants to access the YouTube education session, it is unknown if and how often participants accessed the program. Finally, the program and surveys were done remotely due to the pandemic; an in-person approach may have a different result.

Implication for Nursing and Practice

Nurses are often at the forefront of COVID-19 testing, vaccinations, patient education, and bedside care, which increases their risk for job-related stress. The literature shows that stress is a major contributor to poor health among nurses (Hong et al., 2020), and other HCWs (Gupta & Sahoo, 2020), attrition (Kelly et al., 2021), and the nursing shortage (National Health Care Retention & RN Staff Report [NSI], 2020). Health care workers at high risk for exposure to the

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severe acute respiratory syndrome (SARS) outbreak developed depression, anxiety, and chronic stress (McAlonan et al., 2007).

Mindfulness-based interventions have been shown to decrease stress, job-related tension, emotional exhaustion, as well as improve mood and overall mental health symptoms (Salon et al., 2017). Incorporating such programs into a nursing curriculum and providing professional nurses with effective tools to combat stress, whether working in a pandemic or not, can be valuable to them, their patients, and the healthcare system as a whole.

Stress has the potential to handicap an HCP and interfere with their ability to provide care (Sarafis et al., 2016). Mindfulness-based meditation and breathing have proven to work and can serve as an antidote to stress in the clinical area. Providers with good stress management tools are better able to stay calm under pressure and carry out their duties with less difficulty.

Conclusion

The impact of the COVID-19 pandemic on the mental health and well-being of healthcare providers is significant (Gupta & Sahoo, 2020). Maintaining and safeguarding the emotional health of healthcare workers is paramount in sustaining a strong healthcare system and society. Early stress identification, as well as available options for managing health care provider stress, anxiety, and depression, are needed. Mindfulness-based accessible interventions appear acceptable for healthcare providers, and may be one approach for addressing job-related stress and strain.

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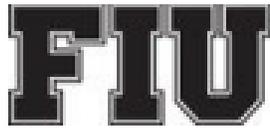
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Appendix A



FLORIDA
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Office of Research Integrity
Research Compliance, MARC 414

MEMORANDUM

To: Dr. Ellen Brown

CC: Rose Fils-Aime

From: Maria Melendez-Vargas, MIBA, Coordinator

Date: June 14, 2021

Proposal Title: “Can an educational intervention program help reduce stress among healthcare workers during a pandemic? A quality improvement project”

Approval # IRB-21-0113-AM01

Reference # 110115

The Florida International University Office of Research Integrity has approved the following modification(s):

- Changed principal investigator from Dr. Michell Duran to Dr. Ellen Brown
- Updated to instead of using the Zoom platform, the YouTube platform will be used to deliver a video/audio version the quality improvement project. That route will allow participant to access the project on their own time during a two-week period and practice mindfulness as many time as they desire.

Special Conditions: N/A.

For further information, you may visit the FIU IRB website at <http://research.fiu.edu/irb>.

MMV/em

Appendix B

You are being asked to be in a quality improvement project. You have been selected to participate in this quality improvement study as you are currently working at Complete Local Specialty Care. The principal investigator of this project is Dr. Ellen Brown and she is a faculty member at Florida International University (FIU). The co-investigators of this project are Dr. Michell Duran, a faculty member at FIU and Rose Fils-Aime, a doctoral candidate at FIU. The project will include approximately 12 participants. Your participation will require 30 minutes of your time weekly for a total of two weeks. You will be given a pre-test and a post-test to evaluate your knowledge, clinical practices and attitudes in stress management during a pandemic after you participate in a presentation about stress management. The purpose of this quality improvement project is to help frontline healthcare workers identify pandemic-related stress early on and provide them with effective mindfulness-based techniques to help decrease such stress and stress-related ailments.

Your completion of the quality improvement project is completely voluntary.

If you choose to participate in the study and complete the pre and post-survey, all your responses will be strictly confidential. Only Dr. Ellen Brown, Dr. Michell Duran and Rose Fils-Aime will see the individual surveys. The information gathered from this study will be shared only in summary form or in research reports. No information will be made available that could identify the responses of either an individual or small group of individuals. There are no foreseeable risks but you may improve your knowledge and efficiency in managing pandemic-related stress.

If you're to participate in the quality improvement project, please complete the pre-survey regarding your professional background, knowledge, and practices for stress management. After

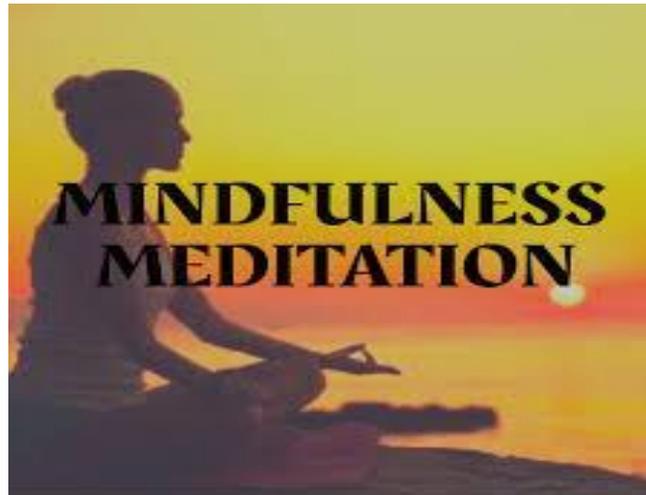
QUALITY IMPROVEMENT PROJECT

completing the pre-survey, you will participate in a 30-minute presentation on stress management and will be given a post survey. We are interested in your response to all questions, even if you are unsure of the best answer. If you decide to participate in the project, you are free to withdraw at any time without any negative effect on your relationship with Complete Local Specialty Care, FIU and all of the investigators involved in the study.

Thank you for your participation. I am here to answer any questions while you take part. If you have questions at a later date, you may contact me, Dr Ellen L Brown, at 305-348-1312, Dr. Mechell Duran at 786-547-9933 and Rose Fils-Aime at 954-708-5649. If you would like to talk with someone about your rights of being a research subject in this research study, you may contact the FIU Office of Research Integrity by phone at 305-348-2494 or by email at ori@fiu.edu. I will provide you with a copy of this page for your records.

Stress kills

Mindfulness heals



1 in 6 healthcare workers providing care to affected patients during a pandemic develops significant stress symptoms (McAlonan et al., 2020)

Let's talk about it

Upcoming educational session (YouTube video and audio)

How long: No more than 30 minutes x 2 weeks

Qualification: Healthcare providers and support staff

Where: YouTube

For additional information, please contact

Florida International University

Nicole Wertheim College of Nursing

Dr. Ellen Brown: Principal investigator

Phone: 305-348-1312

Email: ebrown@fiu.edu

Rose Fils-Aime: Co-investigator

Phone: 954-708-5649

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Appendix D

Pre-survey: Please fill out this **anonymous** survey for a quality improvement project led by the student Rose Fils-Aime

Demographics Please circle one choice for each question.

What is your role?

- (1) Doctor of Medicine (MD) or Physician Assistant (PA) or Nurse Practitioner (NP)
- (2) Medical Assistant (MA)
- (3) Other

What is your gender?

- (1) Male (2) Female

What is your age range?

- (1) 20-30 (2) 31-40 (3) 41-50 (4) 51-60 (5) 61 and older

Perceived Stress Scale

The questions in this scale ask you about your feelings and thoughts **during the last month**. In each case, you will be asked to indicate by circling *how often* you felt or thought a certain way.

0 = Never 1 = Almost Never 2 = Sometimes 3 = Fairly Often 4 = Very Often

- 1. In the last month, how often have you been upset because of something that happened unexpectedly?..... **0 1 2 3 4**
- 2. In the last month, how often have you felt that you were unable to control the important things in your life? **0 1 2 3 4**
- 3. In the last month, how often have you felt nervous and “stressed”? **0 1 2 3 4**
- 4. In the last month, how often have you felt confident about your ability to handle your personal problems? **0 1 2 3 4**
- 5. In the last month, how often have you felt that things were going your way?..... **0 1 2 3 4**
- 6. In the last month, how often have you found that you could not cope with all the things that you had to do? **0 1 2 3 4**
- 7. In the last month, how often have you been able to control irritations in your life?..... **0 1 2 3 4**
- 8. In the last month, how often have you felt that you were on top of things? **0 1 2 3 4**
- 9. In the last month, how often have you been angered because of things that were outside of your control?..... **0 1 2 3 4**
- 10. In the last month, how often have you felt difficulties were piling up so high that you could not overcome them? **0 1 2 3 4**
- 11. How familiar are you with mindfulness meditation techniques?..... **0 1 2 3 4**
- 12. How often have you practice mindfulness meditation techniques in the past? **0 1 2 3 4**

QUALITY IMPROVEMENT PROJECT

Post-survey: Please fill out this **anonymous** survey for a quality improvement project led by the student Rose Fils-Aime

Demographics Please circle one choice for each question.

What is your role?

- (1) Doctor of Medicine (MD) or Physician Assistant (PA) or Nurse Practitioner (NP)
- (2) Medical Assistant (MA)
- (3) Other

What is your gender?

- (1) Male (2) Female

What is your age range?

- (1) 20-30 (2) 31-40 (3) 41-50 (4) 51-60 (5) 61 and older

Perceived Stress Scale

The questions in this scale ask you about your feelings and thoughts **during the last month**. In each case, you will be asked to indicate by circling *how often* you felt or thought a certain way.

0 = Never 1 = Almost Never 2 = Sometimes 3 = Fairly Often 4 = Very Often

- 1. In the last month, how often have you been upset because of something that happened unexpectedly?..... **0 1 2 3 4**
- 2. In the last month, how often have you felt that you were unable to control the important things in your life? **0 1 2 3 4**
- 3. In the last month, how often have you felt nervous and “stressed”? **0 1 2 3 4**
- 4. In the last month, how often have you felt confident about your ability to handle your personal problems? **0 1 2 3 4**
- 5. In the last month, how often have you felt that things were going your way?..... **0 1 2 3 4**
- 6. In the last month, how often have you found that you could not cope with all the things that you had to do? **0 1 2 3 4**
- 7. In the last month, how often have you been able to control irritations in your life?..... **0 1 2 3 4**
- 8. In the last month, how often have you felt that you were on top of things? **0 1 2 3 4**
- 9. In the last month, how often have you been angered because of things that were outside of your control?..... **0 1 2 3 4**
- 10. In the last month, how often have you felt difficulties were piling up so high that you could not overcome them? **0 1 2 3 4**
- 11. As part of this project, you were provided with a 5-minute mindfulness audio exercise. How often did you practice it during the week?.....**0 1 2 3 4**

QUALITY IMPROVEMENT PROJECT

12. How helpful did you find the mindfulness exercise in decreasing your stress level? **1 2 3 4**