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MINDFULNESS TRAINING TO REDUCE PERCEIVED STRESS AMONG
MANUFACTURING EMPLOYEES: AN EVIDENCE-BASED PROJECT

A Doctor of Nursing Practice Project

by

IJEOMA OKORO

Submitted to the Office of Graduate Studies of
Prairie View A&M University
in partial fulfillment of the requirements for the degree of

DOCTOR OF NURSING PRACTICE

August 2023

Major Subject: Nursing Practice

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August 2023

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ABSTRACT

Mindfulness Training to Reduce Perceived Stress among Manufacturing

Employees: An Evidence-Based Project

(August 2023)

Ijeoma Okoro, DNP, Prairie View A&M University

Chair of Advisory Committee: Dr. Abida Solomon

Background: Stress, a state of emotional or physical tension, is experienced by individuals for various reasons. The American Psychological Association identifies money, work, and the economy as the most frequently cited sources of stress. Workers in manufacturing settings are particularly susceptible to increased levels of perceived stress due to the demanding nature of their work. To reduce stress levels, some manufacturing companies have begun implementing different interventions, including mindfulness-based stress reduction.

Objectives: The aim of this project was to implement a weekly 30-minute mindfulness training program over six weeks to reduce perceived stress levels among manufacturing employees at a company located in a large metropolitan region in south-central Texas.

PICOT Question: "Will implementation of an evidence-based mindfulness program (I) reduce perceived stress levels (O) in manufacturing workers (P) compared to the pre-intervention period (C) within six weeks (T)?"

Methodology: This project employed a pre-and post-intervention survey design. The perceived stress scale (PSS) survey, a traditional stress assessment tool consisting of a

10-item questionnaire and a demographics questionnaire, was administered to 37 workers before training. For six weeks, mindfulness-based interventions, such as breathing exercises, meditation, journaling, and guided body scan training, were introduced through weekly reading materials, videos, and practice sessions. After the six-week training, a follow-up assessment using the PSS survey was conducted to evaluate the effectiveness of the intervention. Data evaluation was performed using Intellectus Statistics, and two-tailed Wilcoxon signed-rank tests were used to determine the significance of the pre-and post-intervention findings.

Results: The findings demonstrated a significant ($p = 0.41$) reduction in perceived stress levels among manufacturing workers of African American, White, and Asian ethnicities, due to the evidence-based mindfulness training program.

Conclusion: Mindfulness practices can improve manufacturing-employee well-being, enhance performance, and foster positive interpersonal relationships. Mindfulness training can contribute to a healthier and more productive manufacturing environment by promoting present-moment awareness and reducing stress.

Implication for Practice: Mindfulness practices enhance the well-being of manufacturing workers by increasing self-awareness, reducing perceived workplace stress, and fostering an environment for daily practice.

Keywords: mindfulness, stress, manufacturing workers

DEDICATION

I thank God for giving me the patience to see this program through. Next, I thank my husband, who supported our family when I was unable to, and my lovely daughters, who have been so understanding with Mommy on the days when I was unable to be present. Mommy can now apply mindful parenting, I promise. I am grateful to my parents, siblings, friends, coworkers, and all who were supportive and instrumental in my educational growth.

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I want to express my gratitude to my distinguished chair, Dr. Abida Solomon, for her guidance, support, and supervision throughout the entire process. I also express my thanks to my committee members, the DNP professors at Prairie View A&M, and those who have significantly impacted my professional career. To my patients, you make me a better health practitioner. Finally, I extend a heartfelt thank you to everyone at Alcon Houston for allowing me to carry out my project.

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CHAPTER I

INTRODUCTION

Background

Stress is a nonspecific bodily response to various demands (Tan & Yip, 2018)¹. The Centers for Disease Control and Prevention (CDC) (2022) defined job stress as the harmful physical and emotional reactions that occur when job requirements do not align with the worker's capabilities, resources, or needs. Work-related stress negatively affects quality of life and healthcare costs and may lead to early retirement (Manford et al., 2022). High job demands have been associated with an increased risk of depression, burnout, and cardiovascular disease among workers.

The results of a recent Gallup poll indicated that the percentage of individuals reporting workplace stress increased from 38% to 43% (Milenkovic, 2019). At a local level, a study conducted by the personal finance website WalletHub ranked Texas in sixth place for work-related stress (Culturemap, 2021). Moreover, claims filed with the Equal Employment Opportunity Commission under the Americans with Disabilities Act (ADA) for anxiety disorder and post-traumatic stress disorder have more than doubled over the past decade, accounting for 16.7% of ADA claims compared to 7.1% previously (Phillips, 2022). In 2018, 76% of U.S. workers reported that workplace stress negatively impacted their relationships (Stress.org, 2019). Additionally, data show that 41% of manufacturing employers acknowledge mental health challenges negatively impacting

¹ This thesis follows the style of the *American Psychological Association, 7th Ed.*

employee retention efforts. Furthermore, 28% of manufacturing employers received work-from-home requests due to anxiety or other mental health issues, while 31% witnessed an increase in requests for reasonable accommodation related to employee well-being (Phillips, 2022).

Manufacturing involves the use of labor, machinery, and engineering to produce goods. According to the United States Bureau of Labor and Statistics, the manufacturing industry encompasses establishments engaged in the mechanical, physical, or chemical transformation of materials, substances, or components into new products (United States Bureau of Labor Statistics, 2022). In 2022, the manufacturing sector employed 12.83 million workers, accounting for 11.39% of the economy's total output (NAM, 2022). Manufacturing workers often experience stress stemming from job-related factors and demands. Although some employers have implemented stress management resources such as wellness programs, flexible work hours, and fitness centers, these initiatives only sometimes effectively reduce workplace-induced stress. Common sources of causes of stress in the manufacturing industry include a lack of work-life balance, excessive job demands, and interpersonal issues.

Despite the common usage of the term "stress," particularly in the workplace context, there is no universally accepted definition of job stress. The impact of work-related stress on American companies is significant, with estimated costs ranging from U.S. \$221.13 million–187 billion annually in terms of healthcare costs, absenteeism, and reduced performance (Hassard et al., 2018).

The consequences of work-related stress, including burnout, decreased productivity, poor health, and early retirement among manufacturing workers, have been

largely overlooked (Mohamed et al., 2022). Given the significance of productivity in the manufacturing industry, it is noteworthy that employees who reported higher levels of workplace happiness were more likely to meet job demands (Sreekumar et al., 2018). It has been reported that more than 70% of manufacturing workers experienced high-stress levels, even leading to burnout (Paychex, 2019). The demanding nature of large-scale production, such as meeting quotas, different shift patterns, job insecurity, lack of job control, and ergonomics, emphasizes the critical importance of prioritizing the health and safety of workers in the manufacturing sector (McAsey, 2017). Consequently, a growing body of research in manufacturing companies has been focusing on interventions like Mindfulness-Based Stress Reduction (MBSR) as a resource for managing stress.

MBSR is a clinically standardized meditation technique that has consistently shown efficacy in addressing various mental and physical disorders resulting from inadequate stress management (Chiesa & Serretti, 2009). Mindfulness-based programs (MBPs), which encompass practices such as Meditation, breathwork, and the application of mindfulness in daily life, have been employed to reduce stress. Several evidence-based primary studies have indicated that workplace MBP interventions enable participants to navigate stressful events more skillfully and enhance their overall well-being. The literature pertaining to evidence-based interventions for stress reduction and their prevalence in the workplace has been expanding. MBSR techniques have gained popularity since their inception and have been utilized by individuals experiencing different stress levels and associated symptoms (Ross, 2020). Mindfulness interventions at the workplace have been reported to increase indicators of positive mental health while decreasing indicators of perceived stress among workers (Mistretta et al., 2018).

Mindfulness refers to the state of being fully present in the current moment. MBSR, developed in the United States in the late 1970s, is widely recognized as a structured approach to mindfulness training (Demarzo et al., 2017). Mindfulness-based activities have a positive impact on reducing stress and anxiety (Sanilevici et al., 2021). The duration of mindfulness training programs typically ranges from four to eight weeks, with the eight-week program the most common. However, due to limited research on the effectiveness of specific mindfulness program components, the exact number of weeks or sessions that are most effective and what components should be emphasized remains unclear (Demarzo et al., 2017).

Definition of Relevant Terms

The relevant terms used in this DNP project are listed as follows:

- Deep breathing meditation (DMB) is a mindfulness practice that focuses on the breath to cultivate relaxation, present-moment awareness, and stress reduction (MBSR, 2019).
- Manufacturing jobs involve the direct creation of new products from raw materials or components (Milenkovic, 2019).
- Mindfulness is a form of Meditation that involves a heightened focus on one's present-moment experience, including sensations and emotions, without engaging in interpretation or judgment (MBSR, 2019).
- Meditation is the intentional practice of spending time with one's mind (MBSR, 2019).
- Mindfulness-based stress reduction (MBST) is a structured program that combines mindfulness meditation, body awareness, and yoga practices (MBSR, 2019).

- Mindfulness-based cognitive therapy (MBCT) integrates cognitive therapy and mindfulness practices to aid individuals in managing and preventing relapse of depression and other mental health conditions (MBCT, 2019).
- Occupation is defined as a person's job or profession (US Bureau of Labor Statistics, 2022).
- Perceived stress refers to an individual's subjective feelings or thoughts regarding the stress levels they were experiencing at a particular time or over a specific period (Stress, 2022).
- Stress is a feeling of emotional or physical tension. (Stress, 2020).
- The perceived stress scale (PSS) is a tool developed to assess how individuals appraise the degree of stress in their life situations (PSS, 2020).

Statement of Local Problem

This evidence-based project was conducted at a global manufacturing company in the south-central region of Texas, one of the state's major metropolitan areas. As the director of the site's clinic, the author noted that over the past three years, there had been a noticeable rise in perceived stress levels, low job satisfaction, and high employee turnover. Informal feedback (obtained during interactions with employees using the company clinic) from direct supervisors, managers, and employees highlighted the negative impact of high-stress levels, specifically mentioning the hindrance to productivity caused by "too many projects going on" and "too many meetings." Such information indicated an urgent need for stress management among workers at the site. Additionally, data from a site-specific internal Associate Engagement Data survey (while the author was privy to the results of the survey per their official duties, neither the

survey nor its results can be reproduced here due to company policy) conducted quarterly, with a focus on feedback and areas of improvement, revealed that 70% of workers identified work as a significant source of stress over the years. Common complaints included increased workload, new projects, inadequate time to achieve productivity targets, and lack of support. Despite these concerns, a practical on-site stress management program has yet to be established. This resulted in increased employee turnover, reduced productivity, low morale, and eventual burnout. Therefore, reducing workplace stress is essential to promote employee well-being, decrease employee turnover rates, and enhance overall productivity. Addressing this local problem at the manufacturing site can be achieved by implementing weekly mindfulness training sessions lasting 30 minutes, which can alleviate stress for some employees in the workplace.

Purpose of the Project

Mindfulness practices are widely available in modern society through various formats, including smartphone apps, instructor-led classes, and group sessions. These practices have garnered attention in traditional media outlets. Mindfulness practices are advocated as effective means for practitioners to reduce stress and anxiety while becoming more present in their daily lives (Lemon, 2017). Stress can be reduced by engaging in mindfulness-based interventions such as Meditation and focused breathing. Furthermore, numerous Fortune 500 companies have recognized the value of implementing mindfulness programs in the workplace. Studies have demonstrated that such programs can effectively reduce stress, anxiety, and depression while enhancing performance, focus, memory, and creativity (Janssen, 2018).

The objective of this implementation project was to provide mindfulness training to manufacturing workers to reduce their perceived stress. Proactive measures to identify and prevent stress could assist manufacturing workers in managing their overall health. The prevalence of stress has steadily increased due to factors such as round-the-clock operations, demanding and varying shift work and patterns, the introduction of new projects, and a lack of work-life balance. For example, during evaluations at the site's clinic, most associates (White and blue-collar employees) consistently acknowledged experiencing stressors, with work demands a prominent source. Most associates lacked sufficient time after work to attend to personal obligations, leading to an increase in various health-related risks such as heart disease, mental illness, and substance abuse.

PICOT Question

The question to be addressed in this project was derived using the PICOT framework as follows:

Targeted Population (P): Manufacturing employees based in the south-central region of the State of Texas.

Intervention (I): Weekly mindfulness training sessions provided for six weeks.

Comparison (C): Perceived stress levels before and after intervention.

Expected Outcome (O): Reduced perceived stress levels among manufacturing workers.

Time (T): Six weeks.

The PICOT question to be addressed was, "Will implementation of an evidence-based mindfulness program (I) reduce perceived stress levels (O) in manufacturing workers (P) compared to their pre-intervention levels (C) over six weeks (T)?"

Recommendation for Change

Meditation, breathing exercises, and other mindfulness practices are effective in reducing stress and anxiety. Their popularity has led to over half of large corporations offering mindfulness training to their employees (Harvard et al., 2021). Effective strategies for addressing occupational stress involve sustaining stress management programs, engaging stakeholders at all levels, and maintaining a consistent mindfulness practice. Evidence-based research has informed policymakers and organizational leaders seeking to enhance workplace well-being through these programs.

Summary

Mindfulness training can enhance workers' productivity, job performance, and satisfaction by cultivating their awareness of the job, psychological environment, and conditions. Mindfulness can become second nature with consistent daily practice over approximately three months. A literature review supports the effectiveness of mindfulness-based workplace training in improving employee well-being. Regular mindfulness exercises, such as Meditation and focused breathing, can provide additional health benefits, including improvements in mental health, physical well-being, and overall wellness.

Chapter II comprises a comprehensive literature review that utilizes the Knowledge to Action (KTA) Framework to examine various studies. This framework guided the structured review and assessment of the literature's applicability to the practice of mindfulness and the proposed research, ensuring the inclusion of relevant studies and their contribution to understanding mindfulness within this specific investigation context.

CHAPTER II

LITERATURE REVIEW

Introduction

Workplace stress is an issue reported by workers in virtually all sectors of the economy, but it is particularly prevalent among workers in the manufacturing sector, contributing to higher turnover rates, low job satisfaction, and negative health outcomes (Milenkovic, 2019). Consequently, promoting health has become a critical objective in occupational settings (Vonderlin et al., 2020). MBPs, particularly MBSR programs, have gained popularity in improving various aspects of health, quality of life, social functioning, personal development, and self-reported mindfulness (de Vibe et al., 2017). These programs typically involve mindfulness-based practices delivered to groups of people using established curricula over a defined period, often eight weeks, with hundreds of randomized control trials presented in the literature. Systematic reviews and meta-analyses of these data demonstrated their effectiveness in reducing stress, anxiety symptoms, and depressive symptoms and improving chronic pain management (Brinkmann et al., 2020, Loucks et al., 2022).

This literature review advances the understanding of MBPs for stress reduction in manufacturing settings. It provides a summary and critical appraisal of evidence related to different mindfulness interventions, their effectiveness, and other non-mindfulness-based workplace programs available for stress management.

MBPs are recognized as essential components of occupational health promotion programs, offering benefits extending beyond personal well-being to crucial workplace functioning (Vonderlin et al., 2020). These proposed benefits include stress and burnout

reduction, improved mental well-being, decreased somatic complaints, increased mindfulness, overall well-being, compassion, and job satisfaction. A recent meta-analysis supports the effectiveness of MBPs in promoting employee health and well-being across various occupational settings (Vonderlin et al., 2020). However, it is also acknowledged that customization and adaption of MBPs to specific contexts and demographic groups are necessary (Loucks et al., 2022).

Workers in the manufacturing sector face unique stressors, including the physical, chemical, and ergonomics of the work environment, high job demands, low job control, and low social support, that greatly impact their stress levels, health, job performance, and job satisfaction (Serrano, 2019). A study examining the effects of six-week and three-week MBPs on 28 manufacturing workers revealed promising results that even brief but customized mindfulness interventions in the workplace could be as effective as longer programs (Calcagni et al., 2021). While the study's authors indicated that large sample sizes were needed to test their conclusions, they acknowledged that small sample sizes of well-described and contextualized scenarios, such as those contemplated in this study, were still valuable and contribute to the field.

To provide employees with tools for stress management in specific occupational settings, this DNP project aimed to implement a six-week MBP targeting manufacturing industry employees to reduce perceived stress levels.

Literature Search Strategy

To gather the most current information on mindfulness training for stress reduction in the working population, various online databases and search engines were utilized, including CINHALL with Full Text, Cochrane, PubMed, and Google Scholar.

Additionally, online databases and resources from the Centers for Disease Control and Prevention (CDC) were used to obtain current statistics on stress incidences and the effectiveness of mindfulness training. Keywords employed in the search included mindfulness, manufacturing, workplace stress, Meditation, breath work, and anxiety. Publication years were considered broadly, but priority was given to reviews and studies published within the last five years. Inclusion and exclusion criteria were established during the search process. Inclusion criteria included mindfulness-based interventions implemented in organizations and their effectiveness in reducing stress. Exclusion criteria included inconclusive outcomes following mindfulness-based interventions and identified barriers to practice.

The literature review justified the introduction of mindfulness training by highlighting prevailing stress statistics and the effectiveness of mindfulness training. Various types of mindfulness interventions, such as MBSR and mindfulness-based cognitive therapy (MBCT), were examined in terms of their outcomes. The review also encompasses non-mindfulness-based training, interventions, and programs aimed at stress reduction in the workplace. Examples of these included policy-level interventions and programs such as mental health days, yoga, music, exercise classes, and company retreats.

Overview of Mindfulness-Based Programs

Engaging in employment can have positive effects on an individual's health and outlook on life. However, while a job may provide future stability, the stress within the workplace sometimes outweighs the perceived benefits and exposes an individual to health threats (Brinkmann et al., 2020). The United States National Institute for

Occupational Safety and Health defined workplace stress as harmful physical and emotional responses that develop when job requirements do not align with the worker's capabilities, needs, and resources. Consequently, this leads to poor health and avoidable injuries. Inadequate stress management, as Badu et al. (2020) highlighted, can result in reduced productivity, burnout, early retirement, and long-term health issues.

MBPs are effective in improving overall well-being. Mindfulness is centered around being aware and present, and consistent practice has demonstrated benefits in managing stress, anxiety, depression, burnout, and other health-related issues. While mindfulness has its roots in Buddhist traditions, it has gained popularity in Western culture in recent decades. The practices can be both formal, such as breathing exercises, body scans, sitting, and walking, and informal, such as purpose-driven communication, nutrition, and relationship building. Studies have indicated the proven benefits of mindfulness programs across various organizations, including healthcare, manufacturing, school settings, and other occupational sectors. Moreover, mindfulness practices enhance an individual's attention and awareness of present experiences (Janssen et al., 2018).

Types of Mindfulness Interventions

Mindfulness-Based Stress Reduction

MBSR is an eight-week, evidence-based mindfulness training program developed by Dr. Jon Kabat-Zinn at the University of Massachusetts Medical Center in 1979 (Mindful Leader, 2022). Initially designed for chronically ill patients who were unresponsive to traditional treatments, MBSR has been studied concerning anxiety, depression, and stress reduction. Reibel and McCown (2019), in developing a guide for

teachers of MBPs, examined the benefits of MBSR in reducing stress, depression, anxiety, and burnout and improving quality of life. Their findings provided valuable insights and resources that were useful in implementing the project proposed in this study, drawing on evidence-based literature with consistently positive outcomes. Dane and Brummel (2014) conducted a survey among restaurant workers that highlighted the effectiveness of MBPs as evidenced by improvements in job performance, server experience, and reduced turnover intention.

Mindfulness-Based Cognitive Therapy

According to Segal et al. (2002), MBCT was developed as a guide for clinicians in understanding the “whys” and “how-tos” of conducting mindfulness practices and cognitive interventions to support recovery from depression and prevent relapse. Mindfulness facilitated a shift into an alternative mode of mind, transcending ordinary thinking. It encourages a shift from critical thinking, which can perpetuate negative downward mood spirals, to a mode of mind characterized by direct, non-conceptual experiences with no judgment (MBCT, 2018). The rationale is that higher stress levels can contribute to sadness and anxiety, making it essential to adopt practices that reduce unnecessary rumination while improving stress management skills.

Effectiveness of Mindfulness Interventions in the Workplace

Restaurant Industry

Mindfulness in the workplace can provide valuable intervention to mitigate the disruptive factors that contribute to fear, anxiety, and post-traumatic stress disorder. According to Hugh-Jones et al. (2018), workplace mindfulness is associated with increased job satisfaction and decreased turnover, and Fouts (2019) posited that this holds

for restaurant workers. A survey of American restaurant industry managers and service workers examined mindfulness behaviors, job performance, server experience, and turnover intention. The findings revealed significant positive correlations between server experience and job performance, as well as between workplace mindfulness and job performance. A significant negative correlation was found between workplace mindfulness and turnover intention.

Healthcare Industry

A study conducted among healthcare professionals in Spain showed that 15% of participating workers reported that a mindfulness intervention helped in reducing stress (Rodriguez-Vega et al., 2020). Mindfulness practice has been shown to counter the fight-or-flight response associated with anxiety and stress. Johnson et al. (2020) reported that mindfulness training improved individuals' ability to focus on positive events rather than distractions, resulting in increased job performance.

School-Based Systems

The literature indicates that students who practiced mindfulness exercises such as breathing exercises and yoga four times per week showed improved regulation skills in dealing with stress (Child Trends, 2019). Hugh-Jones et al. (2018) conducted a semi-structured interview with 21 participants working at a higher education institution, which showed that positive benefits were reported in response to self-care, perceived choice, stress detection, restoration of recovering self-agency, and upward spiraling.

The concept of mindfulness involves three interwoven mechanisms that form a cyclical process: (1) intention (being purposeful), (2) attention (paying close attention), and (3) attitude (being open and non-judgment) (Krikaous et al., 2021). While most

individuals habitually react to stress in unhealthy ways, mindfulness practice has shown efficacy in promoting beneficial health outcomes through consistent approaches.

Mindfulness is viewed as a skill and a way of being that can be developed through an array of approaches to promote relaxation, leading to improved attention, concentration, relationships, and emotional intelligence.

Stedham and Skaarv (2019) developed an integrative conceptual framework that explained the indirect effect of mindfulness on leadership effectiveness through trust, linking mindfulness-based leader behaviors and characteristics to overall leader effectiveness in organizations. Individuals who embrace mindfulness typically develop focused attention to managing their thoughts and feelings effectively. Mindfulness training is an intervention that should be implemented in the workplace to enhance employees' mental health and well-being.

Mindfulness Practices

Mindfulness practices include techniques such as breath work, body scan meditation, and guided imagery. Breathwork can be practiced for different durations, calming the body by selecting a comfortable inhalation and exhalation time and holding the breath for as long as possible. To promote relaxation, exhaling is doubled compared to inhaling; for example, inhaling for four seconds and exhaling for eight seconds.

Breathing imagery induces relaxation by imagining colors or images while lying down.

Micklitz et al. (2021) found that the mechanisms of MBPs involve acceptance/compassion, awareness/self-regulation, and fostering personal growth and self-care.

However, interventions or programs with substantial benefits may also carry the potential for harm, defined in this context as worsened symptoms or functioning after exposure to MBPs. Therefore, ethical considerations are essential in designing and implementing any MBP (Baer et al., 2019). Scientific literature currently lacks a comprehensive understanding of harm or harmful outcomes associated with MBPs, but instructor factors, such as educating participants about the rationale and potential risks and benefits, may be necessary to prevent harm (Baer et al., 2019). Including monitoring methods in MBP design can serve as a measure of effectiveness and aid in understanding the potential risks for participants.

Training/Interventions/Programs to Reduce Workplace Stress (Non-Mindfulness-Based)

Non-mindfulness-based policy-level programs, such as know-your-number screenings, have been implemented in the workplace to reduce the stress of taking time off for primary health visits. These screenings involve quick and voluntary health assessments, including blood pressure, weight, body mass index, high-density lipoprotein, low-density lipoprotein, triglycerides, glucose, and total cholesterol. This program allows employees to avoid the challenge of taking time away from work to visit their primary care physician and provides an additional wellness benefit during annual insurance negotiations.

Other programs targeting workplace stress reduction have utilized company retreats, such as golf tournaments held at local clubs, which have promoted bonding, team spirit, and a positive outlook on life. Mindful yoga, an awareness-based system incorporating stretching and strengthening poses, breathing exercises, and ethical

Meditation to connect to the mind, body, and spirit (Falsafi & Leopard, 2015), has also been employed. However, the workplace programs offered for stress reduction purposes need more consistency, leading to the absence of an efficient stress reduction program in the given setting.

Summary

Mindfulness training enhances workers' productivity, job performance, and job satisfaction by increasing their awareness of the job, psychological environment, and their state of well-being. Through consistent daily practice, mindfulness can become a natural part of workplace well-being programs with significant clinical value. Current literature supports the positive impact of mindfulness-based workplace training on employee well-being. Embracing mindfulness involves a commitment to self-care. While there is limited data on the specific benefits of mindfulness practice for workers in a manufacturing setting, early identification of stress-mitigating factors highlights the need for further research to help manufacturing workers avoid income loss, burnout, and adverse long-term health effects.

The methodology of the mindfulness project is discussed in Chapter III.

CHAPTER III

METHODOLOGY

Introduction

The selected local manufacturing site for this mindfulness-based training employed approximately 1,300 workers. The objective was to implement a 30-minute, once-weekly evidence-based mindfulness training program over six weeks to reduce employee stress. Considering the lack of definitive evidence on the optimal program duration, a six-week program was implemented to allow ample time for pre-and post-intervention assessments and data analysis.

The study compared participants' scores from the PSS survey before and after the intervention, with the expected outcome of observing a reduction in perceived stress following the completion of the six-week mindfulness program.

As stated earlier, the inclusion criteria included consenting participants who reported high levels of perceived stress. Exclusion criteria included individuals who had previously undergone mindfulness-based training and did not perceive it to be effective in managing their stress levels.

Theoretical Framework

To reduce perceived stress and enhance job satisfaction at the selected site, the KTA Framework was adopted. The KTA Framework, developed in 2006 by Dr. Ian Graham and colleagues, serves as a conceptual framework for translating knowledge into sustainable, evidence-based interventions (Field et al., 2014). Figure 1 illustrates the components of the KTA Framework, which consists of the Knowledge Creation cycle surrounded by an Action Cycle (Field et al., 2014). The knowledge creation process is

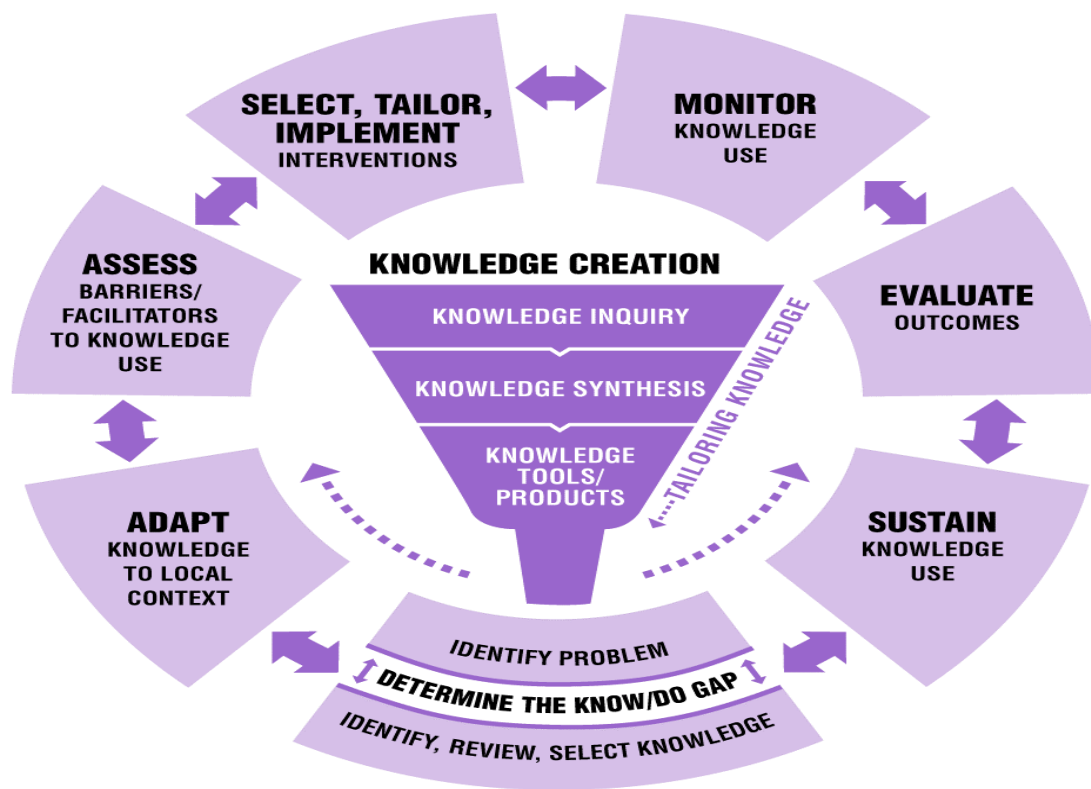
used by researchers to generate knowledge, which can be utilized as a decision aid or clinical pathway. On the other hand, the Action Cycle encompasses multiple phases aimed at identifying the problem:

- a) adapting the knowledge to the specific context
- b) assessing Barriers to knowledge use
- c) selecting the appropriate implementation strategy to make changes in the chosen setting
- d) monitoring knowledge utilization
- e) evaluating outcomes
- f) sustaining the use of knowledge

The seven phases of the KTA action do not necessarily need to be completed sequentially as there is flexibility to move between steps concurrently (RNAO, 2022).

□ **Figure 1**

Knowledge to Action Framework



Project Design

This DNP project utilized a pre-and post-intervention survey design. Pre- and post-intervention surveys were used to assess the impact and effectiveness of the intervention program. The objective of conducting pre-and post-intervention surveys was to compare participants' work performance, behaviors, and outcomes before and after the intervention to determine the extent of change or improvement resulting from the proposed intervention.

Setting

The setting for this evidence-based project was a manufacturing company situated in one of the state's largest metropolitan cities within the south-central region of Texas. The manufacturing site consisted of various departments, including production, research and design, quality control, human resources, sales administration, facilities management, and security. It housed an employee health clinic that provided comprehensive care for full-time employees, part-time employees, and contractors, offering a wide range of services such as work-related injury assessment, personal sick visits, reasonable accommodation requests, and wellness and health promotion events. The clinic operates from 8 am to 5 pm on Mondays, Wednesdays, and Fridays and from 11 am to 7 pm on Tuesdays and Thursdays. It remained closed on weekends and major holidays, with a complete shutdown during Christmas week for all employees annually. The setting employed different shifts, with administrative staff working traditional eight-hour shifts and production associates following staggered 10-hour shifts around the clock.

Population and Sample

The site employed over 1,300 employees and operated 24 hours per day, seven days per week. However, in this manufacturing setting, employees had different start and end times for their work shifts. Most employees worked between 8 and 12 hours per day, while some departments offered the option to work from home instead of coming to the site daily. This arrangement improved productivity for some and allowed flexibility to participate in out-of-work stress management interventions. The population demographics included both males and females, individuals with high school diplomas and those without college education, as well as individuals with higher college degrees.

There was also diversity in terms of nationality, with the administrative staff primarily being Caucasian and the production workers consisting mostly of immigrants with no prior work experience. The longest period of service among employees was 39 years. However, due to the nature of the job, turnover and retention have been challenging in this environment.

Recruitment Strategy

The enrolled participants were notified via email before the start of the intervention. Participation was voluntary, and interested volunteers provided informed consent through email. The recruitment email clearly outlined the goals, purpose, and expected outcomes of the project. Flyers for the project were distributed to the on-site communications team and displayed on the factory's weekly visual board to provide more information, increase visibility, and encourage volunteer sign-up and engagement (see Appendix L). Weekly reminder emails were sent to participants regarding upcoming sessions. Participants completed information sheets, including consent forms (see Appendix F), which were then recorded in a master code sheet (see Appendix G) using blind coding. Unique participant codes were generated and used as identifiers on the perceived stress scale survey, demographic sheet, and pre-and post-intervention surveys.

Intervention

Prior to initiating the intervention, ethical approval was obtained from the University Research Ethics Committee (PVAMU IRB) (see Appendix F), along with a written letter of support from the company (see Appendix E). The intervention consisted of 30-minute weekly sessions over a duration of six weeks. For mindfulness training, the Palouse Mindfulness, an online MBSR program, was utilized as a guided resource during

the sessions. Each participant was provided with reading materials, online videos, and journals during the weekly sessions- (see Appendices I, J, and K). The intervention utilized the following schedule:

Week 1- Introduction to informal mindfulness practice through simple awareness and a body scan meditation.

Week 2- Sitting meditation.

Week 3- Mindfulness breathing.

Week 4- Stress management and breathing activity.

Week 5- Mindfulness and communication.

Week 6- Mindfulness and compassion with a loving-kindness meditation.

To reinforce the skills acquired and provide ongoing support, a weekly recap of each session was sent via email. This recap served as a resource for further practice or reference, especially in dealing with challenging work-related stressful situations.

Instruments/Measures

Data on perceptions of stress were assessed using the Perceived Stress Scale (PSS) survey (see Appendix A). The PSS is a widely used tool for measuring stress perception (Cohen et al., 1994). It consists of a 10-item questionnaire that takes approximately three minutes to complete, depending on reading proficiency. Items 1, 2, 3, 6, 9, and 10, which are negatively phrased, such as "In the last month, how often have you felt nervous and stressed," comprise Factor 1 (Perceived Helplessness). Conversely, items 4, 5, 7, and 8, which are positively phrased, such as "In the last month, how often have you felt that things were going your way," made up Factor 2 (Liu et al., 2020).

Data Collection

Data collection involved the use of pre-and post-intervention surveys to evaluate and meet the project's objectives. The survey data were processed and analyzed using Qualtrics software, which provides a comprehensive system for data collection across various organizations. In addition to the pre-and post-intervention surveys, the PSS was employed to measure perceived stress. At the end of the six-week training, a survey was sent to all participants via email to collect data on their stress levels.

Data Analysis

For data analysis, the collected data were analyzed using the two-tailed Wilcoxon paired test for several important reasons:

1. **Assessing change:** the two-tailed Wilcoxon paired test allowed for a comprehensive assessment of change by considering both increases and decreases in the measured variables. In the context of mindfulness training, this was important to capture any statistically significant changes in the outcome measures before and after the intervention.
2. **Non-parametric analysis:** the Wilcoxon test is a non-parametric test that does not rely on assumptions about the distribution of the data. This made it suitable for analyzing data that may not follow a normal distribution, which was often the case with subjective measures of mindfulness, well-being, or psychological variables.
3. **Robustness to outliers:** the two-tailed Wilcoxon paired test is relatively robust against outliers or extreme values. Outliers can occasionally occur in subjective

self-report data, and using the Wilcoxon test reduced their influence on the overall analysis.

4. Small sample sizes: the Wilcoxon test can be effectively used even with small sample sizes, making it suitable for studies with limited participants. In this project, the required sample size was 31.
5. Statistical significance: by employing a two-tailed test, the Wilcoxon analysis provided a comprehensive assessment of statistical significance. It considered both increases and decreases in the measured variables, ensuring that any significant changes were detected, regardless of the direction of change.

Overall, using the two-tailed Wilcoxon paired test offered robustness, flexibility, and sensitivity to capture changes in the outcome measures of the six-week mindfulness training program. It allowed for a comprehensive evaluation of the program's effectiveness and provided meaningful insights into the impact of mindfulness training on the measured variables.

To achieve a statistical power of 80% and a significance level of 5% (two-sided) for detecting an effect size of 0.6 between pairs, a sample size of at least 31 was required. Data were obtained from the PSS survey, which was administered to all 37 participants before and after the training.

Methodological Considerations

This research faced several potential challenges that could have hindered its overall effectiveness. For instance, there could be a threat to internal validity, specifically the testing threat. This threat arises when there is an interaction between the treatment and the pre-test. Therefore, it was not possible to determine whether the pre-testing

process influenced the results, as there were no baseline measurements available for comparison with untreated groups. Another challenge was the possibility of participant dropout, which could impact the intended target sample due to factors beyond the control of the project. Additionally, the instrumentation effect was a factor to consider. This effect refers to changes in the measuring instruments that may contribute to observable differences between the pre-and post-intervention survey results. Loss of interest and fatigue among participants could introduce instrumentation bias.

Summary

Mindfulness entails continuous, moment-to-moment awareness of one's experiences. This DNP project aimed to assess the effects of weekly 30-minute sessions over six weeks on stress in the occupational setting using a pre-test and post-test design.

In Chapter IV, the results of the intervention are presented and discussed.

CHAPTER IV

RESULTS

Introduction

In this chapter, the data obtained, the results of the data analysis, the study's findings, and a summary of the outcomes of this DNP project are described and presented. A detailed explanation of the data analysis is provided, highlighting significant successes and areas for improvement. Additionally, actionable recommendations for the participants to consider in their future endeavors are provided.

Demographic Characteristics

In the six-week mindfulness session conducted in a manufacturing worksite, a total of 37 employees participated, surpassing the required minimum sample size of 31. The demographic characteristics of the participants are summarized below:

Gender

Table 1 displays the gender distribution among the participants. Out of the 37 participants, 21 were female, accounting for 57% of the group, while 16 were male, representing 43% of the participants.

Table 1*Genders of Study Participants*

Variable	n	%
Gender		
<i>What is your gender?</i>		
<i>Female</i>	21	57
<i>Male</i>	16	43

Ethnicity

As presented in Table 2, among the participants, 25 individuals identified as African American, accounting for 66% of the group. Three individuals identified as White, comprising eight percent of the group. Five individuals identified as Asian, representing 13% of the participants. Seven participants identified as belonging to other ethnicities, accounting for five percent of the group.

Table 2*Ethnicity of Study Participants*

Variable	n	%
Ethnicity		
<i>Are you of Hispanic, Latino, or Spanish origin?</i>		
<i>No</i>	31	84
<i>Yes</i>	6	16
<i>How would you describe yourself? Please select all that apply.</i>		
<i>Black or African American</i>	25	66
<i>White</i>	3	8
<i>Asian</i>	5	13
<i>Other</i>	4	5

Employment Status

As presented in Table 3, out of the 37 total participants, 35 individuals were full-time employees, accounting for 95% of the group. Additionally, two participants were contractors, comprising five percent of the participants.

Table 3

Employment Status of Study Participants

Variable	<i>n</i>	%
Employment		
<i>What is your current employment status?</i>		
<i>Employed full-time (40 or more hours per week)</i>	35	95
<i>Contractor</i>	2	5

Educational Attainment

As presented in Table 4, among the participants, only five individuals had not obtained a college degree, while 16 individuals had obtained an advanced degree.

Table 4

Educational Attainment of Study Participants

Variable	<i>n</i>	%
Education		
<i>What is the highest degree or level of school you have completed?</i>		
<i>Doctorate or professional degree (e.g., M.D., DDS, Ph.D.)</i>	6	16
<i>Master's degree (e.g., M.A., MS, MEd)</i>	10	26
<i>Bachelor's degree (e.g., B.A., BS)</i>	11	28
<i>Associate's degree (e.g., A.A., AS)</i>	5	13
<i>In some colleges, no degree</i>	4	11
<i>High school degree or equivalent (e.g., GED)</i>	1	3

Variable	<i>n</i>	%
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Results of Mindfulness Training

The six-week mindfulness training was provided to a total of 37 manufacturing employees at the local site, which met the sample size criteria of $n \geq 31$, after excluding individuals ($n = 3$) who reported previous attendance at a mindfulness session and found it ineffective.

Figure 2 illustrates the timeline of the intervention. Following a week of pre-intervention preparation, which involved distributing a pre-test survey containing the PSS and demographic questionnaires, the six-week intervention took place. The post-test survey was distributed during the week following the intervention.

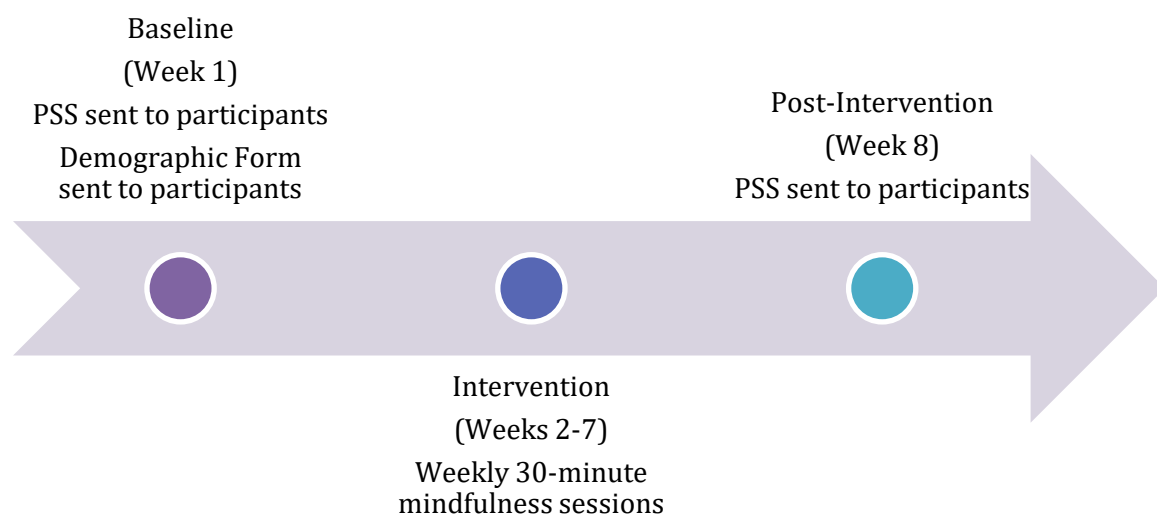
All participants who enrolled in the intervention attended every weekly 30-minute session, which included an introduction to mindfulness, reading materials, videos, open discussions, and techniques for sustaining the weekly mindfulness practices. Throughout the six weeks, participants engaged in group discussions shared their experiences, and received guidance from the instructor. Outside of the sessions, participants were encouraged to practice mindfulness and maintain a personal notebook to reflect on their progress and observations.

Overall, the weekly mindfulness sessions implemented over six weeks yielded positive outcomes for manufacturing employees. Participants reported increased awareness, reduced feelings of stress, improved focus and productivity, enhanced communication and collaboration, greater emotional well-being, and a desire to continue practicing mindfulness. Furthermore, positive effects were observed in terms of daily

mindfulness practice on stress, anxiety, depression, and attention. These outcomes are known to contribute to a healthier and more productive work environment.

Figure 2

Timeline of Project Activities-



Analysis of Data

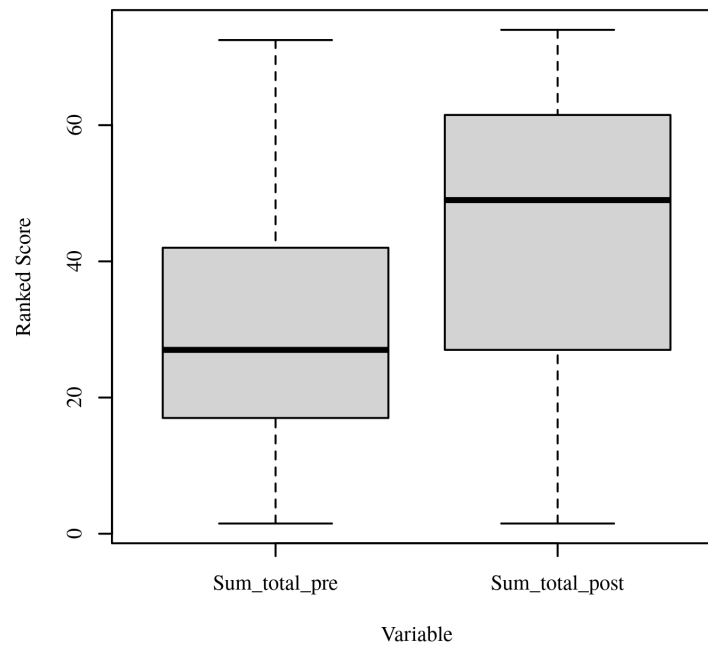
The Wilcoxon test, also known as the Wilcoxon signed-rank test, is a non-parametric statistical test utilized in this study to determine whether there was a significant difference between the pre-and post-intervention surveys. This was used for addressing the PICOT question, "Will implementation of an evidence-based mindfulness program (I) reduce perceived stress level (O) in manufacturing workers (P) compared to pre-intervention (C) in 6 weeks (T)?" The responses from the surveys were transcribed anonymously into Excel and analyzed using the Intellectus Statistics software program.

A two-tailed Wilcoxon signed-rank test was conducted to determine whether there was a significant difference between the sum-total pre-intervention and the sum-total post-intervention scores. This non-parametric test does not rely on distributional assumptions like the paired samples *t*-test (Conover & Iman, 1981). The results of the two-tailed Wilcoxon signed-rank test were found to be statistically significant based on an alpha value of .05 ($V = 178.00$, $z = -2.05$, $p = .041$), indicating that the differences observed between the sum-total pre-intervention and sum-total post-intervention scores were unlikely to be due to chance. The median of the sum-total pre-intervention scores ($Mdn = 12.00$) was significantly lower than the median of the sum-total post-intervention scores ($Mdn = 16.00$).

The significant improvements in stress levels, mental health, physical health, emotional well-being, and quality of life demonstrated by the Wilcoxon analysis highlighted the effectiveness of mindfulness training in promoting wellness and population health. Incorporating mindfulness practices into healthcare programs or workplace settings can lead to healthier individuals, enhanced community well-being, and reduced healthcare costs associated with stress-related and chronic health conditions.

Figure 3

Boxplot of the ranked values of sum-total pre-intervention and sum-total post-intervention scores



Significant Successes

1. Improved stress reduction and well-being: participants in the six-week mindfulness training experienced reduced stress levels and enhanced overall well-being due to the mindfulness training. The median of the sum-total pre-intervention score ($Mdn = 12.00$) was significantly lower ($p < 0.05$) than the median of the sum-total post-intervention scores ($Mdn = 16.00$).
2. Increased self-awareness and emotional regulation: mindfulness contributed to participants' heightened self-awareness and improved their ability to regulate their emotions, especially in the workplace, effectively. The findings based on the sum

total scores indicated that mindfulness training was beneficial for everyone, regardless of their level of education or race.

3. Enhanced focus and attention: all 37 fully participating individuals reported noticeable improvements in concentration, focus, and attention, leading to greater productivity and task performance both during and after the training program, as evidenced by journal entries.

Areas for Improvement:

1. Consistency in practice: to maintain and potentially increase the positive effects of mindfulness practices, participants should establish a consistent mindfulness practice beyond the initial training period (Creswell, 2017).
2. Application to the workplace context: manufacturing workers should further explore and apply mindfulness techniques to address work-related challenges, such as managing job stress or improving interpersonal relationships (Goodman et al., 2017).
3. Deepening mindfulness skills: participants should focus on deepening their mindfulness skills by exploring additional mindfulness techniques or advanced practices, such as loving-kindness meditation or body scan exercises (Loving et al., 2023).

Summary

By subjecting the data to statistical analysis, the impact of the six-week mindfulness intervention program was assessed, and the significance of any changes was evaluated. The results of the analysis indicated a significant positive effect of the intervention. The two-tailed Wilcoxon signed-rank test revealed a significant difference

between the pre-and post-intervention measurements, showing a comparative decrease in stress levels.

In addition to stress reduction, the mindfulness program also had a positive impact on other measures. Participants reported improved focus, increased self-awareness, and enhanced overall well-being. Considering the demographic and employment characteristics of the study participants, the results suggest that wider implementation of mindfulness sessions could improve the health outcomes of a diverse working population, such as that in the United States. Furthermore, considering recent reports that individuals of color experienced higher levels of stress compared to their White counterparts during the COVID-19 pandemic (Prasad et al., 2021), the significant reduction in stress among participants of color as a result of the mindfulness program holds significant clinical importance.

Chapter V delves into a detailed discussion of the study findings, highlighting the limitations of the study and presenting future recommendations.

CHAPTER V

DISCUSSION AND CONCLUSIONS

Introduction

This section provides a detailed examination of the study's findings and their implications within the broader context of existing literature on mindfulness training. The focus is on presenting key findings, highlighting any significant changes in participants' well-being and mental health as a result of the mindfulness training program. These findings are then compared to previous research to explore the consistency or divergence between our results and prior studies.

This DNP project involved 37 manufacturing employees who participated in a six-week mindfulness training program. The program consisted of 30-minute weekly sessions that incorporated various mindfulness techniques, including breath awareness, body scan, and mindful movement. The objective of the program was to equip participants with the necessary tools and skills to cultivate present-moment awareness, non-judgmental acceptance, and compassion toward themselves and others. Prior to the training, participants completed self-report measures assessing their levels of perceived stress, anxiety, depression, and overall mental well-being. The program encompassed an introduction, lectures, exercises guided by videos and readings, and practice worksheets. Following the formal discussions, informal discussions were also encouraged when time permitted.

Summary and Discussion of Results

Stress can contribute to the development of diseases and engagement in unhealthy behaviors, which can lead to poor health outcomes. Therefore, the observed

decrease in stress levels suggests that the adoption of mindfulness practices by workers can significantly improve their overall health outcomes.

Effects of Mindfulness Training on Stress

Mindfulness training has been shown to reduce stress levels effectively, a common experience that can have negative impacts on both mental and physical health across various populations. In this study, the distribution of perceived stress levels, as measured by the PSS, indicated that at the beginning of the program, most participants reported experiencing stress without having access to proven stress reduction techniques. However, by week four of the program, most participants reported actively practicing mindfulness techniques such as breathwork or body scan during situations that typically caused them stress due to work demands. Notably, one participant expressed the desire to continue the program beyond the initial six weeks, highlighting a personally significant increase in work productivity that they attributed to the mindfulness training.

Effects of Mindfulness Training on Anxiety

Anxiety is a common mental health issue that can have a significant impact on daily life. In the manufacturing industry, employees often experience heightened anxiety due to factors such as varying shift schedules, a lack of work-life balance, and other health concerns. Research has demonstrated the positive impact of mindfulness training on anxiety levels. A study conducted by Li et al. (2023) found that an MBSR program significantly decreased anxiety symptoms in individuals with lung cancer.

Effects of Mindfulness Training on Depression

Depression is a prevalent mental health issue that can have significant negative impacts on one's quality of life. Mindfulness training has demonstrated effectiveness in

reducing symptoms of depression. A systematic review, which included 25 studies, evaluated the efficacy of mindfulness-based interventions in reducing depression among lung cancer patients and reported positive outcomes (Li et al., 2023). Another recent literature review indicated that participation in MBPs can enhance various factors that contribute to improved outcomes in depression treatment across different health and mental health populations (Maddock & Blair, 2023).

Considering the significant reduction in stress observed among the study participants, it is reasonable to infer that this DNP mindfulness-based intervention program had a positive impact on moderating depression.

Effects of Mindfulness Training on Attention

Attention is a critical cognitive function that plays a significant role in daily life, academic performance, and work productivity. Research has shown that mindfulness training can enhance attention. Yakobi et al. (2021) conducted a study that demonstrated a significant positive effect of in-class mindfulness sessions on attention in healthy adults. Improving attention is closely linked to the practice of mindfulness, which involves intentionally paying attention to the present moment without judgment. Considering the demographic and employment characteristics of the study participants, the results suggest that wider implementation of mindfulness sessions could improve the health outcomes of a diverse working population, such as that in the United States. Furthermore, considering recent reports that individuals of color experienced higher levels of stress compared to their White counterparts during the COVID-19 pandemic (Prasad et al., 2021), the significant reduction in stress among participants of color as a result of the mindfulness program holds significant clinical importance.

Discussion of Results in Relation to the Literature

Over the past decade, there has been a growing body of literature examining the effectiveness of mindfulness training in the workplace. One consistent finding from this literature is that mindfulness training has the potential to impact employee well-being positively. Studies, such as those conducted by (Li, J et al., (2023) and Yakobi et al., (2021), have demonstrated that employees who participate in mindfulness programs report reduced stress levels, improved mental health, and overall enhanced well-being. These findings are particularly significant given the increasing levels of stress and burnout in today's fast-paced work environments (CDC, 2022). Mindfulness interventions, such as meditation and breathing exercises, provide employees with practical tools to effectively manage their stress and cultivate a sense of balance and resilience. After six weeks, many employees who participated in the weekly mindfulness sessions reported a significant decrease in their perceived stress levels.

Another notable observation from the literature is that mindfulness training can improve employee performance and productivity. Mindfulness-based interventions, such as breathing exercises, daily Meditation, or journaling in the workplace, have been associated with increased focus, attention, and cognitive flexibility. By cultivating present-moment awareness and reducing mind-wandering, employees are better equipped to concentrate on their tasks and make more informed decisions. Furthermore, mindfulness has been linked to enhanced creativity and problem-solving abilities, which can contribute to innovation and organizational effectiveness.

Throughout the six weeks, participants in this study actively engaged in group discussions, shared their experiences, and received guidance from the instructor. They

were encouraged to practice mindfulness outside of the sessions and maintain a personal journal to reflect on their progress and insights. By the end of the training, participants had developed foundational mindfulness skills and experienced growth in areas such as present-moment awareness, self-compassion, stress reduction, and overall well-being by sharing their experiences.

The weekly mindfulness sessions were successfully implemented for manufacturing employees with the aim of enhancing their well-being and job performance. The outcomes of the sessions were overwhelmingly positive, as reported by the participating manufacturing employees. They experienced heightened awareness, reduced stress levels, improved focus and productivity, enhanced communication and collaboration, and greater emotional well-being. Furthermore, they expressed a strong desire to continue practicing mindfulness, recognizing the benefits it brings to their personal and professional lives. These positive outcomes contributed to the creation of a healthier and more productive work environment for all employees involved.

Ethical Considerations

This DNP project was designed and conducted following standard ethical considerations. Therefore, basic guidelines were followed at each phase to ensure trustworthiness and integrity. First, informed consent was obtained from all participants, and their voluntary participation was ensured prior to enrollment. Second, a letter of support was also obtained from the organization where this project was conducted. Third, Prairie View A&M University's Institutional Review Board (IRB) reviewed the project during the defense proposal to ascertain compliance with federal, institutional, and ethical guidelines for the protection of participant safety and well-being. Fourth, all data

collected was securely stored by the primary investigator in a locked box and will be retained for a period of up to three years in accordance with the researcher's duty and obligation.

Limitations of the Study

While the findings of this study are important, it is crucial to acknowledge certain limitations. Although the literature generally supports the positive effects of mindfulness training in the workplace, there have been mixed findings in some studies. Therefore, further research is needed better to understand the effectiveness and generalizability of mindfulness-based interventions. Further research is needed to explore the long-term effects of mindfulness interventions in the workplace, including their sustained impact over time. This includes conducting more longitudinal studies to assess the long-term effects. Additionally, future research should examine the impacts of mindfulness-based interventions on stress and emotional control with larger and more diverse sample sizes to ensure the replicability of these findings.

A summary of key limitations noted during the project implementation includes:

- The relatively small sample size made it difficult to generalize the results.
- Reliance on self-report measures (PSS) may introduce bias and may not provide a comprehensive picture of participants' stress and emotional regulation abilities.
- The project was conducted over a short period, and the long-term effects of this mindfulness training are unknown.
- Implementation of the intervention in the manufacturing industry was influenced by various factors, making it challenging to determine the optimal timing for all employees.

Addressing these limitations through future research will contribute to a more comprehensive understanding of the effectiveness and potential benefits of mindfulness-based interventions in the workplace.

Actionable Recommendations

These recommendations were shared with all participants who sought ways to maintain their practice after the six weeks of sessions.

1. Establish a daily practice: participants were encouraged to establish a regular daily routine for mindfulness practice, even if it was just for a few minutes, to sustain the benefits gained during the training program.
2. Mindful cues: participants were encouraged to incorporate mindful cues or reminders throughout the day to bring their attention back to the present moment. This included setting reminders or using sticky notes with prompts related to mindfulness.
3. Mindful breaks: participants were advised to take brief mindfulness breaks during work hours to recharge and refocus. This involved engaging in short breathing exercises or mindful walks during breaks.
4. Peer support and accountability: creating a supportive environment is essential. Participants were encouraged to consider organizing follow-up sessions or establishing a peer support network where participants could share experiences, address challenges, and provide encouragement to one another.
5. Additional resources: participants were to be provided with recommendations for books, apps, or online resources that offer guided meditations, mindfulness

exercises, or further information to support and enhance their ongoing mindfulness practice.

Future Directions and Considerations

While mindfulness training has demonstrated effectiveness in various settings such as healthcare, education, and the workplace, there are several areas for future exploration in the context of mindfulness training in a manufacturing setting. These potential future directions include:

1. Exploring the impact of mindfulness training on worker well-being.

Manufacturing work can be physically and mentally demanding, leading to high levels of stress and burnout among employees. Future research could investigate the impact of mindfulness training on worker well-being, including job satisfaction and overall mental health.

2. Investigating the relationship between mindfulness training and productivity/performance. Mindfulness training improves attention and cognitive control, which could enhance productivity and performance in a manufacturing setting. Further research could examine the link between mindfulness training on production metrics such as throughput, quality, and efficiency.

3. Evaluating the effectiveness of different mindfulness training protocols. There are various mindfulness training protocols available, such as MBSR and MBCT. Future studies could compare and evaluate the effectiveness of these different protocols in a manufacturing setting to identify the most effective approach for improving worker well-being and productivity.

4. Examining the impact of organizational culture on mindfulness training effectiveness. Organizational culture plays a crucial role in the implementation and effectiveness of mindfulness training. Future investigations could explore how organizational culture impacts the adoption and outcomes of mindfulness training in the manufacturing industry.
5. Investigating the impact of mindfulness training on safety. Safety is a critical concern in manufacturing, and mindfulness training has the potential to improve safety by promoting worker awareness and attention. Future research could examine the impact of mindfulness training on safety metrics such as accident rates and near-misses.

By addressing these future research directions, a deeper understanding of the effectiveness and potential benefits of mindfulness training in the manufacturing industry can be gained, ultimately leading to the development of evidence-based strategies to improve worker well-being and organizational outcomes.

Conclusions

This DNP project aimed to explore the effectiveness of mindfulness practice in reducing perceived levels of stress within a manufacturing setting. A pre-and post-intervention survey design, which involved assessing perceived stress levels using the PSS survey before and after implementation of the six-week mindfulness training intervention, was utilized to examine the effectiveness of mindfulness practice in reducing stress within a manufacturing setting. The sample size criteria, both inclusive and exclusive, were considered, and the results showed a significant decrease in perceived stress based on a two-tailed Wilcoxon signed-rank test with an alpha value of

.05 ($V = 178.00$, $z = -2.05$, and $p = .041$). Literature on mindfulness training in the workplace suggests that these interventions can be beneficial for employees and organizations as a whole. Mindfulness practices have the potential to enhance employee well-being, improve performance, and foster positive interpersonal relationships. By promoting present-moment awareness and reducing stress, mindfulness training can contribute to a healthier and more productive work environment.

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APPENDICES

Appendix A

Perceived Stress Scale

Perceived Stress Scale

A more precise measure of personal stress can be determined by using a variety of instruments that have been designed to help measure individual stress levels. The first of these is called the **Perceived Stress Scale**.

The Perceived Stress Scale (PSS) is a classic stress assessment instrument. The tool, while originally developed in 1983, remains a popular choice for helping us understand how different situations affect our feelings and our perceived stress. The questions in this scale ask about your feelings and thoughts during the last month. In each case, you will be asked to indicate how often you felt or thought a certain way. Although some of the questions are similar, there are differences between them and you should treat each one as a separate question. The best approach is to answer fairly quickly. That is, don't try to count up the number of times you felt a particular way; rather indicate the alternative that seems like a reasonable estimate.

For each question choose from the following alternatives:

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?
- _____ 2. In the last month, how often have you felt that you were unable to control the important things in your life?
- _____ 3. In the last month, how often have you felt nervous and stressed?
- _____ 4. In the last month, how often have you felt confident about your ability to handle your personal problems?
- _____ 5. In the last month, how often have you felt that things were going your way?
- _____ 6. In the last month, how often have you found that you could not cope with all the things that you had to do?
- _____ 7. In the last month, how often have you been able to control irritations in your life?
- _____ 8. In the last month, how often have you felt that you were on top of things?
- _____ 9. In the last month, how often have you been angered because of things that happened that were outside of your control?
- _____ 10. In the last month, how often have you felt difficulties were piling up so high that you could not overcome them?

Appendix B

Body Scan Meditation

Before doing the Body Scan Meditation for the first time, please read [The Body Scan Meditation](#). This 32-minute version is best when done as part of the 8-week MBSR course, but a [20-minute version](#) is also available.

Sitting Meditation (32 min)

Before doing this Meditation for the first time, please read the [Description of the Sitting Meditation](#). This 32-minute version is best when done as part of the 8-week MBSR course, but a [20-minute version](#) is also available.

Loving-kindness Meditation (13 min)

The Loving-kindness Meditation, sometimes known as a "Metta Prayer," is traditionally done for successively wider circles of caring, beginning with yourself (*see a simple form of the [Metta Prayer](#)*). Because many of us are so self-critical that it can be difficult to find loving feelings for ourselves, this Meditation begins with a person who you know to be loving toward you, and only after this do you bring focus to yourself, then successively widening the circle of goodwill to those closest to you, then those whom you feel neutral toward, then those with whom you have difficulties, and continuing outward until it includes all living beings.

Mindfulness and Communication

If you were to consider all the truly stressful situations in your life, you would probably find that many, if not most, involve other people. This week, we focus on communication and what it means to be mindful in our interactions with others, whether it be family members, coworkers, or neighbors. Our focus up until now has been on our internal world (thoughts, feelings, and sensations); now, we move from the intra-personal to the inter-personal, taking into account another's world and the place where their world and ours meet. This means recognizing that "the other" (person or persons) have their own perceptions, feelings, and needs, which are almost certainly different than ours.

Silent Meditation (30 min)

This audio was created so that you could have a 30-minute silent meditation without having to watch the clock. It begins with three chimes and ends with three chimes, with silence between. There is also a [15-minute version](#) and a [20-minute version](#).

"Soften, Soothe, Allow" Meditation (15 min)

This Meditation is an alternative to the "Turning Toward..." process introduced in Week 5 and is guided by [Kristin Neff](#). For more about "Soften, Soothe, Allow," see the [one-page description](#) and [Thinking with the Heart \(the origin of Soften, Soothe, Allow\)](#).


Appendix C

Letter of upcoming project intent to Alcon Houston Staff

We all have work stress and home stress (like homework time) no matter where we are in our life's journey. The last few years have been especially stressful with so much uncertainty and change. At the beginning of this summer Ijeoma Okora, our occupational health site lead, approached me and offered to host "**Mindfulness Sessions**" at our site to help our associates cope with stress. The sessions will include meditation, guided breathing, self-care tools and techniques, ways to intentionally unplug and find calm in the present moment, as well as materials to reinforce these techniques. IJ is currently wrapping up a **weight loss program** and plans to initiate the **Mindfulness Sessions** later in the fall (October/November). **Watch your email** for more information on these upcoming sessions. I believe they will be **beneficial** and appreciate IJ's thoughtfulness in providing them.

Appendix D

Example of Internal AED Survey



Mark Your Calendars!
Associate Experience Dashboard (AED) pulse is launching soon.

We Value Your Feedback
Take your pulse and voice what matters most to you in your work.

Survey begins September 26 and ends October 10, 2022

Alcon

Business Use Only

Appendix E

Letter of Support

9965 Buffalo Speedway
Houston, Texas. 77054

Phone: +1(713) 668 9100
www.alcon.com



May 18, 2022

Prairie View A & M School of Nursing
6436 Fannin Street
Houston, Texas. 77030

To Whom it May Concern,

Ijeoma Okoro, FNP informed Alcon Houston about implementation of her Doctoral Project: Mindfulness Training to Reduce Perceived Stress among Manufacturing Workers here at the Houston site.

I am writing to express my unequivocal support for this project and its implementation at the Houston site. Stress in the workplace has been shown to negatively impact our workers' health, reduce productivity, increase turnover, and incur business costs if it is not managed effectively through evidence-based resources and interventions.

We will provide Ijeoma, who has worked for Alcon and is our on-site Nurse Practitioner, with any resources she requires for this project. We will also make arrangements for our employees to attend trainings while working around their schedule.

We are confident that this project will benefit our site greatly and wish Ijeoma the best of luck.

Sincerely,

Jennifer Via, General Manager-Alcon MTO Houston

Appendix F

IRB Consent

**PRAIRIE VIEW A&M UNIVERSITY
OFFICE OF RESEARCH COMPLIANCE
CONSENT FORM**

TITLE OF STUDY: Mindfulness Training To Reduce Perceived Stress Among Manufacturing Employees: An Evidence-Based Project

PROTOCOL NUMBER:

DEAR STUDY PARTICIPANT:

You are invited to participate in a research study of Mindfulness Training To Reduce Perceived Stress Among Manufacturing Employees: An Evidence-Based Project

You were selected as a possible participant because you work in a Manufacturing setting.

We ask that you read this form and ask any questions you may have before agreeing to be in the study.

This study is being conducted by Ijeoma Okoro, APRN, MSN, FNP-BC

Background Information

The purpose of this study is to provide mindfulness training to manufacturing workers to reduce perceived stress

Procedures:

If you agree to participate in this study, we will ask you to do the following things:

1. Complete a pre-post survey using the Perceived Stress Scale Questionnaire
2. Attend a weekly mindfulness training for 30 minutes

Risks and Benefits of participating in the Study

The study has risks no greater than those encountered in everyday life.

(Risk must be explained, including the likelihood of the risk. If there are significant psychological risks to participation, the participant should be told under what conditions the researcher will terminate the study. If the risks are no greater than those encountered in everyday life, this should be stated.)

The benefits to participation are: improve mindfulness practice to reduce stress

PRAIRIE VIEW A&M UNIVERSITY
OFFICE OF RESEARCH COMPLIANCE
CONSENT FORM

Compensation:

No compensation will be awarded to participants

Confidentiality:

The records of this study will be kept private. In all reports resulting from this study, we will not include any information that will make it possible to identify you as a participant. Research records will be stored securely and only researchers will have access to the records.

(If tape recordings or videotapes are made, explain who will have access, if they will be used for education purposes, and when they will be erased.)

Voluntary Nature of the Study:

Participation in this study is voluntary. Your decision whether or not to participate will not affect your current or future relations with Prairie View A&M University. If you decide to participate, you are free to not answer any question or withdraw at any time without affecting those relationships.

Contacts and Questions:

The researchers conducting this study is Ijeoma Okoro, APRN, MSN, FNP-BC.

You may ask any questions you have now. If you have questions later, **you are encouraged** to contact the Principal Investigator at 713-295-4340 or at iokoro1@pvamu.edu.

Committee Chair: Dr. Sharisse Hebert, 713-797-7050, sahebert@pvamu.edu

(If the researcher is a student, include advisor's name, telephone number and e-mail address here.)

If you have any questions or concerns regarding this study and would like to talk to someone other than the researcher(s), **you are encouraged** to contact Donna Pulkrabek, Director of Research Compliance at (djpulkrabek@pvamu.edu or researchcompliance@pvamu.edu) in the Office for Research and Innovation, P.O. Box 519; MS 2800 Prairie View, Texas 77446 Phone 936.261.1588

You will be given a copy of this information to keep for your records.

PRAIRIE VIEW A&M UNIVERSITY
OFFICE OF RESEARCH COMPLIANCE
CONSENT FORM



Statement of Consent:

I have read the above information. I have asked questions and have received answers. I consent to participate in the study.

Signature: _____ Date: _____

Signature of parent or guardian: _____ Date: _____
(If minors are involved)

Signature of Investigator: _____ Date: _____

THIS PROJECT HAS BEEN REVIEWED BY THE
PRAIRIE VIEW A&M UNIVERSITY INSTITUTIONAL REVIEW BOARD
FOR THE PROTECTION OF HUMAN SUBJECTS.
Phone: (936) 261-1553, Office of Research & Graduate Studies

Recruitment Email

Dear Potential Study Participant,

I am conducting a project for my Doctoral program at Prairie View A&M Nursing Practice program implementing mindfulness-based stress training for for six weeks.

Mindful employees are better equipped to handle day-to-day stress

Studies show that meditation training can help curb the tendency for distraction, strengthening the participant's ability to concentrate and even boosting memory. Individuals who complete mindfulness training are more collaborative and have better resources to manage day to day work dynamics.

Following an eight-week program, research has shown lasting changes in brain regions associated with memory, sense of self, empathy and stress.

Whether you meditate regularly or have never meditated before, this program will cover the science behind mindfulness and include short practices to help refresh your mind and reduce stress.

If you agree to participate in this study, please see the following requirements stated below.

- Utilize the Perceived Stress Scale to complete a pre-post survey.
- Commit to attending a 30 minutes mindfulness training on site every week starting on (month, 2022)

If you are interested and choose to participate, please reply to the email to confirm your commitment.

Additionally, further information will be given on training dates, conference room, consent to participate, and all associated privacy related concerns.

My goal at the end of six weeks is to {support positive mental health in the office, give everyone more tools for stress reduction, prevent burnout, build resiliency in this time of change, keep the team healthy and happy}.

*No equipment, mat or special clothing needed, all training materials will be provided.

Appendix G

Attendance Sheets

Recruitment Email

Dear Potential Study Participant,

I am conducting a project for my Doctoral program at Prairie View A&M Nursing Practice program implementing mindfulness-based stress training for for six weeks.

Mindful employees are better equipped to handle day-to-day stress

Studies show that meditation training can help curb the tendency for distraction, strengthening the participant's ability to concentrate and even boosting memory. Individuals who complete mindfulness training are more collaborative and have better resources to manage day to day work dynamics.

Following an eight-week program, research has shown lasting changes in brain regions associated with memory, sense of self, empathy and stress.

Whether you meditate regularly or have never meditated before, this program will cover the science behind mindfulness and include short practices to help refresh your mind and reduce stress.

If you agree to participate in this study, please see the following requirements stated below.

- Utilize the Perceived Stress Scale to complete a pre-post survey.
- Commit to attending a 30 minutes mindfulness training on site every week starting on (month, 2022)

If you are interested and choose to participate, please reply to the email to confirm your commitment.

Additionally, further information will be given on training dates, conference room, consent to participate, and all associated privacy related concerns.

My goal at the end of six weeks is to {support positive mental health in the office, give everyone more tools for stress reduction, prevent burnout, build resiliency in this time of change, keep the team healthy and happy}.

*No equipment, mat or special clothing needed, all training materials will be provided.

Appendix H

Weekly Activity Schedule

	Activities	Mode of Training
Week 1	Mindful Meditation Pre-test Introduction Lecture Exercise Post-test	In Person
Week 2	Sitting Meditation Pre-test Introduction Lecture Exercise Post-test	In Person
Week 3	Stress management and breathing activity Pre-test Introduction Lecture Exercise Post-test	In Person
Week 4	Mindfulness and communication Pre-test Introduction Lecture Exercise Post-test	In Person
Week 5	Mindfulness and communication Pre-test Introduction Lecture Exercise Post-test	In Person
Week 6	Mindfulness and compassion with a loving-kindness mediation Pre-test Introduction Lecture Exercise Post-test	In Person

Appendix I

Practice Log

palousemindfulness.com

Informal Practice Log - Week 7

What was the situation? What process did you use? <small>(Simple Awareness, Mindful Eating, STOP, "Turning Toward", Walking)</small>	What was going on with you when you thought to do the process? (body, mind, emotion)	What did you notice WHILE you were doing the process? (body, mind, emotion)	What did you notice AFTER you did the process? (body, mind, emotion, action)	What did you learn?
EXAMPLE <i>I was cleaning the garage and getting frustrated with how long it was taking and decided to use Simple Awareness.</i>	<i>I felt frustrated at how long it was taking, hurrying just to get through, thinking "I HATE doing this - I have so many other things to do!"</i>	<i>I started to pay attention to the one part I was working on: the pile of tools in the corner, colors, shapes, how it felt to be holding the saw handle.</i>	<i>I actually continued with the process for a while. I was much calmer, only focused on what I was doing at THAT moment.</i>	<i>It wasn't the job itself which was frustrating, but my thinking about all the other things I had to get done.</i>
<small>7th day & beyond is optional</small>				

Appendix J

Activity Log

palousemindfulness.com

Practice Log - Week 1

FORMAL PRACTICE: Read [The Body Scan Meditation](#). On the first day, do the [Raisin Meditation](#) (have two raisins and a glass of water handy). For the next five days, do the [Body Scan](#). Don't expect to feel anything in particular from these practices. In fact, give up all expectations about it. Just let your experience be your experience. The audio guidance for all the Practices, can be found in the left-hand menu of the online course (on a smartphone, tap the menu icon just under "Palouse" on the top banner). **NOTE: One of your six formal practices can be one of the live group meditations listed in the [Online Meditation page](#).**

Record on this form each time you do a practice. In the comment field, put just a few words to remind you of your impressions of that particular practice: what came up, how it felt, what you noticed in terms of physical sensations, emotions, thoughts, etc. **It's important to write the comments immediately after the practice because it will be hard to reconstruct later.**

Once you have done at least six days of practice and feel that you've gotten the essence of this "Week", you may go to the next week, although you can stay here longer if that feels right.

INFORMAL PRACTICE: Each day this week, see if you can bring mindful awareness to some otherwise routine activity and record it on the [Informal Practice Log \(Simple Awareness\)](#).

...Date...	Formal Practice Comments (Raisin Meditation & Body Scan)
7th day & beyond is optional	

Appendix K

Practice Videos

Week 1 - <https://www.youtube.com/watch?v=BIWo7sqWLNk>

Week 2 - https://www.youtube.com/watch?v=O_StSJFUkiA

Week 3 - <https://www.youtube.com/watch?v=VUjiXcfKBn8>

Week 4 - <https://www.youtube.com/watch?v=tCX7kTUJDH8>

Week 5 - <https://www.youtube.com/watch?v=rJHBW8-56zU>

Week 6 - https://www.youtube.com/watch?v=-d_AA9H4z9U

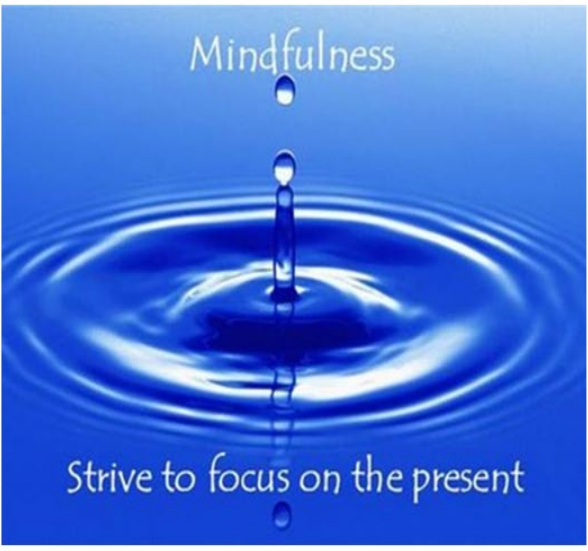
Appendix L

Flyer

Mindfulness Sessions for Alcon Houston



Facilitated by Ijeoma Oloro, MSN, APRN, FNP



CURRICULUM VITAE

Ijeoma Okoro APRN, MSN, FNP-C

Belinok5@gmail.com

EDUCATION

DOCTOR OF NURSING PRACTICE, DNP

*Prairie View A & M University, School of Nursing
Houston, TX. | 2023.*

MASTER'S IN NURSING, MSN (CUM LAUDE)

*University of Texas Health Science Center
Houston, TX | December 2015*

BACHELOR'S IN NURSING, BSN

*University of Arlington
Arlington, TX | June 2012*

ASSOCIATE DEGREE IN NURSING

*Houston Community College, Houston, TX
December 2009*

WORK EXPERIENCE

- Company: Alcon
Position: Occupational Health Lead 2020-Present
Job: Nurse Practitioner
- Company: GoHealth Urgent Care
Position: Nurse Practitioner 2018-present
Job: Family nurse Practitioner

PROFESSIONAL, TECHNICAL AND WORK-RELATED EXPERIENCE AND SKILLS

- | | |
|-----------------------------------|----------------------------------|
| • Suturing and laceration repairs | • Incision and drainage |
| • Foreign body removal | • Toe nail removal |
| • Ear lavage | • Splint stabilization |
| • X-ray interpretation | • EKG interpretation |
| • Pre-employment screening | • IV therapy |
| • Sports physicals | • Policy development & DOT exams |

PUBLICATIONS AND PRESENTATIONS

- DNP Project: Mindfulness Training To Reduce Perceived Stress and improve workers well-being-An Evidence-Based Project
- Reasonable Suspicion- Policy and Procedures
- Substance Abuse Updated Process for Manufacturing Workers