Using Mindfulness to Decrease Stress in College Students

Saska Pavlovic

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USING MINDFULNESS TO DECREASE STRESS IN COLLEGE STUDENTS

by

SASKA PAVLOVIC

EVIDENCE-BASED PRACTICE PROJECT REPORT

Submitted to the College of Nursing and Health Professions

of Valparaiso University,

Valparaiso, Indiana

in partial fulfillment of the requirements

For the degree of

DOCTOR OF NURSING PRACTICE

2021
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ACKNOWLEDGMENTS

I would like to thank first and foremost my academic advisor, Dr. Julie A. Koch DNP, APRN, FNP-BC, FAANP for her support and guidance throughout this DNP project. I would also like to thank Dr. Phrosini Samis-Smith, DHeD, MSSA, MSCEP who graciously allowed me to link to the research she was conducting and use her classroom time to conduct this DNP project. Without her, this DNP project implementation would not have been possible. I would also like to offer gratitude to the university’s health care center staff and health care center director Dr. Kelley Eshenaur for allowing me to utilize the health care center during the duration of this DNP project. I would lastly like to thank my mom and dad who have supported me endlessly throughout this program and to who I will forever be grateful for the opportunities they have given me.
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ABSTRACT
The prevalence of stress is increasing in colleges, where students are experiencing anxiety at an alarming rate, with anxiety being the topic most discussed in university counseling centers. The purpose of this evidence-based practice project was to determine the effect of mindfulness exercises on college students’ perceived stress. The Stetler Model guided the project development and implementation. The literature search revealed that best practice included mindfulness exercises through a combination of face-to-face instruction and remote online audio meditation for a duration of eight weeks. For this project, 56 undergraduate students (health care-leadership, health-science, and nursing majors) enrolled in a health care leadership class were asked to participate. Consenting students completed the Perceived Stress Scale (PSS-10) at baseline. Mindfulness activities, in the form of 3- to 10-minute audiovisual sessions, were provided prior to the start of scheduled class for a period of eight weeks. Students were also encouraged to use and track additional guided audio meditations outside of the classroom. At the end of the 8-week period, paired t-tests were used to evaluate the effect of the intervention on students’ stress. Findings included a modest reduction in total PSS-10 scores from baseline to post-intervention: 20.23 vs. 18.70 ($t = 1.743, p = 0.089$). But statistically significant improvement in scores were noted on the item that assessed how often students felt nervous and stressed $M = 3.33$ vs. $M = 2.93$, ($t = 2.716, p = .010$). A repeated measures ANOVA was run on post-intervention total PSS-10 scores to assess for efficacy within specific demographic variables (gender, major, academic grade level, GPA, and counseling center visits), but none of these were statistically significant. The secondary outcome of PSS-10 scores based on the total days of mindfulness exercise intervention participation showed not significant ($p = .085$) results. However, the mean post-intervention PSS-10 score did decrease with general utilization of mindfulness exercise sessions. The results may be clinically significant and may provide college-aged students with the resources needed to combat stress as they continue their education and enter the workforce.
CHAPTER 1

INTRODUCTION

Background

More than 40 million adults have an anxiety disorder, specifically most experience their first episode by the age of 22 (Anxiety and Depression Association of America [ADAA], 2015). In this young adult population, the prevalence of stress is increasing in colleges and as a result students are experiencing anxiety at an alarming rate. Moreover, anxiety is the topic most discussed in university counseling centers, where 65.7% of students report experiencing overwhelming anxiety (American College Health Association [ACHA], 2019).

Anxiety stems from stress, which Hans Selye defined “as the body’s nonspecific response to any demand, whether it is caused by or results in pleasant or unpleasant stimuli” (American Institute of Stress [AIS], 2020, para 7). There are four different types of stress: (a) acute stress, where the fight or flight response is activated and the body prepares to fight off the stressor; (b) chronic stress, which is uncontrolled built up stress that can affect the physiological health and the immune system; (c) eustress, which has positive connotations; and (d) distress, which has negative connotations (AIS, 2020). College students’ stress coincides with being in the period of emerging adulthood. They may be overwhelmed with academic work, extracurricular activities, a new environment, or new relationships; and for some students, this may be the first time they have had to make decisions on their own. They may face challenges as they try to find their identity and be independent. Health care students, in particular, may experience additional stress as they take on simulations, clinicals, and the personal and legal responsibility of caring for patients.

An increasing amount of stress can lead to generalized anxiety disorder (GAD), defined as “a condition exhibited by excessive worry, tension, apprehension, and uneasiness from anticipated danger that is not controlled on most days of the week for at least 6 months” (Cook
Anxiety can cause autonomic hyperactivity, sleep disturbance, shortness of breath, increased heart rate, dizziness, trembling, and abdominal disturbances. Anxiety can also be a predisposing disorder of depression and built up stress can cause burnout, and suicidal ideation (Cook & Wolz, 2017; O'Driscoll et al., 2017). Therefore, in order to prevent the detriments of untreated stress, early implementation of effective stress reduction interventions is essential.

The effects of mindfulness and mindfulness-based stress reduction (MSBR) interventions on alleviating stress and anxiety have been studied. Mindfulness is defined as “paying attention in a particular way, on purpose, non-judgmentally, to the present moment” (O'Driscoll et al., 2017, p. 851). Mindfulness interventions can include meditation, guided/mental imagery, relaxation, and breathing exercises. Mindfulness has shown to improve coping mechanisms by increasing sound judgement, self-awareness, self-care, and decreasing counter behaviors (Daya & Hearn, 2018). Mindfulness training has also shown to reduce cortisol levels, which reduce stress, distress, and the risk of stress cultivated diseases (Daya & Hearn, 2018).

Data from the Literature Supporting Need for the Project

National Data

Among 67,972 university students who participated in the ACHA national survey, stress was reported to be the factor that affected academic performance the most (34.2%), followed by anxiety (27.8%). Students reported experiencing the following in the last 12 months: feeling overwhelmed (87.4%), having overwhelming anxiety (65.7%), feeling so depressed it is difficult to function (45.1%), considering suicide (12.2%), and attempting suicide (2.0%) (ACHA, 2019). Nearly one-fourth of the students reported being diagnosed with anxiety (24.3%) and 20.0% were diagnosed with depression (ACHA, 2019). One-third of respondents (33.3%) rated their stress level as “average”; 45.3% rated their stress as “more than average”; and 13.4% reported a “tremendous amount of stress” (ACHA, 2019). Within respondents of the ACHA (2019)
survey, females were more likely than males to rate their stress as tremendous (48.2% as compared to 38.8%, respectively).

Data from the Clinical Agency Supporting Need for the Project

The site of project implementation, University X was a private, faith-based institution in the Midwest, serving more than 3,500 students (DNP Program Director, personal communication, July 7, 2020). University students could seek care for stress and anxiety related issues from the student health center, which provided primary care services focusing and health and wellness, or the university counseling center. The university counseling center provided nearly 100 outreach programs in the 2018-2019 year: psychoeducational programs, informational sessions, institutional service appointments, training events, conference presentations, and social events. The university counseling center had also provided a stress reduction and relaxation room where services (e.g., bio feedback, relaxation CDs, light therapy, impermanence board, sand garden, and massage chair) were provided. The availability and scope of counseling services were advertised by the university across campus through table tents and display boards in the student union and through the university’s Snapchat© account, and TV advertisements (Counseling Services Personnel, 2019).

Similar to college students across the nation, University X students were experiencing levels of stress and anxiety. For the academic year of 2018-2019, demand for counseling services was at an all-time high. The university’s counseling center provided services to 301 students, with 2514 intake and follow up therapy sessions (Counseling Services Personnel, personal communication, July 6, 2019). The average number of sessions in the academic year per student was eight, which was noted to be higher than most universities (Counseling Services Personnel, personal communication, July 6, 2019). Increased student anxiety and distress was associated with the changes of finding ones’ identity and becoming an autonomous adult or revolved around relationship concerns (Counseling Services Personnel, personal communication, July 6, 2019). The Counseling Center Assessment of Psychological Symptoms
(CCAPS) was used to measure the students’ anxiety level every third session and at the end of therapy. Anxiety was the most discussed topic, with 248 students reporting anxiety/anxiety like symptoms during their sessions. Other topics frequently discussed included depression (203 students), family (124 students), stress (109 students), academic performance (84 students), suicidality (82 students), trauma (79 students), and eating/body image (74 students); most students discussed a combination of these topics (Counseling Services Personnel, 2019). Because a diagnosis of anxiety relies on self-reporting of symptoms and a subjective interpretation of the health care staff, the prevalence of anxiety and stress on campus could have been higher than these data reveal (Counseling Center Assistant Director, personal communication, July 6, 2020).

**Purpose of the Evidence-Based Practice Project**

Anxiety and stress have become prevalent among the student population in colleges across the nation. Untreated stress has shown to be detrimental to a university students’ physical and mental health (Daya & Hearn, 2018; Gonzalez-Valero et al., 2019; Gutman et al., 2020; He et al., 2018; Kemper et al., 2015; Lo et al., 2017; McConville et al., 2017; O’Driscol et al., 2017; Yang et al., 2018; Yusufov et al., 2019). Because mindfulness training has demonstrated effectiveness in reducing stress, the purpose of this EBP project was to determine if mindfulness exercises, delivered over an 8-week period, would decrease perceived student stress among students with majors in the health professions. The ultimate goal was to reduce the stress levels among these students to improve their overall college experience and enhance the learning needed to prepare them for their future roles in the health care industry.

**PICOT Question**

The PICOT model was used to formulate the research question. PICOT stands for: patient population or patient condition or interest (P), intervention of interest (I), comparison of interest (C), outcome of interest (O), and time (T) (Schmidt & Brown, 2019). The PICOT question for this project is as follows: In health care college students (P), what is the effect of
mindfulness exercise (I) on their perceived stress scores post-intervention (O) compared to their pre-intervention perceived stress scores (C) over an 8-week period (T).

**Significance of the EBP Project**

Consistent with college experiences across the nation, anxiety was the greatest problem currently being addressed at University X’s counseling center. Uncontrolled stress could turn into chronic stress and cause “headaches, high blood pressure, and chest pain to heart palpitations, skin rashes, and loss of sleep” (ADAA, 2020, para 2). Experts have noted that stress can also lead to anxiety, depression, burnout, and may cause students to consider or commit suicide (Daya & Hearn, 2018; Gonzalez-Valero et al., 2019; Gutman et al., 2020; He et al., 2018; Kemper et al., 2015; Lo et al., 2017; McConville et al., 2017; O’Driscoll et al., 2017; Yang et al., 2018; Yusufov et al., 2019). “Without adequate treatment, young adults experiencing a mental health issue are more likely to receive lower GPAs, drop out of college or be unemployed than their peers who do not have a mental health challenge” (Chadron State College, n.d., para 6). Thus, it was imperative to find the most effective interventions to decrease stress in the college student population, so that the level of stress did not escalate and lead to other physical and mental health risks. This project addressed the concern of increasing student stress on University X’s and utilized an evidence-based approach to implement a mindfulness intervention aimed at decreasing student levels of stress. The project was designed to improve outcomes by improving the students’ mental health, academic performance, personal lives, and relationships.
CHAPTER 2
EBP MODEL AND REVIEW OF LITERATURE

Evidence-based Practice Model

The Stetler model was the evidence-based model utilized for this DNP project. The model provided five phases to guide the clinician in the implementation of evidence-based nursing practice (Melnyk & Fineout-Overholt, 2015). It had been noted to be a practitioner-oriented model focusing “on critical thinking and use of findings by the individual practitioner” (Stetler & Marram, 1976, as cited in Melnyk & Fineout-Overholt, 2015, p. 279). Using the Stetler model, all recommendations were applied at the skilled practitioner level, from research to practice in the real world (Melnyk & Fineout-Overholt, 2015).

Overview of EBP Model

The six assumptions of the Stetler model include the following: 1) the formal organization may or may not be involved in the individual’s utilization of research, 2) utilization may be instrumental, conceptual, and/or symbolic, 3) other types of evidence and/or non-research related information are likely to be combined with research findings to facilitate decision-making or problem-solving, 4) internal and external factors can influence an individual’s or groups’ view and use of evidence, 5) research and evaluation provide us with probabilistic information, not absolutes, and 6) lack of knowledge and skills pertaining to research utilization and EBP can inhibit appropriate and effective use (Stetler, 2001, p. 274).

The five phases of the Stetler model (2001) that can be further applied to guide the DNP project include (a) preparation, (b) validation, (c) evaluation/decision making, (d) translation/application, and (e) evaluation. In phase one (preparation), the researcher searches, sorts, and selects pieces of evidence, analyzes potential issues or catalysts that may arise, compares them with current practice, and considers internal and external factors focusing on top priority issues. Next, the researcher may form a team, identify key stakeholders, and assign
a project facilitator. Measurable outcomes will be defined, and systematic reviews/guidelines will be primarily selected. In phase two (validation), evidence will be critiqued, the strength, level, quality, and sufficiency of each individual evidence will be analyzed, and statistical and clinical significance will be differentiated. In phase three (comparative evaluation/decision making) findings will be synthesized and their similarities and differences evaluated, and a decision whether to use the evidence will be made based on the strength of the evidence, or the level of strength of the recommendation. In phase four (translation/application), type, methods, and levels of application are confirmed, and strategies of dissemination and change or implementation are planned. In phase five (evaluation), evaluation is performed by the type, method, or level; the cost and benefit of the change is considered; a goal is identified, and evidence obtained to achieve goals (Stetler, 2001).

**Application of EBP Model to DNP Project**

Because the Stetler model (2001) was viewed as a practitioner-oriented model which could be used by an individual practitioner to guide change, it was deemed applicable for use in this DNP project. Specifically, the five phases of the Stetler model of EBP guided the development of this DNP project.

During the first phase (preparation), the DNP student project manager identified the problem of increasing stress at University X’s campus. A University X professor expressed the need of a management intervention to decrease stress in students and to ultimately prevent detrimental health effects of stress. To prepare for the search for evidence, inclusion and exclusion criteria were created. A literature search was then performed that focused on stress-related interventions in health care college students. In the literature search, as the Stetler model suggested, systematic reviews were reviewed first. A team of stakeholders was formed including the DNP student project manager, the university professor, the director of the university’s counseling center, the assistant director of the university’s counseling center, the student health center director, nurse practitioners, nurses, medical assistants, psychiatrist,
psychologist, other health center staff, and the students. During the first phase, it was determined appropriate that the outcome would be measured via the widely used psychological instrument for measuring the perception of stress: Cohen’s Perceived Stress Scale (PSS-10).

For this project, the second phase of the Stetler model (2001) was accomplished as the DNP student project manager critiqued and synopsized relevant sources of evidence. The level and quality of each selected evidence was identified, and statistical and clinical significance were evaluated. Sources were evaluated for sufficiency and credibility. The viability of the evidence-based strategy to decrease stress in college students was validated by the evidence reviewed.

Moving to phase three of the Stetler model (2001), the comparative evaluation/decision making stage, the selected evidence was synthesized by the DNP student project manager. Pieces of evidence were logically organized, and similarities and differences of findings were identified. It was then determined that the evidence obtained identified an intervention that fit the targeted setting and was feasible. Thus, an evidence-based strategy to address the clinical problem was identified, and the DNP student project manager moved to phase four.

In phase four, translation/application, the DNP student project manager identified the types, methods, and levels of evidence that would be specifically helpful in the implementation phase of the project. It was important to identify how translating and applying the evidence would answer the clinical question. It was also essential to use the evidence to develop a change strategy and develop a formal plan for dissemination of findings.

In phase five, the DNP student project manager needed to consider the costs and benefits of implementing the change. A plan for evaluating the effects of the intervention on the intended outcome (student stress) was developed.

**Strengths and Limitations of EBP Model for DNP Project**

One of the major strengths of using the Stetler model to guide this DNP project was that it was step-by-step process that was easily applicable. The phases of the model were
descriptive, clear, and were able to flow effortlessly. It had also been noted that the phases of the model could lead to a change in the real world and were applicable in both clinical and non-clinical settings. Its applicability in non-clinical settings was especially pertinent, as this DNP project was set in an educational environment.

In conjunction with this DNP project, limitations of the Stetler model were not readily identified prior to implementation. The DNP student project manager found the Stetler model to be practical and easily applicable to guide this practice change.

**Literature Search**

**Sources Examined for Relevant Evidence**

An exhaustive literature search was conducted using multiple databases including CINAHL, Cochrane Library, Joanna Briggs Institute, PsycInfo, and MEDLINE with Full Text (via EBSCO). An extensive hand search of five journals was completed and article abstracts were analyzed for relevance to the project topic. Pieces of evidence were also citation chased from the reference lists of articles that were deemed to be relevant to topic.

Multiple trials were initially completed to identify the most relevant keywords and medical subject headings (meSH) in each database. The final literature included a combination of keywords including MM "Meditation" OR MM "Mindfulness" OR MH "Mindfulness" OR MM "Guided Imagery" AND anxiety OR stress* OR anxious AND student*. A complete list of keywords used in each particular database can be found in Appendix A.

Inclusion criteria for the search included a publication date of 2015 to 2020, English language, scholarly peer-reviewed journals, research article, and Age Groups: Young Adulthood (18-29 years) in PsychINFO. Articles were included if they pertained to college students that were in the health care field, were in a university setting, measured stress, and used mindfulness exercises as an intervention. Exclusion criteria included evidence that (a) pertained to hospital, surgical, clinical, or outpatient settings, and (b) solely focused on students diagnosed with an anxiety disorder.
The literature search yielded a total of 657 results. Sixty-two articles were deemed relevant, based on their title. After carefully assessing the abstracts, eliminating duplicates, and eliminating articles referenced in chosen systematic reviews, 10 articles remained and moved forward for appraisal. Additionally, five journals were hand searched and 10 articles seemed relevant to this project after reviewing the title. Through assessment of the abstract, the methods, and the discussion sections of the articles, none of these articles were relevant to the project; therefore, they were excluded. Five articles were citation chased and 13 pieces of evidence were deemed worthy of further reviewed based on title. Upon further inspection of abstract, one piece of evidence was relevant and chosen for this project. In total, after appraisal and careful analysis and review of evidence, 11 articles provided the body of evidence supporting this project. A more detailed representation of the literature search can be found in Appendix A.

Levels of Evidence

A total of 11 pieces of evidence provided the foundation for this DNP project report: six systematic reviews (SRs), two randomized controlled trials (RCTs), one cross sectional study, one cohort trial, and one correlational design study (see Appendix B). Following approval to use the tools (see Appendix C), the evidence was appraised and level of evidence assigned using Johns Hopkins Nursing Evidence Based Practice Research Appraisal Tool, ©The Johns Hopkins Hospital/The Johns Hopkins University; the appraisal tool ranks evidence ranging from Level I, which is the highest level of evidence, to level V which is the lowest (Dang & Dearholt, 2017). RCTs and experimental studies are considered to be level I evidence; while quasi-experimental studies are considered to be level II; and level III are nonexperimental studies. If the study design is a SR, meta-analysis (MA), or metasynthesis, level I is assigned if the review contains all RCTs. A level II is assigned to SRs that include a combination of RCTs and quasi-experimental studies, or quasi-experimental studies only; a level III includes a combination of RCTs, quasi-experimental, and non-experimental, or only non-experimental studies. If any study
in a SR is qualitative, a level III rating is assigned. Using the Johns Hopkins Non-Research Evidence Appraisal Tool, clinical practice guidelines and consensus or position statements are ranked as level IV evidence (Dang & Dearholt, 2017). Level V evidence are literature reviews and expert opinions, case reports, clinician experience and consumer preference, and community standards. Integrative reviews, literature reviews, case reports, opinions of nationally recognize experts, or quality improvement, program, or financial evaluation are level V evidence (Dang & Dearholt, 2017).

Using the Johns Hopkins Nursing Evidence Based Practice Research Appraisal Tool, ©The Johns Hopkins Hospital/The Johns Hopkins University, with the standards explained above, the DNP project report evidence was ranked. Three pieces of evidence were assigned a level I rating, an RCT (Gutman et al., 2020), an SR of RCTs (Lo et al., 2017), and an RCT (Yang et al., 2018). Six pieces of evidence were assigned level II rating including a SR of RCTs, Non-RCTs, and pretest and posttest designs (Daya & Hearn, 2018), a SR and MA of quasi-experimental, and pre-experimental studies (Gonzalez-Valero et al., 2019), a cohort trial (Kemper et al., 2015), a SR of RCTs and Non-RCTs (McConville et al., 2017), a SR of RCTs and Non-RCTs (O’Driscoll et al., 2017), and a SR and meta-analysis of experimental and quasi-experimental studies (Yusufov et al., 2019). Finally, two studies were ranked as level III evidence, including a cross-sectional descriptive study (He et al., 2018) and a correlational descriptive study (Rayan, 2019).

**Appraisal of Relevant Evidence**

Following a review of the levels of evidence, the selected literature was appraised for quality using the Johns Hopkins Nursing Evidence Based Practice Evidence Level and Quality Guide, ©The Johns Hopkins Hospital/The Johns Hopkins University. The quality appraisal includes three levels of ratings: (A) high quality, (B) good quality, and (C) low quality or major flaws (Dang & Dearholt, 2017).
The criteria for each of the quality ratings (A, B, and C) varies by levels of evidence. Quantitative studies (levels I, II, and III) use one set of criteria to determine their quality rating. A quantitative study earning a high quality (A) rating would produce consistent results that are generalizable. It would contain adequate control and sample size, conclusions that were definitive, and a comprehensive literature review would have been completed, so that the study could provide consistent recommendations. A (B) quality piece of evidence is described as having consistent results, an adequate sample size, some control, conclusions that were fairly definitive, recommendations that were based on fairly comprehensive literature and were reasonably consistent. A (C) quality level would have inconsistent results, little evidence, inadequate sample size, and the study conclusions would be unable to be drawn (Dang & Dearholt, 2017).

A subjective process is undertaken for judging the quality of qualitative studies (Dang & Dearholt, 2017). Because no commonly agreed-on principles exist (Dang & Dearholt, 2017), qualitative research (single studies or meta-analyses) is rated in only two categories: high/good (A/B) quality or low (C) quality. In order for a piece of evidence to be considered (A/B) quality, the report must have transparency, diligence, verification, self-reflection and scrutiny, participant-driven inquiry, and insightful interpretation. Studies that have few or none of the qualities listed in high/good quality, or do not contribute much to the review of the findings are considered (C) or low quality studies.

Level IV evidence (i.e., clinical practice guidelines, consensus, or position statements) would be considered of (A) high quality if (a) it was sponsored by a professional, public, or private organization or government agency, (b) there was systematic literature search documentation, (c) results were consistent with sufficient numbers that have well-designed studies, (d) strength and quality of the studies were evaluated based on specific criteria, and if there were definitive conclusions, (e) there was clearly evident national expertise, and (f) the article was no older than five years (Dang & Dearholt, 2017). Level IV evidence would be
considered of (B) good quality if it was (a) sponsored by an official organization, or agency, (b) the literature search was undefined, poorly defined, or limited, (c) the results were reasonably consistent, and the numbers were sufficient for the well-designed studies, (d) strengths and limitations of the studies were evaluated with fairly definitive conclusions, (e) national expertise was clearly evident, and (f) the study was no older than five years (Dang & Dearholt, 2017).

Level IV evidence that would be of (C) low quality includes (a) material that was not sponsored by an official organization or agency, (b) it was undefined or poorly defined, (c) the literature strategy was limited, (d) there was no evaluation of the study’s strengths and limitations, (e) there was insufficient evidence and inconsistent results where conclusions could not be drawn, and (f) the study was older than five years.

The quality rating criteria for Level V evidence would be differentiated by the subtype of evidence: (a) organizational experience and (b) other resources. Level V evidence from organizational experience (i.e., quality improvement, program or financial evaluation), was also appraised as (A) high quality, (B) good quality, and (C) low quality or major flaws. For this experiential and non-research evidence (A) high quality rating was achieved when the evidence included (a) aims and objectives that were clear, (b) results were consistent in multiple settings, (c) formal quality improvement, financial, or program evaluation methods were used, (d) there were definitive conclusions, (e) the recommendations were consistent and referenced scientific evidence (Dang & Dearholt, 2017). Level V evidence was considered (B) good quality when (a) the aims and objectives were clear, (b) the results were consistent in a single setting, (c) there was formal quality improvement, financial, or program evaluation methods were used, and (d) the recommendations were reasonably consistent with some reference to scientific evidence. Level V evidence was considered (C) low quality when (a) the aims and objectives were unclear or missing, (b) the results were inconsistent, (c) quality improvement, financial, or program evaluation were poorly defined, and (d) recommendations from the evidence could not be made (Dang & Dearholt, 2017). Level V evidence from other resources (i.e., integrative reviews,
literature review, expert opinion, case report, community standard, clinician experience, and consumer preference was also rated as (A) high quality, (B) good quality, and (C) low quality or major flaws, although the description of each is slightly different than the ones described previously (Dang & Dearholt, 2017). These studies were rated (A) high quality if (a) the expertise was clearly evident, (b) definitive conclusions were drawn, (c) the rationale was scientific, and (d) the field had thought leader(s). In a (B) good quality study, (a) the expertise was credible, (b) conclusions were fairly definitive, and (c) a logical argument for opinions were provided. For (C) low quality studies, (a) the expertise was dubious and or not discernable, and (b) a conclusion was not able to be drawn (Dang & Dearholt, 2017).

**Level I Evidence**

**Gutman et al. (2020).** Gutman et al. (2020) conducted a good quality (B rating) randomized control trial (RCT) that evaluated if stress could be reduced with a multimodal mindfulness program in graduate health care students conducted over an 8-week period. First year occupational (OT) and physical therapy (PT) students ($N = 36)$ in their second semester at a university participated and completed the study. Completion was defined as attending at least six of eight in-person sessions and submitting log entries for six of the eight weeks. The students were randomized into intervention ($n = 18$) and control groups ($n = 18$) to achieve an equal number of students in each group. Each group contained 8 OT students and 10 PT students. The participants in total were predominantly female ($n = 29$, 80.55%), White (58.33%) or Asian (33.33%), with a mean age of 24.27 (range = 22 - 32 years).

The multimodal mindfulness intervention was comprised of a 40-minute in person weekly session for eight weeks and 10-minute guided meditations four times a week for eight weeks. Week 1 of the in person session consisted of an educational session where a general overview of mindfulness was provided, meditation tools were given to be used to reduce stress (i.e., guided imagery, walking or sitting mindfulness meditation, or progressive muscle relaxation) and opportunities were given to participate in mindfulness practice (Gutman et al., 2020). Week 2 of
the in-person session included creative activities whose focus is to be in the present moment (i.e., mindful coloring). Week 3 consisted of the students being engaged in sessions of mindful movement (e.g., yoga). In Week 4, the students participated in a sound bath session, which was described as “music, vibration, and sound were used to experience transcendent states of time and being” (Gutman et al., 2020, p. 4). In Week 5, students journaled and used meditation and discussed and reflected upon ways to manage stress. Week 6 consisted of students practicing cognitive reframing techniques and skills to be able to identify their emotions and reactions to stress. In Week 7, students learned and practiced self-compassion. Finally, in Week 8, students participated in pet therapy. During these eight weeks, the students simultaneously participated in 10-minute self-guided meditations, outside the weekly in person sessions, four times a week. These guided meditations, facilitated by professional meditator and musician Jason Stephenson©, were available on YouTube©. The control group did not receive the intervention but was invited to participate in a 2-hour mindfulness workshop at the end of the study (Gutman et al., 2020).

The level of stress was evaluated using Cohen’s PSS-10, a 10-item 5-point Likert-type scale (1 = no stress; 5 = high stress) which had high internal consistency (Cronbach’s alpha .85, p < .01) and high test-retest reliability (r = .85, p < .01). Both the control and the intervention group completed the PSS-10 1-week pre-intervention and 1-week post-intervention period. Level of stress was also evaluated 1-week pre-intervention and 1-week post-intervention in both the control and intervention group using the Student Stress Management Scale (SSMS). The SSMS is a 12-item, 5-point, self-report Likert scale that was developed by the researchers for this study to be more specific for evaluating stress levels in graduate students. Face validity was established by having five graduate occupational therapy students review the scale items and provide feedback. Other SSMS psychometric properties were not established for this tool. The participants in the intervention group completed a daily log after each activity, which measured the stress levels before and after each activity using numeric ratings on a 5-point Linkert scale.
(1 = low stress, 5 = high stress). Narrative responses were also recorded using an open-ended qualitative questionnaire that included eight questions which addressed how satisfied the students were with the program and how their experience had been, which activities they found most helpful or not helpful in managing stress, if and how the program helped regulate the students’ mood or emotion, and if and how the program helped manage academic work and responsibilities. The students’ grade point average and counseling visit frequency were also recorded and evaluated before the semester and one week after the end of the semester.

Gutman et al. (2020) reported that scores of the PSS-10 did not differ significantly between the intervention ($M = 36.11$, $SD = 7.09$) and control ($M = 33.16$, $SD = 7.00$) groups at baseline ($Z = -1.363$, $p = .173$); but a significant difference was noted post-intervention between the intervention group ($M = 19.66$, $SD = 6.14$) and the control group ($M = 31.60$, $SD = 6.80$) (Gutman et al., 2020). The effect size of the PSS-10 score differences between groups post-intervention was large ($Z = -4.291$, $p < .000$). Although the researchers did not conduct further statistical analyses, it was appropriate to note that participants in the intervention group had a 16.45 point reduction in self-reported stress on the PSS-10, while the control group’s mean PSS-10 score decreased by only 1.55 points.

Scores of the SSMS also did not differ significantly in intervention group ($M = 23.61$, $SD = 3.53$) versus control group ($M = 23.05$, $SD = 2.46$) ($Z = -0.207$, $p < .83$, $d = .18$) at baseline. However, SSMS scored did significantly differ post-intervention between the intervention group ($M = 20.83$, $SD = 4.71$) and the control group ($M = 27.38$, $SD = 5.56$). A large effect size was also found ($Z = -3.330$, $p < .001$, $d = -1.27$).

Gutman et al. (2020) found that the intervention did not impact GPA, as there were no statistically significant differences in GPA between the control and intervention groups at baseline ($M = 3.72$ vs. $M = 3.64$, respectively) and for the semester during the intervention ($M = 3.66$ vs. $M = 3.65$, respectively). The researchers did note that there was no statistically significant differences between the groups for counseling visit frequency prior to and during the
intervention semesters; but, interestingly, the number of visits among the intervention group increased from $M = 0.27$ preceding the intervention to $M = 1.61$ during the intervention semester. Eight students in the intervention group who had not been seen the previous semester were seen at least twice during the intervention semester, but Gutman et al. (2020) did not complete statistical analyses comparing the intervention group, pre- and post-intervention, which is one of the flaws of this study. The eight themes reported from the narrative logs (better sleep, stress reduction, clearer focus, greater energy, greater self-compassion, taking time for self, better life balance, and new well-being tools) did not provide additional insight into this finding.

Gutman et al.’s (2020) study provided support for this DNP project. Especially pertinent to this project was the timeframe (8-weeks), the use of the PSS-10, the evaluation of the student usage of the counseling center and the association with the intervention, and the combination of weekly meetings supported by guided meditation completed individually.

**Lo et al. (2017).** Lo et al. (2017) conducted a good quality (B) systematic review of 24 RCTs whose interventions aimed to improve mental health in undergraduate or post-graduate health care students. A total of 2,491 first and second year medical and nursing students participated in the studies. Of the 24 RCTs, 12 were completed in the U.S. and Canada; and in 23 studies where gender was reported, 68% of the participants were female. Throughout the studies, the following interventions were included: cognitive behavioral interventions, mindfulness interventions, relaxation interventions, and psychoeducational interventions. Other interventions included the following content: relaxation, static awareness of present moment e.g. breath awareness, static awareness of present moment body scan, meditation/ guided imagery, and dynamic awareness of present moment e.g. yoga. The average session lasted 79 minutes and the average number of sessions was 11, or 15 minutes of practice daily for 133 days.

In the studies where stress was measured, Lo et al. (2017) reported that the effect of psychoeducational interventions on stress was not significant compared to the control group.
Lo et al. (2017) reported the effect of cognitive behavioral interventions on stress reduction to be significant compared to the control group ($SMD = .37$; $95\% CI [-.61, .13]; p = .002$). The difference in the effect of relaxation interventions on stress reduction was significant as well ($SMD = -.34; 95\% CI [-.67, -.01]; p = .04$). Mindfulness interventions were found to be significantly effective compared to the control group ($SMD = -.54; 95\% CI [-.85, -.24]; p = .0004$). Within the Lo et al. (2017) review, two studies were particularly applicable to this EBP project: Erogul et al. (2014) and Warnecke et al. (2011). Erogul et al. (2014) used MSBR for 8 weekly 75-minute sessions and daily 20-minute at home sessions; this intervention resulted in significant stress reduction as measured by the PSS-10 ($SMD = -.6; 95\% CI [-1.13, -.07]; p = .03$). Warnecke et al. (2011) found a significant reduction in PSS-10 scores ($SMD = 3.44, 95\% CI [-6.20, -6.68]; p < .05$) using mindfulness exercises for 30-minute daily sessions over an 8-week period, supplemented by daily journaling.

Lo et al.’s (2017) systematic review provided key support for this DNP project. The data supported the effectiveness of using interventions for a duration of 8 weeks, with face-to-face sessions and individual exercises, which were the key components of the intervention planned for this project.

Yang et al. (2018). Yang et al. (2018) conducted an RCT to determine whether the use of an audio-guided mindfulness intervention could decrease the stress levels in medical students. A sample of 88 medical students at a university were selected to use Headspace®, a mindfulness training program which can be downloaded as an application on the student’s phone, for 10 to 20 minutes daily for 30 days. The program began with 10-minute sessions for the first 10 days, then advanced to 15-minute sessions for the next 15 days, and 20-minutes for the remaining 5 days. Students listened to the program’s audio-guided prompts instructing them to (a) pay attention at their body at rest, (b) breathe intentionally, (c) enact their five senses with the intention to relax, and (d) become overall more mindful and aware.
To evaluate outcomes, Yang et al. (2018) had students complete the following: baseline (T1) questionnaires on demographics, PSS-10, Five-Facet Mindfulness Questionnaire (FFMQ), and General Well-Being Schedule (GWBS). Students then completed the PSS-10, FFMQ, and GWBS at the 30-day mark (T2) and then again at the 60-day mark (T3). Stress scores, measured with the PSS-10, showed a significant decrease from T1 to T3 ($F_{[2,142]} = 3.98, p < .05$) in the intervention group. The PSS-10 scores were not statistically different between the intervention and control group at baseline ($M = 19.70 \ [SD = 7.45] \ vs. \ M = 19.12 \ [SD = 6.32]$). The PSS-10 scores between the intervention and control group at T2 were ($M = 17.62 \ [SD = 5.66] \ vs. \ M = 19.50 \ [SD = 5.84]$). The PSS-10 scores between the intervention group and control group at T3 were ($M = 17.08 \ [SD = 6.02] \ vs. \ M = 19.30 \ [SD = 5.63]$). A subgroup the “per-protocol” group in which the participants used the intervention at least once was separately compared to the control group to assess the effectiveness of the mobile application. The PSS-10 scores between the per-protocol group and the control group at T1 were ($M = 20.00 \ [SD = 6.89] \ vs. \ M = 19.12 \ [SD = 6.32]$), at T2 ($M = 17.61 \ [SD = 5.09] \ vs. \ M = 19.50 \ [5.84]$), at T3 ($M = 16.50 \ [SD = 5.33] \ vs. \ M = 19.30 \ [SD = 5.63]$).

The Yang et al. (2018) study was significantly applicable to this DNP project which also used a meditation mobile application as a supplement to the twice a week in person sessions. The study showed that a mobile application can be an effective tool in decreasing stress scores. The evaluation of outcomes using the PSS-10 was efficacious for this DNP project, as the PSS-10 had been selected to measure student stress levels.

**Level II Evidence**

**Daya et al. (2018).** Daya et al. (2018) conducted a good quality (B) SR to determine if undergraduate medical students’ stress levels, burnout, fatigue, or depression would decrease with mindfulness-based interventions. The SR included four RCTs, one non-RCT, and seven pretest posttest design studies. MSBR and mind-body exercises were included in 83.3% of the studies, while mindfulness-based cognitive therapy (MCBT) and CD/DVD mindfulness exercises
were included in 16.7% of the studies. Four studies of seven measuring stress showed a reduction in stress using MSBR, and two utilized a CD/DVD to deliver content. The Garneau et al. (2013) study, within the Daya et al. (2018) review found that MSBR exercises (e.g., body scan, sitting meditation, yoga, meditation with imagery, home practice exercises, and group mindfulness discussions) significantly reduced stress measured using the PSS-10 in students pre-program \(M = 17.41; SD = 6.85\) compared to post-program \(M = 15.26; SD = 5.79\) \((p = 0.026)\). Phang et al. (2015) study was also included in this review, and in this study a program called Mindful-Gym was delivered on DVD for 5 weeks and included exercises such as mindful body stretching and relaxation, mindful breathing, imagery, gratitude, and body scan loving kindness. Outcome measure included in the study was the PSS-10 in which PSS-10 scores for the intervention group reduced from \(M = 18.11 (SD = 6.4)\) pre-intervention to \(M = 15.49 (SD = 5.46)\) post-intervention, while the scores only decreased from \(M = 19.58 (SD = 5.70)\) to \(M = 19.04 (SD = 5.14)\) for the control group.

This systematic review supported the effectiveness of mindfulness-based exercises on stress reduction. Based on the significant results of stress reduction in the Daya et al. (2018) review, a combination of MSBR exercises have been shown to work effectively and were used in this DNP project. The Daya et al. (2018) also supported an eight-week intervention; the use of the PSS-10 for measuring perceived stress further supported the selection of the tool for this DNP project.

**Gonzales-Valero et al. (2019).** Gonzales-Valero et al. (2019) conducted a high quality (A) SR to determine which meditation treatment or cognitive behavioral program was the most effective at decreasing stress, anxiety, and depression in students. The SR with MA included 34 quasi-experimental studies and pre-experimental studies with a total of 3,296 students. The review studied the interventions of cognitive-behavioral programs, mindfulness programs, and body therapy programs such as Yoga-Tai Chi. When all interventions were compared,
Mindfulness techniques programs that measured levels of stress showed the greatest effect size ($M = -0.53$, $95\%$ CI [-0.64, -0.42]).

Within the Gonzales-Valero et al. (2019) systematic review, individual studies had significant applicability to this DNP project: Delgado-Pastor et al. (2015), Lynch et al. (2011), Phang et al. (2016), and Spadaro and Hunker (2016). Delgado-Pastor et al. (2015) conducted a study comprised of participants being randomly put into three groups: a mindfulness cognitive training group, a mindfulness interoceptive training group, and a non-intervention control group. The mindfulness training for all intervention participants was structured in 2 one-hour sessions per week over three weeks. Guided meditation increased from 15 to 20 minutes for the first session to 40 to 45 minutes for all subsequent sessions and each session ended with “(a) encouraging the participants to practice home daily and to generalize the mindfulness attitude learned during the session to everyday situations; (b) identifying difficulties during the meditation for practice and suggesting strategies for coping with these difficulties; and (c) deepening the participants’ understanding of the mindfulness principles based on their comments” (Delgado-Pastor et al., 2015, p. 194). At the end of the intervention period, PSS-10 scores for the control group increased from $M = 29.6$ ($SD = 7.6$) to $M = 30.7$ ($SD = 5.3$), reflecting an increase in perceived stress. Those in the mindfulness cognitive group had a reduction in their PSS-10 scores from $M = 32.6$ at baseline ($SD = 6.8$) to $M = 28.1$ ($SD = 6.2$) post-intervention. A similar reduction in PSS-10 scores was seen among the mindfulness interoceptive group, $M = 32.2$ at baseline ($SD = 6.3$) to $M = 26.2$ ($SD = 5.4$) post-intervention. In the Lynch et al. (2011) study, the researchers conducted an 8-week once weekly 1.5-hour meditation-based program for university students, with activities ranging from a mindfulness introduction to meditations based on the topic of relationships. PSS-10 scores in the intervention group decreased significantly, ($M = 19.33; SD = 10.20$) pre-intervention compared to ($M = 10.11; SD = 7.18$) post-intervention ($z = -2.25, p = .03$), while stress scores reduced more modestly in the control group ($M = 17.83; SD = 10.68$) pre-intervention compared to PSS-10 ($M = 13.33; SD = 7.18$) post-intervention ($z = -
.95; \( p = .34 \). Phang et al. (2016) conducted a study aimed at significantly reducing stress levels in medical students. A brief-Group Mindfulness-Based Cognitive Therapy (b-GMBCT) was used for a weekly two-hour session for four weeks, and the students were also given a booklet and a CD to practice mindfulness at home. Phang et al. (2016) found a pre- to post- intervention difference in PSS-10 scores of \( (M = -3.85; 95\% \text{ CI } [-4.82, -2.88]; SD = 5.70; t = 6.67, p < .001) \). The PSS-10 was also used by Spadaro and Hunker (2016) to evaluate the effectiveness of an 8-week online mindfulness intervention on perceived stress among undergraduate and graduate nursing students. The intervention was based on the MBSR model which included body scan, eating meditation, sitting meditation, walking meditation, guided meditations, loving kindness meditations, and mindful movement through hatha yoga. The online intervention was effective at significantly reducing \( (p = .19) \) PSS-10 scores from baseline \( (M = 35.27; SD = 4.304) \) to 8-weeks post-intervention \( (M = 34; SD = 2.742) \) and the reduction was even more pronounced 24-weeks post-intervention \( (M = 33.46; SD = 3.325) \).

The studies included within the Gonzales-Valero et al. (2019) review showed that mindfulness exercises based on the MBSR model can be implemented within a 4- to 8-week program and based on the significant results of the PSS-10 scores, mindfulness exercises can be effective in reducing perceived stress. These findings provided support for the 8-week intervention planned for this DNP project and further supported the use of the PSS-10 for measuring perceived stress among college students.

**Kemper et al. (2015).** Kemper et al. (2015) conducted a high quality (A) cohort study to determine if a 12-week Mind-Body Skills (MBS) program, including twelve 1-hour modules could effectively reduce students’ stress levels. A sample of 103 graduate students, residents, and fellows in the field of dietetics, medicine, nursing, social work, dentistry, occupation and physical therapy, public health, and psychology who thoroughly completed the program and the post-training survey were included. The MBS program curriculum focused on attention meditation, mindfulness meditation, positive affect meditation, and guided imagery/hypnosis. Perceived
stress levels were measured via the PSS-10. The results showed that perceived stress scores increased by 2.5 points (17%) at the beginning of the graduate school program in the students not engaged in MBS but decreased nearly 1.0 points (5%) in students who completed the MBS program ($p = .006$).

This study was applicable to this DNP project as mindfulness exercises were deemed effective in reducing perceived stress. The PSS-10 was the measurement used in this study and was the tool selected to measure perceived stress in this DNP project.

**McConville et al. (2017).** McConville et al. (2017) conducted a good quality (B) systematic review to provide an analysis of which mindfulness exercises reduce student stress most effectively. The SR included nineteen articles, 12 of which were RCTs, and 7 non-RCTs with students who studied medicine, nursing, social work, psychology, medicine, or health sciences in podiatry, occupational therapy, physiotherapy, or graduate nursing. Various mindfulness interventions were implemented throughout the studies. The programs were based on mindful meditation, mindful movement, loving kindness meditation, Vipassna, Zen, mindfulness based cognitive therapy, and mindfulness-based stress reduction. The structure and duration of the programs included the following: MBSR for 1 ½ to 2-hour sessions for 7 to 10 weeks in addition to didactic teaching on stress, mindfulness mediation, application, home practice, and mindful movement; MBSR for 1 ½ hours over 4 weeks; MINDFULGym program for 2-3 hours per week for 4-5 weeks; MINDFULGym DVD/CD for 5 weeks in addition to a 30-minute guided mindfulness CD daily for 8 weeks; Mindfulness training for 10 minutes followed by a 5-minute discussion for a duration of 28 classes; Mindful meditation for 28 to 30 days with audio guided CD for 20 minutes followed by instructor guided practice for 10 minutes, and continued independent practice after the 2 sessions. Eleven of the studies reported a significant effect on mindfulness post intervention ($SMD = -.44$; 95% CI [-.57, -.31]; $p < .01$) and a decrease of stress was maintained at the 3 months follow up ($SMD = .22$; 95% CI [-.61, .17]; $p = .27$). A decrease in stress, however, was not maintained with the DVD MINDFULGym programs.
This review was applicable to this DNP project as the authors demonstrated that using a CD or audio instruction, for independent practice in combination with instructor guided practice, for eight weeks was effective in decreasing perceived stress. This DNP project utilized both methods of practice with the expectation of producing significantly effective results in an implementation time frame of eight weeks.

O’Driscoll et al. (2017). O’Driscoll et al. (2017) conducted a good quality (B) systematic review to determine the effectiveness of MBSR and MBCT therapy on undergraduate university students. The systematic review included 11 studies including nine RCTs and two non-RCTs. A total of 1,566 medical, psychology, nursing, and premedical undergraduate students were included in the review. The MBSR course included 2 1/2 hour weekly classes for 8 weeks, 45-minute daily practice, and a full day practice on the 6th week. Two articles reported a significant result on the reduction of stress ($p = .019$) and ($p < .001$) and one article reported significantly reduced stress post intervention ($p = .03, 95\% \text{ CI } [0.37, 6.89]$), however, this was not maintained at the 6-month follow up ($p = 008, 95\% \text{ CI } [0.37, 6.19]$).

This review affirmed applicability to this EBP project as the studies included in this review utilized a MBSR type program, which was also utilized in this EBP project. Applicability was also affirmed with data from this review which demonstrated effectiveness of the 8-week intervention implementation time frame.

Yusufov et al. (2019). Yusufov et al. (2019) conducted a high quality (A) SR and meta-analysis (MA) with the purpose of determining (a) the most effective intervention in decreasing stress and anxiety and (b) the appropriate duration of the intervention. This review included 34 experimental and nine quasi-experimental studies. Four thousand four-hundred graduate and undergraduate students between the ages of 18.8 to 36.1 were included in the studies. A variety of interventions were evaluated within the SR (e.g.,: cognitive behavioral therapy, coping skills training, relaxation training, MBSR, psychoeducation, and social support) and the interventions varied from in duration from one day to 12 weeks. Yusufov et al. (2019) found that surprisingly
all interventions except MBSR significantly decreased perceived stress. The Cohen’s $d$ effect size was small to medium (0.44), (95% CI [0.24, 0.64], $p < .01$). However, the reviewers did report that MBSR effectively reduced anxiety ($d = 0.50$; -0.64 to 1.23, 95% CI [-1.12, .92]).

The PSS-10 method of measurement in this review made this piece of evidence applicable to this DNP project. The positive effect of MBSR also supported the designed intervention.

**Level III Evidence**

Articles ranked as Level III evidence provide a perspective on the impact and correlation between nursing students’ stress and perceived well-being. Although these pieces of evidence did not evaluate a specific intervention, the authors did discuss the benefit of mindfulness for well-being. In addition, these research studies demonstrate the frequency in which the PSS-10 is selected to evaluate stress among college students.

**He et al. (2018)**. He et al. (2018) performed a good quality (B) cross-sectional study to determine if stress impacts nursing students’ perceived well-being negatively. The researchers used convenience sampling and invited all students from the Bachelor of Nursing program at the university to participate in an online survey. Five-hundred and thirty-eight online survey questionnaires were completed. The PSS-10 was one of the scales used to measure the students’ perceived stress. The students’ demographic information was also collected: age, gender, marital status, visa status, nursing background, grade level, enrollment mode, employment status, living arrangement, and other information related to their lifestyle and psychosocial health. The students perceived well-being included scores in categories such as environmental mastery, personal growth, autonomy, purpose in life, positive relationships, and self-acceptance. PSS-10 scores among the group reflected moderately high levels of stress ($M = 27.91$; $SD = 7.30$). In addition, there was a significant correlation of -.46 between perceived stress and positive psychological well-being (P-PWB). There was also a significant correlation of -.55 between perceived stress and negative psychological-well-being (N-PWB). Greater levels
of stress resulted in the students having a higher negatively perceived well-being \( (p < .001) \), and mindfulness had a significant positive relationship with well-being \( (p < .001) \). Therefore, the researchers noted that it could be inferred that because mindfulness had a positive relationship on a student’s well-being, mindfulness could also aid in reducing a student’s stress level (He et al., 2018).

The positive correlation between mindfulness and well-being made this study applicable to this DNP project. This DNP project aimed to use mindfulness exercises to decrease student stress levels. The study also used the PSS-10 measurement to evaluate perceived stress. Likewise, this DNP project used the PSS-10 to measure students’ perceived stress levels.

Rayan (2019). Rayan (2019) conducted a good (B) quality correlational study to determine if stress was relational to self-efficacy and mindfulness in nursing students in their final year of study. Two-hundred final year nursing students (154 female) and (46 male) with the average age of 23.35 years from four Jordan universities participated in this study. The students were given demographic questionnaires; and based on these, their stress levels were measured via the PSS-10. The results showed that female students had higher PSS-10 scores \( (M = 22.51; SD = 5.84) \) than male students \( (M = 18.57; SD = 5.95) \), and that married students had higher PSS scores \( (M = 23.92; SD = 3.11) \) than the single students \( (M = 21.17; SD = 6.35, p < .05) \). The results also showed that stress had a significant negative association with mindfulness \( (r = -0.45, p < .01) \) (Rayan, 2019).

This study is applicable to the DNP project as the researchers used the PSS-10 as a tool of measurement and showed that there was a negative association between stress and mindfulness. This DNP project aimed to increase mindfulness with the goal of decreasing stress in health care students.
Construction of Evidence-based Practice

Synthesis of Critically Appraised Literature

A review of literature confirmed that stress is heightened in health care university students due to the pressure to perform, greater responsibility, higher workloads, and academic and clinical demands (Daya & Hearn., 2018; Gonzales-Valero et al., 2019; Gutman et al., 2020; He et al., 2018; Kemper et al., 2015; Lo et al., 2017; McConville et al., 2017; O’Driscoll et al., 2017; Rayan, 2019; Yang et al., 2018; Yusufov et al., 2019). Consequences of unmanaged stress can lead to a deterioration of the students' mental health and cause them to have anxiety, depression, burnout, and/or suicidal thoughts or actions (Gonzalez-Valero et al., 2019; O’Driscoll et al., 2016).

The literature reviewed and appraised supported the premise that stress reducing strategies (e.g., MBSR, MCBT, mind-body stress programs, mindfulness training programs, and/or combinations of these) were effective techniques to reduce student stress. In addition, researchers noted that there was a positive relationship between mindfulness and a student’s well-being and a negative association between stress and mindfulness (He et al., 2018; Rayan, 2019). Therefore, it was surmised that there was a need for interventions that increase mindfulness and in turn reduce stress. MBSR techniques were shown to be the effective in reducing student stress (Daya & Hearn., 2018; McConville et al., 2017; O’Driscoll et al., 2017; Yusufov et al., 2019). A combination of mindfulness exercises including mindfulness meditation, attention meditation, positive affect meditation, guided meditation, guided imagery/hypnosis, at home self-meditation, and or daily diary recording showed a significant effect in the reduction of student stress when used in combination (Gonzales-Valero et al., 2019; Kemper et al., 2017; Lo et al., 2017; McConville et al., 2017; Yang et al., 2018). Although the supportive literature included variations in the duration of the intervention, there was consistency within a number of studies that the stress reduction intervention was most effective when utilized for 8 weeks (Gutman et al., 2020; Lo et al., 2017; O’Driscoll et al., 2017).
audio-guided programs on mindfulness meditation via mobile applications, or CD/DVDs were also found to be an effective way of implementing the stress reducing intervention on university students (Daya & Hearn, 2018; McConville et al., 2017; Phang et al., 2015; Phang et al., 2016; Spadaro & Hunker, 2016; Yang et al., 2018).

**Best Practice Model Recommendation**

The review of literature showed that when implemented together a combination of mindfulness exercises (i.e. mindfulness meditation, guided mediation, or guided imagery) can reduce stress in health care university students (Gonzales-Valero et al., 2019; Kemper et al., 2017; Lo et al., 2017; McConville et al., 2017; Yang et al., 2018). Online mobile applications such as Headspace®, or audio guided CD/DVDs can provide a combination of these mindfulness exercises and be effectively used to reduce student stress in this DNP project (Daya & Hearn, 2018; McConville et al., 2017; Phang et al., 2015; Phang et al., 2016; Spadaro & Hunker, 2016; Yang et al., 2018). Although the interventions within the supportive literature differed in the number of times a week and the amount of time spent on the intervention, in general, the body of evidence supported an 8-week intervention time frame and found this duration of time to be effective in reducing student stress (Gutman et al., 2020; Lo et al., 2017; O’Driscoll et al., 2017). The PSS-10 scale was most commonly used to measure the students’ stress level, and it was reported as being a reliable and valid tool (Gutman et al., 2020; He et al., 2018; Kemper et al., 2015; Rayan, 2019; Yang et al., 2018). Therefore, for this DNP project, it was appropriate to implement a combination of mindfulness exercises through in person instruction and online at home audio meditation using a mobile application, CD, or web-based resource for the duration of 8 weeks to reduce health care student stress.
CHAPTER 3

IMPLEMENTATION OF PRACTICE CHANGE

College students focusing on careers in health care are known to have increasing levels of stress while in a period of emerging adulthood, where they experience a new environment, workloads, relationships, academic and clinical work, and or the responsibility of caring for patients. This DNP project aimed to decrease the health care college student’s stress by implementing an effective stress reduction strategy. An implementation of an effective approach is imperative to prevent the detrimental effects of built up stress in health care college students.

Participants and Setting

The participants in this EBP project consisted of 57 undergraduate college students at a mid-sized, faith-based, private midwestern university. The undergraduate class, from which the project participants were recruited, consisted of a mix of sophomore, junior, and senior students with the following majors: health science (HS), health care leadership (HCL), and nursing. Undergraduate health care college students with an access to a smartphone were eligible to participate. Students with a self-disclosed diagnosis of generalized anxiety disorder, and students who were deaf were designated to be excluded, but none of the students met these exclusion criteria.

Pre-Intervention Group Characteristics

Following the obtainment of informed consent (Appendix D), demographic data were collected and recorded at the first two sessions, prior to the first week of DNP project implementation. The demographics collected were the students’ gender, ethnicity, major, academic grade level, most recent GPA, and number of counseling center visits in the past year (see Appendix E). At the request of the course faculty (who has a focus on exercise physiology), participation in physical activity in the last 30 days and weekly physical activity participation over the past 30 days were also included. Of the 68 students enrolled in the course, 57 chose to participate initially and
provided demographic data. The respondents included a mixed gender of 90% (51) female students and 10% (6) male students. Their ethnicity included 80% (46) White, 2% (1) Black or African American, 9% (5) Asian/Pacific Islander, and 9% (5) Other. Only one student (1%) was a nursing major; 19% (11) students were HCL students, and 80% (45) were HS students. The participants encompassed three academic grade levels with 79% (45) sophomores, 18% (10) juniors, and 3% (2) seniors. Sixty-three percent of the students (36) had a self-reported GPA of 3.5 to 4.0; 28% (16) had a GPA of 3 to 3.49; and 9% (5) had a GPA of 2.5 to 2.9. Fourteen percent (8) students visited the counseling center within the past year, with a total of 31 counseling center visits between the eight students. Ninety-three percent (53) of students participated in a physical activity in the past 30 days, while 7% (4) did not. Within the past 30 days, all 53 exercising students reported physical activity that ranged from less than moderate, moderate, and vigorous activity (See Appendix E). Eleven of the exercising students (20.8%) reported physical activity fewer than a total of 150 minutes/week; less than moderate activity), 41.5% (22 students) reported moderate physical activity of 150 minutes/week total, 37.7% (20) students reported vigorous physical activity (75 minutes/week total) (See Appendix E).

**Intervention**

The DNP project took place during the fall semester of 2020. The first week included an orientation session and collection of data. The intervention was implemented from September 8th, 2020 to October 29th, 2020 for the duration of eight weeks. This duration of intervention was chosen as an 8-week implementation because it was seen to be widely effective in the supportive literature (Gutman et al., 2020; Lo et al., 2017; O’Driscoll et al., 2017). Following completion of the implementation, a week was dedicated to the collection of post-intervention data. Additional details on the weekly content are included in Appendix F.

The need for social distancing during the coronavirus pandemic limited the number of participants who could attend in the physical classroom and the implementation planned required a minor revision. Due to the limited in class attendance restriction, the twice weekly
intervention took place with half of the students participating in class on campus and the other half via a synchronous online video conferencing platform Zoom©. Students were divided by the course instructor into two groups. Group 1 attended class on campus on Tuesdays and used the Zoom© platform for class attendance on Thursdays; Group 2 attended class via Zoom© on Tuesdays and attended class on campus on Thursdays. The activities were provided simultaneously for the two groups for a maximum of approximately 10 minutes after the regularly scheduled class time.

The first week consisted of an orientation session. During the orientation session, informed consent was obtained (Appendix D), the demographic forms were obtained (Appendix E), and the baseline PSS-10 (Appendix G and H) were completed. Students were reminded that participation was voluntary and would not affect their grade in the course. The orientation session was provided twice during the first week of class to ensure that all the students who wanted to participate had the opportunity to do so. Students who consented to participate, turned in the informed consent, demographic form, and PSS-10 (labeled only with the last four digits of their cell phone numbers, as identifiers to link their pre- and post-intervention data; neither the project site facilitator/course instructor or the DNP student project manager had access to these numbers) and self-placed them in three folders labeled “informed consent,” “demographic questionnaire,” and “PSS-10” at the exit door of the classroom. Once all students exited the classroom, the DNP student project manager collected the three folders and placed it in the project site facilitator’s locked office. The DNP student project manager met with the project site facilitator to tabulate data on group characteristics from the demographic form and to evaluate baseline PSS-10 scores.

The following eight weeks were comprised of twice weekly MBSR guided meditation including YouTube© guided meditation from The Honest Guys©, GoZen©, Jason Stephenson©, MyLife© (See Appendices F, I - M), and Grow Well. In addition to the sessions provided in person and/or via Zoom©, students were directed to use the meditation YouTube© channels
listed above, along with the MyLife© meditation mobile application daily. Students were sent a Google© sheet to fill out on a weekly basis which included a column for the last four digits of their phone number (to ensure anonymity) and a column for the number of days they have listened to meditations for that week.

Week 10 of the project concluded the implementation program. During the class sessions in Week 10, any remaining questions were answered, and the PSS-10 and mental imagery questionnaire (see Appendix N) were completed and collected using the same procedures to maintain anonymity. Two class times during Week 10 were used for the collection of data to allow all students ample time to complete the forms.

**Comparison**

The students served as their own comparison group. Post-intervention PSS-10 scores were compared to the same student’s pre-intervention data. Students who failed to complete the PSS-10 at Week 10 were eliminated from final data analysis.

**Outcomes**

The primary outcome of the study was the students’ stress level, as measured using Cohen’s (1994) PSS-10 pre-intervention (during the Week 1 orientation sessions) and post-intervention at 10 weeks. The DNP student project manager reviewed student demographic data to assess for outside variables that may have affected the student’s stress level. At week 10, the PSS-10 was re-administered and a mental imagery questionnaire was given to assess the effectiveness of the program. The Google© sheet was also assessed for the number of days per week students spent meditating both outside and inside the classroom.

**Data**

The PSS-10 (Appendix G) consists of 10 questions which focus on how respondents have felt over the last month. The respondents circle how often they have felt a certain way on a Likert scale from 0 to 4: 0 (never), 1 (almost never), 2 (sometimes), 3 (fairly often), and 4 (very often). To obtain the PSS-10 scores, response scores are reversed on the four positively stated
items (items 4, 5, 7, and 8) and then summing across all 10 items (Cohen, 1994), with total scores ranging from 0 (no stress) to 40 (high stress).

The PSS-10 was designed for use with community samples with at least a junior high school education (Cohen, 1994). The PSS-10 has been used in a number of research studies (Gutman et al., 2020; He et al., 2018; Kemper et al., 2015; Rayan, 2019; Yang et al., 2018) and has established validity and reliability. Liu and colleagues (2020) reported a good concurrent validity and adequate internal consistency with Cronbach’s alpha coefficients ranging from 0.67 to 0.91. In one piece of supportive evidence for this DNP project, Gutman et al. (2020) reported a high internal consistency of ($\alpha = .85, p < .01$) and test-retest reliability ($r = 0.85 p < .01$).

Because the items were easy to understand, and the response alternatives were simple to grasp (Cohen, 1994), the measurement fit perfectly with the needs of this DNP project.

**Collection of data, management, and analysis.**

PSS-10 scores, as well as the post-intervention mental imagery questionnaire, were collected post-intervention in the 10th week. The DNP student project manager then ensured that the appropriate code numbers were attached to the data and all the identifying student information removed from the data in order to maintain subject confidentiality. The data were then placed into SPSS for statistical analysis.

The effectiveness of the intervention was determined by analyzing the pre-intervention stress scores (PSS-10) and comparing them to the post-intervention stress scores. Demographic characteristics were assessed to determine if any confounding variables affected the students’ stress scores. The mental imagery questionnaire and the Google© sheet were utilized to assess the effectiveness of the program and to determine how often students practiced meditation outside as well as inside the classroom. The SPSS 25.0 statistics software program was used to analyze data. Paired samples $t$-tests were used to compare pre-intervention PSS-10 scores to post-intervention PSS-10 scores, thereby evaluating the effectiveness of the intervention for the entire group. A repeated measures analysis of variance
ANOVA) was the test run for specific subsegments (i.e., major, gender, ethnicity, major, academic grade level, GPA, counseling visits, and days of mindfulness exercise utilization).

**Protection of Human Subjects**

As this DNP project, was part of a previously designed study, the project site facilitator obtained IRB approval from University X. Both the project site facilitator and DNP student project manager completed CITI training (see Appendix O) prior to obtaining informed consent (see Appendix D). The students were made aware that their participation in the study was completely voluntary and that they could opt out at any time with no consequences. The students were made aware that their grade was not affected by choosing to participate or not participate. The DNP student project manager explained the project and what would be required of the students for the following nine weeks and how their confidentiality would be maintained. The DNP student project manager explained that there were no risks to participating in this study. The students were made aware that the benefits of the study intervention could include increased relaxation, decrease in blood pressure, respiratory rate, and or heart rate, decrease in stress and anxiety, improvement in sleep, and overall well-being. Student anonymity was maintained by having the questionnaires identified only by the students' last four digits of their cell phone number. Questionnaires were kept in the project site facilitator's locked office cabinet and kept locked when the project site facilitator was not physically present.
CHAPTER 4

FINDINGS

This EBP project was designed to determine if mindfulness exercise would decrease perceived stress scores in undergraduate health care students at a midwestern university. The PICOT question for this project was as follows: In health care college students, what is the effect of mindfulness exercise on their perceived stress scores compared to their pre-intervention perceived stress scores over an 8-week period? The intervention included twice weekly in person MBSR (mindfulness exercise) guided meditation for the duration of 8-weeks. In this chapter, data analysis is provided and the EBP project outcomes are presented along with the comparison of the effectiveness of mindfulness exercise on the pre- and post-PSS scores.

Participants

Demographics data included the students’ gender, ethnicity, major, academic grade level, most recent GPA, and number of counseling center visits in the past year. Per request of the course faculty, participation in physical activity in the last 30 days and weekly physical activity participation over the past 30 days were also included. However, since the focus of this EBP project did not pertain to physical activity, data analysis did not focus on this section of the demographics. The following section discusses the participants size and demographic characteristics.

Size

Of the 57 participants initially completing demographic data, 43 completed the project. One student withdrew from the course and therefore from the project as well. The remaining 13 students failed to complete the post-PSS form on the last day of data collection and were therefore removed from the data analysis.
Characteristics

Fourteen percent (6) of the participants were male and 86% (37) were female. Thirty-three (76.7%) of participants were White, one (2.3%) was Black or African American, five (11.6%) were Asian or Pacific Islander, and four (9.3%) of the participants self-identified as Other. Of the 43 participants, 33 (76.7%) students had a health science major, nine (20.9%) were health care leadership majors and one (2.3%) was a nursing major. Academic grade levels consisted of 34 (79.1%) sophomores, seven (16.3%) juniors, and two (4.7%) seniors. Two (4.7%) of the participants had a GPA of 2.5 to 2.99, 13 (30.2%) had a GPA of 3.0 to 3.49, and 28 (65.1%) had a GPA of 3.5 to 4.0. Thirty-eight (88.4%) of the participants did not visit the counseling center within the past year, two (4.7%) participants visited the counseling center once in the past year, one (2.3%) participant visited twice, one (2.3%) visited three times, and one (2.3%) participant visited six times.

Instrument reliability

The PSS-10, which consists of 10 questions that focus on how respondents have felt over the last month, was used in this EBP project. The respondents circle how often they have felt a certain way on a Likert scale from 0 to 4 (Cohen, 1994). Total scores range from 0 (no stress) to 40 (high stress). The higher the sum of the 10 questions, the higher the level of perceived stress (Cohen, 1994). The PSS-10 was designed for use with community samples with at least a junior high school education (Cohen, 1994). The PSS-10 was chosen for this EBP project because it evaluates perceived stress which fit perfectly with what this project was measuring. The PSS-10 scale was also fairly easy to understand.

The PSS-10 had previously established validity and reliability; noted within a review by Liu and colleagues (2020) to have good concurrent validity and adequate internal consistency with Cronbach’s alpha coefficients ranging from 0.67 to 0.91. Within the study by Gutman et al. (2020) used in this EBP project, the researchers reported a high internal consistency of ($\alpha = .85$, $p < .01$) and test-retest reliability ($r = 0.85 p < .01$). Validity and reliability of the PSS-10 were
also evaluated for this EBP project. Cronbach’s alpha in this EBP project had an internal consistency of $\alpha = .714$ and a moderate positive correlation test-retest reliability of $r(41) = .599$, $p < .01$).

**Changes in Outcomes**

Twenty-five of the 43 participants had an improved PSS-10 score post-intervention (see Table 4.1). Their scores ranged from a reduction of 1 to 14 points in the PSS-10 score. Three participants reported no change in their PSS-10 scores. The remaining 15 participants had an increase in perceived stress ranging from a 1- to 13-point increase. Five of the six males decreased their PSS-10 scores by as much as 14 points (ranging from a 1- to 14-point reduction); while one male’s PSS-10 score increased by 3 points. Twenty of 37 females reported lower PSS-10 scores ranging from 1- to 12-point reductions. Three reported no change in their PSS-10 scores. The remaining 14 female participants’ PSS-10 scores increased during the intervention period, ranging from no change to one participant having a 13-point increase in her PSS-10 score.
Table 4.1

PSS-10 Scores

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<th>Participant</th>
<th>Pre-Intervention</th>
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<td>26</td>
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<td>+3</td>
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<tr>
<td>43</td>
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<td>-9</td>
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</table>

Total: Pre-intervention $M = 20.23$ ($SD = 5.74$); Post-intervention $M = 18.70$ ($SD = 6.48$); ($t(42) = 1.743, p = .089$).
Statistical Testing and Significance

Paired samples t-tests were run using the Statistical Package for the Social Science 25 (SPSS-25) software to determine the effectiveness of the mindfulness exercise intervention for the entire group of participants. The paired samples t-tests established any significance in the PSS-10 scores before and after the mindfulness exercise intervention.

Analysis of variance (ANOVA) were run for the smaller demographic groups. Data can be analyzed using a repeated measures ANOVA for a study design that investigates differences in mean scores under three or more different conditions. If statistically significant, a post hoc test would be run to highlight where the difference specifically occurred.

Statistical significance for all analyses was set at $p < .05$. The $F$ statistic was calculated using ANOVA to describe the variation between the means of the groups of the demographic variables.

Findings

Primary Outcome

Pre- and Post-PSS Scores. A paired-samples t-test was calculated to compare the mean pre-intervention total PSS-10 score to the mean post-intervention PSS score. The mean decreased from 20.23 ($SD = 5.74$) pre-intervention to 18.70 ($SD = 6.48$) post-intervention. But, the modest 1.53 point reduction was not statistically significant within this group of 43 participants ($t = 1.743, p = .089$).

Paired samples $t$-tests were also run on each of the individual items within the PSS-10 (see Table 4.2). Question 3 asked “In the last month, how often have you felt nervous and ‘stressed’?” This was the only question which reached statistical significance for changes from pre- to post-intervention scores ($M = 3.33$ to $M = 2.93$) ($t = 2.716, p = .010$). Question 8 which asked, “In the last month, how often have you felt that you were on top of things?” the decrease in mean scores pre- to post-intervention ($M = 1.63$ to $M = 1.35$) neared statistical significance ($t = 1.908, p = .063$).
### Table 4.2

*Perceived Stress Scale (PSS-10) Individual Questions*

<table>
<thead>
<tr>
<th>Pre-Post Individual PSS-10 Questions</th>
<th>MD (SD)</th>
<th>Significance (2-tailed) p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Question 1</td>
<td>.09 (1.17)</td>
<td>.605</td>
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<tr>
<td>Question 2</td>
<td>.14 (1.06)</td>
<td>.393</td>
</tr>
<tr>
<td>Question 3</td>
<td>.40 (.95)</td>
<td>.010*</td>
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<tr>
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<td>Question 6</td>
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<td>.393</td>
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<td>Question 7</td>
<td>.23 (1.04)</td>
<td>.151</td>
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<tr>
<td>Question 8</td>
<td>.28 (.96)</td>
<td>.063</td>
</tr>
<tr>
<td>Question 9</td>
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<td>.117</td>
</tr>
<tr>
<td>Question 10</td>
<td>.05 (1.09)</td>
<td>.781</td>
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</table>

*result is significant p < 0.05

**Demographic variables.**

A repeated measures ANOVA was calculated to compare the mean pre-intervention to mean post-intervention PSS-10 scores for females ($n = 37$). The mean of the pre-intervention PSS-10 score 20.68 ($SD = 5.86$) decreased slightly post-intervention to 19.49 ($SD = 5.83$), but this reduction was not statistically significant ($t = 1.253$, $p = .218$). Among males ($n = 6$), mean of PSS-10 scores decreased from 17.50 ($SD = 4.32$) pre-intervention to 13.83 ($SD = 8.64$) post-intervention, but this change was also not statistically significant ($t = 1.543$, $p = .183$). (see Table 4.3).
Repeated measures analysis of variance (ANOVA) was also conducted to determine the variation in pre- and post-intervention PSS-10 scores between the means of the demographic groups including: gender, major, academic year, GPA, and counseling center visits before and during the intervention. Table 4.3 demonstrates the relationship between the participant demographic characteristics and the pre-and post-intervention PSS-10 scores. A repeated measures ANOVA was calculated to compare the mean of pre- and post-intervention PSS-10 scores in female versus male students. Although, as noted previously, males’ post-intervention PSS-10 scores decreased more than the females’ post-intervention PSS-10 scores, no significant difference exists among pre- and post-PSS score and gender \((F(1,41) = .949, p = .336)\). It is also of note that all of the males had a GPA of 3.5 or above. Pre- and post-intervention PSS-10 scores were also calculated comparing the major of health science and health care leadership. Students with the health science major had a greater decrease in the mean PSS-10 scores from 20.52 \((SD = 4.97)\) pre-intervention to 18.67 \((SD = 6.47)\) post-intervention, compared to students with a health care leadership major, whose mean did not change from pre-intervention 19.78 \((SD = 8.38)\) to post-intervention 19.78 \((SD = 6.47)\). No significant difference exists among pre- and post-intervention PSS score and major \((F(2, 40) = .534, p = .590)\), thus, no significant main effects or interactions were found. As there was only one nursing student participant, this data could not be calculated. Junior students had the greatest decrease from pre- intervention \((M = 23; SD = 9.04)\) to post-intervention \((M = 17.71; SD = 6.13)\) PSS-10 scores; as compared to sophomores’ \((M = 19.88; SD = 4.91\) vs. \(M = 18.82; SD = 6.73)\) and senior students’ \((M = 16.50; SD = 3.54\) vs. \(M = 20.00; SD =5.66)\). No significant difference exists among the pre- and post-intervention PSS-10 score and academic grade level \((F(1, 40) = 2.523, p = .093)\). Students with a GPA of 2.5 to 2.99 had the greatest decrease in PSS-10 scores pre-intervention \((M = 14.00; SD = 15.56)\) to post-intervention \((M = 11.00; SD = 4.24)\). However, no significant main effects or interactions were found between pre- and post-intervention PSS-10 score and GPA \((F(2, 40) = .196, p = .823)\).
Students who visited the counseling center one to three times within the past year \((n = 4)\) showed a greater decrease in post-intervention PSS-10 scores from \(M = 24.75\) to \(M = 20.75\) than the one student who visited the counseling center six times within the past year (whose PSS-10 score increased by 2 points). It is of note that all three students documenting previous services at the counseling center on the initial demographic form did not report visiting the counseling center during the time of the intervention. But, an additional two students who visited the counseling center for the first time during the intervention period had initial mean PSS-10 scores of 23.00, with post-intervention PSS-10 mean scores reduced to \(M = 20.50\). Even with the reduction in PSS-10 scores noted, the interaction between pre- and post-intervention PSS-10 scores and counseling center visits was nonsignificant \((F(2,4) = .277, p = .771)\) and data was not collected on the number of times these students went to the counseling center during the time of the intervention. One of these students was a high mindfulness exercise utilizer with a decreased PSS score of 8 points, while the other student was low mindfulness exercise utilizer whose post-PSS score increased by 3 points.

Of the 40 students that completed the question assessing whether they felt the intervention was helpful, two students (5%) strongly agreed, 23 students agreed (57.5%), 11 students neither agreed or disagreed (27.5%), and four students disagreed (10%). Of these students, 10 (25%) students experienced psychological changes, clarifying these changes as positive impact of the intervention: their heart rate went down and they felt calmer. One student stated “If I was previously stressed, it slowed my heart rate down (not in a bad way).” Overall, the students agreed that mindfulness exercise was beneficial in decreasing stress. This perspective was also evidenced by the decrease in PSS-10 scores post mindfulness exercise intervention.
Table 4.3

PSS-10 Scores Based on Demographics

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<tr>
<th>Demographics</th>
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<th>Pre-PSS M</th>
<th>Post-PSS M</th>
<th>Significance</th>
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<td>Male</td>
<td>6</td>
<td>17.50</td>
<td>13.83</td>
<td><em>p</em> = .336</td>
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<td><strong>Major</strong></td>
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<tr>
<td>Health Science</td>
<td>33</td>
<td>20.52</td>
<td>18.67</td>
<td></td>
</tr>
<tr>
<td>Health Care Leadership</td>
<td>9</td>
<td>19.78</td>
<td>19.78</td>
<td><em>p</em> = .534</td>
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<tr>
<td><strong>Grade Level</strong></td>
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<td></td>
<td></td>
<td></td>
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<tr>
<td>Sophomore</td>
<td>34</td>
<td>19.88</td>
<td>18.82</td>
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<tr>
<td>Junior</td>
<td>7</td>
<td>23.00</td>
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<tr>
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<td>2</td>
<td>16.50</td>
<td>20.0</td>
<td><em>p</em> = .093</td>
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<tr>
<td><strong>GPA</strong></td>
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<td></td>
<td></td>
<td><em>p</em> = .823</td>
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<tr>
<td>3.5 – 4.0</td>
<td>28</td>
<td>19.68</td>
<td>18.54</td>
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<tr>
<td>3.0 – 3.49</td>
<td>13</td>
<td>22.38</td>
<td>20.23</td>
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<tr>
<td>2.5 – 2.99</td>
<td>2</td>
<td>14.00</td>
<td>11.00</td>
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</tr>
<tr>
<td><strong>Counseling Center Visits</strong></td>
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<td></td>
<td></td>
<td><em>p</em> = .771</td>
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<tr>
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<tr>
<td>Before Intervention (4 or More)</td>
<td>1</td>
<td>18.00</td>
<td>20.00</td>
<td></td>
</tr>
<tr>
<td>During Intervention (Number not Specified)</td>
<td>2</td>
<td>23.00</td>
<td>20.50</td>
<td></td>
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</table>

*Note.* Nursing excluded due to only one student having this major.
Secondary Outcomes

Mindfulness exercise. A 3 x 3 mixed-design ANOVA was calculated to examine the effects of the pre-and post-intervention PSS-10 score and total days spent listening to mindfulness exercise. No significant main effects or interactions were found. The difference among pre-and post-intervention PSS-10 score and total days spent listening to mindfulness exercise interaction ($F(12, 29) = 1.857, p = .085$), the main effect for pre-intervention and post-intervention PSS score ($F(1, 29) = 1.604, p = .215$), and the main effect for total days spent listening to mindfulness exercise ($F(12, 29) = .910, p = .549$) were not significant. PSS-10 scores were not influenced by total days spent listening to mindfulness exercise. However, it should be noted in Table 4.4 that the mean post-intervention PSS-10 score did decrease with utilization of mindfulness exercise sessions.

Table 4.4

<table>
<thead>
<tr>
<th>Mindfulness Exercise</th>
<th>Students (n)</th>
<th>Pre-PSS M (SD)</th>
<th>Post-PSS M (SD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>High Utilizers (15-21 sessions)</td>
<td>10</td>
<td>21.30 (5.12)</td>
<td>21.10 (6.79)</td>
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<tr>
<td>Moderate Utilizers (8-14 sessions)</td>
<td>17</td>
<td>19.94 (6.57)</td>
<td>18.59 (5.90)</td>
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<tr>
<td>Low Utilizers (1-7 sessions)</td>
<td>15</td>
<td>19.40 (5.26)</td>
<td>17.0 (6.97)</td>
</tr>
<tr>
<td>Total</td>
<td>42</td>
<td></td>
<td>p = .085</td>
</tr>
</tbody>
</table>

Note. One student did not specify how many sessions they attended.
CHAPTER 5
DISCUSSION

The purpose of this EBP project was to implement an intervention to help undergraduate college students cope with stress. Specifically, the EBP project student manager implemented a mindfulness exercise intervention aimed towards helping undergraduate health care college students at a private midwestern university cope with their stress levels. This chapter will explain the findings of this EBP project, evaluate the strengths and limitations of the EBP project, discuss the implications for the future, and evaluate the applicability of the Stetler Model.

Explanation of Findings

Primary Outcome

Perceived Stress

The results of this EBP project showed a decrease in the mean PSS-10 scores from pre-intervention 20.23 ($SD = 5.74$) to post-intervention 18.70 ($SD = 6.48$), improvements that although, not statistically significant were consistent with the supportive evidence (Daya et al., 2018; Delgado-Pastor et al., 2015; Erogul et al., 2014; Gonzales-Valero et al., 2019; Gutman et al., 2020; Kemper et al., 2015; Lynch et al., 2011; McConville et al., 2017; O’Driscoll et al., 2017; Phang et al., 2016; Spadaro & Hunker, 2016; Warnecke et al., 2011; Yang et al., 2018). It cannot be determined whether the small number of participants in this project ($N = 43$) contributed to the inability to achieve statistical significance. Yet, the participant size of the reviewed studies varied between 88 participants (Yang et al., 2018) to 1,566 participants (O’Driscoll et al., 2017), with the exception of the Gutman et al. (2020) study, which had 36 participants. It is of note, that Erogul et al. (2014) study ($N = 58$) resulted in statistically significant stress reduction ($p = .03$) as measured by the PSS-10, however the decrease in PSS-10 mean scores post intervention was only by 0.6 points. Kemper et al. (2015) ($N = 103$)
reported statistically significant changes, although their PSS-10 post intervention scores decreased by only 1 point. Thus, it is not inappropriate to consider that statistical significance could have been obtained within this EBP project had there been a larger number of participants.

In reviewing the research studies within the supportive evidence that resulted in the most significant decreases in PSS-10 scores, the studies that resulted in the most significant decrease of post-intervention PSS-10 scores included an MBSR type program that included either 10 to 20 minute daily sessions, 1- to 3-hour weekly sessions, or up to 3 hour weekly sessions in addition to daily at home sessions from 3 to 12 weeks intervention (Delgado-Pastor et al., 2015; Erogul et al., 2014; Gutman et al., 2020; Kemper et al., 2015; Lo et al., 2017; Lynch et al., 2011; McConville et al., 2017; O'Driscoll et al., 2017; Phang et al., 2016; Warnecke et al., 2011; Yang et al., 2018). The duration of 8-weeks for an intervention supported this EBP project; however, the amount of time the intervention was practiced varied within each study. The duration of MBSR sessions for this EBP project was 3 to 10 minutes twice weekly which was on the lower side of the intervention time; therefore, this may have impacted the results. The need to fit the intervention within a feasible schedule for students (e.g., limited number of minutes per session, sessions per week, and numbers of weeks) could have therefore resulted in the modest post-intervention PSS-10 score decrease and the inability to achieve statistical significance. Although providing a convenient location and schedule for the MBSR activities enhanced participation, it is appropriate to question participant “buy in” regarding the anticipated effectiveness of the intervention. Even though students were encouraged to listen to additional meditations on their own outside the classroom and were provided guidance and resources to do so, this was inconsistent, as noted in Table 4.4.

In addition, it is of point to consider that during the implementation of this EBP project the world was going through a pandemic. This extremely unprecedented, uncertain time may have caused high stress within this EBP project’s participants. The students participating in this
EBP project faced an extremely stressful environment not knowing how the pandemic would impact their learning and everyday lives. These participants, specifically, had to accommodate to virtual learning by utilizing a video communication platform Zoom® to participate in classroom activity for half of their scheduled classes during this EBP project implementation. Thus, it is difficult to compare this EBP project to previous research findings, as those studies were likely not conducted during crises times.

**Demographics**

The DNP student project manager was looking to determine if the intervention was more effective for any of the specific demographic segments, but while minor differences among various demographics were noted, the number of participants in each of these subsegments made it difficult to determine relevancy and impossible to analyze the data through SPSS for demographics other than those discussed below.

**Gender.** When comparing the gender of the population of this EBP project to that of the supportive evidence, Gutman et al. (2020) had a similar sample size with predominantly female participants as this EBP project. Gutman et al. reported a 16.45 point reduction in post-intervention PSS-10 scores; however, they provided one weekly 40-min in-person group session and four weekly 10-minute online sessions. Simultaneously the students participated in 10-minute self-guided meditations, outside the weekly in person sessions, four times a week. Their study was 8-weeks long as well; however, the duration of the individual mindfulness exercises was longer compared to this EBP project. Thus, when addressing a predominantly female population, it could be surmised that the less intense MBSR sessions could have attributed to the lack of effectiveness within these participants.

The finding of females scoring higher at baseline and post-intervention than their male counterparts were consistent with those reported by Rayan (2019). In addition to higher pre-intervention PSS-10 scores, female participants in this EBP project also reported less of a positive impact of the MBSR activities. A number of factors could have contributed to this
The female students participating in this EBP project could have been familiar with MBSR, meditations, or yoga prior to the start of this intervention. They may have practiced MBSR in the past or had already been actively practicing MSBR to manage their stress. On the contrary, the males may have benefited from MSBR as they may have never used it in the past.

**Major.** To explain the differences in baseline scores and effectiveness of the intervention by major, it must be noted that students with the health science major compete for a seat to be in the physician assistant program at the university. This need to focus on grades may be the reason for the increased baseline PSS-10 score compared to the health care leadership major students, and the finding that the MBSR was modestly impactful in the higher stressed group.

**Academic Level.** To address why seniors were the only grade level whose mean post-intervention PSS scores increased from baseline, it is logical to consider that the senior students may have been under additional stress as they may have been more worried about reaching a required GPA needed for graduation or were even under further pressure to find a job post-graduation in the time of the pandemic when jobs are scarce.

**GPA.** GPA levels did not appear to be a significant factor in PSS-10 scores, as post-intervention PSS scores decreased for each GPA category. However, a potential explanation for the finding that those with the lowest GPA had the lowest stress levels post intervention may lie in student attitude. One could question if those with the lowest GPA (which was still a passing grade) tended to have less self-imposed stress about their studies.

This EBP project did not acquire the student’s GPA post intervention, therefore it is unknown if any group’s GPA improved and if this improvement was related to their perceived stress. Within literature in the Gutman et al. (2020) study, the researcher’s intervention did not impact GPA.

**Counseling Center Visits.** Consistent with the literature supporting this EBP intervention, counseling center use prior to or during this project did not correlate with statistically significant effectiveness of MBSR. Those students with previous counseling center
services had greater reduction in post-intervention PSS-10 scores, but the number of students meeting these criteria was too small to draw any conclusions. Within literature the Gutman et al. (2020) study also found no statistically significant differences between the groups for counseling visit frequency prior to and during the intervention semesters.

Secondary Outcomes

Mindfulness exercise. A secondary outcome of this EBP project included examining post-intervention PSS-10 scores based on the total days of mindfulness exercise intervention participation. Although the total days of meditations listened did not appear to closely correlate with decreased stress, the mean post-intervention PSS score did decrease with general utilization of mindfulness exercise sessions. These specific findings in total days of meditations weekly listened were not found within literature; however, the greater the length of meditations listened to seems to correlate with the positive significance in post-intervention PSS-10 scores (Gutman et al., 2020; Spadaro & Hunker, 2016; Yang et al., 2018).

Strengths and Limitations of the DNP Project

Strengths and limitations of this EBP project will be discussed. A proper in-depth evaluation of each will be reviewed for improvement of future implications on this population and topic. Future projects can benefit from the strengths and shortcomings of this EBP project.

Strengths

A strength of the project was the profound interest in the topic, established by more than three-fourths of students electing to participate in this EBP project. The students voluntarily chose to stay during the last 10 minutes of the scheduled class to complete the bi-weekly mindfulness exercise. The project, which was initially planned before the COVID-19 pandemic, likely had increased student interest and participation due to increased uncertainty and heightened stress levels. Another strength was the interest and cooperation of the professor whose class the participants were recruited from. The professor had a high interest in mental imagery and was doing her own studies on incorporating this with physical exercise; therefore,
the professor was very helpful in providing the classroom time after her lectures and providing the environment (the classroom) needed to conduct this EBP project. Having the physical space readily available for face-to-face meetings provided a way to interact with the students on a more personal level. Another strength was the availability of the students and the professor through email and the ease of communication with them through supportive technology and resources such as Zoom© when needed, and Google© Sheets to facilitate communications with the students.

Limitations

Although the COVID-19 pandemic may have increased interest in participating in stress reduction activities, it also served as the greatest limitation to this EBP project. The uncertainty of the country, state, and university status made implementation more challenging as it was unknown if the university could be required to close during the pandemic. Social distancing requirements resulted in altering the format in which all in-person classes were offered at the university. Within the class utilized for this EBP project, the in-person classroom time had to be split in half between two groups of students, with some attending in class and others attending via Zoom©. Unfortunately, there was no way to determine if those attending online remained online and participated with the mindfulness activities or simply logged off after the lecture. The pandemic also created a challenge because some students became infected or came in contact with COVID-19 and therefore had to isolate or quarantine. Some students were still in quarantine and were not there the last day of data collection, which made it difficult to collect all the participant post-intervention data.

Another limitation was the inconsistent reporting of the meditations listened to weekly by the students outside of the classroom. Many students did not log in the number of days they listened to the meditations that week or logged it inconsistently where not every week was logged. Even with weekly email reminders to log in the information, this was a continuing problem. The online versus face-to-face implementation may have affected the consistency of
reporting this data and the EBP project’s overall results as research supported the efficacy of
the intervention when face-to-face was combined with self-directed activities such as daily
mindfulness exercise and guided meditations (Gutman et al., 2020; Lo et al., 2017; McConville
et al., 2017; O’Driscoll et al., 2017).

An additional limitation of this project was timing of the implementation within the
academic calendar. Results could have been altered as the post-data was collected right after
the students’ finished their final examination. The student participants could have been under
additional stress during the week of finals, which could have caused their PSS-10 scores to be
higher at this particular time.

Finally, a limitation of this EBP project was the homogeneity of the participant
population. The majority of the participants were white females in their late teens to early
twenties. The results may have been different if the gender, race, and age of the participants
were all variable, and the homogeneity of this population makes it difficult to generalize these
findings within more diverse populations.

Implications for the Future

Practice

This EBP project has implications for practice within university classrooms, student
health centers, and student counseling centers. As MBSR has been shown to decrease a
number of physical symptoms, as well as prevent burnout and suicidal ideation (Cook & Wolz,
2017; O’Driscoll et al., 2017), it is important to educate students on different ways to cope with
stress. Mindfulness education can also be provided at freshman orientation and university
events and organizations: e.g., sororities, fraternities, and sport teams. Primary care providers
who also care for college-age patients can also initiate discussions about MSBR into visits
focusing on wellness (e.g., immunization updates, annual physicals) or episodic care.
EBP Model

The Stetler model (2001), viewed as a practitioner-oriented model which could be used by individuals to guide change, was deemed applicable for use in this DNP project and could readily be applied to future projects focusing on mindfulness to address stress. Specifically, future DNP students and clinicians may use this model to guide their EBP projects by following the Stetler model’s step-by-step process.

The phases of the model were clear and distinctive and were applicable in the non-clinical setting of this EBP project. The DNP student project manager found the Stetler model to be practical and did not identify any limitations specifically to the model.

Research

Although it would be beneficial to continue to utilize mindfulness exercise in university settings as young adults are most susceptible to developing anxiety disorders (American College Health Association [ACHA], 2019), it is recommended that future research focus on the benefit of mindfulness activities within more diverse populations. As minorities are often underrepresented, the additional focus on non-white students (especially first-generation college students) is warranted. Because there was significant variance in the length or meditation sessions and the number of sessions in the reviewed research additional research is needed to identify the number and length of sessions that are most effective for reducing stress. Future research or EBP projects should also consider following participants post-intervention to determine if the decreases in stress levels post-intervention are sustainable.

Education

Mindfulness exercise is not often utilized in university settings. Professors, students, counseling centers, and university employees should be educated on mindfulness exercise and how to best incorporate it within their programs to potentially help improve their students’ mental health. Mindfulness exercise can also be included in nurse practitioner programs during courses.
that address anxiety and depression, as well as clinical courses focusing on adolescents and young adults.

**Conclusion**

Stress in college students can lead to anxiety, depression, burnout, and may even cause thoughts of suicide (Daya & Hearn, 2018; Gonzalez-Valero et al., 2019; Gutman et al., 2020; He et al., 2018; Kemper et al., 2015; Lo et al., 2017; McConville et al., 2017; O’Driscoll et al., 2017; Yang et al., 2018; Yusufov et al., 2019). Adequate treatment for stress can lower the students’ chances of receiving a lower GPA, dropping out of college, or even becoming unemployed (Chadron State College, n.d.). Mindfulness can improve coping mechanisms by increasing sound judgement, self-awareness, self-care, decreasing counter behaviors, reducing cortisol levels, stress, and distress (Daya & Hearn, 2018).

Within this EBP project, the mindfulness intervention resulted in a modest decrease in reported stress among the entire group, but limited participants among specific demographic groups made it difficult to evaluate its effectiveness among demographic variables. The inability to achieve statistical significance may have been impacted by the limited number of participants. As the intervention was positively received, with the majority of students agreeing that the intervention was beneficial in decreasing stress, these modest changes may be clinically significant providing college-aged students with the resources needed to combat stress as these students continue their education and prepare to enter the workforce and in turn prevent future detriments that uncontrolled stress may cause.
REFERENCES


Spadaro, K. C., & Hunker, D. F. (2016). Exploring the effects of an online asynchronous mindfulness meditation intervention with nursing students on stress, mood, and cognition: A

https://doi:10.1016/j.nedt.2016.02.006


https://doi-org.ezproxy.valpo.edu/10.1089/acm.2015.0301


https://doi:10.1037/str0000099
BIOGRAPHICAL MATERIAL

Ms. Pavlovic received her Bachelor of Science in Nursing (BSN) degree at Valparaiso University in 2018. During her studies at Valparaiso University Ms. Pavlovic worked as a nurse fellow on an oncology unit. Following graduation, Ms. Pavlovic transitioned in the role as a registered nurse in an intermediate care telemetry unit. She continues to work as a cardiac nurse while she pursues a Doctor of Nursing Practice (DNP) degree at her alma mater. Ms. Pavlovic is expected to graduate in May 2021. She has an interest in global healthcare and has travelled with the Valparaiso University School of Nursing and Healthcare Professions to Ireland to learn about Ireland’s healthcare system. She is a member of Sigma Theta Tau Zeta Epsilon Chapter. During the COVID-19 pandemic Ms. Pavlovic's unit was transitioned into a specialized COVID-19 area, where she continues to work as a frontline nurse administering care. Her DNP project topic stemmed from seeing how the COVID-19 pandemic affected college student mental health. Ms. Pavlovic enjoyed playing a role in managing college student anxiety during this unprecedented time. She aspires to continue to work to improve mental healthcare in her future endeavors.
ACRONYM LIST

ANOVA: Analysis of Variance
b-GMBCT: Brief-Group Mindfulness-Based Cognitive Therapy
CCAPS: Counseling Center Assessment of Psychological Symptoms
FFMQ: Five-Facet Mindfulness Questionnaire
GAD: Generalized Anxiety Disorder
GWBS: General Well-Being Schedule
MA: Meta-Analysis
MBS: Mind-Body Skills
MBCT: Mindfulness-Based Cognitive Therapy
MBSR: Mindfulness-Based Stress Reduction
MMP: Mindfulness Meditation Program
N-PWB: Negative Psychological Well-Being
OT: Occupational Therapy
PSS-10: Perceived Stress Scale 10
PT: Physical Therapy
PA: Physician Assistant
PPWB: Positive Psychological Well-Being
RCT: Randomized Controlled Trial
SSMS: Student Stress Management Scale
SR: Systematic Review
# Appendix A

## Literature Search

<table>
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<th>Database/Resource Searched</th>
<th>Keywords/Phrases Used</th>
<th>Limiters Used</th>
<th>Number of Results from Search</th>
<th>Number of Pieces of Evidence Selected for Use</th>
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<td>CINAHL</td>
<td>(MM &quot;Meditation&quot;) OR (MM &quot;Mindfulness&quot;) OR (MH &quot;Mindfulness&quot;) OR MM &quot;Guided Imagery&quot; AND (anxiety OR stress* OR anxious) AND (student*)</td>
<td>Scholarly (Peer Reviewed) Journals, Research article, Published Date: 2015/01/01-2020/12/31, English Language</td>
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<td>4</td>
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<td>Cochrane Library</td>
<td>(&quot;guided imagery&quot;) OR (meditation) OR (mindful*) AND (Anxiety OR stress* OR anxious)</td>
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<td>JBI</td>
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<td>PsychINFO</td>
<td>(MM &quot;Guided Imagery&quot; OR DE &quot;Imagery&quot; OR MM &quot;Mindful&quot; OR MM &quot;Meditation&quot;) AND (anxiety or stress*) AND (student*)</td>
<td>Scholarly (Peer Reviewed) Journals, Publication Year: 2015-2020, English Language, Age Groups: Young Adulthood (18-29 yrs)</td>
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<td>1</td>
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<td>MEDLINE with Full Text</td>
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<td>Published Date: 2015/01/01-2020/12/31, English Language, Scholarly (Peer Reviewed) Journals</td>
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### Pieces of Evidence selected that were “Citation Chased” from systematic reviews, evidence summaries, guidelines, etc.

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<th>Number of Pieces Searched</th>
<th>Number of New Pieces of “Chased” Evidence Selected for Use</th>
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<tr>
<td>(1) Mental Health: Relaxation Therapies</td>
<td>N/A</td>
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<td>(2) Anxiety: Smartphone Based Interventions</td>
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<tr>
<td>(3) Telemedicine and e-Health: A Systematic Review of Electronic Mindfulness-Based Therapeutic Interventions for Weight, Weight-Related Behaviors, and Psychological Stress</td>
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<td>(4) Essays and Debates in Mental Health</td>
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<td>(5) Interventions to Reduce Perceived Stress Among Graduate Students: A Systematic Review With Implications for Evidence-Based Practice</td>
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### Pieces of Evidence selected that were “Hand Searched” from the table of contents of specific journals

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<th>List the Years/Time Frame that was Searched</th>
<th>Number of Pieces Evaluated</th>
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Number of evidence used: 11
### Appendix B

#### Evidence Table

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<tr>
<th>Citation (APA)</th>
<th>Purpose</th>
<th>Design</th>
<th>Sample</th>
<th>Measurement/Outcomes</th>
<th>Results/Findings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Daya &amp; Hearn, 2018</td>
<td><strong>To evaluate if mindfulness-based interventions decrease undergraduate medical students’ levels of stress, burnout, fatigue, or depression.</strong></td>
<td>SR of 12 studies.</td>
<td>4 RCTs, 1 non-randomized CT, and 7 pretest posttest designs.</td>
<td><strong>IV</strong>: MSBR in addition to mind-body exercises (83.3% of studies). MCBT, and CD/DVD mindfulness interventions 16.7% of studies. <strong>DV</strong>: Levels of stress</td>
<td>Out of 7 studies measuring stress levels, 3 studies using MSBR showed a significant reduction in stress. One study with MSBR and MCT intervention showed a significant reduction in stress.</td>
</tr>
<tr>
<td>Gonzalez-Valero et al., 2019</td>
<td><strong>To determine “the effect of different meditation treatments and/or cognitive-behavioral programs on stress, anxiety, and depression in students at different stages of education” (p. 3).</strong></td>
<td>SR of 34 studies.</td>
<td>Review of quasi-experimental studies and pre-experimental studies with meta-analysis. 34 articles were included with 3296 students.</td>
<td><strong>IV</strong>: Cognitive-behavioral programs, mindfulness programs, and body therapy programs (Yoga-Tai Chi). <strong>DV</strong>: Levels of stress.</td>
<td>Mindfulness techniques programs had a higher average effect size ($\bar{x} = -0.53$, CI [-0.64, -0.42]) in comparison to body therapy programs ($\bar{x} = -0.19$; CI [-0.45, 0.07]) and cognitive-behavioral programs ($\bar{x} = -0.12$; CI [-0.40, 0.16]).</td>
</tr>
<tr>
<td>Citation (APA)</td>
<td>Purpose</td>
<td>Design</td>
<td>Sample</td>
<td>Measurement/Outcomes</td>
<td>Results/Findings</td>
</tr>
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<tr>
<td>Gutman et al., 2020</td>
<td>To determine if stress can be reduced in graduate health care students with a multimodal mindfulness program in an 8-week period.</td>
<td>Randomized Controlled Trial</td>
<td>40 first year occupational and physical therapy students.</td>
<td>IV: Multimodal mindfulness program: one weekly 40 minute in person session for 8 weeks, and four weekly 10 minute guided meditations. DV: Perceived stress levels were measured via the Perceived Stress Scale (PSS-10). Narrative and numeric levels of stress via a daily log.</td>
<td>Post-intervention there was a significant difference between the PSS-10 scores in the intervention group ($M = 19.66$, $SD = 6.14$) versus the control group ($M = 31.61$, $SD = 6.80$). The effect size was large ($Z = -4.291$, $p &lt; .000$, $d = -1.84$).</td>
</tr>
<tr>
<td>He et al., 2018</td>
<td>To determine if stress will have a negative effect on nursing students perceived well-being.</td>
<td>Cross-sectional descriptive Study</td>
<td>538 responses from nursing students.</td>
<td>IV: Students completed an online survey questionnaire.</td>
<td>Negative perceived well-being was reported in students who had greater levels of stress.</td>
</tr>
<tr>
<td>Kemper et al., 2015</td>
<td>To determine the effect of a 12-week Mind-body skills (MBS) program on participants stress levels, empathy, mindfulness, compassion, and confidence in proving care.</td>
<td>Cohort Trial</td>
<td>103 graduate students, residents, and fellows (in dietetics, medicine, nursing, social work, dentistry, occupation and physical therapy, public health and psychology) at Ohio State University who completed pre and post training surveys.</td>
<td>IV: 12, 1-hour modules of MBS curriculum including focused attention meditation, mindfulness meditation, positive affect meditation, guided imagery/hypnosis. DV: Perceived stress levels were measured via Cohen’s 10 item Perceived Stress Scale.</td>
<td>Perceived stress scores increased 2.5 points (17%) at the beginning of the graduate school program in students not engaged in MBS. Stress levels decreased nearly a point (5%) in students who completed MBS ($p = .006$).</td>
</tr>
<tr>
<td>Citation (APA)</td>
<td>Purpose</td>
<td>Design</td>
<td>Sample</td>
<td>Measurement/Outcomes</td>
<td>Results/Findings</td>
</tr>
<tr>
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<tr>
<td>Lo et al., 2017</td>
<td>To systematically review interventions to improve mental health in health care students.</td>
<td>SR of 24 studies.</td>
<td>24 RCT studies 2491 students who are in entry level first or second year of medicine or nursing; 68% of the gender was female.</td>
<td><strong>IV:</strong> Interventions that improved mental health (cognitive behavioral interventions, mindfulness interventions, relaxation interventions, and educational interventions (psychoeducational content, meditation, breath awareness, and relaxation/guided imagery). Mean of sessions was 79 minutes and the mean number of sessions was 11; and/or 15 minutes of practice daily for 133 days.</td>
<td><strong>Psychoeducational Interventions:</strong> Stress reduction: Effect not significant compared to control group ($SMD = -0.07$; 95% CI [-0.29, 0.15].)</td>
</tr>
<tr>
<td></td>
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<td></td>
<td><strong>Cognitive behavioral interventions:</strong> Stress reduction: Results were significant ($SMD = 0.37$; 95% CI [-0.61, -0.13]; $p = .002$).</td>
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<td></td>
<td><strong>Relaxation Interventions:</strong> Stress reduction: Significant results ($SMD = -0.34$; 95% CI [-0.67, -0.01]; $p = .04$).</td>
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<td></td>
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<td></td>
<td><strong>Mindfulness Interventions:</strong> Stress reduction: ($SMD = -0.54$; 95% CI [-0.85, -0.24]; $p = .0004$).</td>
<td></td>
</tr>
<tr>
<td>Citation (APA)</td>
<td>Purpose</td>
<td>Design</td>
<td>Sample</td>
<td>Measurement/Outcomes</td>
<td>Results/Findings</td>
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</tr>
<tr>
<td>McConville et al., 2017</td>
<td>To determine which mindfulness exercises have the most effect on stress, learning, psychological wellbeing, and clinical performance of health care students.</td>
<td>SR of 19 studies.</td>
<td>19 articles (12 RCTs and 7 Non-RCTs) including students studying medicine, nursing, social work, psychology, medicine or psychology, and/or health sciences in podiatry, occupational therapy, physiotherapy, and graduate nursing.</td>
<td>IV: Mindfulness-Based Stress Reduction (MSBR) for 1.5 to 2 hour sessions for 7 to 10 weeks with didactic teaching (on stress, mindfulness meditation, application, home practice, and mindful movement); MSBR for 1.5 hours over 4 weeks; MindfulGym for 2 to 3 hours per week for 4 to 5 weeks; DVD/CD program for 5 weeks Mindfulgym DVD and 30 minute guided mindfulness CD for 8 weeks; Mindfulness training for 10 minutes followed by 5 minute discussion for 28 classes; Mindful meditation for 28 to 30 days with CD for 20 minutes followed by instructor guided practice for 10 minutes, and independent practice after 2 sessions.</td>
<td>Effect on stress: Post intervention 11 studies reported a significant effect on mindfulness (SMD = -0.44; 95% CI [-0.57, -0.31]; p &lt; .01). Stress at follow up in 3 studies showed no significant effect from mindfulness exercise (SMD = -0.22; 95% CI [-0.61, 0.17]; p = 0.27) suggesting a decrease of stress was maintained after 3 months. At follow up, post-DVD program decrease in stress was not maintained.</td>
</tr>
<tr>
<td>Citation (APA)</td>
<td>Purpose</td>
<td>Design</td>
<td>Sample</td>
<td>Measurement/Outcomes</td>
<td>Results/Findings</td>
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<tr>
<td>O’Driscoll et al, 2017</td>
<td>To determine the benefit and the effect of Mindfulness therapies: Mindfulness Based Stress Reduction (MBSR) and Mindfulness Based Cognitive therapy (MBCT) on undergraduate university students.</td>
<td>SR of 11 studies.</td>
<td>11 articles including 9 RCTs and 2 non-RCTs. The sample included a total of 1,556 medical, psychology, nursing, and premedical undergraduate students.</td>
<td>IV: MSBR course (2.5-hour class, 45 minutes practice daily, and full day practice on the 6th week). DV: Levels of stress.</td>
<td>Effect on Stress: Two articles had a significant result on reduction of stress versus control ($p = 0.019$ and $p = &lt; 0.001$). One article reported significantly reduced stress post-intervention ($p = 0.03$, 95% CI [0.37, 6.89], not maintained at 6 month follow up ($p = 0.08$, 95% CI [-0.37, 6.19]).</td>
</tr>
<tr>
<td>Citation (APA)</td>
<td>Purpose</td>
<td>Design</td>
<td>Sample</td>
<td>Measurement/Outcomes</td>
<td>Findings/Results</td>
</tr>
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</tbody>
</table>
| Rayan, 2019   | To determine the relationship between self-efficacy and mindfulness in nursing students. | Correlational Descriptive Study | 200 final year nursing students from four Jordan Universities. | IV: Questionnaire survey on demographics and stress levels. 
DV: Levels of stress measured via PSS-10. | Stress has a significant negative association with mindfulness ($r = 0.45$, $p < .01$). |
| Yang et al., 2018 | To determine whether a mobile application for audio-guided mindfulness meditation can decrease stress levels in medical students. | Randomized Controlled Trial | 88 medical students | IV: Mobile application Headspace for 10 to 20 minutes daily for 30 days. 
DV: Perceived stress scores were measured via the Perceived Stress Score Scale (PSS-10). | Perceived stress had a significant decrease from T1 to T3 ($F_{[2,142]} = 3.98$, $p < .05$) in the intervention group. |
<table>
<thead>
<tr>
<th>Citation (APA)</th>
<th>Purpose</th>
<th>Design</th>
<th>Sample</th>
<th>Measurement/Outcomes</th>
<th>Findings/ Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yusufov et al., 2019</td>
<td>To determine which intervention decreases stress and anxiety and if the duration of the intervention or the students’ grade level determines effectiveness.</td>
<td>SR and meta-analysis of 43 studies.</td>
<td>43 articles of 34 experimental and 9 quasi-experimental studies including a sample of 4,400 undergraduate and graduate students between the ages of 18.8 to 36.1 years.</td>
<td>IV: Interventions used were CBT, Coping skills training, relaxation training, MBSR, psychoeducation, and social support for a short term duration of 1 day to 6 weeks, or long term duration of 8 weeks to 12 weeks. DV: Perceived stress was measured.</td>
<td></td>
</tr>
<tr>
<td>Level II/A</td>
<td></td>
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<td></td>
<td></td>
<td>Perceived stress: All interventions, except MBSR significantly decreased perceived stress compared to the control group ($d = 0.44$, 95% CI [0.24, 0.64], $p &lt; .01$). The duration of the interventions nor the students’ grade level were significant determinants of perceived stress ($Q(1) = .01$, $p = .93$; $Q(1) = .11$, $p = .74$).</td>
</tr>
</tbody>
</table>
Appendix C

Johns Hopkins Model and Tools Permission

**JHNEBP Model and Tools- Permission**

Thank you for your submission. We are happy to give you permission to use the JHNEBP model and tools in adherence of our legal terms noted below:

- You may not modify the model or the tools without written approval from Johns Hopkins.
- All reference to source forms should include “©The Johns Hopkins Hospital/The Johns Hopkins University.”
- The tools may not be used for commercial purposes without special permission.

If interested in commercial use or discussing changes to the tool, please email jhnp@jhmi.edu.

Downloads:
- **JHNEBP Tools-Printable Version**
- **JHNEBP Tools-Electronic Version**

Do you prefer hands-on learning?

We are offering a 5-day intensive Boot Camp where you will learn and master the entire EBP process from beginning to end. Take advantage of our retreat-type setting to focus on your project, collaborate with peers, and get the expertise and assistance from our faculty. Click [HERE](http://www.jhmi.edu) to learn more about EBP Boot Camp. Group rates available, email jhnp@jhmi.edu to inquire.

[Go back to the form]
Title of Study: The Use of Mental Imagery to Reduce Stress in College Students

Principal Investigator: Phrosini P. Samis-Smith, DHEd, MSCEP, MSSA

College of Nursing and Health Professions
60 University Drive, Valparaiso, IN 46383
219-464-5295
Phrosini.samissmith@valpo.edu

Additional Investigators: Julie A. Koch, DNP, APRN, FNP-BC, FAANP; Saska Pavlovic, BSN, RN, DNP Student

Institutional Contact: Institutional Review Board
Valparaiso University
Office of Research and Sponsored Programs
219-464-5798

1. Purpose of the Study
Research has shown that college students exhibit high levels of stress. Techniques such as mental imagery and exercise have been used to reduce stress. The purpose of the study is to evaluate the effect of mental imagery on reducing stress levels in college students who self-identify as (a) less than moderate, (b) moderate, or (c) vigorous exercisers.

2. Study Intervention
Prior to participating in the mental imagery intervention, you will be asked to complete this Informed Consent form, the Perceived Stress Scale (PSS), and the Demographic Questionnaire form. Completing these forms should take no more than 10 minutes of your time. You will be grouped into one of three categories for comparison purposes, based on the information obtained from the Demographic Questionnaire: less than moderate exercisers, moderate exercisers, and vigorous exercisers.

If you consent to participate in this study, you will be led by the Additional Investigator in a 10-minute mental imagery exercises at the conclusion of each class session for a period of 8 weeks. The mental imagery exercise will be conducted as follows: sit upright in your seat with legs placed flat on the floor, close your eyes and breathe out three times. Then, picture yourself in the woods by a babbling brook, taking in the leaves and their fall colors. Imagine the gold of the oak leaves, the reds in the maples, and the smell of the pines and sense your entire spirit listening to the waters go over the rocks calming your entire body. Finally, when you have fully felt this, know that your anxiety has gone, and open your eyes.

Participants must have a smart phone, computer, or tablet to participate.

Following completion of the 8 weeks of guided imagery, at the end of the next class session, you will be asked to complete the PSS and the Mental Imagery Questionnaire. Completion of these forms should take no more than 5 minutes to complete.
3. **Potential Risks and Discomforts**

The potential risks of participating in mental imagery, although rare, could include physiological responses such as changes in breathing, heart rate, or blood pressure. There could be certain words used in the mental imagery exercises that bring hurtful images to mind. Because of these risks, if you have been diagnosed with schizophrenia or post traumatic stress disorder (PTSD), you are not eligible to participate.

If at any time, if you experience these physiological responses or develops hurtful images, you should seek care at from your primary care provider, an urgent care center, the Student Health Center, or Counseling Center.

4. **Potential Benefits**

Those who use mental imagery exercises may note an increase in relaxation, which might lower your blood pressure, heart rate, and breathing. Mental imagery exercises may also decrease stress, stimulate your immune system and promote healing, and improve your sleep.

5. **Confidentiality**

To maintain anonymity, forms completed for this research project will include only the last four-digits of your cell phone number. These four digits will be used to compare your answers on the PSS before and after the mental imagery exercises. Whether you elect to participate or not, you will be asked to fold the form packet containing: the Informed Consent, the PSS, and the Demographic Questionnaire in half with a blank page on the outside (no information will be visible) and place the folded forms in a labeled box at the classroom’s entrance. Using this process, the students can be assured that the instructor does not know who is participating or not. The Principal Investigator will collect the box and place it in a locked drawer in Principal Investigator’s office. The office will remain locked when the Principal Investigator is not physically present. Following completion of the study, data will kept on file in the locked drawer for three years and then shredded.

6. **Contact Information**

If you have questions at any time about this study, or you experience adverse effects as the results of participating in this study, you may contact the researcher whose contact information is provided on the first page. If you have questions regarding your rights as a research participant, or if problems arise which you do not feel you can discuss with the Principal Investigator, please contact the Valparaiso University Institutional Review Board at valpoirb@valpo.edu or 219-464-5798.

7. **Voluntary Participation**

Your participation in this study is voluntary. It is up to you to decide whether or not to take part in this study. You may decline to answer and or all questions. There is no compensation or course incentives, such as extra credit, to participate. Participation in this study is not related to course grades. If you decide to take part in this study, you will be asked to sign a consent form. After you sign the consent form, you are still free to withdraw (stop participating in the mental imagery or decide not to complete the questionnaires at the end of the mental imagery) at any time and without giving a reason. Withdrawing from this study will not affect your grades, your relationship with your professors, or standing in the University. If you withdraw from the study before completing the PSS and Mental Imagery Questionnaire at the end of the intervention, your initial data (Perceived Stress Scale, Demographic Form) will be destroyed.

---

**CONSENT**

I have read and I understand the provided information and have had the opportunity to ask questions. I understand that my participation is voluntary and that I am free to withdraw at any time, without giving a reason and it will not affect your grades, your relationship with your professors, or standing in the University. I understand that I will be given a copy of this consent form. I voluntarily agree to take part in this study.

Participant’s signature________________________________ Date: ____________________
Investigator’s signature________________________________ Date ________________
Appendix E

Demographic Questionnaire

1. Please write the last 4 digits of your cell phone number: _____________________

2. Gender (Please circle one):
   - Male
   - Female

3. What is your ethnicity? (Please circle one)
   - White
   - Black or African American
   - Native American or American Indian
   - Asian/Pacific Islander
   - Other

4. Major (Please circle one):
   - Health Science (HS)
   - Health Care Leadership (HCL)

5. What is your current academic grade level? (Please circle one)
   - Freshman
   - Sophomore
   - Junior
   - Senior

6. Your most recent GPA falls in the following category: (Please circle one)
   - GPA 3.5 - 4.0
   - GPA 3.0 – 3.49
   - GPA 2.5 – 2.99
   - GPA < 2.5
   - Do Not Wish to Disclose
7. How many times have you approximately visited the VU Student Counseling Center in the past year? (Please provide your answer below)
   • ________________

8. Have you participated in physical activity during the last 30 days? (Please circle one)
   • Yes
   • No

9. How would you quantify your average weekly physical activity participation over the past 30 days? (Please circle one)
   • **Less than Moderate (fewer than a total of 150 minutes/week)**
     o This may involve activities that include: sitting using the computer or standing doing light work (i.e. cooking, washing dishes).
     o Moderate activities that are undertaken for less than 150 minutes/week also qualify as a Less than Moderate rating.
   
   • **Moderate (150 minutes/week total)**
     o Moderate exercise activities include: walking very brisk, mowing lawn (i.e. power mower), or bicycling light effort.
     o The Talk Test may also be used to gauge the intensity of your physical activity; in moderate exercise activities you’re able to talk, but not sing the words to your favorite song.
     o Vigorous activities undertaken for less than 75 minutes/week also qualify as Moderate rating.
   
   • **Vigorous (75 minutes/week total)**
     o Vigorous exercise activities include: jogging at 6 mph, shoveling, or hiking.
     o The Talk Test may also be used to gauge the intensity of your physical activity; in vigorous activities, you’re not able to say more than a few words without pausing for a breath.
## Appendix F

### Implementation Schedule

<table>
<thead>
<tr>
<th>Week</th>
<th>YouTube© Meditation Video</th>
</tr>
</thead>
<tbody>
<tr>
<td>Week 1</td>
<td>September 1st and September 3rd: Orientation session obtaining consents, completion of demographic forms, and perceived stress scale (PSS-10)</td>
</tr>
<tr>
<td>Week 2</td>
<td>September 8th and 10th: The Honest Guys “5 MINUTE Calming Meditation (With Guiding Voice) – 2017 Updated Version <a href="https://youtu.be/vsjeQ6Xf8_Y">https://youtu.be/vsjeQ6Xf8_Y</a> (played on both days)</td>
</tr>
</tbody>
</table>
| Week 3    | September 15th: Jason Stephenson “POSITIVE MIND in 5 Minutes Meditation” (5 minutes) https://www.youtube.com/watch?v=3RxXiFgkxGc&t=197s  
September 17th: Jason Stephenson “Short Guided Meditation: Release All Negative Energy & Worries By Jason Stephenson (10 minutes)” https://www.youtube.com/watch?v=G1TD2uVdotM |
| Week 4    | September 22nd: The Honest Guys “5 Minute Stress Relief Guided Meditation” https://www.youtube.com/watch?v=L1QOh-n-eus  
September 24th: The Honest Guys “5 MINUTE Calming Meditation (With Guiding Voice)” https://www.youtube.com/watch?v=i50ZAs7v9es&amp;t=143s |
| Week 5    | September 29th: 5 Minute Quick Break Meditation: A Heart Chakra, Guided Spoken Visualization https://www.youtube.com/watch?v=ytgL6slPNX8  
October 1st: The Honest Guys “Guided Meditation: 5 Minute Stress Relief” https://www.youtube.com/watch?v=YVMdMQo6tY |
October 8th: The Honest Guys “GUIDED MEDITATION: 4 MINUTE STRESS BUSTER” https://www.youtube.com/watch?v=sGbEzlMXtX0 |
Week 7
<table>
<thead>
<tr>
<th>October 13th:</th>
<th>The Honest Guys &quot;MINDFULNESS - 3 MINUTE MEDITATION&quot;</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><a href="https://www.youtube.com/watch?v=evJHBLldMsE">https://www.youtube.com/watch?v=evJHBLldMsE</a></td>
</tr>
<tr>
<td>October 15th:</td>
<td>The Honest Guys &quot;Deep Muscle Relaxation&quot; (8 minutes)</td>
</tr>
<tr>
<td></td>
<td><a href="https://www.youtube.com/watch?v=GSPdoDFSglk">https://www.youtube.com/watch?v=GSPdoDFSglk</a></td>
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</tbody>
</table>

Week 8
<table>
<thead>
<tr>
<th>October 20th:</th>
<th>The Honest Guys &quot;Guided Meditation - A 'Time-out' Visualisation Meditation to Heal and Refresh ©&quot;</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><a href="https://www.youtube.com/watch?v=QT5w5rBUaxw">https://www.youtube.com/watch?v=QT5w5rBUaxw</a></td>
</tr>
<tr>
<td>October 22nd:</td>
<td>Body Scan Meditation by GoZen (6:15 minutes)</td>
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<td></td>
<td><a href="https://www.youtube.com/watch?v=aIC-lo441v4">https://www.youtube.com/watch?v=aIC-lo441v4</a></td>
</tr>
</tbody>
</table>

Week 9
<table>
<thead>
<tr>
<th>October 27th:</th>
<th>Grow Well &quot;Loving Kindness Meditation&quot; (start at 1:15)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><a href="https://www.youtube.com/watch?v=Ulw0VHupTFl">https://www.youtube.com/watch?v=Ulw0VHupTFl</a></td>
</tr>
<tr>
<td>October 29th:</td>
<td>MyLife &quot;Kindness Meditation (Strengthen Happiness)&quot; (5:58 minutes)</td>
</tr>
<tr>
<td></td>
<td><a href="https://www.youtube.com/watch?v=R2EOqFBCmy8">https://www.youtube.com/watch?v=R2EOqFBCmy8</a></td>
</tr>
</tbody>
</table>

Week 10
| November 3rd and 5th: | Collect perceived stress scale (PSS-10) and mental imagery questionnaire. |

In addition to the in person/zoom exercises, the students were encouraged to use the Youtube© channels utilized during class sessions, as well as the MyLife© mobile app daily.
Appendix G

Cohen's Perceived Stress Scale (PSS-10)

PERCEIVED STRESS SCALE

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

Name ___________________________ Date ______________
Age ______ Gender (Circle): M F Other __________________

<table>
<thead>
<tr>
<th></th>
<th>0 = Never</th>
<th>1 = Almost Never</th>
<th>2 = Sometimes</th>
<th>3 = Fairly Often</th>
<th>4 = Very Often</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. In the last month, how often have you been upset because of something that happened unexpectedly?</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>2. In the last month, how often have you felt that you were unable to control the important things in your life?</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>3. In the last month, how often have you felt nervous and “stressed”?</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>4. In the last month, how often have you felt confident about your ability to handle your personal problems?</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>5. In the last month, how often have you felt that things were going your way?</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>6. In the last month, how often have you found that you could not cope with all the things that you had to do?</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>7. In the last month, how often have you been able to control irritations in your life?</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>8. In the last month, how often have you felt that you were on top of things?</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>9. In the last month, how often have you been angered because of things that were outside of your control?</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>10. In the last month, how often have you felt difficulties were piling up so high that you could not overcome them?</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
</tbody>
</table>


Appendix H

Permission for Use of Perceived Stress Scale

PERMISSION FOR USE OF THE PERCEIVED STRESS SCALE
I apologize for this automated reply. Thank you for your interest in our work.

PERMISSION FOR USE BY STUDENTS AND NONPROFIT ORGANIZATIONS: If you are a student, a teacher, or are otherwise using the Perceived Stress Scale (PSS) without making a profit on its use, you have my permission to use the PSS in your work. Note that this is the only approval letter you will get. I will not be sending a follow-up letter or email specifically authorizing you (by name) to use the scale.

PERMISSION “FOR PROFIT” USE: If you wish to use the PSS for a purpose other than teaching or not for profit research, or you plan on charging clients for use of the scale, you will need to see the next page: “Instructions for permission for profit related use of the Perceived Stress Scale”.

QUESTIONS ABOUT THE SCALE: Information concerning the PSS can be found at https://www.cmu.edu/dietrich/psychology/stress-immunity-disease-lab/index.html (click on scales on the front page). Questions about reliability, validity, norms, and other aspects of psychometric properties can be answered there. The website also contains information about administration and scoring procedures for the scales. Please do not ask for a manual. There is no manual. Read the articles on the website for the information that you need.

TRANSLATIONS: The website (see URL above) also includes copies of translations of the PSS into multiple languages. These translations were done by other investigators, not by our lab, and we take no responsibility for their psychometric properties. If you translate the scale and would like to have the translation posted on our website, please send us a copy of the scale with information regarding its validation, and references to relevant publications. If resources are available to us, we will do our best to post it so others may access it.

Good luck with your work.

Sheldon Cohen
Robert E. Doherty University Professor of Psychology
Department of Psychology
Baker Hall 335-D
Carnegie Mellon University
Pittsburgh, PA 15213
Appendix I

Meditation Resources

At the end of each week, you will be asked to fill out a form in class that simply asks you how many times that week you have listened to a meditation. The following are YouTube® channel meditations that will be used in class that you are encouraged to listen to daily in your free time:

- Jason Stephenson®
- The Honest Guys®
- GoZen®
- Grow Well
- MyLife® (also has an app available on iOS or android)
Appendix J

Permission to use The Honest Guys Videos

Dear Saska,

Thank you for your message.

When it is for non-profit such as this study, we always let the meditations be used for free as long as we are credited.

Due to licensing and copyright, we cannot allow people to sell our work on, to redistribute or monetise, but for this, of course, please go ahead and use our content.

Keep safe and well.

Kev and Rick (THG).

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**Sent:** Monday, August 17, 2020 at 2:04 AM  
**To:** thehonestguys@gmx.co.uk  
**Subject:** Form Submission - New Form - DNP Project Report

**Name:** Saska Pavlovic  
**Email Address:** Saska.pavlovic@valpo.edu  
**Subject:** DNP Project Report

**Message:** Hello,  
My name is Saska Pavlovic and I am a Doctor of Nursing Practice Student at Valparaiso University, Indiana U.S. For my degree I am conducting a research study on the effectiveness of guided meditation on stress levels of college students. I would like to inquire on how I can gain permission to use The Honest Guys YouTube videos to play for the students? I would play the videos for the students twice a week for 8 weeks and I hypothesize that the students’ stress levels will decrease at the conclusion of the 8 weeks.

Thank you for your time and help.
Hi, Saska.

Nice to e-meet you, and thanks for reaching out. The topic of your research study sounds fantastic, and also potentially quite helpful, too, for college students and I bet those outside that group, too.

Yes, you’re welcome to use that YouTube video of ours in your research or presentation – however you need it. Since it’s on YouTube, the licensing allows for it to be accessed for free by the public, and utilized however you need, just as long as you provide proper attribution with our company name and web address (GoZen / www.gozen.com/).

Saska, if you have any other questions or need for help, please do let me know and I’ll be happy to assist. Good luck with your research and studies!

--

Ashleigh Saponare
Director of Customer Love
GoStrengths Inc.
https://gozen.com/

On Mon, Aug 17, 2020 at 1:39 AM UTC, Saska Pavlovic <saska.pavlovic@valpo.edu> wrote:
Appendix L

Permission to Use Jason Stephenson’s Videos

Hey Saska,

Thanks for reaching out and enquiring.

This is such a worthwhile study and one Jason would be really pleased to be involved with.

All we would ask is that the students are given a reference or link to Jason’s meditations and also perhaps their own testimonials at the end of the trial.

Please only invite testimonials from those who feel they would like to use them.

Where will you access the meditations from and which one or ones will you be using?

This is quite an honour for Jason, to be honest and we value you asking permission too.

Deep respect.

Leanne McKay

Personal Assistant to Jason Stephenson
Community Coordinator at Relax Me Online Australia
leanne@jasonstephenson.net
empoweredsleepformula.com

I pay respect to the Traditional Custodians of the Lands where I live and work.
Appendix M

Permission to Use MyLife Videos

Hello,

My name is Saska Pavlovic and I am a Doctor of Nursing Practice Student at Valparaiso University, Indiana U.S. For my degree, I am conducting a research study on the effectiveness of guided meditation on stress levels of college students. I would like to inquire on how I can gain permission to use MyLife Youtube videos to play for the students. I would specifically like to play the following video for the students: https://www.youtube.com/watch?v=HRZ6o6fCmyd

I would play meditation videos for the students twice a week for 8 weeks and I hypothesize that the students’ stress levels will decrease at the conclusion of the 8 weeks. I would also encourage the students to use the MyLife application daily in their own time with your permission. Thank you for your time and help.

Saska

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Saska Pavlovic BSN, RN
Valparaiso University College of Nursing and Health Professions
DNP-FNP Student
Sigma Theta Tau International Honor Society of Nursing Member

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Christine (MyLife Su... 8/17/2020

to me ▼

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Christine (MyLife Su... 8/17/2020

to me ▼

### Please type your reply above this line -###

Your request (26320) has been updated. To add additional comments, reply to this email.

---

Christine (Stopbreathethink)
Aug 17, 2020, 2:46 PM PDT

Yes, please do. We’d like you display our website with the video, please: my life
Best,
Christine

MyLife
Appendix N

Mental Imagery Questionnaire

10. Please write the last 4 digits of your cell phone number: _____________________

11. How many mental imagery sessions did you attend? (Please write in a number)
   • _____________________

12. How beneficial was mental imagery to reduce your stress levels? (Please circle one)
   • Strongly Agree
   • Agree
   • Neither Agree or Disagree
   • Disagree
   • Strongly Disagree

13. During the mental imagery exercises, did you ever experience physiological changes (i.e. changes in breathing, heart rate, blood pressure) or hurtful images?
   • Yes
   • No

14. If so, did you seek care from your primary care provider, urgent care center, the Student Health Center, or Counseling Center?
   • Yes
   • No
Appendix O

CITI Program Verification Certificate

This is to certify that:

Saska Pavlovic

Has completed the following CITI Program course:

Group 1: Social Behavioral Educational Researchers
Group 1: Social Behavioral Educational Researchers
1 - Basic Course

Under requirements set by:

Valparaiso University

Completion Date 09-Apr-2020
Expiration Date N/A
Record ID 36153633

Verify at www.citiprogram.org/verify/?w09f67526-f5ef-4b22-99d5-b284ee53ef04-36153633