

University of San Diego

Digital USD

Doctor of Nursing Practice Final Manuscripts

Theses and Dissertations

Spring 5-23-2020

Calm: A Mindfulness Mobile App for Stress Reduction in the Workplace

Gizzele Valencia

University of San Diego, gvalencia@sandiego.edu

Follow this and additional works at: <https://digital.sandiego.edu/dnp>



Part of the [Nursing Commons](#)

Digital USD Citation

Valencia, Gizzele, "Calm: A Mindfulness Mobile App for Stress Reduction in the Workplace" (2020). *Doctor of Nursing Practice Final Manuscripts*. 111.

<https://digital.sandiego.edu/dnp/111>

This Doctor of Nursing Practice Final Manuscript is brought to you for free and open access by the Theses and Dissertations at Digital USD. It has been accepted for inclusion in Doctor of Nursing Practice Final Manuscripts by an authorized administrator of Digital USD. For more information, please contact digital@sandiego.edu.

UNIVERSITY OF SAN DIEGO
Hahn School of Nursing and Health Science
DOCTOR OF NURSING PRACTICE

CALM: A MINDFULNESS MOBILE APP FOR STRESS REDUCTION IN THE
WORKPLACE

by

Gizzele Victoria Del Rosario Valencia, BSN, RN

A Doctor of Nursing Practice Portfolio presented to the
FACULTY OF THE HAHN SCHOOL OF NURSING AND HEALTH SCIENCE
UNIVERSITY OF SAN DIEGO

In partial fulfillment of the
requirements for the degree
DOCTOR OF NURSING PRACTICE

May 01, 2020

Sharon Boothe-Kepple, PhD, MSN, FNP-C, PHN (Chickasaw), Faculty Advisor

Amy M. Kinghorn, MSN, FNP-BC, Clinical Mentor

Abstract

This evidence-based pilot (EBP) project was implemented to decrease stress among employees who work in a financial-based occupational health setting. According to the American Psychological Association's (APA) Stress in America online survey, 64% of survey-respondents reported that work is a significant source of stress (2018). Mindfulness meditation is a spiritual practice that helps a person acknowledge how to experience emotions and events without judgment (Luken & Sammons, 2016). A mobile app-guided mindfulness program could reduce perceived stress and increase mindfulness levels. These practices might improve work productivity, decision-making skills, organizational relationships, self-care, and perspective taking development (Jayawardene, Lohrmann, Erbe, & Torabi, 2017). Thirty-five participants were recruited through convenience sampling. Each participant received a 30-day free trial of a mindfulness mobile app called *Calm*. Participants completed a pre-intervention perceived stress scale (PSS-10) and mindfulness attention awareness scale (MAAS-15) surveys prior to the program launch. Each participant completed a 10- to 15-minute mindfulness session for 21 days using the *Calm* app.

After the 21 days, 19 participants completed the post-survey PSS-10, MAAS-15, and *Calm* feasibility questionnaire. Results showed a cumulative decreased PSS-10 score and an increased MAAS-15 score. All 19 participants would recommend this app to others. Over 80% experienced no problems using the app and more than half of them believed the app helped their work productivity. The *Calm* app was a free benefit and the cost-benefit-analysis showed a 1,823% return on investment. Implementing a mindfulness mobile app in an occupational health setting could decrease stress and increase mindfulness.

Calm: A Mindfulness Mobile App for Stress Reduction in the Workplace

Introduction

According to the American Psychological Association's (APA) Stress in America online survey, 64% of survey-respondents reported that work is a significant source of stress (2018). "Work stress" was the term used when the demands and psychological experiences experienced at work create short-term and long-term physical and mental health strains. Employees with increased levels of work stress might experience fear, burnout, tension, anxiety, sleep disturbances, headaches, and fatigue. These psychological and physical processes could progress to immune, cardiovascular, and metabolic health conditions. These health issues might harm both the employee and employer by promoting employee absenteeism, health care costs acquired by employers, poor judgment, and impaired work function (Ganster & Rosen, 2013).

Background

The site for this evidence-based practice (EBP) project took place in a corporate setting with more than 1,000 employees. The corporate setting provided wellness opportunities in addition to an onsite clinic such as massage, acupuncture, health fairs, and accessible gym. According to the clinic's lead nurse practitioner (NP), approximately 40 employees participate in the massage services each month, and about 20 employees participate in acupuncture services every month.

The doctor of nursing practice (DNP) student and the onsite clinic's lead NP conducted a needs assessment by reviewing trending chief complaints and patient visit diagnoses. All employees who visited the clinic also completed a health and wellness questionnaire asking about their current wellness practices and if they had any stress reduction program requests. The NP stated that employees who seek clinic services for various physical complaints frequently

report high levels of stress. Approximately 100 out of 300 employees who completed the clinic wellness questionnaires noted increased stress, decreased mental focus, and the need for stress reduction interventions.

PICOT Question

Could a mindfulness mobile app in an occupational health setting reduce perceived stress, including work stress, and increase mindfulness awareness level from a pre-test level to post-test levels in 21 days?

Purpose

The purpose of this pilot project was to implement a three-week daily mindfulness mobile app in an occupational health setting to decrease perceived stress, including work stress, and increase mindfulness.

Synthesis of the Evidence

A literature review was performed using the following search engines: Cumulative Index to Nursing and Allied Health Literature, PubMed, ProQuest, Cochrane, and Google Scholar. The search was limited to occupational health and psychology research journals. Keywords utilized in the search were: mindfulness, occupational health, stress, workplace, mobile application, and smartphone. This search yielded 41 related articles. A total of eight articles were chosen to validate the EBP project interventions after further evaluation.

Each article was ranked utilizing the Johns Hopkins Model EBP Evidence Level and Quality Guide under the Johns Hopkins Nursing EBP Model and Guidelines (Dang & Dearholt, 2017). This user-friendly model provided problem-solving guidelines applicable to clinical practice. The model is known for their process called “PET.” This three-step process included “practice question,” “evidence,” and “translation.” It allowed the user to inquire about a practice

problem, rank evidence through a literature review, and create recommendations that might be applied in clinical practice (Dang & Dearholt, 2017). The model's Evidence Level and Quality Guide appraised each article from low to high quality of evidence strength. This tool contained explanations as to why a piece of evidence is either of low, good, or high quality of evidence. Six randomized controlled trials (RCT) and meta-analysis articles rated level one with three being of high quality and the other three of good quality. The other two quasi-experimental articles graded as high-quality evidence (The Johns Hopkins Hospital, 2017).

Mindfulness meditation is a spiritual practice that allows a person to wholeheartedly and non-judgmentally be in the present moment (Luken & Sammons, 2016). This practice teaches an individual how to acknowledge all experienced emotions and events without judgment.

Mindfulness meditation was first referenced on wall art in India from 5,000 to 3,500 BCE (Before the Common Era). Meditation started to play a significant role in Hinduism at 1500 BCE. Taoist China and Buddhist India developed other forms of meditation during the sixth to fifth century BCE (Mead, 2019).

Many people from the Eastern hemisphere practice mindfulness as part of a larger traditional event or by itself. Mindfulness was also popularized by followers of Buddhism and Hinduism for spiritual and religious purposes. Hinduism involved meditative practices around the sacred Veda writings and yoga. Ancient forms of yoga emphasized on stillness, a focus on breathing, and self-presence. Buddhism followers aimed to reach enlightenment through meditation. A traditional Buddhist term for meditation, *bhāvanā*, meant "mental development." Another term for meditation, *dhyāna*, meant "mental calmness" (Mead, 2019; Selva, 2019).

Over the last 20 years, the Western hemisphere adopted Eastern mindfulness meditation practices into individual and nonspiritual practices. Jon Kabat-Zinn, the founder of the Center for

Mindfulness, played a significant role in bringing mindfulness to Western society. He developed the Mindfulness-Based Stress Reduction (MBSR) program in 1995 that aimed to decrease stress (Selva, 2019). Over the last decade, many other Western mindfulness practitioners developed similar programs that involved deep-breathing, body scanning, sitting meditation, or walking meditation. Mindfulness practices are now highly accessible through their many online-guided informal and formal mindfulness programs. Mindfulness practices could be learned through informal self-guided meditation. But, most of this evidence review involved studies that appraised formal learning methods such as online-guided apps, MBSR, and practice groups (Luken & Sammons; Selva, 2019; Spijkerman, Pots, & Bohlmeijer, 2016).

Two RCTs and one meta-analysis concluded that mindfulness in the workplace might improve employee psychological function. According to an RCT that used a mindfulness mobile app in a workplace-setting, short guided mindfulness sessions improved psychosocial outcomes such as decreased anxiety and job strain (Bostock, Crosswell, Prather, & Steptoe, 2018). Slutsky, Chin, Raye, and Creswell's (2018) RCT study concluded that employees that practice mindfulness might experience an increase in attentional focus and job satisfaction and a decrease in work-life conflict. A meta-analysis completed by Spijkerman et al. (2016) determined that an online-guided mindfulness program may reduce perceived stress and increase mindfulness levels.

Mindfulness could reduce stress and emotional exhaustion. These practices might improve work productivity, resilience, decision-making skills, organizational relationships, self-care, interpersonal communication, and perspective-taking, which is the act of perceiving a situation or understanding of the concept from an alternative point of view. These articles stated that short on-line guided mindfulness-based interventions could last between two to 12 weeks.

Other scholars found these timeframes effective in decreasing stress and improving mindfulness (Bostock et al., 2018; Slutsky et al., 2018; Spijkerman et al., 2016; Jayawardene et al., 2017).

Three RCTs stated that it is feasible to use an audio-guided mindfulness intervention through a smartphone application, also known as a mindfulness mobile app (Bennike, Wieghorst, & Kirk, 2017; Bostock et al., 2018; Yang, Schamber, Meyer, & Gold, 2018). Participants could be able to complete a 10 to 20 minute daily mindfulness session using the mindfulness mobile app. The mindfulness mobile apps used in most of these studies included Headspace and Lumosity (Bennike et al., 2017). Bennike et al. (2017) concluded that a short 10 to 20 minute daily meditation using a mobile mindfulness app might drastically reduce mind wandering and increase self-awareness. Bostock et al. (2018) stated that this same method significantly improved their participants' well-being, systolic blood pressures, job strain, distress, and perceived social support in the workplace. This method of mindfulness might also decrease burnout, anxiety, and perceived stress such as workplace stress (Yang et al., 2018).

The mindfulness mobile app's effectiveness could be measured by using a pre and post survey comparison of the participants' Perceived Stress Scale (PSS-10) and Mindfulness Attention Awareness Scale (MAAS-15) scores. A majority of the studies reviewed by Spijkerman et al. (2016), Jayawardene et al. (2017), and Janssen, Heerkens, Kuijer, van der Heijden, and Engels (2018) used the standard PSS-10 scale that measures perceived stress and the MAAS-15 scale that measures mindfulness. A few studies evaluated by Jayawardene et al. (2017) showed a significant decrease in post-intervention PSS-10 scores and an increase in post-intervention MAAS-15 scores compared to the control groups.

Cohen, Kamarck, and Mermelstein's (1983) validated the PSS-10 scale which measures a person's perceived stress. The scale's statements reflect a person's thoughts and feelings within

the last month. The scores range from 0 to 40 with a higher number indicating a higher perception of stress (State of New Hampshire Employee Assistance Program, n.d.).

A score between 0 to 7 indicates a very low health concern and 8 to 11 means a low health concern. A score between 12 to 15 indicates an average health concern and 16 to 20 means a high health concern. Moreover, a score between 21 to 40 show very high health concerns. The greater the score is, the more the person is or at risk for experiencing negative health impacts. Higher levels of perceived stress are also related to a decreased success in health promotion activities such failed smoking cessation attempts and blood glucose control among people with diabetes (University of Wisconsin Milwaukee, n.d.).

Brown and Ryan's (2003) MAAS-15 Likert scale measures mindfulness and posits that increased mindfulness promotes positive moods. The scale's scores are calculated by the average of the 15 items. The scores range from 1 to 6. A person who scores 1 is the least mindful and a person who scores 6 is the most mindful. The higher the score, the more mindful the person is. A mindful person may be seen as self-aware, responsive to internal experiences and emotional states, and aware of his or her behavior. Lower scorers also tend to be more socially anxious, self-scrutinizing, and self-conscious (Brown & Ryan, 2003).

Evidence Based Practice Model

The Iowa model was used to develop this evidence-based practice (EBP) project. This model provided a step-by-step guide on how to implement change in a clinical practice. The revised version added supplemental guidance in identifying triggering opportunities and issues, appraising a body of evidence, piloting the practice change, and integrating the change within the organization. The model focused on details and promoted interdisciplinary collaboration (Buckwalter et al., 2017). Workplace stress in a corporate-setting was a problem and a

knowledge focus trigger to both employees and their employers. There was adequate evidence-based literature on mindfulness mobile apps in stress reduction. The project's interdisciplinary team included the clinical NP, medical assistant, DNP student, and DNP faculty advisor. The pilot study protocols were designed for recruitment and interviewing, intervention implementation, pre/post surveys, and progress sharing. Pre/post and feasibility survey data analysis might provide information on improved outcomes and sustainability. A mindfulness mobile app could be applied throughout the company and other corporate settings if the pilot study showed decreased perceived stress and an increase in mindfulness.

Methods/Outcome Measures

The design of this EBP project was a pilot study of 35 employees in an occupational health setting. Employees were notified about this EBP project through email, word of mouth, fliers, health fairs, and television advertisements. They completed a consent form and health questionnaire with questions related to work stress, current coping mechanisms, and the need for a new stress reduction intervention. Inclusion criteria stated the participants must be employees in this occupational health setting. The convenience sample consisted of individuals who were interested in participating in the study as well as those who expressed a need for a stress reduction intervention on the wellness questionnaire.

These participants completed a pre-intervention questionnaire that asked about their current coping strategies, satisfaction of current stress management practices, and if they had ever heard of mindfulness. Their current coping strategies included: exercise, quality time, eating, social media, quiet time, shopping, entertainment, drinking alcohol, watching television, and listening to music. Four (13%) were very dissatisfied, 11 (33%) were very dissatisfied, eight (24%) were slightly satisfied, eight (24%) were moderately satisfied, and two (6%) were very

satisfied with their current stress management practices. Twenty (60%) participants were aware of mindfulness and meditation. And only 11 (55%) previously tried other forms of mindfulness meditation such as another employer-provided meditation programs, yoga, and other mindfulness mobile and computer-guided apps.

Each participant received a 30-day free trial of a mindfulness mobile app called “Calm” and received training about its use by the DNP student. Participants also completed paper copies of the pre-intervention PSS-10 and MAAS-15 surveys prior to the program launch by an in-person individual meeting.

The study required the participants to use the Calm mindfulness mobile app for 10-15 minutes daily for 21-days. The participants started with the beginner week’s course called “7 Days of Calm.” The first session reviewed the fundamentals of mindfulness meditation. This form of meditation required the participants to sit or lie down in a safe quiet place while they listened to the calming short podcasts narrated by the Calm app. The participants chose between a male or female narrator and selected various background sounds such as rainfall, babbling brooks, and ocean waves. The participants then listened to the narrator’s gentle discussion on the topic of the day. They also closed their eyes and practiced deep breathing exercises and body scanning. Body scanning required the participants to pay attention to each body part and their sensations in a gradual ascending order from their toes to head (Calm, 2020).

The participants engaged in this type of mindfulness meditation with Calm for the remainder of the 20 days. The only thing that changed were the narrator’s discussions on the assigned topic of the day. The next six days covered related topics such as learning to pay attention, patience, and awareness (Calm, 2020). The second week of the program, called “7 Days of Managing Stress,” taught the participants stress-relieving practices. This seven-session

collection included techniques for de-escalating stress, building a mind-body connection, working with strong emotions, and battling negative self-talk (Calm, 2020). The third week, “7 Days of Mental Focus,” taught mental awareness enhancement strategies. This series shared techniques to decrease mind-wandering, deepen concentration, prioritization, and overcoming information overload (Calm, 2020).

Participants finished an online PSS-10 and MAAS-15 post-survey after the 21-day Calm trial. The participants also completed another four-item survey titled “Calm Feasibility Questions.” The first question asked if the participants would recommend the Calm app to others. The second question inquired if they felt that the app helped their work productivity. The third question required them to list what problems did they experience while using the Calm app. And the last question asked if they would continue to use meditation as a positive coping strategy. The purpose of this qualitative survey was to determine the Calm mindfulness app’s practicality. The outcome measures included the comparison of each participant’s pre and post PSS-10 and MAAS-15 surveys scores and the answers of the Calm Feasibility Questions.

Participants who completed the 21-days mindfulness program also shared their progress and mindfulness activity through screenshots and by using the Calm mindfulness mobile app’s “Share your Stats” and “Share your Streaks” features. The “Share your Stats” icon included the participants’ completed total number of sessions, number of mindful minutes, and how many consecutive days they used the app. The “Share your Streaks” icon used a monthly calendar and highlighted the days the participants used the app. It also showed the longest number of consecutive days the participants used the app (Calm, 2020). The project assessed participants’ mindfulness activity by determining how many mindfulness session days were completed and by documenting the amount of time allocated to mindfulness through these features.

Project Development and Implementation Timelines

The project was approved by the University of San Diego's (USD) Institutional Review Board (IRB) and the clinic site's corporate administration in December 2018. The project's design was a pilot study of 35 employees in an occupational health setting. The DNP student, lead NP, and MA directed the project's advertisement and recruitment phase. Throughout January 2019, employees were notified about this EBP project through email, promotional flyers, and by word of mouth. The project also recruited employees who reported high stress, low mental focus, and the need for a stress reduction intervention on the clinic's wellness questionnaire.

The project's pre-launch period was from January through February 2019. This stage involved a DNP student-led individual ten-minute private interview discussing the project's purpose, benefits, timeline, and mindfulness app use. The applicants also completed the consent form and the PSS-10 and MAAS-15 pre-intervention surveys. The program launch took place from mid-February to May where the participants participated in the Calm 21-day mindfulness program. The DNP student provided technical support and motivation during that time. The post-study period occurred from March to August. Participants who completed the 21-day program, online feasibility, PSS-10 and MAAS-15 post-test surveys received a \$10 gift card incentive. Data analysis was finalized in August. The project's findings were disseminated at a stakeholder's meeting in February 2020.

Project Approval

The pilot project protocol and literature review table describing the evidence-based justification of mobile mindfulness apps were presented to the lead clinic NP in September 2018. The project plan was shared with the corporate members via a stakeholder presentation in

October. The clinic site did not need IRB approval. The organization gave a letter of support signed by the chief executive officer, medical director, and lead NP. The DNP faculty advisor also provided a letter of support. The USD IRB application included the two letters of support and research training completion certificates. The project was approved within 24 hours of submission on December 10, 2018.

Results

Nineteen out of the 35 participants completed the intervention. Three (16%) were males, 15 (79%) were females, and one (5%) was transgender. Seven participants were between the ages of 20-39 and 12 were between the ages of 40-59. Nine (47%) participants were White Non-Hispanic, one (5%) was Hispanic, three (16%) were Asian, and six (32%) were other ethnicities. This information was collected through a demographic survey completed by all participants before the intervention launch. Twelve (89%) of the participants completed the full 21-day intervention and two (11%) only finished the first 14 days. Six (32%) employees completed the 21-day intervention in 3 weeks, and 13 (68%) took more than 3 weeks to finish the program. This information was collected through the Calm app's "Share your Stats" and "Share your Streaks" features.

The results were determined by comparing the cumulative pre and post-intervention PSS-10 and MAAS-15 scale scores and calculating the Calm feasibility questionnaire results. The participants' cumulative pre-intervention PSS-10 score of 20.63 decreased by 16.72% from their mean post-intervention score of 13.74 points (see Figure 1). Their cumulative PSS-10 scores downgraded from a high health concern to an average health concern. Their mindfulness scores increased by 6.7% from a mean score of 3.23 to 3.68 (see Figure 2).

Three post-intervention PSS-10 items showed significant improvement in stress levels and favorable responses compared to their pre-intervention scores. The PSS-10's first statement was "In the last month, how often have you been upset because of something that happened unexpectedly?" The third statement was "...how often have you felt nervous and stressed?" The tenth statement was "...how often have you felt difficulties were piling up so high that you could not overcome them?" Majority of the participants answered "sometimes," "almost never", or "never." The participants felt significantly less upset, nervous, overwhelmed, and stressed when answering these three statements. One post-intervention MAAS-15 item presented significant increase in mindfulness and favorable responses compared to their pre-intervention scores. The fourth statement was "I tend to walk quickly to get where I'm going without paying attention to what I experience along the way." Most of the participants answered favorably and showed an increase in mindfulness regarding that statement.

Results of the Calm feasibility questions survey showed that all 19 participants would recommend this app to others. Sixteen (85%) participants experienced no problems using the app and one (5%) had difficulty controlling the background sound. One (5%) participant had poor connection and another one (5%) had difficulty with time management. Twelve (63%) employees felt that the Calm app helped their work productivity and six (32%) were unsure. One (5%) applicant felt that the app did not help with work productivity. Fourteen (74%) participants would continue to use mindfulness as a coping strategy, 5 (26%) said maybe, and none said no. The PSS-10 and MAAS-15 post-intervention results suggested that the mindfulness mobile app is an effective tool in decreasing perceived stress by increasing mindfulness in the workplace (see Figures 1 and 2). The feasibility results concluded that a mindfulness mobile app is an effective coping strategy in an occupational health setting.

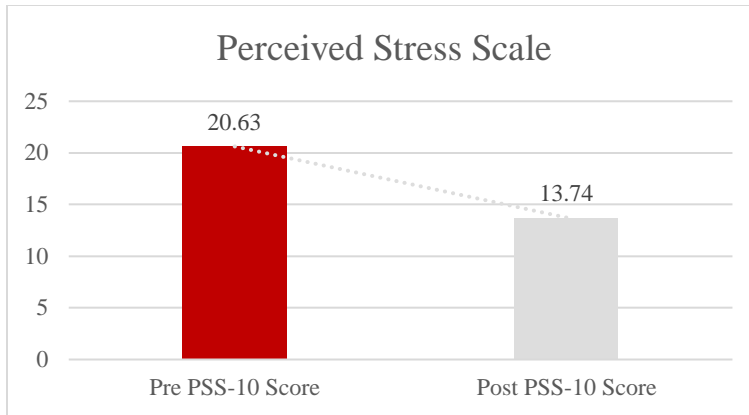


Figure 1. Perceived stress scale results.

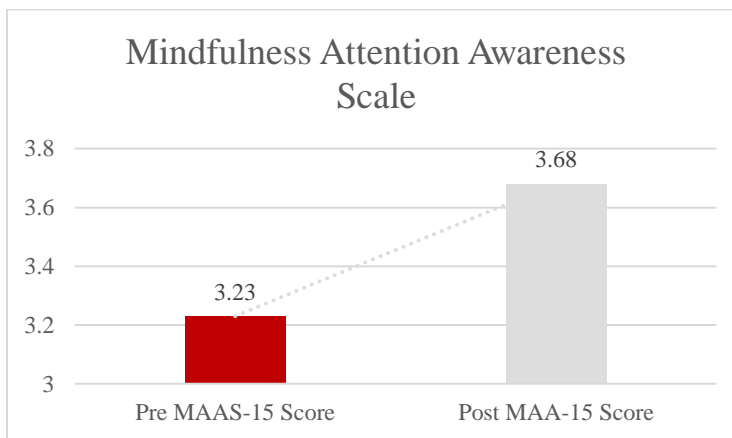


Figure 2. Mindfulness attention awareness scale results.

Discussion

The 19 participants' baseline PSS-10 mean score was 20.63, showing a "high health concern." The post-intervention average score was 13.74, indicating an "average health concern" in the workplace. This meant that the participants perceived stress levels were lower and therefore might experience less negative health impacts related to stress. The MAAS-15 pre and post scores increased from 3.23 to 3.68 suggesting an improved state of mindfulness. This demonstrated that an increase in mindfulness helps to decrease the negative emotional state of perceived stress.

This EBP project's intervention comprised of a daily 10 to 15 minute meditation session for 3 weeks using the Calm mindfulness mobile app. Bostock et al. (2018) recommended a timeframe of 2 to 12 weeks of a daily 10- to 15-minute mindfulness session through a mindfulness mobile app. The EBP project team decided to use the Calm app's three-week program. Two of the 19 participants only completed 2 weeks of the program. And only one of the two showed no improvement with increased perceived stress and decreased mindfulness after the 2 weeks. This participant later communicated that a personal emergency event occurred during the mindfulness mobile app intervention.

Overall, the average PSS-10 and MAAS-15 score improvements quantified the effectiveness of the mindfulness mobile app. The Calm feasibility qualitative questions demonstrated that mindfulness is a positive coping strategy. Additionally, having mindfulness meditations in a mobile app form provided greater accessibility and helped promote meditation adherence. Most participants had no difficulties using the Calm app because of its appealing interface, mindfulness time tracking ability, and ease of use.

Sustainability

Although the DNP student implemented this as a short-term project, sustainability of this EBP project intervention continued to be a priority through continued support from the occupational health clinic. The clinic's health care providers continued to give employees access to the Calm app's 30-day free trial. Other free mindfulness smartphone apps for long-term stress-reduction management would also be available. The health care providers and MA could share mindfulness as a wellness tool during patient visits, health fairs, and flyer and occasional email advertisements. A final proposal to the occupational health setting administration was made to

provide the entire workplace a free one-year Calm app premium membership during the stakeholders meeting.

Limitations

This DNP pilot project had several limitations. The mindfulness app free trial was limited to 30 days. Many participants who exceeded the trial time lost their access and had to create a new account with an alternate email address. The most challenging barrier was the participants' busy schedule. The program required a daily 10 to 15 minute mindfulness meditation session. Adding another step of mindfulness meditation to their daily routine was not a high priority for the participants when compared to the stresses of work and personal life. A few participants commented that finding the time to use the mindfulness mobile app daily increased their stress.

Those limitations were overcome by extending the mindfulness mobile app program time past 21 days. The participants were given the chance to complete a mindfulness session every few days instead of daily. The DNP pilot project team also provided face-to-face meetings, emails, coaching, and support throughout the project timeframe. Other strategies included the use of colorful step-by-step info-graphics, incentives, and verbal motivation. Recommendations for future similar pilot projects might include practicing meditation sessions at least twice per week and the use of an extended mindfulness mobile app membership.

Cost-Benefit

The cost of implementing this EBP project was \$260; program cost details are presented in Table 1 below. Resource costs included paper materials for advertising the study, participant packets, and Amazon gift card incentives. The education, recruitment, and training did not have a cost because those activities occurred during work hours. A program called Calm Health

provided a free 30-day trial access of Calm mindfulness smartphone app to the lead NP and their employees.

Employers and their employees might experience many monetary and quality of life benefits. According to a study conducted on Aetna employees by the Duke University School of Medicine, implementing a mindfulness program in the workplace may decrease total health care costs by seven percent per year. One high-stressed employee might acquire an additional \$2,000 in health care costs per year (Gelles, 2016). Such costs might result from possible increased medical services utilization and absenteeism. Each employee who practiced mindfulness might experience an increase of \$3,000 worth of work productivity gains per year (Gelles, 2016; Wolever et al., 2012).

Increase in work productivity might be related to improvements in cognitive function from a well-rested and less-stressed mind. High stress could drastically damage a person's memory and learning ability. A decrease in health services expenditure and an increase in work productivity in less-stressed employees might benefit the employee and employer. Aetna saw an 11 to 1 return on investment since implementing mindfulness at their workplace (Gelles, 2016; Wolever et al., 2012).

This EBP project applied the Aetna study money values of \$2,000 of additional health care costs acquired from stressed out employees and \$3,000 of increased work productivity mentioned by Gelles (2016) within the cost-benefit-analysis. The return on investment calculation subtracted the total cost of the EBP project to the total savings per participant (employee). That value was then divided by the total cost of the EBP project and was converted to a percentage. The EBP project's return on investment was 1,823% (Gelles, 2016). The cost-benefit-analysis divided the total savings per employee by the total costs spent on this project.

The quotient of 19 represented a positive value, meaning that this intervention is a favorable investment. For the \$260 that was invested, there would a profit of \$5,000 per employee.

Therefore, each employee that practiced mindfulness could result in a benefit 19-fold of the costs. Table 1 below showed the details of each benefit and cost/benefit analysis.

Table 1

Resource Costs

Resources	Cost	Rationale
Education and training	\$0.00	Private in-person interview during work hours discussing the project's purpose risk/benefits, Calm app usage
Patient participation packet documents	\$50.00	Documents including Welcome Letter, PSS-10 & MAAS-15 scales, consent forms, Calm Step by Step instructions, and timeline
Calm mobile app 30-Day Trial	\$0.00	The Calm app program called Calm Health gives clinicians and their patients access to this free trial
Amazon Gift Cards \$10.00x20	\$200.00	Incentives for the project participants
Printed colored flyers	\$10.00	Hand out to employee patients and for advertisement throughout the LPL facility
Total cost	\$260.00	EBP project: 21-Days of Calm program
Benefit	Cost	Rationale
Increase in work productivity	\$3,000	Using a mindfulness mobile app may decrease stress related absenteeism and other health conditions thus promoting an increase in work productivity (Gelles, 2016; Wolever et al., 2012).
Total health care cost savings if participant practices mindfulness	\$2,000	
Total savings per employee	\$5,000	Savings per "mindful" employee
Quality of Life Benefits	Decreased stress and stress-related psychological and physical symptoms muscle tension, blood pressure, headaches, anxiety Increased mindfulness, mental awareness/focus, work productivity	
Cost-Benefit-Analysis & Return on Investment	$\text{CBA} = \frac{\$5,000}{\$260} = 19$	$\text{ROI} = \frac{\$5,000 - \$260}{\$260} \times 100 = 1,823\%$

Implications for Nursing Practice

A smartphone mindfulness mobile app such as Calm might provide positive coping strategies for employees. It might be beneficial for healthcare providers to offer a smartphone mindfulness mobile app as a feasible wellness tool in the workplace. Providers could easily share the benefits of mindfulness by teaching patient's simple techniques to reduce stress and increase mindfulness.

Conclusion

The project site's clinic lead NP concluded that employees often report current underlying stress. The purpose of this DNP pilot project was to implement a 21-day mindfulness practice by using the Calm mindfulness mobile app. This intervention aimed to decrease stress and increase mindfulness amongst 35 participants. Furthermore, only 19 participants completed the study. Stress and mindfulness were measured pre-and post-intervention using the PSS-10 and MAAS-15 scales. Additionally, the participants completed a survey on the feasibility of the mindfulness mobile app.

Nineteen participants completed the intervention. The results showed a decrease in the PSS-10 score by 16.72% and an increase in the MAAS-15 score by 6.7%. All the participants would recommend this app to others and the majority had no difficulty using the Calm app. Most felt they would continue to use mindfulness as a coping strategy and over half of the participants thought it helped increased their work productivity. Mindfulness mobile apps such as Calm might be applied in any occupational health setting as a stress reduction tool. These results plus the cost-benefit of having a free mindfulness mobile app might benefit both the employees and the employers through possible increased work productivity, decreased sick time off, and

mediated stress-related health conditions (Bostock et al., 2018; Slutsky et al., 2018; Spijkerman et al., 2016; Jayawardene et al., 2017).

References

- American Psychological Association. (2018). Stress in America: The state of our nation. Retrieved from <https://www.apa.org/news/press/releases/2018/10/generation-z-stressed>
- Bostock, S., Crosswell, A. D., Prather, A. A., & Steptoe, A. (2018). Mindfulness on-the-go: Effects of a mindfulness meditation app on work stress and well-being. *Journal of Occupational Health Psychology, 24*(1), 1–13. doi:10.1037/ocp0000118
- Bennike, I. H., Wieghorst, A., & Kirk, U. (2017). Online-based mindfulness training reduces behavioral markers of mind wandering. *Journal of Cognitive Enhancement, 1*, 172–181. doi:10.1007/s41465-017-0020-9
- Brown, K. W., & Ryan, R. M. (2003). The benefits of being present: Mindfulness and its role in psychological well-being. *Journal of Personality and Social Psychology, 84*, 822–848. doi:10.1037/0022-3514.84.4.822
- Buckwalter, K. C., Cullen, L., Hanrahan, K., Kleiber, C., McCarthy, A. M., Rakel, B., . . . Tucker, S. (2017). Iowa Model of evidence-based practice: Revisions and validation. *Worldviews on Evidence-based Nursing, 14*(3), 175–182. doi:10.1111/wvn.12223
- Calm. (2020). Calm (Version 4.18) [Mobile application software]. Retrieved from <http://www.calm.com>
- Cohen, S., Kamarck, T., & Mermelstein, R. (1983). A global measure of perceived stress. *Journal of Health and Social Behavior, 24*, 385–396. doi: 10.2307/2136404
- Dang, D., & Dearholt, S. (2017). *Johns Hopkins nursing evidence-based practice: model and guidelines*. 3rd ed. Indianapolis, IN: Sigma Theta Tau International
- Ganster, D. C., & Rosen, C. C. (2013). Work stress and employee health: A multidisciplinary review. *Journal of Management, 39*, 1085–1122. doi:10.1177/0149206313475815

- Gelles, D. (2016). *Mindful work: How meditation is changing business from the inside out*. Boston, MA: Houghton Mifflin Harcourt.
- Janssen, M., Heerkens, Y., Kuijer, W., van der Heijden, B., & Engels, J. (2018). Effects of mindfulness-based stress reduction on employees' mental health: A systematic review. *PloS ONE*, *13*(1), 1–37. doi:10.1371/journal.pone.0191332
- Jayawardene, W.P., Lohrmann, D. K., Erbe, R. G., & Torabi, M. R. (2017). Effects of preventive online mindfulness interventions on stress and mindfulness: A meta-analysis of randomized controlled trials. *Preventive Medicine Reports*, *5*, 150–159. doi:10.1016/j.pmedr.2016.11.013
- Luken, M., & Sammons, A. (2016). Systematic review of mindfulness practice for reducing job burnout. *The American Journal of Occupational Therapy*, *70*(2), 1–13. doi:10.5014/ajot.2016.016956
- Mead, E. (2019). The history and origin of meditation. Retrieved from <https://positivepsychology.com/history-of-meditation/#:~:targetText=Much%20like%20meditation%2C%20the%20historical,with%20the%20practice%20of%20yoga>.
- University of Wisconsin Milwaukee. (n.d.). Perceived stress, PSS. Retrieved from <https://uwm.edu/mcwp/wp-content/uploads/sites/337/2016/01/Perceived-Stress-Scale-Tip-Sheet.pdf>
- Selva, J. (2019). History of mindfulness: From east to west and from religion to science. Retrieved from <https://positivepsychology program.com/history-of-mindfulness/#origins-mindfulness>

- Slutsky, J., Chin, B., Raye, J., & Creswell, J. D. (2018). Mindfulness training improves employee well-being: A randomized controlled trial. *Journal of Occupational Health Psychology, 24*(1), 139–149. doi:10.1037/ocp0000132
- Spijkerman, M. P., Pots, W. T., & Bohlmeijer, E. T. (2016). Effectiveness of online mindfulness-based interventions in improving mental health: A review and meta-analysis. *Clinical Psychology Review, 45*, 102-114. doi:10.1016/j.cpr.2016.03.009
- State of New Hampshire Employee Assistance Program. (n.d.). *Perceived stress scale*. Retrieved from <https://das.nh.gov/wellness/Docs/Percieved%20Stress%20Scale.pdf>
- The Johns Hopkins Hospital. (2017). *Johns Hopkins nursing evidence-based practice*. Retrieved from https://www.hopkinsmedicine.org/evidence-based-practice/_images/EBP%20Tool%20Samples/2017_Appendix%20D_Evidence%20Level%20and%20Quality%20Guide_Page_1.png
- Wolever, R.Q., McCabe, K., Fekete, E., Bobinet, K.J., Mackenzie, E.R., Kusnick, C.A. . . . Baime, M. (2012). Effective and viable mind-body stress reduction in the workplace: A randomized controlled trial. *Journal of Occupational Health Psychology, 17*(2), 246-258. doi: 10.1037/a0027278
- Yang, E., Chamber, E., Meyer, R. M., & Gold, J. I. (2018). Happier healers: Randomized controlled trial of mobile mindfulness for stress management. *Journal of Alternative and Complementary Medicine, 24*, 505-513. doi:10.1089/acm.2015.0301