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Meditation as an Intervention to Help College Students Cope with Stress

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MEDITATION AS AN INTERVENTION TO HELP COLLEGE STUDENTS COPE WITH STRESS

by

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DEDICATION

I would like to dedicate this project to my wonderful husband and family. This dream of mine would never have been accomplished without your unconditional love and continuous support. Your positive support and encouragement throughout this process has been appreciated. I know with you by my side anything is attainable.

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ABSTRACT

According to the American College Health Association (ACHA) (2017), in a survey of 31,463 students, 31.7% stated that stress negatively impacts their academic performance (lower grades, dropped course, etc.). Additionally, 45.1% of the students stated they have more than average stress levels. The purpose of this evidence-based practice (EBP) project was to determine if mindfulness meditation was effective in helping college students cope with stress. Based on current evidence, Jon Kabat-Zinn's online application for mindfulness meditation is supported as an effective way to help college students cope with stress (Regehr et al. 2013; Yusufov et al. 2018; Cavanagh et al. 2013; Greeson et al., 2014). The ACE Star Model of Knowledge Transformation was utilized to help guide this EBP project at a midwestern university. The project manager recruited participants by explaining the project details before one of their class sessions. Participants of this project included 29 undergraduate students. Participants were asked to complete weekly meditation exercises utilizing the online mobile application for eight weeks. In each exercise, the meditation track involves a male voice instructing the individual on how to breathe and what to focus on throughout the meditation. In order to determine if this intervention helped college students cope with stress, baseline and outcome data were measured utilizing the Perceived Stress Scale (PSS). The PSS is a14 item questionnaire that asked participants to rank how often they felt overwhelmed, overloaded, out of control, and unpredictable during the last two weeks on a 5-point Likert scale from 0 (never) to 4 (very often). A Wilcoxon signed rank test was calculated and revealed a significant decrease in PSS scores from pre-intervention to post-

intervention (Z = -2.418, p <.05). This indicates that average PSS scores decreased after utilizing the meditation application, which is associated with less perceived stress.

CHAPTER 1

INTRODUCTION

Evidence-based practice (EBP) involves the use of best available evidence, one's clinical expertise, as well as patient preferences and values to improve health outcomes for not only individuals, but communities and systems (Melnyk & Fineout-Overholt, 2015). According to Melnyk and Fineout-Overholt (2015), EBP is important in delivering the highest quality healthcare and best patient outcomes at the lowest costs. This EBP project will focus on implementing the best practice to help college students cope with stress. An exhaustive literature search was conducted to determine the best evidence for this project. The literature was critically appraised and revealed mindfulness-based interventions that are effective at helping college students cope with stress. A theoretical framework and EBP model were both utilized to guide the development and implementation of this project. Chapter one describes the background, statement of the problem, purpose (including the PICOT question), and significance of the EBP project.

Background

A major change that occurs in young adulthood is the college experience. College introduces these individuals to new roles and lifestyle changes. For example, some students move away from home to attend college. In addition, college requires learning to adapt to social situations and the academic workload (Bamber & Schneider, 2016). Students often experience stress during this transition in their life. According to Folkman (2010), "Stress is defined as a situation that is appraised by the individual as

personally significant and as having demands that exceed the person's resources for coping" (p. 901). This statement helps to show that stress occurs when certain demands are placed upon a person and they perceive it as difficult to handle. On the other hand, coping is defined as a person's dynamic cognitive and behavioral efforts to manage external and/or internal demands that are appraised as exceeding the person's resources (Folkman, Lazarus, Dunkel-Schetter, DeLongis, & Gruen, 1986). Although stress at minimal levels can motivate students, high levels of stress can have negative effects psychologically, socially, and academically (Bamber & Schneider, 2016). Specifically, stress was reported to be "the primary reason students performed poorly in a course, exam, or project" (Bamber & Schneider, 2016, p. 2). Therefore, it is essential to utilize effective interventions to help college students cope with and manage stress.

Statement of the Problem

College student stress has a national impact. According to the American College Health Association (ACHA) (2017), in a survey of 31,463 students, 31.7% stated that stress negatively impacted their academic performance (lower grades, dropped course, etc.). In addition, 45.1% of the students stated they have more than average stress levels. Lastly, 86.5% of the students reported that they felt overwhelmed sometime within the last 12 months. (American College Health Association, 2017). It is evident that college student stress is prevalent and can negatively impact students.

Data from the Literature Supporting Need for the Project

Studies in the literature review revealed the importance of helping college students manage and cope with stress. Specifically, "the effects of stress impact every system in our bodies" (Hintz, Frazier, & Meredith, 2015, p. 137). The combination of

stress and maladaptive coping mechanisms may lead to inadequate sleep, substance abuse, psychiatric disorders, a decline in physical health, and attrition (Yusufov, Nicoloro-SantaBarbara, Grey, Moyer, & Lobel, 2018). Additionally, stress has been associated with higher levels of depression and anxiety (Hintz et al., 2015). Furthermore, ineffective stress management can lead to decreased metabolic and immune functioning. Subsequently, this can lead to "viruses, cancers, diabetes, hypertension, cardiovascular disease, obesity, and chronic pain" (Bistricky et al., 2018, p. 13). Due to the amount of stress they encounter and its negative effects, college students would benefit from an intervention to help them cope. In addition, Yusufov et al., (2018) found that the generation of students today struggle more with stress management than students in the past. Common college student stressors identified in the literature are "…academic pressures, social challenges, family strains, and financial concerns" (Yusufov et al., 2018, p. 2).

Data from the Clinical Agency Supporting Need for the Project

After speaking with the director at the Student Health Center, information regarding college student stress at the site where the project was implemented was gained. Specifically, the director stated that students come in and report that they are stressed (K. Eshenaur, personal communication, May 24, 2018). However, there is no tool currently being used to screen students for stress and no specific stress reducing interventions are being performed. The director stated that sometimes students come in with illnesses that could be contributed to stress. Specifically, she reported stress may lead to weakened immune systems and lead to upper respiratory infections or streptococcal pharyngitis. We then discussed the counseling center at the University

and the services it offers for students that are stressed. Specifically, there is a Stress and Relaxation Room for students. However, the director stated that many students are reluctant to utilize the services offered at the counseling center because of the stigma. The director stated many students do not want to go to the counseling center because they do not want to be diagnosed with 'anxiety' (personal communication, May 24, 2018). It is also noted in the literature that students experiencing high levels of stress are reluctant to seek help (Regehr, Glancy, & Pitts, 2013; Hintz et al., 2015). A program that is effective at helping college students cope with stress is important to offer students. In addition, it is important to offer it in a location where students will utilize the resources. Students are already seeking care at the Student Health Center, therefore providing a program/course that teaches them mindfulness techniques, such as meditation, increases the likelihood of students utilizing these resources.

Purpose of the Evidence-Based Practice Project

The purpose of this project was to determine an intervention to help college students effectively cope with stress. As noted above, college students experience stress and would benefit from an intervention to help them manage their levels of stress appropriately. The literature supported both face-to-face and online mindfulness-based interventions. Due to the frequent use and convenience of technology among college students, an online tool was utilized to effectively implement a mindfulness intervention to help them cope with stress.

Compelling Clinical Question

This EBP project was developed based on the following clinical question: Regarding college students 18 years of age or older, will an online mindfulness

meditation intervention help college students cope with stress compared to no online mindfulness meditation intervention over an eight-week period?

PICOT Question

In EBP, clinical questions should be asked in the PICOT format. The components of the PICOT question include: the patient population (P), the intervention (I), the comparison intervention or group (C), the outcome (O), and the frame (T) (Melnyk & Fineout-Overholt, 2015). This EBP project will now be described in the PICOT format:

(P) – The population of interest is undergraduate college students enrolled in a psychiatric nursing course at Valparaiso University. The student must be 18 years of age or older and own a smartphone compatible to download Kabat-Zinn's application.

(I) – Based on the evidence obtained from the review of the literature an intervention utilizing Jon Kabat-Zinn's online application for mindfulness meditation will be implemented. Participants will be asked to complete weekly, 20-30 minutes of mindfulness meditation. The application does cost ten dollars to buy per student. Therefore, the leader of the EBP project will provide reimbursement for the cost.

(C) – The comparison group of interest is the way participants coped with stress prior to the intervention.

(O) – The expected outcome is that those who receive the mindfulness-based intervention will experience lower levels of perceived stress on the PSS after the intervention.

(T) – The expected time frame of the EBP project is 9 weeks the mindfulness-based intervention will last 8 weeks.

Significance of the EBP Project

Due to the amount of stress college students experience it is important to develop an effective intervention to help college students manage and cope with stress. Although, the University's Counseling Center does offer services for college students experiencing stress, many students do not seek this treatment because of the stigma. Therefore, it is essential that an online intervention that is easily accessible and is proven to be effective in the literature be implemented. In addition, a college student can utilize this online intervention in private and by himself/herself. It is expected that this EBP project will help college students cope with stress. Therefore, future college students who are stressed and seeking care at the health center can also utilize this intervention.

CHAPTER 2

THEORETICAL FRAMEWORK, EBP MODEL, AND REVIEW OF LITERATURE

Chapter two discusses the theoretical framework and evidenced based practice model utilized to guide this project. In addition, this chapter contains information about the extensive review of the literature that was conducted.

Theoretical Framework

Overview of Theoretical Framework

The theoretical framework that guides this project is the Transactional Model of Stress and Coping (TMSC). This was developed by Richard Lazarus and Susan Folkman in 1984. This model views the person and the environment in a bidirectional and dynamic relationship (Lazarus & Folkman, 1984). The basic concepts of this model are: primary appraisal, secondary appraisal, the coping process, emotion-focused forms of coping, problem-focused forms of coping, and adaptational outcomes (Lazarus & Folkman, 1984). The purpose of this model is to "specify antecedents, processes, and outcomes that are relevant to stress phenomena and the overarching concept of stress" (Lazarus & Folkman, 1984, p. 12). This model was chosen to guide this project and help the author better understand stress that college students endure. Specifically, this model will help the author take a more in depth look at college stress by examining the causes, processes, and outcomes of stress. By taking all of this into account, the TMSC helped guide an effective intervention to help college students cope with stress.

The concept of primary appraisal refers to the person evaluating potential threats or harms of the stressor (Glanz & Schwartz, 2008). Lazarus & Folkman (1984) discuss three kinds of primary appraisal: irrelevant, benign-positive, and stressful. An irrelevant

primary appraisal occurs when an individual deems that an encounter “carries no implication for a person’s well-being” (p. 32). In other words, an individual determines that he/she will neither lose or gain anything from this encounter (Lazarus & Folkman, 1984). The benign-positive primary appraisal includes an encounter that is expected to have a positive outcome. For example, the outcome “preserves or enhances well-being or promises to do so” (Lazarus & Folkman, 1984, p. 32). Benign-positive appraisals can be projected in emotions, such as happiness, love, joy (Lazarus & Folkman, 1984). It is important to note that feelings of guilt or anxiety can also be experienced by individuals who feel that he/she will have to pay for his/her feelings of happiness. It is evident that the appraisal process is different from individual to individual (Lazarus & Folkman, 1984). A stress primary appraisal involves harm or loss, threat, and challenge. Harm or loss is when “damage to the person has already been sustained” (Lazarus & Folkman, 1984, p. 32). This could include injury or illness, harm to self-esteem, or loss of something valued. The stress appraisal component of threat are anticipated harms or losses. This can then lead to anticipatory coping (Lazarus & Folkman, 1984). The difference between threat and challenge is “challenge appraisals focus on the potential for gain or growth inherent in an encounter” (Lazarus & Folkman, 1984, p. 33). In addition, challenge is portrayed by feelings of excitement, eagerness and threat is portrayed by feelings of fear, anger, and anxiety (Lazarus & Folkman, 1984). As one can see the process of primary appraisal entails a great deal of thought. Additionally, primary appraisal is individualistic and will be different from person to person.

Secondary appraisals determine if and what can be done regarding a stressful encounter (Lazarus & Folkman, 1984). During this appraisal process, the individual

determines what coping options are available. Additionally, the individual questions whether these coping options will be effective. Secondary appraisal and primary appraisal relate to one another. If an individual feels that he/she cannot effectively cope or deal with a harm/loss then his/her stress levels will increase (Lazarus & Folkman, 1984). On the other hand, if an individual feels as though he/she has control over a stressor, then a challenge appraisal is likely to happen. As one can see the appraisal process is complex and the components affect one another.

According to Lazarus & Folkman (1984), coping as a process has three main features. The first includes assessments of what an individual actually thinks or does, instead of what an individual usually does or would do. The next feature is examining what the person actually thinks or does in a specific context. Specifically, it is important to understand what the individual is coping with. Lastly, the coping process involves changing coping thoughts and actions as stressful events happen (Lazarus & Folkman, 1984). The coping process is a "function of continuous appraisals and reappraisals of the shifting person-environment relationship" (Lazarus & Folkman, 1984, p. 142). Additionally, Lazarus & Folkman, (1984) describe the difference between coping function and coping outcomes. Specifically, a coping function is the purpose of a strategy, whereas coping outcomes are the effect of a strategy. Furthermore, coping functions can be applied in specific contexts and are more situation-specific, compared to more general coping functions.

Lazarus & Folkman (1984) discuss emotion-focused forms of coping. A type of forms of emotion-focused coping include cognitive processes. These processes are focused on decreasing emotional distress. Examples of actions to decrease emotional

distress include selective attention or avoidance. Many of these strategies are found in almost every stressful encounter (Lazarus & Folkman, 1984). On the other hand, there are a smaller number of cognitive processes that aim to increase emotional distress. Apparently, some individuals believe they need to feel worse before they can feel better (Lazarus & Folkman, 1984). Certain types of cognitive appraisals are equivalent to reappraisals. Another group of emotion-focused coping is that of behavioral strategies. These include physical exercise, meditation, venting anger, having a drink, or seeking emotional support. It is important to note that behavioral strategies are not themselves, reappraisals but can lead to reappraisals. "We use emotion-focused coping to maintain hope and optimism, to deny both fact and implication, to refuse to acknowledge the worst, to act as if what happened did not matter" (Lazarus & Folkman, 1984, p. 151).

Another type of coping if problem-focused coping (Lazarus & Folkman, 1984). These strategies are directed at defining the problem at hand. Followed by generating solutions, determining costs and benefits and alternatives, and in the end acting upon them. It is important to note that problem-focused coping entails more that problem solving. Specifically, problem-focused coping also includes strategies that are directed inward, while problem solving focuses on an analytic process focused on the environment (Lazarus & Folkman, 1984).

It is important to note that problem-focused and emotion-focused coping can affect one another. An example given by Lazarus & Folkman (1984) is provided "A student beginning a major exam experiences great anxiety. The anxiety abates when attention is turned to taking the exam. In this instance, turning to the task (problem-focused coping) results in a reduction of emotional distress" (p. 153).

The resources an individual has available to him/her also affects his/her coping. Resources are defined as something an individual draws upon whether they are available or not. Lazarus & Folkman (1984) discuss resources that are properties of a person (health and energy; positive beliefs; and problem-solving and social skills). A person in good health is likely to have more energy to spend on coping than an individual that is ill. Similarly, an individual that has positive beliefs is likely to have positive coping efforts. Problem-solving skills include searching for information and analyzing a problem, generating and evaluating alternatives and outcomes, and implementing a plan. Social skills are important coping resources due to the prevalence of social functioning in individuals. These skills "refer to the ability to communicate and behave with others in ways that are socially appropriate and effective" (Lazarus & Folkman, 1984, p. 163).

Now that appraisals and coping have been discussed, it is appropriate to discuss adaptation. In this section, the three major classes of adaptational outcomes, social functioning, morale, and somatic health will be introduced and described. Social functioning is described as the skills necessary for maintaining roles and relationships. "A person's overall social functioning is largely determined by the effectiveness with which he or she appraises and copes with the events of day-to-day living" (Lazarus & Folkman, 1984, p. 223). Morale is how people feel about themselves and their conditions of life (Lazarus & Folkman, 1984). According to Lazarus & Folkman (1984), morale depends on appraising events as challenges, coping with negative outcomes by looking at them in a positive way, and effectively managing demands. It is said that learned helplessness and depression is related to the issue of morale. Stress, emotion,

and coping are casual factors in somatic illness (Lazarus & Folkman, 1984). In addition, different styles of coping can affect health by "influencing the frequency, intensity, duration, and patterning of neurochemical stress reactions" (Lazarus & Folkman, 1984, p. 224).

In summary, the adaptational outcomes of coping with a stressor are affected by the primary and secondary appraisals, as well as the coping process. To summarize, the concepts of the TMSC are interrelated and vital to an individual dealing with a stressor.

Application of Theoretical Framework to EBP Project

The transition to college introduces students to new roles and responsibilities. This change in a student's life can be stressful. The American College Health Association (ACHA) (2017) conducted a survey of 31,463 students and found that 45.1% of the students stated they have more than average stress levels. Additionally, 31.7% stated that stress negatively impacts their academic performance (lower grades, dropped course, etc.) (ACHA, 2017). The combination of stress and maladaptive coping mechanisms may lead to in adequate sleep, substance abuse, psychiatric disorders, a decline in physical health, and attrition (Yusufov, Nicoloro-SantaBarbara, Grey, Moyer, & Lobel, 2018). Additionally, stress has been associated with higher levels of depression and anxiety (Hintz, Frazier, & Meredith, 2015). Furthermore, ineffective stress management can lead to decreased metabolic and immune functioning. Subsequently, this can lead to "viruses, cancers, diabetes, hypertension, cardiovascular disease, obesity, and chronic pain" (Bistricky et al., 2018). Due to the amount of stress they encounter and its negative effects, college students would benefit

from a model to help them cope. Family nurse practitioners (FNPs) at the Student Health Center have the potential to help college students cope with the stressors they experience in a positive way with the implementation of the TMSC.

As stated previously, primary and secondary appraisals are key concepts in the TMSC. Individuals' sensitivity and susceptibility to events differ. For example, one student may feel challenged by a stressor, whereas another student may feel threatened by the same stressor. Similarly, one student may exhibit signs of anger during a stressful situation, whereas another student may exhibit feelings of anxiety during the same stressful situation. The primary appraisal of irrelevance involves the student determining the relevance of the stressor to him/her (Lazarus & Folkman, 1984). Again, this can vary from student to student.

As previously stated, secondary appraisal includes determining if and what can be done about a stressor (Lazarus & Folkman, 1984). In this context this would be how college students see themselves dealing with the stressors. This would include how college students determine what coping efforts are available and whether they feel they will be effective or not (Lazarus & Folkman, 1984). For example, after this project, students can use mindfulness techniques to help them deal with stressors they encounter. In the survey of 31,463 students, the ACHA (2017) found that 86.5% of students reported that they felt overwhelmed sometime within the last 12 months. Therefore, this would suggest that college students do not perceive to have much control over their outcomes. Similarly, stress has been reported to lead to suicidal ideation and depression in young adults (Welle & Graf, 2011). As one can see, perceived control over emotions can have a big impact on college students.

College students utilized both emotion-focused and problem-focused forms of coping. In the context of cognitive processes, college students could use avoidance behaviors as an attempt to decrease emotional distress. Similarly, college students could use behavioral strategies to help them cope such as physical exercise, meditation, venting anger, having a drink of alcohol, or seeking emotional support. The mindfulness-based intervention of this project falls into the behavioral strategy's category.

Health and energy are resources that can affect a college student's coping process. For example, a student that is ill has decreased energy to expend on coping. In other words, it is easier to cope when one is feeling well than when feeling ill. In addition, if a college student has positive beliefs about him/herself this will positively affect his/her coping. Problem-solving skills are important resources for coping. In this context, a problem-solving skill would be the college student preparing for an examination (Lazarus & Folkman, 1984). Social skills help college students communicate and behave appropriately among other individuals. In addition, social skills encourage problem-solving with other students, and help with cooperation and support. (Lazarus & Folkman, 1984). Stress in college students can lead to maladaptive coping mechanisms. Specifically, elevated stress levels in students have led to alcohol use and alcohol-related issues (Bodenlos, Noonan, & Wells, 2013). In addition, students with higher stress levels are less likely to exercise, more likely to have unhealthy eating and sleeping habits, and likely to use tobacco products or drugs (Bistricky et al., 2018, & Hintz, Frazier, & Meredith, 2015). As stated previously,

maladaptive coping mechanisms can lead to poor sleep behaviors, psychiatric and physical health disorders and poor academic performance.

Thus far all of the concepts of the TMSC lead to the outcomes of coping with a stressor. If the student utilizes positive and effective coping mechanisms this will likely lead to a positive coping outcome. On the other hand, if a student chooses a negative coping mechanism such as drinking alcohol, this could lead to a negative coping outcome.

Strengths and Limitations of Theoretical Framework for EBP Project

A strength of the TMSC is that all of the concepts of the model are applicable to stressors college/university students may experience. In addition, the theoretical framework is easy to understand and is generalizable to any stressful situation. The TMSC has been previously used in studies regarding college students and stress. For example, Hurst, Baranik, & Daniel (2012) utilized this theoretical framework in order to determine trends among college student stressors and to better understand the cognitive appraisal of college student stressors. Yusufov et al. (2018) also used the TMSC to explain the cognitive appraisal process and the relationship between stress and anxiety in college students.

While the TMSC has strengths, it also has limitations. Specifically, the TMSC is not specific to the healthcare field. Therefore, the concepts of this model are broad and can be applied to any individual experiencing stress. Because of this generalizability, this theoretical framework is not specific to college students.

Evidence-based Practice Model

Overview of EBP Model

The ACE Star Model of Knowledge Transformation was developed at the University of Texas Health Science Center San Antonio in the Academic Center for Evidence-Based Practice (ACE) (Dang et al., 2015). This model was developed early during the evidence-based practice (EBP) movement (Dang et al., 2015). The ACE Star Model of Knowledge Transformation can help individuals overcome common challenges of the EBP process. For example, the ACE Star Model of Knowledge Transformation can assist individuals with the volume of research and integrating the knowledge into best practice (Dang et al., 2015). Specifically, the ACE Star Model of Knowledge Transformation focuses on how knowledge is the solution to moving research into practice (Dang et al., 2015). This model "…depicts the relationships between various stages of knowledge transformation, from newly discovered knowledge through to best practice and outcomes" (Dang et al., 2015, p. 306). The ACE Star Model of Knowledge Transformation has five points that define different forms of knowledge including: discovery research, evidence summary, translation to guidelines, practice integration, and process and outcome evaluation (Dang et al., 2015).

The first point of discovery research involves gathering new knowledge from a literature search. Knowledge can be obtained from primary research studies, including individual scientific studies (Dang et al., 2015). This stage involves "laying the groundwork for a body of research" (Bonis, Taft, & Wendler, 2007, p. 84).

The second point of evidence summary includes synthesizing all of the knowledge into a summary (Dang et al., 2015). This stage is considered the "differentiating factor between research utilization and evidence-based practice" (Bonis, Taft, & Wendler, 2007, p. 84). Individual studies are rigorously evaluated and the

findings of the research are summarized into a meaningful statement (Bonis, Taft, & Wendler, 2007; Kring, 2008). This stage helps combat "…the barrier of too much literature to review" (Kring, 2008, p. 180).

The third point of translation into action involves the combination of expertise and evidence in order to make best practice recommendations (Dang et al., 2015). This stage focuses on translating the knowledge gained from the literature into practice. This is typically translated into a practice document or tool that guides and clinicians can utilize in practice. An example of this type of tool would be a clinical practice guideline (CPG) (Kring, 2008).

The fourth point of practice integration is the use of the evidence in practice (Dang et al., 2015). This step involves incorporating the change into practice (Bonis, Taft, & Wendler, 2007). This is one of the most difficult stages in the process because change is difficult to implement. Specifically, many individuals are resistant to change which leads to ineffective implementation. Although, clinical practice guidelines are EBP based, some clinicians do not use them in the clinical setting (Kring, 2008). Strong leadership is required to make an effective change in this stage (Kring, 2008).

The fifth point involves evaluating the impact of the EBP. This could include evaluating "…patient health outcomes, satisfaction, efficacy and efficiency of care, and health policy" (Dang et al., 2015, p. 306). This part of the model focuses on identifying and measuring the meaningful end points to ensure the safest and quality care (Kring, 2008). This is an important step as it provides continuing evidence that EBP should continue to guide practice.

Application of EBP Model to EBP Project

The ACE Star Model of Knowledge Transformation is applicable to this EBP project regarding increasing college students' ability to cope with stress. The five-point model will help guide this project. Specifically, an exhaustive literature search was conducted to obtain knowledge to implement into practice. The search generated results supporting interventions to help college students cope with stress. In addition, the evidence was critically appraised and a synthesis of the knowledge was generated. This synthesis includes a summary of the different mindfulness interventions to help students cope with stress. The third phase of this model was achieved by implementing an online mindfulness-based meditation application at a university. Specifically, the Perceived Stress Scale (PSS) was utilized to screen participants for perceived stress. The literature supported both synchronous and online mindfulness-based interventions. Due to the frequent use and convenience of technology among college students, an online tool was utilized to effectively implement a mindfulness intervention to help them cope with stress. The intervention was evaluated at the end of the project to determine the efficacy of the intervention in helping students cope with stress.

Strengths and Limitations of EBP Model for EBP Project

A strength of the ACE Star Model of Knowledge Transformation is the simplicity of the model. The model and its components are easy to understand. The model is specific to the healthcare setting. Therefore, this model is applicable in the Student Health Center in a university setting.

A limitation of the ACE Star Model of Knowledge Transformation is that not all evidence will be able to be transformed into a guideline. According to the ACE Star Model of Knowledge Transformation the translation phase refers to a tool or document

such as a clinical practice guideline. However, in this scenario a clinical practice guideline was not created. In addition, there are not recommendations on how to effectively implement a change or integrate evidence into practice.

Literature Search

Sources Examined for Relevant Evidence

In order to find information regarding effective interventions to decrease college student stress, an exhaustive literature search was conducted. The databases used for the search were Cumulative Index for Nursing and Allied Health (CINAHL), Medline via Ebsco, PsycINFO, ProQuest Nursing and Allied Healthsource, Health Source: Nursing/Academic Edition, Joanna Briggs Institute (JBI) and the Cochrane Library. The keywords chosen for the search were based upon the PICOT question: Regarding college students, will mindfulness meditation help students cope with stress compared to no mindfulness meditation over an eight-week period? Variations of the words college, university, higher education stress, coping, strategy, control, decrease, manage, reduce, and college students were used to search the databases. MeSH subject headings were used in CINAHL, PsycINFO, Medline via Ebsco, ProQuest Nursing and Allied Healthsource, and Health Source: Nursing/Academic Edition in order to create a more relevant search. Boolean operators, quotations and asterisks were also utilized to reveal pertinent results. Limiters were used in order to increase the accuracy of this literature review. Specifically, in order to find updated information, the review of the literature focused on articles that were published from 2012-2018. Additionally, the examination of these databases was limited to the English language

and scholarly peer reviewed. To ensure the search was conducted appropriately, librarian assistance was obtained.

The final search in CINAHL generated 227 results. After the titles and abstracts of the 227 results were reviewed, 16 results were kept as relevant evidence. After reviewing the 16 articles in full and in depth, it was determined that one piece of evidence was appropriate for this project. Studies were eliminated because the intervention was pharmacological, or irrelevant to this project. Studies were not kept if the focus was not specific to stress, or if the study focused on stress but not necessarily ways to reduce stress. For example, some studies discussed how stress affected alcohol use or mental health disorders. Also, studies that focused on a specific gender or ethnicity were not kept. Some of the results discussed post-traumatic stress disorder in college students, but not stress itself. In addition, there were results that had college students as the population but did not discuss stress.

The Health Source: Nursing/Academic Edition final search yielded 157 results. After the titles and abstracts of the 157 results were reviewed, eight results were kept as relevant evidence. Of the eight pieces of evidence reviewed more in depth, the one piece of evidence kept, was a duplicate of the one kept from CINAHL. Studies were eliminated if the focus of the study was not specifically on stress, for example some studies focused on the overall psychological health. In addition, studies were excluded if their focus was on a wellness seminar for incoming freshman. Studies were not kept if the focus was not specific to stress, or if the study focused on stress but not necessarily ways to reduce stress. For example, some studies discussed how stress affected alcohol use or mental health disorders.

The final search of Medline produced 267 results. After the titles and abstracts of the 267 results were reviewed, 13 results were kept as relevant evidence. Of the 13 results that were reviewed more in-depth, four pieces of evidence, one of which was a duplicate of the CINAHL result, were kept. The reasons why studies were eliminated or excluded in this search were similar to the CINAHL search. Specifically, studies were eliminated if the focus was not specific to stress, or if the study focused on stress but not necessarily ways to reduce stress. For example, some studies discussed how stress affected alcohol use or mental health disorders. Also, studies that had a population that was not relevant to this project were not kept. In addition, there were results that had college students as the population but did not discuss stress. In addition, studies were excluded if their focus was on a wellness seminar for incoming freshman. One study was eliminated because it was a protocol for a potential study to be completed.

PsycINFO yielded 218 results in the final search. After the titles and abstracts of the 218 results were reviewed, 13 pieces of evidence were reviewed more in depth. Of these 13 pieces, three pieces of evidence were kept, two of these were duplicates from other databases. Studies were eliminated if the focus was not specific to stress, or if the study focused on stress but not necessarily ways to reduce stress. For example, some studies discussed how stress affected alcohol use or mental health disorders. Also, studies that had a population that was not relevant to this project were not kept. In addition, there were results that had college students as the population but did not discuss stress. In addition, studies were excluded if their focus was on a wellness seminar for incoming freshman.

ProQuest generated 166 results, six results were reviewed but none were kept as evidence. Studies were eliminated if the focus was not specific to stress, or if the study focused on stress but not necessarily ways to reduce stress. For example, some studies discussed how stress affected alcohol use or mental health disorders. Also, studies that had a population that was not relevant to this project were not kept. In addition, there were results that had college students as the population but did not discuss stress. In addition, studies were excluded if their focus was on a wellness seminar for incoming freshman. One study was eliminated because it was a pilot study.

The search of Cochrane generated 29 results, one of which was kept and was a duplicate from other database searches. This was the only piece of evidence relevant to college students and stress reduction interventions. The other results dealt with stress but was not related to the correct population, or the studies had no relevance to stress.

JBI yielded 28 results with no sources of evidence being kept. None of the articles within the JBI search were relevant to the topic of stress reduction interventions for college students.

Due to the large number of results generated by specific searches, titles and abstracts were diligently reviewed. Articles specifically focusing on interventions to reduce/manage college student stress were then kept and reviewed. After reviewing all of the articles that contained stress reduction interventions, those that focused on mindfulness-based interventions were kept as final pieces of evidence. Therefore, articles containing interventions that were not mindfulness-based specific, such as dog-assisted therapy, music therapy, or exercise/dance were not chosen. Articles were not

chosen if they were not specific to college student stress. In addition, there were articles that discussed college students stress and dietary habits or negative effects. However, these articles did not discuss interventions to reduce stress, therefore they were not kept as evidence.

Five pieces of best evidence were obtained from the final literature search. The inclusion criteria were as follows: interventions specific to college/university students and stress management, scholarly/peer reviewed evidence, English language, and published between 2012-2018. Exclusion criteria included evidence that focused on degree specific students.

Table 2.1

Literature Search Summary

Database	**Total Results**	**Duplicates**	**Full Text Reviewed**	**Accepted**
Medline	267	8	13	3
PsychINFO	218	9	13	1
CINAHL	227	14	16	1
Health Source Nursing/Academic Edition	157	8	8	0
ProQuest	166	5	6	0
Cochrane	29	1	1	0
JBI	28	0	0	0
Total	1,092	45	57	5

Appraisal of Relevant Evidence

The Critical Appraisal Skills Programme (CASP) checklists for Systematic Reviews and Randomized Controlled Trials were used the appraisal of the evidence found within the literature search (https://casp-uk.net/casp-tools-checklists/). The CASP appraisal tool highlights three broad issues that should be considered when appraising evidence. These issues include questioning whether the results of the study are valid, what the results of the study are, and if the results will help in a local setting. In addition, the checklists offer detailed questions for the appraiser to ask themselves. Also, this tool offers hints for the appraiser to help them better understand the question. The checklist is clearly written, easy to understand and utilize and provides a section for the appraiser to make notes. Refer to appendix B for a copy of the tool.

Levels of Evidence

After the literature search was conducted, the selected evidence was evaluated and ranked. Melnyk &Fineout-Overholt's (2015) hierarchy of evidence was utilized to determine the level of evidence selected. According to this hierarchy of evidence a Level I includes systematic reviews or meta-analyses of all relevant randomized control trials (RCT). Two pieces of evidence were deemed Level I. A Level II entails well-designed RCTs. Three pieces of evidence were collected and rate Level II. Well-designed controlled trials without randomization are considered Level III evidence. Level IV evidence includes well-designed case-control and cohort studies. Systematic reviews of descriptive and qualitative studies are considered Level V evidence. Level VI evidence includes single descriptive or qualitative studies. Lastly, evidence from the

opinion of authorities or expert committees' reports are considered Level VII (Melnyk & Fineout-Overholt, 2015). A summary of the evidence is shown in Appendix A.

Table 2.2
Levels of Evidence

Authors	Levels of Evidence	Database
Cavanagh et al. (2013)	II	Medline
Greeson, Juberg, Maytan, James, & Rogers, (2014)	II	CINAHL
Hintz, Frazier, & Meredith, (2015)	II	Medline
Regehr, Glancy, and Pitts (2013)	I	Cochrane
Yusufov, Nicoloro-SantaBarbara, Grey, Moyer, & Lobel (2018)	I	PsychInfo

Level I

As previously stated, Level I evidence includes systematic reviews or meta-analyses of all relevant randomized control trials (RCT). Two pieces of evidence were deemed Level I and will be discussed further in detail below.

Regehr, Glancy, and Pitts (2013) conducted a systematic review and meta-analysis that focused on interventions to reduce stress in university students. The purpose of this review and meta-analysis was "…to examine the effectiveness of interventions aimed at reducing stress in university students" (Regehr et al. 2013, p. 1). Studies included in this review and meta-analysis were experimental and parallel cohort quasi-experimental.

Regehr et al. (2013) conducted a three-stage screening procedure of the studies. The first stage involved the authors reading the study's title and abstract and deciding if it was appropriate. The second stage entailed reviewing full copies of articles and those that were kept were based on the inclusion and exclusion criteria. The third stage included data extraction from the accepted articles from the first and second stages of screening. Databases searched by the authors included Medline, Embase, PsychINFO, ERIC, Applied Social Science Abstracts, Social Sciences Abstracts, PsychINFO, and Dissertation Abstracts International. The literature search by Regehr et al. (2013) was conducted between February and March 2012, and generated 3138 articles. After removing duplicates, 442 titles and abstracts were reviewed and evaluated. Studies were excluded in this step if the study focused on a pharmacological intervention, or the population was not college/university students. This resulted in 63 studies that were chosen for full text examination. Studies that were excluded at this point were not intervention studies or did not have anxiety or stress as an outcome being measured. After this, 29 controlled trials were deemed appropriate for meta-analysis. Further, 24 studies had sufficient information and had comparators in order to allow for meta-analysis.

The population of the studies included undergraduate, graduate, and professional students. The studies included students from different disciplines, such as medical science, nursing, economics, medicine, law, social work, technology, psychology, and arts and sciences. Most of the studies included in

the meta-analysis were based in the United States (19). There were a total of 1431 participants among the studies deemed appropriate for the meta-analysis.

Regehr et al. (2013) grouped stress interventions into categories of arts-based, psycho-educational, cognitive/behavioral/mindfulness-based, and other. One study was classified in the other category but was not included in the meta-analysis. The controlled trial grouped in the other category used a combination of "energy therapy through healing touch and self-care coaching based on comfort theory" (Regehr et al., 2013, p. 6). The art-based interventions included two studies, neither of which was included in the 24 studies deemed appropriate for the meta-analysis. One study focused on Group Empowerment Drumming, which uses "drumming to enhance social support, provide exercise and intellectual stimulation, and heighten spirituality" (Regehr et al., 2013, p. 6). The group met for one hour each week, for six weeks. This study was not included in the meta-analysis because according to Regehr et al. (2013) it did not contain sufficient data. The other study focused on poetry therapy, which helps students express thoughts and feelings. This included seven-sessions of poetry therapy. This study was not included in the meta-analysis because it did not have comparators. The psycho-educational interventions group also included two studies, neither of which was included in the 24 studies deemed appropriate for the meta-analysis. One of the studies included discussed an online stress-intervention, which provided tools and strategies to help with stress management. In this intervention group students were required to spend at least 20 minutes on the website, four separate times over two weeks. This study was

not included in the meta-analysis due to insufficient data. The other study included a 45-minute seminar for social work students that focused on "personality styles and behavior, signs of stress, and concrete methods for managing stress" (Regehr et al., 2013, p. 6). This study was not included in the meta-analysis due to the absence of comparators.

The majority of the studies, 24 to be specific, were classified in the cognitive, behavioral, and/or mindfulness category. All of these studies were deemed appropriate and included in the meta-analysis. The cognitive therapy focuses on helping individuals identify and modify dysfunctional beliefs influence response to distress. (Regehr et al., 2013). The behavioral interventions use controlled breathing or music relaxation to control physical stress reactions. Most of the interventions in the cognitive-behavioral group were 4-8 weekly sessions, while some involved one session. Additionally, there were five studies that focused on Stress Inoculation Training (STI). This training includes education on sources of stress and way to decrease stress. Also, it includes information on coping skills and relaxation training. Lastly, this training includes applying information learned to situations (Regehr et al., 2013). There were four studies included that used a combination of relaxation training, imagery, and education. The models integrated group training sessions and homework practice utilizing guided imagery and relaxation tapes. Seven studies integrated relaxation techniques and education with the use of cognitive restructuring. One study utilized Eye- Movement Desensitization and Reprocessing (EMDR) for student's test anxiety. The treatment involves directing the client's attention to

the external stimulus (usually eye movements) while, at the same time, concentrating on the cause of the emotional distress. Seven studies involved mindfulness-based approaches and were developed based on Kabat-Zinn's Mindfulness-Based Stress Reduction (MBSR). The mindfulness-based practices include focused breath awareness and relaxation or sweeping. Mindfulness in stressful situations and social interactions, and acceptance of self and others was included in sessions. The weekly at home sessions were led by cassette tapes. Other practices included mindfulness of breath and hatha yoga postures.

Primary outcomes that were assessed for all included studies were psychological stress and anxiety symptoms. The Spielberger State-Trait Anxiety Inventory (STAI) and Perceived Stress Scale (PSS) were common measurements used to measure the primary outcomes of stress and anxiety. The STAI was used in 12 of the studies and the PSS was used in 10 of the studies. Additionally, secondary outcomes were measured in some studies, but not all, and included decreased levels of depression and physiological stress responses. The Beck Depression Inventory was used in two studies and was one of the ways depression was measured, although it was not the most common. Among the studies, salivary cortisol was utilized in four studies to measure physiological arousal. The number of sessions and time span of the interventions within the studies varied in length from one session to weekly sessions for 15 weeks.

Standard differences in means, confidence intervals, z-scores, and p-values were calculated for each study in the review and a figure was provided with the results. "Standard mean differences (SMD) were determined by

calculating the Hedges' g" (Regehr et al., 2013, p. 5). According to Regehr et al. (2013) Hedges' g was used instead of the Cohen's d because it entails an adjustment for small sample bias. In order to obtain an overall estimate effect size inverse variance methods were utilized. Also, "heterogeneity between studies was calculated using *I*^2" (Regehr et al., 2013, p. 5). This helps determine if the percentage of variability in results among studies are likely due to treatment effect instead of chance. Regehr et al. (2013) concluded that cognitive, behavioral, and mindfulness-based interventions were significantly effective at reducing stress, anxiety, and depression compared to control groups "(Standard Difference in Means point estimate -0.77; 95% CI -0.88 to -0.58)" (p. 7). In addition, heterogeneity was moderate (29.4%). Analyses were also conducted for secondary outcomes of depression and salivary cortisol. Regehr et al. (2013) found that among six cognitive behavioral and mindfulness-based studies the results for depression were significant comparing the treatment group and control group (SDM-0.81; 95% CI – 1.49 to -0.13). Also, heterogeneity was high (I^2=86.6%). There were three studies included for the analysis of salivary cortisol (SDM-0.52; 95% CI -0.83 to -0.20) and heterogeneity was 0% (Regehr et al., 2013).

The meta-analysis conducted by Regehr et al. (2013) concluded that cognitive, behavioral, and mindfulness-based interventions are effective in decreasing stress, anxiety, depression, and cortisol response in university students. The authors found that the results were consistent, even though the students were from different disciplines, the interventions varied in length, the

interventions were different, and the studies were completed in different countries.

After appraising this review with the CASP tool, it was deemed good quality. It was deemed good quality because Regehr et al. (2013) clearly stated the purpose of the review. Additionally, the authors searched for appropriate articles and all the articles included in the review were appropriate and focused on interventions to reduce/manage stress. Regehr et al. (2013) summarized the results of the studies. In addition, the results of this review can be applied to the population of college students.

Similarly, Yusufov, Nicoloro-SantaBarbara, Grey, Moyer, & Lobel (2018) conducted a meta-analysis evaluating stress reduction interventions for undergraduate and graduate students. The purpose of this meta-analysis was to determine the effectiveness of interventions in reducing anxiety and perceived stress in students. The authors focused on six types of evidenced-based interventions including: cognitive-behavioral therapy (CBT), coping skills training, relaxation training, mindfulness-based stress reduction (MBSR), psychoeducation, and social support. CBT includes ways to identify and alter maladaptive thinking and behavior. Coping skills training involves modifying skills to overcome with stressors. Relaxation training involves progressive muscle relaxation techniques, meditation, guided imagery, and biofeedback. MBSR was developed by Kabat-Zinn and focuses on “enhancing one’s ability to attend to present moment experiences in a receptive way” (Yusufov et al., 2018, p. 3). Focusing on the present moment helps to decrease self-focused thoughts and

emotions, which can lead to poor mental health. Psychoeducation aims to increase the knowledge of stress, including causes and effects. Social support encourages individuals to express thoughts, emotions, and experiences to one another. Yusufov et al. (2018) also examined if the effectiveness of the intervention was altered by the length of the interventions or the status of the student (undergraduate or graduate), which had not been previously completed. Yusufov et al. (2018) tested the following hypotheses in this meta-analysis:

> "Hypothesis 1: Interventions that incorporate techniques that aim to alter cognitive appraisals of stressors, specifically those that use CBT or coping skills training, will have robust effect sizes for perceived stress and smaller effect sizes for anxiety.
>
> Hypothesis 2: Interventions that aim to reduce negative emotional responses to stressors, specifically those that use relaxation training, will have robust effect sizes for anxiety and smaller effect sizes for perceived stress.
>
> Hypothesis 3: Interventions using MBSR, social support, or psychoeducational techniques will have similar effect sizes for both outcomes (perceived stress and anxiety) because such techniques focus both on cognitive appraisal and emotional responses" (p. 4).

Yusufov et al. (2018) conducted their literature search to range from 1980-2015. The specific date range was chosen as 1980 was an important year in the development of stress research and evidence -based interventions. In addition, the large year span allowed for a larger number of studies to be included in the

review. The authors searched PubMed and PsychINFO, as well as completed a hand search. After duplicates were removed, 254 potential studies were identified. After examination of abstracts, 58 studies were found eligible. After further examination and evaluation, 43 studies met the inclusion criteria. Specifically, studies had to be "…published in a peer-reviewed journal (i.e., dissertations were excluded), used a prospective design with perceived stress or anxiety quantitatively assessed with a standardized measure both before and after the intervention, included undergraduate or graduate student participants, used a control group, and reported results needed to calculate an effect size" (p. 5). Several measures of anxiety and perceived stress were identified, however no psychometric data for the instruments were provided. Although other instruments were used to measure anxiety, the State-Trait Anxiety Inventory was the most commonly used tool and was used in 34.9% of all the studies. While other tools were identified to measure stress, the Perceived Stress Scale was the most commonly used among 30.2% of all the studies.

The authors completed data abstraction and statistical analyses among the studies included in the review. Means and standard deviations for anxiety and perceived stress were obtained for each study. If the mean, standard deviation, or sample size scores were not available then the authors calculated effect sizes using effect size estimates. In order to determine changes in psychological distress before and after the intervention in both the intervention and control groups, the authors used the standardized mean gain difference effect size (d). Among the studies included in the review, "the treatment group

sample sizes ranged from 7 to 195 (M= 45.8, SD= 38.1)" and the control group sample sizes were from 12 to 162 "(M= 43.6, SD= 32.3)" (Yusufov et al., 2018, p. 7). The total number of treatment and control participants was 4,400. The mean ages were from "18.8 (SD= 1.4) to 36.1 (SD= 10.7) years" (Yusufov et al., 2018, p. 7). While some studies included in the review were conducted in other countries, the majority of the studies (30) were conducted in the United States. The duration of the interventions varied among the studies. Specifically, 21 studies were classified as short term (1 day- 6weeks), 17 were long-term (8 weeks- 12 weeks). In addition, 28 studies had undergraduate students as the population and 15 studies had graduate students as the population.

Yusufov et al. (2018) used Cohen's recommendations "d=0.20, small; d=0.50, medium; and d=0.80, large" to determine the extent of aggregate effect sizes (Yusufov et al., 2018, p. 7). The authors also conducted two mixed-effects moderator-analyses to determine if the efficacy of the interventions for anxiety and stress were due to the duration or student level.

Yusufov et al. (2018) found that participants receiving the intervention had larger decreases in anxiety compared to the control group. "The inverse-variance weighted mean effect size for anxiety was 0.62, 95% confidence interval (CI) [0.37, 0.87], p<.001" (Yusufov et al., 2018, p. 7). Yusufov et al. (2018) found that both duration of intervention and student level had no statistically significant effect on anxiety "(Q (1) = 2.02, p = .16; Q (1) =.99, p=.32)" (p. 7). It was found that long-term relaxation training interventions "(d= 1.58, 95% CI [0.74, 2.42], p<.01)" were more effective in reducing anxiety compared to short-

term relaxation training “(d=0.63, 95% CI [0.20, 1.05], p<.05)” (Yusufov et al., 2018, p. 7). Both graduate and undergraduate students experienced statistically significant reductions in anxiety with relaxation training interventions “(graduate students: d= 1.81, 95% CI [1.06, 2.56], p< .001; undergraduate students: d = 0.57, 95% CI [0.20, 0.95], p < .05)” (Yusufov et al., 2018, p. 7). Graduate students had a statistically significant reduction in anxiety using the psychoeducation interventions compared to the control group “(d= 1.78, 95% CI [0.84, 2.73], p < .001)” (Yusufov et al., 2018, p. 7). While, the undergraduate students had a “marginally significant reduction in anxiety (d = 0.40, 95% CI [0.05, 0.84], p < .08)" (Yusufov et al., 2018, p. 7). In order to rule out publication date bias, the authors ran moderator analyses and found that the publication date did not alter the effect sizes for anxiety of specific interventions.

Yusufov et al. (2018) determined aggregate effect size for perceived stress which was “0.44, 95% CI [0.24, 0.64], p<.01” (Yusufov et al., 2018, p. 10). This means that those receiving an intervention had larger decreases in perceived stress when compared to the control group. “All of the aggregate effect sizes for perceived stress based on technique used were positive” (Yusufov et al., 2018, p. 10). All except MBSR were found to be statistically significant. Yusufov et al. (2018) concluded that studies using CBT and social support interventions had medium aggregate effect sizes. Whereas, coping skills training (0.45), psychoeducation (0.43), and relaxation training (0.36) were small to medium. It was found that both the duration of the intervention and the student level were not significant moderators of perceived stress “Q (1) = .01, p

=.93; Q (1) = .11, p = .74" (Yusufov et al., 2018, p. 11). In order to rule out publication date bias, the authors ran moderator analyses and found that the publication date did not alter the effect sizes for perceived stress of specific interventions.

Yusufov et al. (2018) hypotheses one and two were supported by the results in this meta-analysis. Hypothesis one projected that interventions using CBT or coping skills training would have a larger impact on perceived stress over anxiety. Whereas, hypothesis two predicted that interventions focusing on relaxation training would have more of an effect on anxiety rather than perceived stress. However, aspects of hypothesis three were both supported and not supported. Specifically, psychoeducation reduced both perceived stress and anxiety. Whereas, social support reduced perceived stress and had no effect on anxiety. Conversely, mindfulness-based interventions reduced anxiety but not perceived stress. Yusufov et al. (2018) found that both undergraduate and graduate students face stress and both are willing to learn ways to reduce feelings of stress. Additionally, the meta-analysis revealed that interventions lasting longer than eight weeks were not more effective than those that lasted less than eight weeks.

To conclude, Yusufov et al. (2018) found that the interventions effect on perceived stress was equivalent among graduate and undergraduate students. Whereas, graduate students had a larger reduction in anxiety compared to undergraduate students when using psychoeducation and relaxation training. Additionally, Yusufov et al. (2018) concluded "that most interventions lasting 8

weeks or more were no more effective in reducing anxiety or perceived stress than were interventions lasting fewer than 8 weeks" (p. 12). Lastly, Yusufov et al. (2018) found that all of the interventions were effective in reducing anxiety or stress.

This review was also deemed good quality when using the CASP tool. Yusufov et al. (2018) clearly discussed the focus of their review. Also, the authors described their literature search in detail and the studies chosen for the review were appropriate and related to the focus. The results of the studies were summarized and a concise statement was made regarding their results.

Level II

Level II evidence entails well-designed RCTs. Three pieces of evidence were rated Level II and are discussed in the next section.

Online Interventions

Cavanagh et al. (2013) conducted a randomized control trial (RCT) to determine if a brief, online, mindfulness-based intervention could decrease perceived stress and anxiety/depression symptoms in college students.

The sample included 104 students from a university South of England. The students ranged from 19 to 51 years of age (M= 24.7 years, SD= 6.44 years) and included 92 females. All of the participants were required to have access to a computer and to the University's virtual learning environment. The authors obtained approval from the University's ethics committee and informed consent from each participant prior to the beginning of the study.

The Five Facet Mindfulness Questionnaire (FFMQ) was a tool utilized to measure changes in an individual's likelihood to be mindful daily. The FFMQ is a 5-point Likert-type scale. This tool had good internal consistency at baseline with a Cronbach's alpha =0.91. The Perceived Stress Scale (PSS) was utilized to determine how unpredictable, overloaded, or uncontrollable an individual's life is and is also a 5-point Likert-type scale. This tool also showed good internal consistency at baseline with a Cronbach's alpha = 0.91. The patient health questionnaire for depression and anxiety (PHQ-4) was utilized as a screening measure for depression and anxiety focusing on experiences during the past two weeks. This questionnaire using a 4-point Likert scale and had showed good internal consistency with a Cronbach's alpha = 0.87. An engagement and experience questionnaire was utilized to determine the participants' engagement with mindfulness. No psychometric data were given for this questionnaire. The FFMQ, PSS, and PHQ-4 were administered pre- and post-intervention.

Advertisement for the study was completed on the University's campus. The participants signed up to the 'Learning Mindfulness Online' course and completed baseline questionnaires. The informed consent was also given at this time. The participants were randomly assigned to a group that started the online intervention immediately (the intervention group, n=54) or to a wait list group (the control group, n=50) within 24 hours of completing the baseline questionnaires. A computer-generated blocked random allocation method was used for randomization. The participants assigned to control group were informed they would begin the intervention two weeks later.

The ‘Learning Mindfulness Online’ intervention consisted of knowledge regarding mindfulness and practice, and audio-based practices that participants were to follow was administered through the University’s virtual learning facility but with Moodle. The authors provided background information on mindfulness and noted that the “most well established and thoroughly evaluated” interventions are the mindfulness-based stress reduction (MBSR) and mindfulness-based cognitive therapy (MBCT) (Cavanagh et al., 2013, p. 573). As previously, stated MBSR was developed by Kabat-Zinn. Specifically, the online program had five sections. The first section was text and video about the history and advantages of mindfulness. The second section included guided mindfulness mediation and instructions. The third section included frequently asked questions about mindfulness and what to expect. The fourth section was a daily journal and a place for students to reflect on their experiences. The fifth section entailed a study information sheet, contact information for researchers, and information about the university’s counseling services, as well as mental health charities (Cavanagh et al., 2013). Specifically, the participants were invited to partake in daily 10-minute guided mindfulness meditation via audio tracks. The meditation was provided in either a male’s or female’s voice and both versions were recorded by an expert psychologist in mindfulness-based therapies. Reminder emails were sent out at three-day intervals for a total of four emails. These emails included reminders for participants to continue the daily practice and had tips for the practice.

Statistical analyses were performed using IBM SPSS Statistics 19 and computed at $p \leq 0.05$, two-tailed. "Results were analyzed and are reported on an intention to treat (ITT) basis using the baseline-observation carried forward method (BOCF)" (Cavanagh et al., 2013, p. 575). The BOCF assumes that participants in the intervention that did not complete the post-intervention measurements did not benefit and takes into account missing data. In order to determine differences between the groups, measures analyses of variance (ANOVA) were conducted on the FFMQ, PSS, and PHQ-4 scores.

The results of this RCT found a significant increase in mindfulness in the intervention group "(t (53) = 3.56, p=0.001, d= 0.27, 95% CI for d= (0.11, 0.42))" compared to the control group "(t (49) = 0.42, p=0.68, d=0.03, 95% CI for d= (-0.13, 0.20))" (Cavanagh et al., 2013, p. 575). Additionally, there was a significant decrease in perceived stress scores in the intervention group "(t (53) = 3.73, p<0.001, d=0.37, 95% CI for d= (0.16, 0.57))" compared to the control group "(t (49) = 0.44, p =0.66, d=0.05, 95% CI for d= (-0.16, 0.25))" (Cavanagh et al., 2013, p. 575). Cavanagh et al., 2013 found a significant decrease in anxiety and depression in the intervention group "(t (53) = 3.00, p = 0.004, d = 0.24, 95% CI for d= (0.08, 0.40))" compared to the control group "(t (49) = 0.07, p= 0.94, d=0.01, 95% CI for d= (-0.15, 0.16))" (Cavanagh et al., 2013, p. 575). There were 58 participants that completed the questionnaires at pre- and post-intervention, which was 52.3%. Specifically, 35 (70%) of the participants in the control group completed the post-intervention questionnaire, whereas 23(42.6%)

of the participants in the intervention groups completed the post-intervention questionnaire.

In summary, it was found by Cavanagh et al., (2013) that an increase in mindfulness within the intervention group was strongly associated with a decrease in perceived stress ($r= -0.73$, $p<0.001$) and symptoms of anxiety and depression ($r=-0.59$, $p<0.001$). There were 20 participants (87%) that responded that completing the online mindfulness intervention was of some benefit to them and only 3 (13%) participants claimed it was no benefit at all.

The randomized control trial by Cavanagh et al. (2013) was also appraised utilizing the CASP tool and was deemed good quality. This was determined because randomization was utilized to separate the participants into groups. Cavanagh et al. (2013) discussed the number of participants and stated the reasons for drop outs. In addition, the questionnaires response rates were discussed. The groups were similar and treated equally. Descriptions of statistical analysis were provided in the study. Furthermore, the results of this study can be applied the population of interest in this paper.

Hintz, Frazier, & Meredith, (2015) conducted a randomized control trial with the aim to develop and assess the effectiveness and feasibility of an online intervention to enhance stress management in undergraduate students. Specifically, this intervention focused on present control, which has been linked to decreased levels of depression, anxiety, stress and increased control of other variables.

The authors based their study on the temporal model of control. This model of control focuses on past, present, and future control. According to Hintz et al. (2015) present control is consistently associated with positive mental health. Hintz et al. (2015) stated "…focusing on the present may inhibit ruminating about the past or worrying about the future, both of which tend to be associated with worse outcomes" (p. 138). In order to increase present control within their online intervention, the authors used Bandura's work on self-efficacy as a basis. A topic of self-efficacy discussed was coping self-efficacy, which is defined as "confidence in one's ability to cope effectively when things are not going well" (Hintz et al., 2015, p. 138).

Hintz et al., (2015) conducted two pilot studies before they conducted this study to determine the feasibility of developing the intervention and to gain information to improve the intervention.

The first pilot study was created using Moodle. The online course contained written text, pictures, student testimonial, expert videos, and practice exercises. Thirty-one participants were recruited for the first pilot study and randomly assigned to intervention group or the stress-information-only group. The intervention group contained information on stress and present control, whereas the stress-information-only group contained only information about stress. An analysis of covariance (ANCOVA) was completed to determine if present control increased because of the intervention. The between-group difference was not significant because of the "…small sample size, F (1, 19) = 1.80, p = .20, partial n^2 = .09, the between-group effect size was medium (d =

.51)" (Hintz et al., 2015, p. 139). The feedback from this pilot study found that the participants thought the expert videos, lesson content, and practice exercises were the most helpful. However, the participants did not think the images were related to the content and found the student testimonial hard to follow.

The second pilot study was conducted and incorporated the feedback from the first pilot study. The authors placed more emphasis on the expert videos, changed the format of the student testimonial from one student to a group of small students, and added more videos with lesson content. The authors did not include a comparison group in the second pilot study because it was focused on intervention refinement. The 34 participants were psychology students at the same university. The authors stated the "…results of paired t tests assessing increases in present control, $t(17) = -3.30$, $p < .01$, and decreases in negative affect, $t(18) = 2.13$, $p < .05$, were significant" (Hintz et al., 2015, p. 139). Again, the participants found the expert videos to be useful and commented on the overall benefits of the program. The participants also stated they found the student videos hard to follow and boring to watch.

After conducting the pilot studies, the authors determined it was feasible to create an online present control intervention. The authors incorporated the participants' feedback from both pilot studies when creating the online intervention. The authors hypothesized that the present control intervention (PCI) group and PCI plus feedback group would increase in present control significantly from pretest to posttest and follow up compared to the stress-information-only group. Additionally, the authors hypothesized that the two

control interventions groups would decrease in perceived stress, depression, anxiety and stress symptoms compared to the stress-information-only group.

The authors conducted a priori power analysis using G*Power 3.17 to determine that 159 participants would be needed to obtain a medium effect in an ANCOVA, "…with three groups and one covariate at a significance level of .05, power of .80" (Hintz et al., 2015, p. 140). The participants were psychology students at a midwestern university that were offered extra credit for participation. After approval for the study from the University's Institutional Review Board was obtained, the participants were prescreened using the Perceived Control Over Stressful Events Scale (PCOSES) and those with lower present control scores were chosen (scores of 3 or less) for the study. The authors stated there was no other inclusion or exclusion criteria. Initially, 404 participants were prescreened using the PCOSES. There were 292 (72%) of the 404 that met the eligibility criteria of a score of 3 or less on the PCOSES. These participants were then sent an email inviting them to participate. There were 97 participants randomly assigned to the PCI group, 98 to the PCI plus feedback group, and 97 to the stress information-only group. "The final sample was those who completed the pretest and began the intervention (N= 223; 76% of those randomized)" (Hintz et al., 2015, p. 140). The PCI group received personal feedback after each module via e-mail. Hintz et al. (2015) stated, "Personalized feedback has been rated as more interesting and helpful than general feedback and is associated with higher levels of behavior change" (p. 139). The demographics of the population were described, most participants were female

(70%) and ranged from 18-21 years of age (77%). The most common race/ethnicity was European American/White (71%). The participants were mostly freshmen (48%), while also containing sophomores (16%), juniors (16%), and seniors (16%).

Measures utilized in this study included: The Present Control subscale of the PCOSES, the Depression Anxiety Stress Scales, and the Perceived Stress Scale. All of these measurements were administered prior to the intervention (T1), immediately after the intervention (T2), and three weeks following the intervention (T3). The PCOSES is a 22-item measure via a 4-point scale to assess present control. The calculated reliability of the instrument for this study ranged from .83 T1 to .86 T3. The Depression Anxiety Stress Scales was used to assess depression, anxiety, and stress and is a 21-item measure with three seven-item scales. The calculated reliability of the instrument for this sample ranged from .84 to .90. The Perceived Stress Scale was utilized to measure the perception of stress and is a 10-item instrument. The calculated reliability of the instrument for this sample ranged from .86 to .88. The students also rated the elements of the intervention three weeks after the intervention was completed. This included rating the expert videos, lesson content, and activities on a scale from one (unhelpful/confusing) to five (very helpful). (Hintz et al., 2015). It was found that 87% of the participants (n=195) completed the follow-up survey at three weeks after completion.

The online intervention was created using Google sites and consisted of four modules. The modules contained a video of an expert that provided

education on the topic, a presentation that focused on experiences of past participants, and an applied exercise. The first module focused on knowledge about common stressors and outcomes of college students. The second module provided definitions of past, present, and future control and also described advantages associated with present control. The third module provided the students with ways to avoid pitfalls when implementing present control. The students then had one week to implement a present control and had reflective logs to complete. The fourth module contained a video educating the students on how to continue to utilize the information they had learned. Motivational interviewing (MI) questions were included in the module exercises and stress logs because research has proven their effectiveness in behavior change.

Hintz, Frazier, & Meredith, (2015) conducted and provided statistical analyses regarding their study. Due to the attrition over time, the authors assessed the pattern of missingness in the data and concluded that no procedures to estimate missing values needed to be used. Specifically, ANCOVAs to determine differences between the groups. The authors found the between-group effect sizes for T2 present control scores to be medium to large when comparing “the present control conditions to the stress-information-only condition: d = .67 (PCI vs. stress information only) and d = .54 (PCI plus feedback vs. stress information only). The difference between the two present control intervention groups was small (d = .13)” (Hintz et al., 2015, p. 142). The authors found medium to large effect sizes between groups (PCI/stress information only: d = .66, PCI plus feedback/stress information only: d = .59) for

present control at T3" (Hintz et al., 2015, p. 142). The effect size was small (d=.07) for the difference between the two PCI groups at T3.

Hintz et al. (2015) conducted MANCOVA to assess group differences postintervention in the four mental health outcome variables, T1 scores were included as covariates. The univariate tests showed significant between-group differences for perceived stress, anxiety, and depression, however not stress symptoms. After the intervention, it was found that between-group effect sizes comparing the PCI and stress-information-only groups varied from *d* = .19 for stress to *d* = .39 for depression, the average effect size was *d* = .32. The effect sizes for between-group comparing the PCI plus feedback and stress-information-only groups ranged from *d* = .18 for anxiety to *d* = .37 for depression, the average effect size was *d* = .29. No significant differences were found between the PCI and PCI plus feedback groups (*d*s = .02-.15). A MANCOVA to determine between-group differences in regards to the four mental health outcomes was conducted at the three-week post intervention completion. "Effect sizes were generally small to medium at T3: PCI versus stress-information only: *d*s = .14–.43 (average *d* = .31), PCI plus feedback versus stress-information only: *d*s = .24–.52 (average *d* = .39)" (Hintz et al., 2015, p. 143). No significant differences between the PCI and PCI plus feedback groups were found and effect sizes were very small (*d*s = |.04–.16|). In other words, this study's results revealed an increase in present control over stress.

The participants in the study rated the helpfulness and amount of material remembered form the intervention. The ratings of helpfulness were moderate for

each component (*M*s = 3.64-3.87 out of 5). Similarly, ratings of material remembered was moderate (*M*s = 3.39-4.03 out of 5). Among the two intervention groups, the mean ratings for use of present control after the intervention was from 2.54 to 2.58 out of 5.

This randomized control trial was also appraised using the CASP tool and achieved good quality ranking. Hintz et al. (2015) used randomization to create separate the participants among the groups. Also, the sample size was large sample. Hintz et al. (2015) described the reliability and validity of measurements utilized. In addition, the authors provided a detailed description of what the online intervention entailed. Hintz et al. (2015) provided tables and descriptions of the statistical tests performed. Lastly, the results of this study could be utilized within the setting of this project.

Synchronous Interventions

Greeson, Juberg, Maytan, James, & Rogers, (2014) conducted a randomized control trial to determine the effectiveness of Koru (a mindfulness training program) in college students.

The sample population included 90 undergraduate, graduate, and professional students. The ages ranged from 18-59 with the mean age being 25.4 with a SD= 5.7. The sample consisted of mostly women (66%) and most white (62%) and non-Hispanic (85%). Three-quarters of the participants were graduate or professional students. The eligibility criteria for the study was students who were:

> "(a)currently enrolled as an undergraduate, graduate, or professional student; (b) at least 18 years of age; (c) proficient in English; (d) able to use a computer with internet access; and (e) willing to be randomized to either the Koru group or the wait-list control group" (Greeson et al., 2014, p. 223).

After consent was obtained, participants completed self-report questionnaires online one week before and after participating in the Koru program. Researchers also obtain full approval from the university's Institutional Review Board.

Blocked randomization (block size = 2) was used to ensure balanced study groups after every 2 students enrolled (Greeson et al., 2014). Participants were randomized to either the Koru intervention group or the wait-list control group. Research Randomizer was utilized to create the randomization schedule. In addition, the randomization of groups was completed by the study coordinator in order to keep the assignments blind from other study staff. After randomization the students were emailed their group assignment. The Koru instructors then sent students an introductory email. It is important to note that Koru instructors were not involved in student recruitment, consent, randomization, or data collection in order to prevent any potential bias.

The Koru program in this study was offered at the university where this study was conducted. The program was offered through the Counseling and Psychological Services. The program entailed four required 75-minute classes with 12-14 students in each class with one to two teachers. Additionally, it was

mandatory for the students to practice meditation for at least 10 minutes daily and complete a log. Also, students were required to complete required readings of the course book developed by Jon Kabat-Zinn, the creator of MBSR. The program was free and voluntary. Students did not receive course credits for partaking in the program. The classes included a teaching and practicing segment of mindfulness meditation and one or two mind-body skills. The mind-body skills included guided imagery, eating meditation, walking meditation, or breathing exercises.

Measurements used in this study were the Perceived Stress Scale (PSS), Medical Outcome Study Sleep Scale (MOS SLP9), Cognitive and Affective Mindfulness Scale-Revised (CAMS-R), Self-compassion Scale (SCS), Gratitude Questionnaire (GQ-6), and a demographics survey (Greeson et al., 2014). The PSS was utilized to measure perceived stress and had a Cronbach's alpha of .83 at both time points. The MOS SLP9 is a subscale of the Medical Outcomes Study and has 9-items that measures six sleep dimensions. Higher scores mean larger sleep problems. The Cronbach's alpha was .88 at both time points. The CAMS-R was utilized to measure four aspects of mindfulness (attention, awareness, acceptance, and present-focus). The Cronbach's alpha was .88 (baseline) and .80 (post intervention). The SCS is a 26-item scale that contains six subscales (Self-judgment, Self-kindness, Isolation, Common Humanity, Mindfulness, Over-identification). These subscales are summed to a total score with higher scores indicating increased levels of self-compassion. The Cronbach's alpha was .94 (baseline) and .95 (post intervention). The GQ-6 was

used to measure dispositional gratitude and had a Cronbach's alpha of .88 for both time points.

The statistics in the study were completed using the IBM SPSS software version 20. The primary analyses of between-group effects were tested using linear mixed-effects models. Greeson et al., (2014) used linear mixed-effects models over ANOVA because of statistical advantages. The authors used *t* tests to determine between-group differences at baseline and post intervention. The Cohen's *d* and *n* ^ 2 was used to determine effect sizes for between-group differences over time. Additionally, "…statistical significance for all parameter estimates was set at z=1.96, α =.05, 2-tailed" (Greeson et al., 2014, p. 226).

Greeson et al., (2014) found that the control group's perceived stress scores did not change (t=0.71, p=0.48). However, the Koru group's perceived stress scores significantly decreased (t=3.62, p=.001). In addition, a medium effect size on perceived stress was noted (*d* = .45) (Greeson et al., 2014). The Koru group's sleep quality improved significantly (*t* = 3.04, *p* = .003) compared to the control group (*t* = 0.03, *p* = .98). A medium effect size on sleep problems was noted (*d* = .52). It was found that mindfulness increased among the Koru group (*t* =−6.60, *p* < .001) compared to the control group (*t* = 0.59, *p* = .56). Furthermore, a large effect size on mindfulness of feelings and thoughts was noted (*d* = -.95). Similarly, self-compassion scores increased in the Koru group (*t* =−6.38, *p* < .001) compared to the control group (*t* =−0.20, *p* = .84). The effect size for self-compassion scores was large (*d* = -.75). (Greeson et al., 2014). Greeson et al., (2014) found "mixed-effects models on students originally

assigned to the wait list (n = 45) who took Koru later in the semester replicated all significant effects observed among students who were randomized to take Koru first" (p. 229). Additionally, the effect sizes for the wait list group taking Koru were large for mindfulness (*d* = .76) and total self-compassion scores (*d* = .93). Medium effect sizes were found for perceived stress (*d* = .53) and most self-compassion subscales (*d* = .55-.70). The effect size for improvements in sleep problems was much larger (*d* = 1.90).

To summarize, Koru produced improvements in perceived stress, sleep quality, mindfulness, and self-compassion. The enrollment and retention were high, indicating the students liked Koru (Greeson et al., 2014). Also, Koru has decreased time requirements (five hours of class over 4 weeks and 10 minutes of daily practice) compared to many mindfulness-based interventions (27 hours of class over 8 weeks and 45 minutes of daily practice). This could suggest that college students are more appealed to Koru because of the decreased time requirements (Greeson et al., 2014).

This study was deemed to have good quality. Greeson et al., (2014) described in detail what Koru is and the purpose of the study was clearly stated. An in-depth description of the study design was provided. Additionally, random assignment to groups was done. Also, Greeson et al., (2014) discussed validity and reliability of the measures used. The statistics were provided and discussed. The results of this study could also be utilized and applied to this research project.

Construction of Evidence-based Practice

Synthesis of Critically Appraised Literature

It is evident that stress among college students is an issue. This can lead to subsequent health issues and negative coping mechanisms. To promote health and optimal academic performance it is important to prevent or reduce the stress that college students experience. The literature has shown effective ways to help college students manage and cope with stress. There is strong evidence indicating the effectiveness of mindfulness-based interventions in reducing college student stress.

Several tools to measure stress were discussed throughout the literature. The PSS was found among most of the literature and has proven to be valid and reliable (Regehr et al. 2013; Yusufov et al. 2018; Cavanagh et al. 2013; Greeson et al., 2014).

Mindfulness programs have been proven to be effective in helping college students cope and deal with stress (Regehr et al. 2013; Yusufov et al. 2018; Cavanagh et al. 2013; Greeson et al., 2014; Hintz et al., 2015). There was sufficient evidence suggesting the positive effects of mindfulness-based interventions such as meditation (Regehr et al. 2013; Yusufov et al. 2018; Cavanagh et al. 2013; Greeson et al., 2014). In addition, asynchronous and synchronous mindfulness-based interventions were both proven to be effective. The length of the programs varied, but eight weekly sessions was a common span utilized.

Best Practice Model Recommendation

Based on evidence obtained from the literature, an online mindfulness-based meditation application was implemented. As previously stated, mindfulness meditation has proven to be an effective way for students to cope with stress. The length of this project was nine weeks to allow adequate time for implementation and data collection. The length of the program itself will be eight weeks. The population will be focused on undergraduate nursing students. The PSS will be utilized pre- and post- intervention to assess perceived stress levels. The intervention was completed asynchronously for convenience of the participants. The TMSC and the ACE Star Model of Knowledge Transformation will be utilized to effectively implement this mindfulness meditation intervention and help sustain the intervention.

How the Best Practice Model will Answer the Clinical Question

The best practice model was developed after critically appraising the literature and aided in answering the PICOT question: Regarding college students, will mindfulness meditation help students cope with stress compared to no mindfulness meditation over an eight-week period? An exhaustive literature search and evidence appraisal was conducted in order to develop an intervention to help college students cope with stress. This mindfulness meditation program will be implemented at a university's psychiatric nursing course, based on the evidence, to help college students cope with stress.

CHAPTER 3

IMPLEMENTATION OF PRACTICE CHANGE

Chapter three corresponds with the translation stage of the ACE Star model. This stage focuses on translating the knowledge gained from the literature into practice. Utilizing the evidence obtained from the literature, an online program was utilized to help college students cope with stress. Sufficient evidence was obtained suggesting the positive effects of mindfulness-based interventions such as meditation (Regehr et al. 2013; Yusufov et al. 2018; Cavanagh et al. 2013; Greeson et al., 2014). The program included eight weekly meditation sessions utilizing Jon Kabat-Zinn's Mindfulness-based stress reduction (MBSR) online application to help college students cope with stress. The data gathered answered the PICOT question: Regarding college students, will mindfulness meditation help students cope with stress compared to no mindfulness meditation over an eight-week period?

Participants and Setting

The setting for this project was a private midwestern university's general education course and a psychiatric nursing course. The midwestern university is a private Lutheran institution founded in 1859 that provides students with knowledge in undergraduate and graduate studies (Valparaiso University, n.d.). Universities and colleges across the nation have health centers available for students if they need medical attention. The student health center at this university offers a variety of services. A few of the many services offered include: men's and women's wellness exams, orthopedic care, immunizations, rapid strep, mono, flu, and STD testing, pregnancy testing, urinalysis testing, nebulizer treatments, and minor lacerations repair

(Valparaiso University Student Health Center, n.d.). In addition, the student health center offers a Wellness Program. This purpose of the program is to "…enhance organizational health by fostering interest and encouraging students to initiate or expand healthier lifestyles, provide diverse wellness programs to meet a wide range of personal health needs, and develop a positive school culture that is focused on celebrating and improving the quality of life for all students" (Valparaiso University Student Health Center, n.d.).

Not only does the student health center employ a part-time physician and advanced practice nurses (APNs), such as nurse practitioners to diagnose and treat medical issues, they also offer preventative services. Specifically, the student health center offers immunizations that help to prevent certain diseases from developing which could negatively affect a student's academic capabilities. In conjunction with its mission, the staff at the student health center also focus on the student's mental and emotional well-being. This is important because as stated by the health center's director, many students come in feeling overwhelmed and stressed (K. Eshenaur, personal communication, May 24, 2018). This stress can have a negative impact on academics and the student's quality of life.

The participants included 29 undergraduate students. Inclusion criteria were (a) the student must own a smartphone compatible to download Kabat-Zinn's application; (b) the student was enrolled in the general education course or the psychiatric nursing course; (c) the student must be 18 years of age or older; (d) the student must be proficient in English. The general education courses contained about 25 students in each section of the course. The professor of the general education course offered extra

credit for participation in this project as one of the extra credit opportunities in the course. The one undergraduate student was recruited from a general education course in the fall semester and 28 students were recruited from a nursing course in the spring semester. The professor of the psychiatric nursing course offered credit as one of the required course assignments for participation in this project. Once informed consent was obtained participants were screened using the Perceived Stress Scale (PSS). Participants were also asked to complete a demographic questionnaire. Participants were provided a packet of documents that included instructions on how to download the application, weekly logs, project manager contact information and information on additional resources if their stress levels became overwhelming or unmanageable (See Appendix C).

Outcomes

The goal of the evidenced-based project was to increase students' abilities to cope with stress by implementing a mindfulness-based stress reduction intervention. Baseline data were measured immediately before the intervention and outcome data were measured one week after the intervention utilizing the perceived stress scale (PSS). The PSS is a questionnaire that contains 14 questions that can be administered to determine perceived stress. Using the PSS, participants were asked to rank how often they felt overwhelmed, overloaded, out of control, and unpredictable during the last two weeks on a 5-point Likert scale from 0 (never) to 4 (very often) (Cavanagh et al., 2013). The PSS was administered via paper and pencil by the project manager following the class.

Intervention

The review of the literature revealed mindfulness-based stress reduction (MBSR) developed by Jon Kabat-Zinn is well established and proven to be effective in helping college students cope with stress (Regehr et al. 2013; Yusufov et al. 2018; Cavanagh et al. 2013; Greeson et al., 2014). In addition, literature has demonstrated online interventions to be as effective as synchronous interventions (Hintz et al., 2015; Cavanagh et al. 2013). The two meta-analyses included in this review revealed that eight weekly sessions were a common and effective time frame for the length of the intervention. (Regehr et al. 2013; Yusufov et al. 2018).

Based on the evidence obtained from the review of the literature an intervention utilizing Jon Kabat-Zinn's online application for mindfulness meditation was implemented. Participants were asked to purchase Jon Kabat-Zinn's online application for ten dollars utilizing the gift card provided by the project manager. The participants were asked to complete 20-30 minutes of meditation, depending on the track, weekly for 8 weeks. The meditation tracks selected for this intervention were supported by evidence obtained from the literature. Also, the sitting and lying meditation exercises were chosen over the lake and mountain meditation exercises as they are most applicable. For the sitting meditation exercise participants were asked to find any place of their choice and complete the meditation exercise while sitting. The lying meditation exercise was the same as the sitting but the participant was to be lying instead of sitting. In each exercise, the meditation track involved a male voice instructing the individual on how to breathe and what to focus on throughout the meditation. The meditation exercise included a play/pause feature that the participants could utilize if needed. Participants were asked to complete a 20-minute sitting meditation exercise during

week one utilizing the application. Week two entailed completing a 20-minute lying down meditation exercise. Week three included completion of a 30-minute sitting meditation exercise. Week four entailed completing a 30-minute lying down meditation exercise. Week five included completing a 20-minute sitting meditation exercise. Week six included completing a 20-minute lying down mediation exercise. Week seven included completing a 30-minute sitting meditation exercise. Lastly, week eight included completing a 30-minute lying down meditation exercise. Each week the students were asked to complete a reflective log on paper and pencil allowing them to reflect on their mindfulness experience that week. The project manager provided copies of this assignment in a packet that was given to the participants at the initial meeting. This log asked the students to reflect on their mindfulness experience that week, specifically, asking them to state what they thought of the weekly meditation exercise and how they felt they benefited from it. The participants were asked to list the last four digits of their cellphone number on the top of each log to track individual trends. The participants were asked to turn the log in to their professor when they met for class sessions. The project manager collected the logs at the end of the class sessions and placed the logs in an envelope and sealed it shut.

Planning

The ACE Star model was utilized to guide this EBP project. The first point of discovery research involves gathering new knowledge from a literature search (Dang et al., 2015). An exhaustive literature search was conducted to obtain knowledge to implement into practice. The search generated results supporting interventions to help college students cope with stress.

The second point of evidence summary includes synthesizing all of the knowledge into a summary (Dang et al., 2015). The evidence was critically appraised and a synthesis of the knowledge was generated. This synthesis includes a summary of the studies describing different mindfulness interventions to help college students cope with stress. This step helped guide the next stage of the model.

The third point of translation into action involves the combination of expertise and evidence in order to make best practice recommendations (Dang et al., 2015). This stage focuses on translating the knowledge gained from the literature into practice. The third phase of this model was achieved by implementing an intervention proven to be effective in helping college students cope with stress. The literature supported both face-to-face and online mindfulness-based interventions. Due to the frequent use and convenience of technology among college students, Kabat-Zinn's online application was utilized to effectively implement a mindfulness intervention to help college students cope with stress. The Perceived Stress Scale (PSS) was administered to students prior to beginning the intervention. The students were then directed to the online stress management tool. The participants were given a paper document that contained step by step instructions on how to purchase and download the application. This document also included a picture of the application for visualization. The intervention was evaluated at the end of the project to determine the efficacy of the intervention in helping students cope with stress.

The fourth point of practice integration is the use of the evidence in practice (Dang et al., 2015). This step involves incorporating the change into practice (Bonis, Taft, & Wendler, 2007). The director at the student health center and the professors of

each course understand the importance of EBP. In addition, they are aware of the number of students experiencing stress and the need for an effective intervention for students to utilize. The online application utilized in this EBP project can be integrated into the Wellness Program and recommended to future students after the intervention is completed. This will help effectively implement this change currently, and in the future.

The fifth point involves evaluating the impact of the EBP project. This was achieved by administering questionnaires to determine perceived stress college students experience. In addition, statistical tests will be calculated to determine the effectiveness of the intervention.

Data

Measures

The Perceived Stress Scale (PSS) was the most frequently utilized tool in the literature to screen for stress in college students (Regehr et al. 2013; Yusufov et al. 2018; Cavanagh et al. 2013; Greeson et al., 2014, Hintz et al., 2015). Therefore, the PSS was used to measure stress levels of the sample in this project. The reliability and validity of this scale have been established in previous studies (Cavanagh et al. 2013; Greeson et al., 2014, Hintz et al., 2015). Specifically, in the original article developing the PSS, Cohen, Kamarack, & Mermelstein (1983) found the coefficient alpha reliability for the PSS to be .84, .85, and .86 among three different samples. Two of the samples were college students and the third was more a heterogeneous group enrolled in a smoking-cessation program. Additionally, Cavanagh et al. (2013) utilized the PSS in their study to determine a brief, online, mindfulness-based intervention could decrease perceived stress and anxiety/depression symptoms in college students. The PSS

showed good internal consistency at baseline with a Cronbach's alpha = 0.91 (Cavanagh et al., 2013). Hintz et al., (2015) also utilized the PSS in their study to develop and assess the effectiveness and feasibility of an online intervention to enhance stress management in undergraduate students. The reliability for the PSS in this study ranged from .86 to .88 (Hintz et a., 2015). Greeson et al., (2014) also used the PSS in their study to determine the effectiveness of Koru in college students. The PSS was utilized to measure perceived stress and had a Cronbach's alpha of .83 at both time points (Greeson et al., 2015). Based upon the evidence form the literature, the PSS was utilized to measure perceived stress among the college students in this project.

Collection

Participants completed a one-time demographic questionnaire before the intervention. The demographic questionnaire asked the participant to state their gender, age, ethnicity, college level (freshman, sophomore, junior, or senior), major, number of credit hours, and whether the participant was a commuter or lives on campus. In addition, the participants were asked to complete the PSS on paper before the intervention and one week after the completion of the intervention. All of the PSS measurements were collected in the participants classroom setting via paper and pencil to ensure consistency. The participants were asked to write the last four digits of their cellphone number on the top of each questionnaire to help identify the pre-test and post-test for data analysis.

Management and Analysis

A pre-test/post-test design was utilized to measure the effectiveness of the mindfulness-based intervention in helping college students cope with stress. This type of design allowed comparison of data before mindfulness meditation intervention and after the intervention. The statistical tests utilized were a Wilcoxon signed rank test and a Wilcoxon rank sum test. Descriptive statistics were obtained from the data on demographic questionnaire.

Protection of Human Subjects

Prior to implementation of this evidenced-based practice project, approval from the university's institutional review board (IRB) was obtained as an expedited project. Due to lack of participation in the fall semester from the general education course students, the project and recruitment continued into the spring semester targeting nursing students. Therefore, approval from the university's IRB was also obtained for continuation on the project. After educating the participants on the study, informed consent was obtained. Students voluntarily joined the study. These students were asked to complete the demographic questionnaire and the PSS at the end of their class. Students were provided a handout with instructions on how to access the on-line program including a picture of the application, a schedule of the weekly assignments to complete, and a copy of the weekly logs for each week. As previously stated, the professor of the general education course offered the participants extra credit for participation as one of the extra credit opportunities of the class. The professor of the psychiatric nursing course offered credit for one of the required course requirements for participation in this project. The project manager provided the students with a gift card that same day in order for the students to buy the application. In addition, participants

were provided information on resources available at the university's counseling center, a local mental health facility, and a local emergency room if they felt their stress levels are overwhelming. Students were also provided with the contact information for the project manager in case they had any questions about the on-line program. Students were asked to complete a reflective log each week to ensure completion of the weekly exercise. This asked the students to reflect on their mindfulness experience each week, asking them to state what they thought of the weekly meditation exercise and how they felt they benefited from it. The students were asked to turn in the reflective log assignment to their professor when the class met. The project manager collected the assignments from the professor. To ensure confidentiality of the participants, all paper data remained locked in a safe at the project managers home and all electronic data will remained on the project manager's password protected computer. Following completion of this project, all data will be destroyed after a three-year period. Any presentations or publications including data from this project will not contain any personally identifying information of the participants.

CHAPTER 4

FINDINGS

This EBP project was developed to help college students cope with stress. Specifically, the project manager implemented a mindfulness-based meditation intervention and evaluated its effectiveness in helping college students cope with stress. The EBP project was guided to answer the PICOT question: Regarding college students, will mindfulness meditation help students cope with stress compared to no mindfulness meditation over an eight-week period? The following will discuss the participant characteristics and data analyses utilized to determine the outcomes and effectiveness.

Participants

The following section will discuss, in detail, the characteristics of the participants in this project.

Size

In total, 29 undergraduate students from a private midwestern university participated in the project. One student was recruited from a general education course and 28 students were recruited from an undergraduate psychiatric nursing course. Only one participant from the general education course completed both the pre- and post-intervention Perceived Stress Scale (PSS). Whereas, 28 nursing students completed the pre-intervention PSS and 26 completed the post-intervention PSS.

Characteristics

The participant characteristics were assessed by completion of a demographic questionnaire. The items on the demographic questionnaire included gender, age,

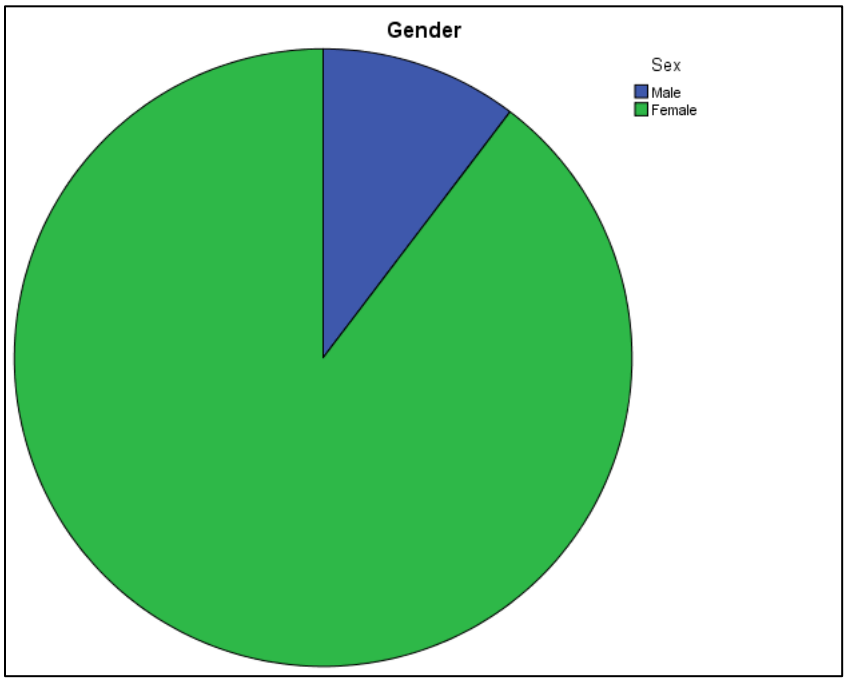
ethnicity, college level (freshman, sophomore, junior, or senior), major, number of credit hours taking that semester, and whether the participant was a commuter or lived on campus. The mean age of participants (n=29) completing the pre-PSS was (*M* = 25.4, SD=5.5) and the post-PSS (n=27) mean was (*M* = 25.7, SD=5.6), both ranged from 19-41 years of age. The majority of participants completing the pre-PSS were female (n=26, 89.7%), and male (n=3, 10.3%) (Figure 4.1). Similarly, those that completed the post-PSS were mostly female (n=25, 86.2%) and male (n=2, 6.9%). The majority of participants were white (n=23, 79.3%), while two of the participants (6.9%) were black or African American, two of the participants (6.9%) fell into the other category, one participant (3.4%) was Hispanic or Latino, and one participant (3.4%) was Asian/Pacific Islander (Figure 4.2). Those that completed the post-PSS were mostly white (n=22, 75.9%). In addition, the majority of participants were seniors (n=27, 93.1%), only one sophomore (n=1, 3.4%) and one junior (n=1, 3.4%) (Figure 4.3). Those that completed the post-PSS were seniors (n=25, 86.2%), one junior (n=1, 3.4%), and one sophomore (n=1, 3.4%). Also, the majority of participants were nursing majors pre-PSS (n=28, 96.6%) and post-PSS (n=26, 89.7%) and only one participant (n=1, 3.4%) non-nursing pre- and post-PSS. The number of credit hours ranged from 18-22 pre- and post-PSS with a pre-PSS mean of (SD=1.0) and post-PSS mean of (SD=1.0). Most of the participants that completed pre-PSS (n=22, 75.9%) were commuters, while some of the participants (n=7, 24.1%) lived on campus. Similarly, the majority that completed the post-PSS (n=21, 72.4%) were commuters, and some lived on campus (n=6, 20.7%). Demographic characteristics are shown in table 4.1. A Wilcoxon rank sum test was computed to compare pre-PSS and post-PSS demographic data of the participants. A

Wilcoxon test is a nonparametric test equivalent to an independent t-test that compares ordinal level data to determine whether or not two related samples are from the same distribution (Cronk, 2018). This test was chosen due to the small sample size of 29. Among all categories the results were not statistically significant (Z=.000, P>.05). In other words, the participants were not statistically different among categories and were similar.

Table 4.1
Demographic Characteristics

Characteristics	Pre n (%)	Post n (%)
Gender		
Male	3 (10.3)	2 (6.9)
Female	26 (89.7)	25 (86.2)
Ethnicity		
White	23 (79.3)	22 (75.9)
African American	2 (6.9)	2 (6.9)
Hispanic or Latino	1 (3.4)	1 (3.4)
Asian/Pacific Islander	1 (3.4)	N/A
Other	2 (6.9)	2 (6.9)
College Level		
Sophomore	1 (3.4)	1 (3.4)
Junior	1 (3.4)	1 (3.4)
Senior	27 (93.1)	25 (86.2)
Major		
Nursing	28 (96.6)	26 (89.7)
Non-nursing	1 (3.4)	1 (3.4)
Commuter or Live on Campus		
Commuter	22 (75.9)	21 (72.4)
Live on Campus	7 (24.1)	6 (20.7)

Figure 4.1 Gender



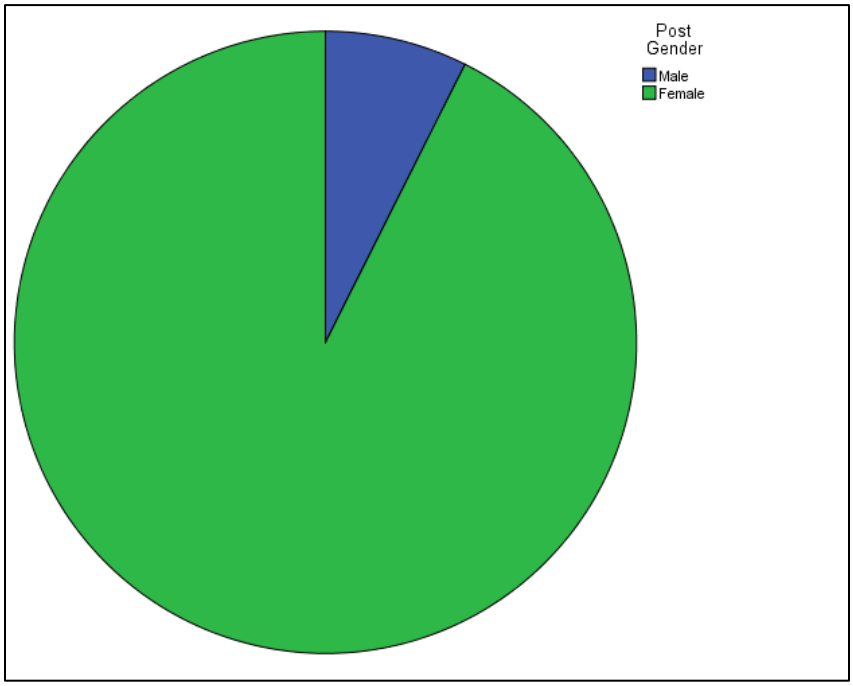
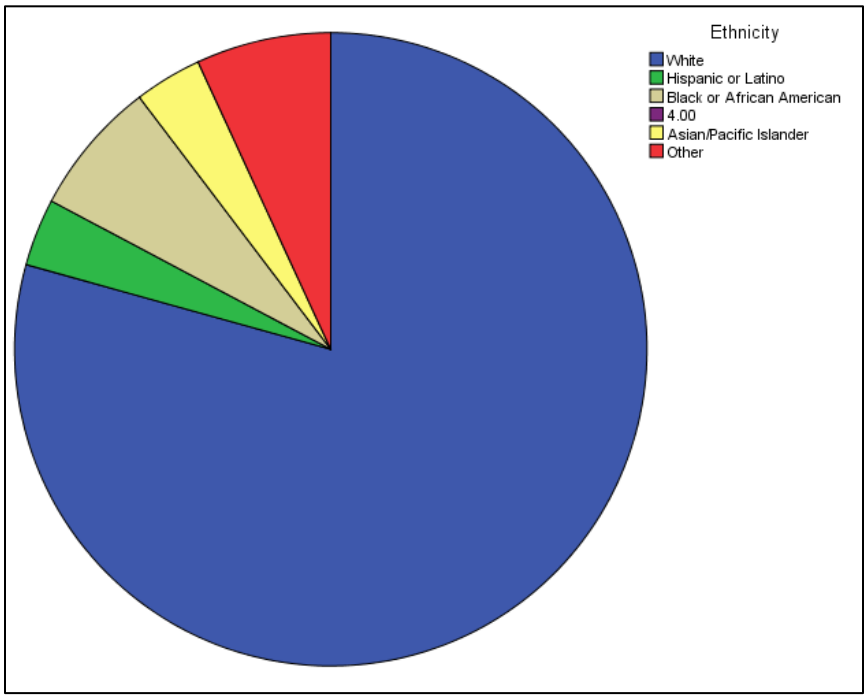


Figure 4.2 Ethnicity



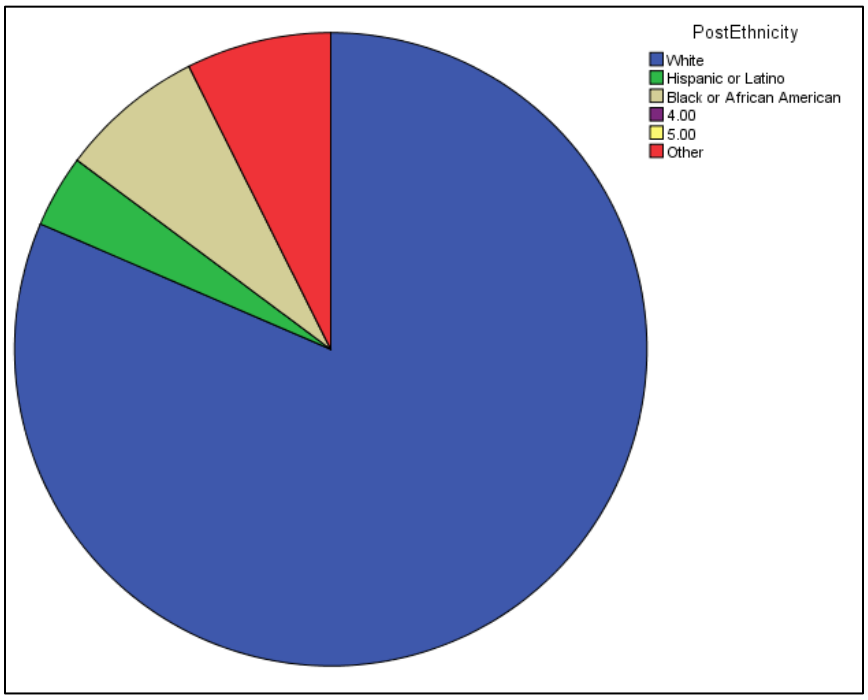
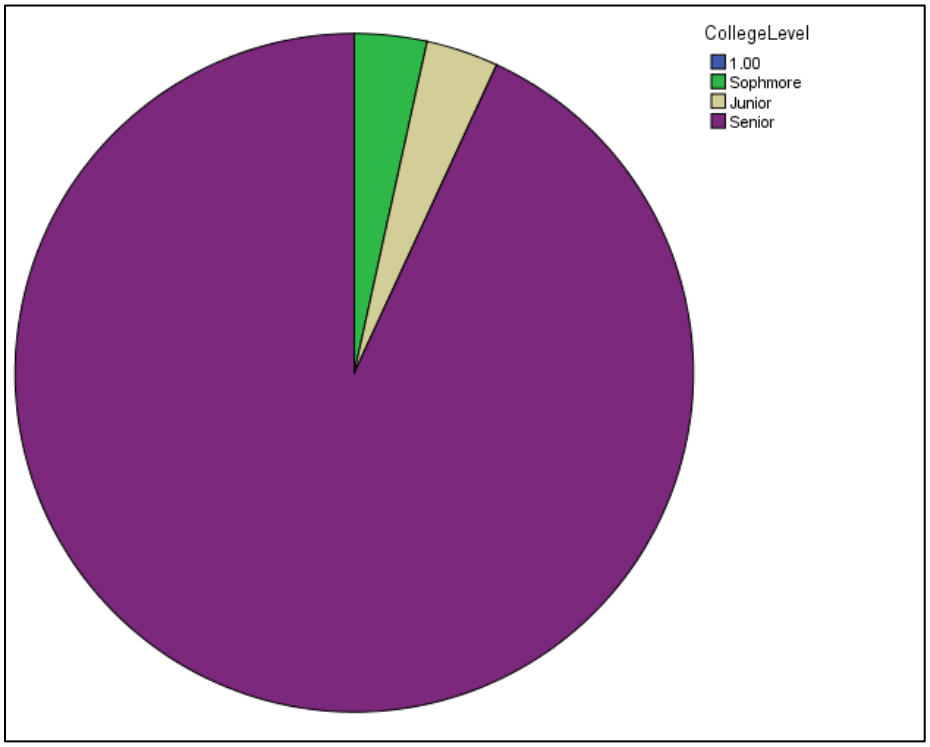
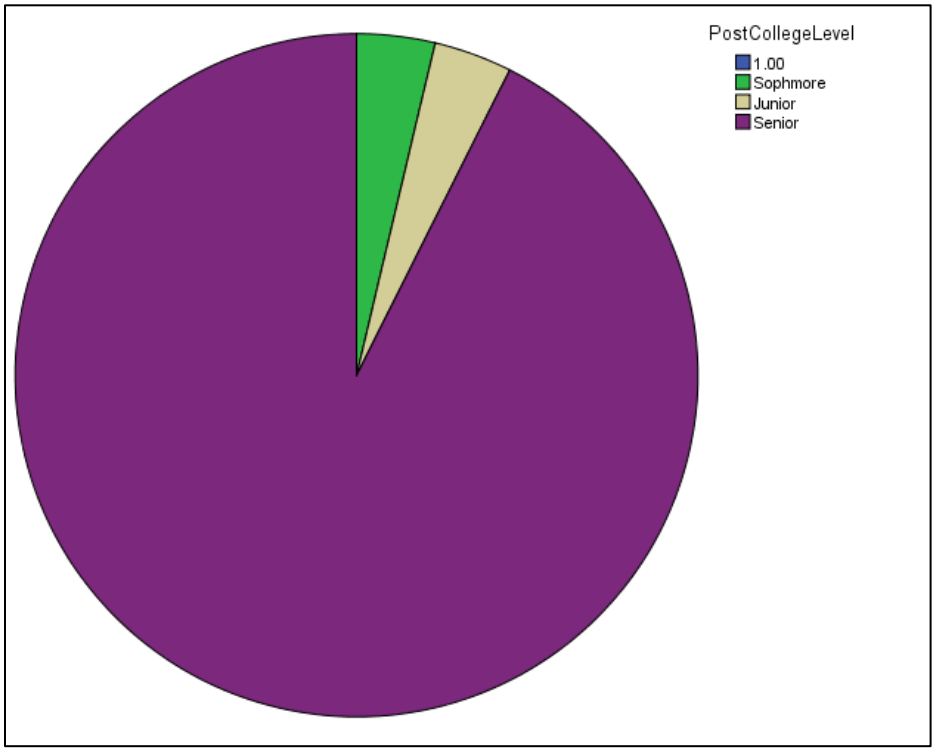


Figure 4.3 College Level





Instrument Reliability

The reliability and validity of the PSS have been established in previous studies (Cavanagh et al. 2013; Greeson et al., 2014, Hintz et al., 2015). The Cronbach's alpha is a measure of internal consistency that "determines the degree to which all the items are measuring the same construct" (Cronk, 2018, p. 125). It should be noted that results close to 1.00 indicate very good internal consistency and numbers close to 0.00 indicate poor internal consistency (Cronk, 2018). Specifically, in the original article reporting on the development of the PSS, Cohen, Kamarack, & Mermelstein (1983) found the coefficient alpha reliability for the PSS to be .84, .85, and .86 among three different samples. Two of the samples were college students and the third was a heterogeneous group enrolled in a smoking-cessation program. Additionally, Cavanagh et al. (2013) utilized the PSS in their study to determine if a brief, online, mindfulness-based intervention could decrease perceived stress and anxiety/depression symptoms in college students and it demonstrated good internal consistency at baseline with a Cronbach's alpha = 0.91 (Cavanagh et al., 2013). Hintz et al., (2015) also utilized the PSS in their study to develop and assess the effectiveness of an online intervention to enhance stress management in undergraduate students. The reliability for the PSS in this study ranged from .86 to .88 (Hintz et a., 2015). Greeson et al., (2014) also used the PSS in their study to measure perceived stress with Cronbach's alpha of .83 at both time points (Greeson et al., 2015). Based upon the evidence from the literature, the PSS was utilized to measure perceived stress among the college students in this project.

The reliability of the PSS was also determined for this EBP project by determining the Cronbach's alpha. This was determined by completing calculations in SPSS 24.0. The Cronbach' alpha was .898 for pre-intervention data and .903 for post-intervention data, both indicate good internal consistency and reliability.

Changes in Outcomes

The primary outcome for this EBP project was to measure perceived stress among undergraduate college students. The goal of this project was to answer the PICOT question: Regarding college students, will mindfulness meditation help students cope with stress compared to no mindfulness meditation over an eight-week period? The mindfulness meditation resulted in decreased PSS scores ($p < .05$).

Statistical Testing

In order to determine whether the mindfulness meditation intervention was effective, a Wilcoxon signed rank test was calculated comparing the mean PSS scores of the same participants at two different times: pre-intervention and one-week post-intervention. The Wilcoxon test is a nonparametric test that compares ordinal level data to determine whether or not two related samples are from the same distribution (Cronk, 2018). The statistical testing was completed using SPSS 24.0.

Significance

Statistical analyses revealed a significant decrease in PSS scores from pre-intervention to post-intervention ($Z = -2.418$, $p < .05$). The mean pre-PSS was 34.7 ($SD = 3.54$) and the mean on the post-intervention PSS was 33.3 ($SD = 2.99$). This indicates that average PSS scores decreased after utilizing the meditation application, which is associated with less perceived stress.

Perceived Stress. The Perceived Stress Scale is a questionnaire that contains 14 items that can be administered to determine perceived stress. Using the PSS, participants were asked to answer the 14 questions using a 5-point Likert scale from 0 (never) to 4 (very often). In the original article developing the PSS, in order to obtain a PSS score, there are seven positively worded items that need to be reversed scored. These items include 4, 5, 6, 7, 9, 10, and 13. After reversing the scores of the positive items, the PSS score can be calculated by summing all 14 items. (Cohen, Kamarack, & Mermelstein, 1983). A Wilcoxon signed rank test was calculated to compare the mean pre-intervention PSS score to the mean post-intervention PSS score; the mean on the pre-intervention PSS was 34.7 (*SD* = 3.54) and the mean on the post-intervention PSS was 33.3 (*SD* = 2.99). The pre-intervention PSS scores ranged from 30-43, while the post-intervention PSS scores ranged from 28-39. A statistically significant decrease from pre-intervention PSS scores to post-intervention PSS scores was found. See Table 4.2 to compare the participant responses to each PSS question.

Table 4.2
Comparison of Pre- and Post-Intervention Perceived Stress Scores

Item	Response *M*(SD)
Question 1	
Pre-PSS	2.21(.94)
Post-PSS	1.96(.98)
Question 2	
Pre-PSS	2.03(1.1)
Post-PSS	2.04(1.1)
Question 3	
Pre-PSS	3.00(.85)
Post-PSS	2.70(.95)
Question 4	

Pre-PSS	1.28(.797)
Post-PSS	1.26(.86)
Question 5	
Pre-PSS	1.38(.86)
Post-PSS	1.11(.80)
Question 6	
Pre-PSS	1.45(.83)
Post-PSS	1.11(.97)
Question 7	
Pre-PSS	1.83(.80)
Post-PSS	1.63(.84)
Question 8	
Pre-PSS	1.79(1.08)
Post-PSS	1.296(.82)
Question 9	
Pre-PSS	1.62(.68)
Post-PSS	1.44(.75)
Question 10	
Pre-PSS	1.41(.68)
Post-PSS	1.44(.80)
Question 11	
Pre-PSS	2.31(1.0)
Post-PSS	1.85(.95)
Question 12	
Pre-PSS	3.62(.62)
Post-PSS	3.22(.85)
Question 13	
Pre-PSS	1.34(.97)
Post-PSS	1.37(.93)
Question 14	
Pre-PSS	2.03(1.1)
Post-PSS	1.63(.93)

Total PSS	
Pre-PSS	34.7(3.54)
Post-PSS	33.3(2.99)

The weekly logs participants were asked to complete were also analyzed. Participants were asked to indicate on the weekly log whether or not they completed the weekly meditation exercise that week. Descriptive statistics were utilized to analyze this information (see Table 4.3). The number of participants completing the first weekly meditation exercise and weekly log was 29, yielding a 100% completion rate. There were also 29 participants that completed the second weekly meditation exercise and weekly log, yielding a 100% completion rate. There were 25 participants that completed the third weekly meditation exercise and weekly log, or 86.2% of participants. The number of participants completing the fourth weekly meditation exercise and weekly log was 26, yielding an 89.7% completion rate. There were 24 participants that completed the fifth weekly meditation exercise and weekly log, or 82.8%. The number of participants completing the sixth weekly meditation exercise and weekly log was 26, yielding an 89.7% completion rate. There were 20 participants that completed the seventh weekly meditation exercise and weekly log, or 69% of participants. The number of participants completing the eighth weekly meditation exercise or weekly log was 19 or 65.5%.

Table 4.3
Completion of Weekly Logs

Week	Number of Participants (%)
Week 1	29(100%0)
Week 2	29(100%)
Week 3	25(86.2%)
Week 4	26(89.7%)
Week 5	24(82.8%)
Week 6	26(89.7%)
Week 7	20(69%)
Week 8	19(65.5%)

The weekly logs completed by the participants also yielded qualitative information. For example, one participant stated, “I can say my level of stress and anxiety slightly decreased after one session. I felt that I had a sense of control and that I can overcome it.” Another participant stated, “This week has been very stressful, so I’m glad to be doing this mindfulness meditation to help calm me down.” Many of the participants stated that the mindfulness meditation helped them get a restful night’s sleep. Overall, participants enjoyed the mindfulness meditation exercises.

The mindfulness-based meditation intervention implemented by the project manager was successful at helping college students cope with stress. This was evidenced by the decreased PSS scores post-intervention. The PSS yielded good internal consistency and was effective at measuring perceived stress in college students. Although not all of the participants completed the post-PSS, the post

demographic data characteristics were similar to the pre-PSS. Overall, mindfulness meditation is an effective intervention to help college students cope with stress.

CHAPTER 5

DISCUSSION

The purpose of this EBP project was to implement an intervention to help college students cope with stress. Specifically, the project manager implemented a mindfulness-based meditation intervention and evaluated its effectiveness in helping college students cope with stress. The following will explain the findings of this project. In addition, this chapter will evaluate the applicability of the Transactional Model of Stress and Coping (TMSC) and the ACE Star Model of Knowledge Transformation to this project. This chapter will also discuss the strengths and limitations of this EBP project.

Explanation of Findings

The utilization of the Perceived Stress Scale allowed for assessing the primary outcome of perceived stress. The PSS was administered immediately prior to the intervention and one week after completion of the intervention.

Perceived Stress. The results of the EBP project revealed a significant decrease in perceived stress when comparing pre- and post-intervention PSS scores (<.05). The PSS scores decreased from pre-intervention (M = 34.7, *SD* = 3.54) to post-intervention (M = 33.3, SD = 2.99), indicating an overall decrease in perceived stress after utilizing the mindfulness meditation application for a total of eight weeks.

The significant decrease in PSS scores is consistent with previous studies utilizing mindfulness-based meditation to help college students cope with stress (Regehr et al. 2013; Yusufov et al. 2018; Cavanagh et al. 2013; Greeson et al., 2014).

Evaluation of Applicability of Theoretical and EBP Frameworks

Theoretical Framework

The theoretical framework that guided this project was the Transactional Model of Stress and Coping (TMSC). The basic concepts of this model are: primary appraisal, secondary appraisal, the coping process, emotion-focused forms of coping, problem-focused forms of coping, and adaptational outcomes (Lazarus & Folkman, 1984). This model helped the author take a more in depth look at college stress to help implement an effective intervention to help college students cope with stress. The concept of primary appraisal refers to the person evaluating potential threats or harms of the stressor (Glanz & Schwartz, 2008). Keeping this concept in mind while completing this EBP project allowed the project manager to realize that the participants will view stressors in a different way. The secondary appraisals concept involves determining if and what can be done during a stressful encounter, specifically determining what coping options are available. Therefore, this concept was essential to this EBP project, as the participants can identify the mindfulness-based meditation intervention as a future coping mechanism for stress. The coping process was also an important concept for this EBP project. Specifically, the participants had to change or modify their coping routines in order to complete the mindfulness meditation intervention. Therefore, the project manager thoroughly explained and educated potential participants on the benefits of mindfulness meditation in regards to college student stress. Specifically, the project manager focused on discussing the evidence that supports mindfulness meditation in helping college students cope with stress. In order for potential

participants to be interested in partaking in this project, it was important to ensure they truly understood the intervention and the benefits. Utilizing the mindfulness-based meditation intervention could also affect the concept of adaptational outcomes. To be more specific, the way college students cope with stress affect how they will adapt to the stressor. By using Jon Kabat-Zinn's JKZ Series 2 mindfulness meditation application in the future, students can adapt to stressors in a positive way. Specifically, college students can utilize this application to help them effectively cope with stress.

EBP Framework

The ACE Star Model of Knowledge Transformation was utilized to help implement this project. The ACE Star Model of Knowledge Transformation can help individuals overcome common challenges of the EBP process. The ACE Star Model of Knowledge Transformation has five points that define different forms of knowledge including: discovery research, evidence summary, translation to guidelines, practice integration, and process and outcome evaluation (Dang et al., 2015). The ACE Star Model served as an excellent guide for this EBP project. The first point of discovery research was obtained by gathering knowledge from a detailed literature search. The search generated results supporting interventions to help college students cope with stress. In addition, the evidence was critically appraised and a synthesis of the knowledge was generated. This synthesis included a summary of the different mindfulness interventions to help students cope with stress. The third phase of this model was achieved by implementing an online mindfulness-based meditation application at a university. Specifically, the Perceived Stress Scale (PSS) was utilized to screen participants for perceived stress. The intervention was evaluated at the end

of the project to determine the efficacy of the intervention in helping students cope with stress. Specifically, data analyses were completed to determine the effectiveness of the intervention.

Strengths and Limitations of the EBP Project

After evaluating this EBP project, it was determined that there were both strengths and limitations. It is important to identify and evaluate the strengths and limitations of this project in order to make improvements for future projects.

Strengths

One strength of the project was the interest and cooperation of both professors of the courses where participants were recruited at the university where this project was implemented. Both of the professors had background information regarding mindfulness, so they both were in full support. Another strength was the availability of the professors and the ease of communication with them. For example, the professors would always respond in a timely fashion if the project manager contacted them. In addition, both of the professors offered class credit for participation in the project. This helped increased participation in the project.

Another strength of the project was the ability of the project manager to speak face to face with potential participants. This was helpful as it allowed the potential participants to ask questions and put a face with the project manager. Being able to put a face with the project manager helps the potential participants to connect with the project manager. Also, speaking with the potential participants in person allowed the project manager to address any confusions or uncertainties. In addition, the nursing course met three times per week in the afternoon, unlike the general education course

that met once bi-weekly. The course schedule frequency made it easier to meet with the nursing class and collect documents from the professor.

Another strength of the project was a grant the project manager received. Due to a grant the project manager received, the participants were given gift cards to cover the cost of the meditation application.

Limitations

While there were several strengths of this project, there were also limitations. A major limitation of this project was the lack of recruitment and participation in the first class of students. This class only met once biweekly and was worth one credit hour. In addition, the class had unexpected cancellations. Therefore, it was hard to meet with this class and collect documents. In addition, not all students were present when meeting with the classes. Having more time for recruitment could have increased the number of participants. The ten-dollar fee of the application was a limitation at first because the project manager covered the cost on her own, but after receiving a grant, the project manager was able to overcome this challenge.

Additionally, the timeframe for this project did not allow for assessment of long-term follow up. Specifically, it would have been ideal to assess the participants' perceived stress one month after completion of the intervention. The lack of long-term follow-up in the fall was due to winter recess for students. Also, due to lack of recruitment in the fall semester and the need for continued recruitment in the spring, there was a lack of long term follow up in the spring. Specifically, the project manager had a deadline in the spring semester that had to be met that prevented long term follow up.

Another limitation of the project is that not all of the participants turned in and completed the weekly logs for week seven (69%) and eight (65.5%). Since just over 50% of the participants completed the weekly logs in the seventh and eight week there could have been extraneous variables that could have helped college students cope with stress, which could have led to a decrease in PSS scores. For example, students were one spring recess before obtaining the post-PSS score. Therefore, students may not have been as stressed due to the break from school. Specifically, students did not have to attend classes, did not have exams, and may have had fewer assignments. In addition, students could use exercise as a way to cope with stress. Also, students could have had personal issues, physically or emotionally, that could have been resolved leading to decreased stress. Similarly, the project manager was not able to monitor participant activity on the meditation application. Therefore, it is not possible to determine whether students were truly using the application.

Implications for the Future

This EBP project was implemented to determine the effectiveness of a mindfulness-based meditation application in helping college students cope with stress. This intervention revealed a significantly lower post-intervention PSS score compared to the pre-intervention PSS score, which indicates a decrease in perceived stress. Due to the amount of stress college students experience and the impact it can have, it is important to consider future implications of this EBP project in regards to practice, theory, research, and education.

Practice. This EBP project has implications for practice at student health centers and student counseling centers. The combination of stress and maladaptive coping

mechanisms may lead to in adequate sleep, substance abuse, psychiatric disorders, a decline in physical health, and attrition (Yusufov, Nicoloro-SantaBarbara, Grey, Moyer, & Lobel, 2018). Therefore, it is important for student health centers to be aware and knowledgeable of effective coping interventions to offer stressed students.

Theory. The TMSC was applicable to this project and can be used for future implications of a project similar to this one. This theoretical framework allowed the project manager to deeply understand all the aspects of stress and coping. Specifically, this theoretical framework assisted the project manager in identifying that individuals identify and cope with stress in different ways. It is important to keep this in mind when researching and implementing an effective intervention to help college students cope with stress.

Research. Implications for future research should include a way to determine if participants continued to use the meditation application after the project was completed. Similarly, it would be important to research ways to provide education on the importance of continuing this effective intervention.

Mindfulness meditation has been shown to help college students cope with stress, but is still underutilized in the college setting. Therefore, it would be beneficial to research effective ways to integrate this intervention into required classes for students to help them cope with stress.

Education. As previously stated, this type of intervention is underutilized in the college setting. Therefore, it is not only important to educate students on mindfulness meditation but also professors and healthcare professionals at student health centers. Professors could educate students on an effective way to cope with stress and may be

able to include this in their teaching material. Similarly, the providers at student health centers could provide students with the information to obtain this resource to help them cope with stress.

Conclusion

In conclusion, it is evident that college student stress has a national impact. Due to the negative effects of college student stress, it is important to ensure students have effective ways of coping with it. The TMSC was an appropriate theoretical framework for this EBP project. In addition, the ACE Start Model was an excellent resource to help guide this project. It was determined that the utilization of Jon Kabat-Zinn's online application for mindfulness meditation for eight weeks was significant in decreasing participants' PSS scores, when compared pre- and post-intervention. Due to its effectiveness this application should be offered to future students experiencing stress.

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BIOGRAPHICAL MATERIAL

Mrs. Bottos graduated from Valparaiso University with a Bachelor of Science in Nursing degree in 2014. During her undergraduate studies, Marissa attended a study abroad trip to India. While in India Marissa toured the Taj Mahal and learned about healthcare in a diverse community unlike the US. She has worked in multiple areas of nursing including, long term care facilities and a medical-surgical unit. She currently works in endoscopy, where she has discovered her passion. In 2017, she returned to Valparaiso University and is currently working to earn her Doctor of Nursing Practice degree. Marissa is a member of the Sigma Theta Tau International Zeta Epsilon chapter. As a future APRN, Marissa will use her experience as an endoscopy nurse to help provide future patients with thorough education about the value of screening colonoscopies. Though many patients are fearful of a cancer diagnosis, Marissa has worked to help alleviate their fears through therapeutic and comprehensive communication.

ACRONYM LIST

ACHA: American College Health Association

ANCOVA: analysis of covariance

APNs: advanced practice nurses

BOCF: baseline-observation carried forward method

CAMS-R: Mindfulness Scale-Revised

CASP: critical appraisal skills programme

CBT: cognitive behavioral therapy

CINAHL: Cumulative Index for Nursing and Allied Health

EBP: Evidence-based practice

EMDR: eye-movement desensitization and reprocessing

FFMQ: Five Facet Mindfulness Questionnaire

FNP: family nurse practitioner

GQ-6: Gratitude Questionnaire

IRB: institutional review board

ITT: intention to treat

JBI: Joanna Briggs Institute

MBSR: mindfulness-based stress reduction

MOS SLP9: Medical Outcome Study Sleep Scale

PCI: present control intervention

PCOSES: Perceived Control Over Stressful Events Scale

PSS: Perceived Stress Scale

RCT: randomized control trial

SCS: Self-compassion Scale

SMD: standard mean differences

STI: Stress inoculation training

STAI: spielberg state-trait anxiety inventory

TMSC: Transactional Model of Stress and Coping

Appendix A
Evidence Summary

Citation (APA)	Purpose	Design	Sample	Measures/Outcomes	Results/ Findings	Level/Quality
Cavanagh, K., Strauss, C., Cicconi, F., Griffiths, N., Wyper, A., & Jones, F. (2013). A randomised controlled trial of a brief online mindfulness-based intervention. *Behavior Research and Therapy, 51*(9), 573-578. doi:10.1016/j.brat.2013.06.003	To determine if a brief, online, mindfulness-based intervention could decrease perceived stress and anxiety/depression symptoms in college students.	Randomized control trial (RCT)	104 students ranged from 19-51 years of age	Five facet mindfulness questionnaire (FFMQ) Perceived Stress Scale (PSS) Patient health questionnaire for depression and anxiety (PHQ-4)	Found a significant increase in mindfulness in the intervention group ($t(53) = 3.56$, $p=0.001$, $d= 0.27$, 95% CI for d= (0.11, 0.42)) A significant decrease in perceived stress scores in the intervention group ($t(53) = 3.73$, $p<0.001$, $d=0.37$, 95% CI for d= (0.16, 0.57)) A significant decrease in anxiety and depression in the intervention group ($t(53) = 3.00$, $p = 0.004$, $d = 0.24$, 95% CI for d= (0.08, 0.40))	II Good

Greeson, J. M., Juberg, M. K., Maytan, M., James, K., & Rogers, H. (2014). A randomized controlled trial of koru: A mindfulness program for college students and other emerging adults. *Journal of American College Health, 62*(4), 222-233. doi:10.1080/07448481.2014.887571	To determine the effectiveness of Koru (a mindfulness training program) in college students.	Randomized control trial (RCT)	90 undergraduate, graduate, and professional students with ages ranging from 18-59	Measurements used in this study: the Perceived Stress Scale (PSS) Medical Outcome Study Sleep Scale (MOS SLP9) Cognitive and Affective Mindfulness Scale-Revised (CAMS-R) Self-compassion Scale (SCS) Gratitude Questionnaire (GQ-6) demographics survey	The Koru group's perceived stress scores significantly decrease (t=3.62, p=.001) The Koru group's sleep quality improved significantly (t = 3.04, p = .003) It was found that mindfulness increased among the Koru group (t =−6.60, p < .001) Self-compassion scores increased in the Koru group (t =−6.38, p < .001)	II Good

Hintz, S., Frazier, P. A., & Meredith, L. (2014). Evaluating an online stress management intervention for college students. *Journal of Counseling Psychology, 62*(2), 137-147. doi:10.1037/cou0000014	To develop and assess the effectiveness and feasibility of an online intervention to enhance stress management in undergraduate students	Randomized control trial (RCT)	223 students	The Present Control subscale of the PCOSES Depression Anxiety Stress Scales Perceived Stress Scale	Between-group effect sizes for T2 were medium to large: d = .67 (PCI vs. stress information only) and d = .54 (PCI plus feedback vs. stress information only) Difference between the two intervention groups was small (d = .13)" Medium to large effect sizes for T3 between groups (PCI/stress information only): d = .66, (PCI plus feedback/stress information only): d = .59 The effect size was small (d=.07) for the difference between the two PCI groups at T3.	II Good

Regehr, C., Glancy, D., & Pitts, A. (2013). Interventions to reduce stress in university students: A review and meta-analysis. *Journal of Affective Disorders*, 148, 1-11. doi:10.1016/j.jad.2012.11.026	To provide "an evidenced-based approach for interventions to reduce stress in university students" (p. 2)	Meta-analysis of studies (experimental and cohort quasi-experimental)	24 studies were included for the meta-analysis	Multiple standardized measures were used to assess psychological stress and anxiety symptoms. For example, the Spielberger State-Trait Anxiety Inventory (STAI) and the Perceived Stress Scale (PSS) were used in some of the studies.	Results offer "strong support that cognitive, behavioral, and mindfulness-based approaches are effective in reducing the effects of stress on university students, including reducing levels of anxiety, depression, and cortisol response" (p. 10)	Level I Good

Yusufov, M., Nicoloro-SantaBarbara, J., Grey, N. E., Moyer, A., & Lobel, M. (2018). Meta-analytic evaluation of stress reduction interventions for undergraduate and graduate students. *International Journal Of Stress Management,* doi:10.1037/str0000099	The purpose of this meta-analysis was to determine the effectiveness of interventions in reducing anxiety and perceived stress in students.	Meta-analysis of studies	43 studies met the inclusion criteria for the meta-analysis	Several measures of anxiety and perceived stress were identified used to measure anxiety, the State-Trait Anxiety Inventory was the most commonly used tool and was used in 34.9% of all the studies. While other tools were identified to measure stress, the Perceived Stress Scale was the most commonly used among 30.2% of all the studies.	It was found that long-term relaxation training interventions (d= 1.58, 95% CI [0.74, 2.42], p<.01) were more effective in reducing anxiety compared to short-term relaxation training (d=0.63, 95% CI [0.20, 1.05], p<.05) Both graduate and undergraduate students had statistically significant reductions in anxiety with relaxation training interventions (graduate students: d= 1.81, 95% CI [1.06, 2.56], p< .001; undergraduate students: d = 0.57, 95% CI	I Good

					[0.20, 0.95], p < .05) Graduate students had a statistically significant reduction in anxiety using the psychoeducation interventions compared to the control group "(d= 1.78, 95% CI [0.84, 2.73], p < .001) Undergraduate students had a slightly significant reduction in anxiety (d = 0.40, 95% CI [0.05, 0.84], p < .08) Yusufov et al. (2018) determined aggregate effect size for perceived stress which was "0.44, 95% CI [0.24, 0.64], p<.01" (Yusufov	

					et al., 2018, p. 10). Indicating the intervention group had larger decreases in perceived stress when compared to the control group.	

Appendix B

Critical Appraisal Skills Programme

CASP
Critical Appraisal Skills Programme

www.casp-uk.net
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Summertown Pavilion, Middle Way Oxford OX2 7LG

CASP Checklist: 11 questions to help you make sense of a **Randomised Controlled Trial**

How to use this appraisal tool: Three broad issues need to be considered when appraising a trial:

- Are the results of the study valid? (Section A)
- What are the results? (Section B)
- Will the results help locally? (Section C)

The 11 questions on the following pages are designed to help you think about these issues systematically. The first three questions are screening questions and can be answered quickly. If the answer to both is "yes", it is worth proceeding with the remaining questions. There is some degree of overlap between the questions, you are asked to record a "yes", "no" or "can't tell" to most of the questions. A number of italicised prompts are given after each question. These are designed to remind you why the question is important. Record your reasons for your answers in the spaces provided.

About: These checklists were designed to be used as educational pedagogic tools, as part of a workshop setting, therefore we do not suggest a scoring system. The core CASP checklists (randomised controlled trial & systematic review) were based on JAMA 'Users' guides to the medical literature 1994 (adapted from Guyatt GH, Sackett DL, and Cook DJ), and piloted with health care practitioners.

For each new checklist, a group of experts were assembled to develop and pilot the checklist and the workshop format with which it would be used. Over the years overall adjustments have been made to the format, but a recent survey of checklist users reiterated that the basic format continues to be useful and appropriate.

Referencing: we recommend using the Harvard style citation, i.e.: *Critical Appraisal Skills Programme (2018). CASP (insert name of checklist i.e. Randomised Controlled Trial) Checklist. [online] Available at: URL. Accessed: Date Accessed.*

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Paper for appraisal and reference:.....

Section A: Are the results of the trial valid?

1. Did the trial address a clearly focused issue?

Yes ☐
Can't Tell ☐
No ☐

HINT: An issue can be 'focused' In terms of
- the population studied
- the intervention given
- the comparator given
- the outcomes considered

Comments:

2. Was the assignment of patients to treatments randomised?

Yes ☐
Can't Tell ☐
No ☐

HINT: Consider
- how this was carried out
- was the allocation sequence concealed from researchers and patients

Comments:

3. Were all of the patients who entered the trial properly accounted for at its conclusion?

Yes ☐
Can't Tell ☐
No ☐

HINT: Consider
- was the trial stopped early
- were patients analysed in the groups to which they were randomised

Comments:

Is it worth continuing?

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4. Were patients, health workers and study personnel 'blind' to treatment?

Yes ☐
Can't Tell ☐
No ☐

Comments:

5. Were the groups similar at the start of the trial

Yes ☐
Can't Tell ☐
No ☐

HINT: Consider
• other factors that might affect the outcome, such as; age, sex, social class

Comments:

6. Aside from the experimental intervention, were the groups treated equally?

Yes ☐
Can't Tell ☐
No ☐

Comments:

Section B: What are the results?

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7. How large was the treatment effect?

HINT: Consider
- what outcomes were measured
- Is the primary outcome clearly specified
- what results were found for each outcome

Comments:

8. How precise was the estimate of the treatment effect?

HINT: Consider
- what are the confidence limits

Comments:

Section C: Will the results help locally?

9. Can the results be applied to the local population, or in your context?

Yes ☐
Can't Tell ☐
No ☐

HINT: Consider whether
- the patients covered by the trial are similar enough to the patients to whom you will apply this
- how they differ

Comments:

10. Were all clinically important outcomes considered?

Yes ☐
Can't Tell ☐
No ☐

HINT: Consider whether
- there is other information you would like to have seen
- if not, does this affect the decision

Comments:

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11. Are the benefits worth the harms and costs?

Yes ☐
Can't Tell ☐
No ☐

HINT: Consider
- even if this is not addressed by the trial, what do **you** think?

Comments:

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CASP Checklist: 10 questions to help you make sense of a **Systematic Review**

How to use this appraisal tool: Three broad issues need to be considered when appraising a systematic review study:

- Are the results of the study valid? (Section A)
- What are the results? (Section B)
- Will the results help locally? (Section C)

The 10 questions on the following pages are designed to help you think about these issues systematically. The first two questions are screening questions and can be answered quickly. If the answer to both is "yes", it is worth proceeding with the remaining questions. There is some degree of overlap between the questions, you are asked to record a "yes", "no" or "can't tell" to most of the questions. A number of italicised prompts are given after each question. These are designed to remind you why the question is important. Record your reasons for your answers in the spaces provided.

About: These checklists were designed to be used as educational pedagogic tools, as part of a workshop setting, therefore we do not suggest a scoring system. The core CASP checklists (randomised controlled trial & systematic review) were based on JAMA 'Users' guides to the medical literature 1994 (adapted from Guyatt GH, Sackett DL, and Cook DJ), and piloted with health care practitioners.

For each new checklist, a group of experts were assembled to develop and pilot the checklist and the workshop format with which it would be used. Over the years overall adjustments have been made to the format, but a recent survey of checklist users reiterated that the basic format continues to be useful and appropriate.

Referencing: we recommend using the Harvard style citation, i.e.: *Critical Appraisal Skills Programme (2018). CASP (insert name of checklist i.e. Systematic Review) Checklist. [online] Available at: URL. Accessed: Date Accessed.*

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Paper for appraisal and reference:.....

Section A: Are the results of the review valid?

1. Did the review address a clearly focused question?

Yes ☐
Can't Tell ☐
No ☐

HINT: An issue can be 'focused' In terms of
- the population studied
- the intervention given
- the outcome considered

Comments:

2. Did the authors look for the right type of papers?

Yes ☐
Can't Tell ☐
No ☐

HINT: 'The best sort of studies' would
- address the review's question
- have an appropriate study design (usually RCTs for papers evaluating interventions)

Comments:

Is it worth continuing?

3. Do you think all the important, relevant studies were included?

Yes ☐
Can't Tell ☐
No ☐

HINT: Look for
- which bibliographic databases were used
- follow up from reference lists
- personal contact with experts
- unpublished as well as published studies
- non-English language studies

Comments:

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4. Did the review's authors do enough to assess quality of the included studies?

Yes ☐
Can't Tell ☐
No ☐

HINT: The authors need to consider the rigour of the studies they have identified. Lack of rigour may affect the studies' results ("All that glisters is not gold" Merchant of Venice – Act II Scene 7)

Comments:

5. If the results of the review have been combined, was it reasonable to do so?

Yes ☐
Can't Tell ☐
No ☐

HINT: Consider whether
- results were similar from study to study
- results of all the included studies are clearly displayed
- results of different studies are similar
- reasons for any variations in results are discussed

Comments:

Section B: What are the results?

6. What are the overall results of the review?

HINT: Consider
- If you are clear about the review's 'bottom line' results
- what these are (numerically if appropriate)
- how were the results expressed (NNT, odds ratio etc.)

Comments:

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7. How precise are the results?

HINT: Look at the confidence intervals, if given

Comments:

Section C: Will the results help locally?

8. Can the results be applied to the local population?

Yes ☐
Can't Tell ☐
No ☐

HINT: Consider whether
- the patients covered by the review could be sufficiently different to your population to cause concern
- your local setting is likely to differ much from that of the review

Comments:

9. Were all important outcomes considered?

Yes ☐
Can't Tell ☐
No ☐

HINT: Consider whether
- there is other information you would like to have seen

Comments:

10. Are the benefits worth the harms and costs?

Yes ☐
Can't Tell ☐
No ☐

HINT: Consider
- even if this is not addressed by the review, what do **you** think?

Comments:

Appendix C

Packet Contents

Resources Contact Information

Project Manager Contact Info:

Marissa.Bottos@valpo.edu

Valparaiso University Counseling Center

Alumni Hall (North side of building)

1602 LaPorte Ave.

Valparaiso, IN 46383

Counseling Center (CC)

Phone: 219.464.5002

Fax: 219.464.6865

counseling.center@valpo.edu

Valparaiso Medical Center Emergency Room

1900-2000 Roosevelt Rd

Valparaiso, IN 46383

(219) 263-4900

Porter-Starke Services

601 Wall St., Valparaiso, IN 46383

219.531.3500

Last four digits of cellphone number_____

Demographic Data

Sex:

_____Male

_____Female

Ethnicity:

_____White

_____Hispanic or Latino

_____Black or African American

_____Native American or American Indian

_____Asian / Pacific Islander

_____Other

Major: _____

Age: _____

College Level:

_____Freshman

_____Sophmore

_____Junior

_____Senior

Number of Credit Hours: _____

Commuter or Live on Campus:

_____Commuter

_____Live on Campus

Informed Consent

Principal Investigator: **Marissa Bottos, BSN, RN**
Doctoral of Nursing Student
Valparaiso University
College of Nursing and Health Professions
Marissa.bottos@valpo.edu

Project Advisor: **Dr. Julie Brandy, PhD, RN, FNP-BC**

1. **Purpose of the study:**

   The purpose of this evidenced-based practice project to implement mindfulness meditation to increase college students' ability to cope with stress.

2. **Procedures to be followed:**

   Participation in this project is voluntary. If you agree to participate, the project manager will ask you to fill out a demographic questionnaire and a questionnaire to determine the amount of perceived stress you are experiencing. The project manager will provide you a handout with instructions on how to access the on-line program including a picture of the application and a schedule of the weekly assignments to complete. You will be asked to purchase Jon Kabat-Zinn's online application for ten dollars utilizing the Visa gift card provided by the project manager. You will be asked to complete 20-30 minutes of meditation, depending on the track, weekly for 8 weeks. The mediation sessions on the application that you will be asked to complete include sitting meditation and lying meditation exercises. Each week you will also be asked to complete a reflective log on paper and pencil allowing you to reflect on your mindfulness experience that week. The project manager will provide the copies of this assignment for your professor to distribute in a large sealable envelope for each week. This log will ask you to reflect on your mindfulness experience that week, specifically, asking you to state what you thought of the weekly meditation exercises and how you felt you benefited from it. You will be asked to list the last four digits of your cellphone number on the top of each log to track individual trends. You will be asked to turn the log in to your professor by the end of each week. Your professor will be asked to place the logs in the envelop and then seal it shut. The project manager will then collect the log assignments from your professor weekly.

3. **Discomfort and risks:**

   By asking the students to focus on their stress levels when completing the Perceived Stress Scale and while meditating, this may cause students increased stress. Therefore, additional resources will be provided to students if their stress levels become too overwhelming.

4. **Benefits:**

   Stress can have negative effects on your academic performance and your personal health. Participation in this study can help you learn a way to cope with stress in a positive way. Your professor will offer extra credit for participation in this project as one of the extra credit opportunities in the course.

5. **Statements of Confidentiality:**

The project manager will implement strategies to keep your participation in this evidenced-based practice project confidential. Approval for this evidenced-based practice project will be obtained from the Valparaiso University Institutional Review Board. If you have any questions or concerns related to this project, you may contact Marissa Bottos (Marissa.bottos@valpo.edu).

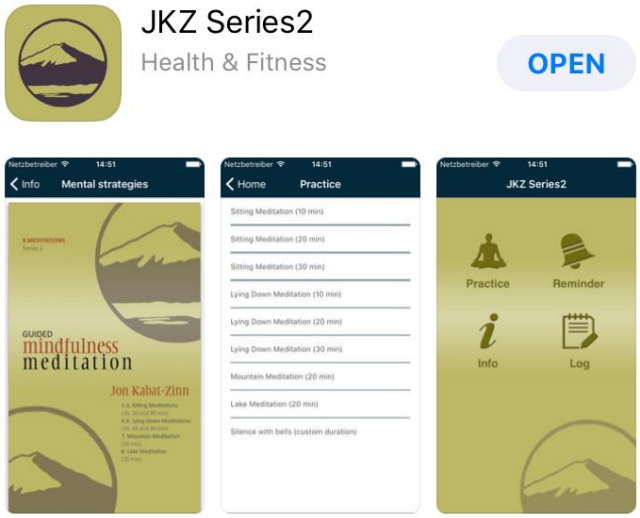
You must be 18 years of age or older to partake in this evidence-based practice project.

You will be given a copy of this form for your records.

Participant Signature	Date
Project Manager	Date

Instructions

1. Open the App Store or Google Play on your phone.
2. Type in the search bar “jkz series2” and select install/download. The application costs $9.99 so use the gift card provided to you by the project manager to purchase this application.
3. The application should look like this.



4. Each week you will then click on “practice” and then chose the assigned meditation exercise for that week.

Weekly Reflective Log: By the end of each week (Sunday) please answering the following questions and turn log into Professor by end of each week.

1. What did you think of the mindfulness meditation exercise completed this week?
2. State one or more ways you benefited from the mindfulness meditation this week?

Week	Weekly Assignment
Week 1 1/9/19 – 1/13/19	Open the app, click on practice, then complete the 20-minute sitting meditation exercise. Complete weekly reflective log (instructions above)
Week 2 1/14/19 – 1/20/19	Open the app, click on practice, then complete the 20-minute lying down meditation exercise. Complete weekly reflective log (instructions above)
Week 3 1/21/19 – 1/27/19	Open the app, click on practice, then complete the 30-minute sitting meditation exercise. Complete weekly reflective log (instructions above)
Week 4 1/28/19 – 2/3/19	Open the app, click on practice, then complete the 30-minute lying down meditation exercise. Complete weekly reflective log (instructions above)
Week 5 2/4/19 – 2/10/19	Open the app, click on practice, then complete the 20-minute sitting meditation exercise. Complete weekly reflective log (instructions above)
Week 6 2/11/19 – 2/17/19	Open the app, click on practice, then complete the 20-minute lying down meditation exercise. Complete weekly reflective log (instructions above)
Week 7 2/18/19 – 2/24/19	Open the app, click on practice, then complete the 30-minute sitting meditation exercise. Complete weekly reflective log (instructions above)
Week 8 2/25/19 – 3/3/19	Open the app, click on practice, then complete the 30-minute lying down meditation exercise. Complete weekly reflective log (instructions above)

Last four digits of cellphone number_____

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 how often you felt or thought a certain way. Although some of the questions are similar, there are differences between them and you should treat each one as a separate question. The best approach is to answer each question fairly quickly. That is, don't try to count up the number of times you felt a particular way, but rather indicate the alternative that seems like a reasonable estimate.

For each question choose from the following alternatives:

0. never
1. almost never
2. sometimes
3. fairly often
4. very often

1. _____In the last month, how often have you been upset because of something that happened unexpectedly?

2. _____In the last month, how often have you felt that you were unable to control the important things in your life?

3. _____In the last month, how often have you felt nervous and "stressed"?

4. _____In the last month, how often have you dealt successfully with irritating life hassles?

5. _____In the last month, how often have you felt that you were effectively coping with important changes that were occurring in your life?

6. _____In the last month, how often have you felt confident about your ability to handle your personal problems?

7. _____In the last month, how often have you felt that things were going your way?

8. _____In the last month, how often have you found that you could not cope with all the things that you had to do?

9. _____In the last month, how often have you been able to control irritations in your life?

10. _____In the last month, how often have you felt that you were on top of things?

11. _____In the last month, how often have you been angered because of things that happened that were outside of your control?

12. _____In the last month, how often have you found yourself thinking about things that you have to accomplish?

13. _____In the last month, how often have you been able to control the way you spend your time?

14. _____In the last month, how often have you felt difficulties were piling up so high that you could not overcome them?

Cohen, S., Kamarck, T., & Mermelstein, R. (1983). A global measure of perceived stress. *Journal of Health and Social Behavior, 24*(4), 385-396

Weekly Log

Last four digits of cellphone number_____

Please check one of the following:

_____I have completed the weekly meditation exercise. Please continue to below.

_____I have not completed the weekly meditation exercise.

WEEK #

Weekly Reflective Log: If you have completed the weekly meditation exercise please answer the following questions.

3. What did you think of the mindfulness meditation exercise completed this week?

4. State one or more ways you benefited from the mindfulness meditation this week?