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Susan McKee

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TOWARD REDUCING STRESS AND ANXIETY IN NURSING  
STUDENTS: IMPLEMENTING AN EVIDENCE-BASED  
MINDFULNESS PROGRAM

by

SUSAN JONAS MCKEE, RN, MSN, MED

A dissertation submitted in partial fulfillment  
of the requirements for the degree of  
Doctor of Nursing Practice  
School of Nursing

Dr. Carol Rizer, DNP, APRN, CRNA – retired  
Committee Chair

The University of Texas at Tyler  
May 2019

The University of Texas at Tyler  
Tyler, Texas

This is to certify that the DNP Scholarly Project of

SUSAN JONAS MCKEE

has been approved for the final project requirements on 3/21/19

for the Doctor of Nursing Practice Degree

Approvals:

DocuSigned by:

*Carol Rizer*

02E1F1348BBC4B2...

Faculty Mentor: Carol Rizer

DocuSigned by:

*Willa Decker*

08D58F9A0DD7421...

Industry Mentor: Willa Decker

DocuSigned by:

*Sandra Petersen DNP*

276240E83BDB4E7...

Member: Sandra Petersen

DocuSigned by:

*Cheryl D. Parker, PhD, RN-BC, CNE*

8B0E6EECC4FE4E4...

Member: Cheryl D. Parker, PhD, RN-BC, CNE

DocuSigned by:

*Barbara Haas*

985A922F3BF54C7...

Executive Director: Barbara Haas

DocuSigned by:

*Yong Tai Wang*

BA526018E0B84E4...

Dean: Yong Tai Wang

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## **Acknowledgments**

Committee Chair

Dr. Carol Rizer

DNP, APRN, CRNA – retired

Committee Co-Chair

Dr. Sandra Petersen

DNP, APRN, FNP/GNP-BC, PMHNP

Industry Advisor

Willa Decker

MSN, APRN, MA, RN

## **Dedication**

To the faculty who facilitated my learning and personal growth in amazing ways, especially Dr. Sandi Petersen and Dr. Cheryl Parker who talked me off the ledge and bolstered my resolve to finish my degree; Dr. Carol Rizer who was a constant source of encouragement even during her own challenges; and Willa Decker who demonstrated grace and kindness.

To my cohort who walked along with me as the inaugural DNP class and encouraged, commiserated, and completed this adventure as a team.

To my Mom and friends who suffered the process with me and listened to every complaint or excuse to miss something but remained steadfast in support when needed.

To my daughters who missed their mom while I completed three nursing degrees during their childhood and teenage years. I hope that I have modeled the importance of lifelong education, the satisfaction of setting and reaching challenging goals, and the value of dedicating yourself to significant causes.

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## **Abstract**

# **TOWARD REDUCING STRESS AND ANXIETY IN NURSING STUDENTS: IMPLEMENTING AN EVIDENCE-BASED MINDFULNESS PROGRAM**

Susan Jonas McKee, RN, MSN, MED

Committee Chair: Dr. Carol Rizer, DNP, APRN, CRNA – retired  
Committee Co-Chair: Dr. Sandra Petersen, DNP, APRN, FNP/GNP-BC, PMHNP

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Stress and anxiety are increasing in college students, especially in nursing students who complete didactic and clinical courses concurrently. Nursing students report feeling overwhelmed, with distress affecting academic performance and balance of school and personal demands. Mindfulness is an evidence-based method of reducing human suffering due to troubling conditions such as pain, chronic illness, or psychological issues including stress and anxiety. This paper addresses the state of the science of mindfulness and details the current mental health concerns of college students, specifically nursing students. The body of evidence, gathered through a systematic search, suggests that mindfulness reduces stress and anxiety in college and in nursing students, assisting them in coping with challenges and issues throughout nursing school. This project implemented an 8-week series of experiential learning and mindfulness

practice sessions which resulted in decreased nursing student stress and anxiety and increased mindfulness, as the evidence suggested. Results support the use of mindfulness training as a student support tool adjunct to counseling or academic remediation. Recommendations and lessons learned from implementing the mindfulness series are presented.

*Keywords: mindfulness, stress, anxiety, nursing students, evidence-based practice*

## **Chapter 1: Development of the Clinical Question and Problem Identification**

### **(EBP Process Steps 0, 1, and 2)**

#### **Background and Significance of the Leadership Issue**

In the fall 2016 American College Health Association's (ACHA's) National College Health Association II (NCHA II) nationwide survey of 28,000 undergraduate students, 61.9% reported experiencing overwhelming anxiety in the previous 12 months (ACHA, 2017b). Of students formally diagnosed with a mental health concern within those 12 months, 19.7% reported a diagnosis of anxiety, which surpassed diagnoses of depression (ACHA, 2017b). More than 55% of the students answered that their stress level was more than average or tremendous (ACHA, 2017b). In addition, 87.4% of the students reported that they felt overwhelmed by "all that they had to do" (ACHA, 2017b, p. 13). Almost 72% of the students reported that they would like information on stress reduction as a service from their institution to help them cope with stress and anxiety (ACHA, 2017a).

Bartlett, Taylor, and Nelson (2016) used the NCHA II to compare mental health indicators and stress levels in general (non-nursing) and nursing students. Nursing students selected above average and tremendous stress more often than the general group. Furthermore, none of the nursing students selected no stress, but 6.9 % of general students answered they experienced no stress (Bartlett, Taylor, & Nelson, 2016). Within the prior 12 months, nursing students reported having a diagnosis of anxiety significantly more often than general students in the survey ( $\chi^2(1)=7.5589$ ,  $p=0.006$ ) (Bartlett, Taylor,

& Nelson, 2016). Nursing students reported that stress and anxiety affected their academic performance more often than their non-nursing classmates (Bartlett, Taylor, & Nelson, 2016).

Van der Riet, Rossiter, Kirby, Dluzewska, and Harmon (2015) conducted a pilot study in which a 7-week stress management and mindfulness program was implemented to reduce stress in nursing students. Prior to the program, nursing students verbally reported they had trouble sleeping, and would “wake up in the middle of the night and lie there for hours worrying about all the things that I cannot do anything about at that moment” (Van der Riet et al., 2015, p. 46). In addition, students reported having negative thoughts and felt rushed when completing tasks (Van der Riet et al., 2015).

Crary (2013) remarked that nursing students deal with didactic and clinical courses together, unlike other health professions that receive classroom instruction prior to clinical experiences. Results of the Perceived Stress Scale (internal consistent  $\alpha=0.84$ ) identified that first-year nursing students had higher means in perceived stress related to nursing courses as well as physical complaints such as stomach and back pain, palpitations, and fatigue (Crary, 2013). In addition, the first-year students were more likely to cope by using distraction, blame themselves for problems, and were less likely to seek support than second-year nursing students (Crary, 2013, p. 82). Crary (2013) went on to suggest that enhancing the nursing students’ internal resources may help them cope with challenges of nursing school and movement into the health care atmosphere.

Chernomas and Shapiro’s (2013) cross-sectional descriptive exploratory study surveyed over 400 nursing students with 31% reporting moderate, severe, or extremely



severe anxiety, and 24% reporting moderate, severe, or extremely severe stress on the Depression, Anxiety, Stress Scales (p. 259). Student answers to open-ended questions included being overwhelmed with coursework, irritable and stressed out, and fearing that they would make mistakes that would be considered unsafe practice resulting in school failure (Chernomas & Shapiro, 2013). The comments identified the academic and personal demands of nursing school. Chernomas and Shapiro suggested that students with lower anxiety scores were more likely to successfully balance school and personal demands. Based on their survey findings, it is reasonable to be concerned that nursing students' stress and anxiety may affect their learning ability as well as delivery of safe patient care (Chernomas & Shapiro, 2013).

Recognition of the issue is common for many nursing faculty and advisors. Students seek counsel for self-reported stress and anxiety, with some unable to mobilize internal and external resources, resulting in undue struggles and even withdrawal from nursing programs. Students told of emergency room visits for chest pain, rapid pulses, or shortness of breath. This facilitated the realization that increasing students' ability to cope may enhance their success and persistence in nursing school.

### **Anxiety and Stress**

Anxiety is described as “an abnormal and overwhelming sense of apprehension and fear often marked by physical signs (such as tension, sweating, and increased pulse rate), by doubt concerning the reality and nature of the threat, and by self-doubt about one's capacity to cope with it” usually related to an upcoming event (Anxiety, 2018). Parekh (2017) described general anxiety as persistent and excessive worry that interferes with daily activities and may result in physical

symptoms such as restlessness, feeling on edge, easily fatigued, difficulty concentrating, muscle tension, or problems sleeping. More specifically, anxiety in college students involves worry about everyday issues including school, work, money, friends, and health that interferes with daily life (Got anxiety?, 2014).

Stress is defined as a “physical, chemical, or emotional factor that causes bodily or mental tension and may be a factor in disease causation” (Stress, 2018). Symptoms include feeling “overwhelmed, worried, or run-down” (American Psychological Association [APA], 2018). Chronic stress may contribute to the development or worsening of other chronic health conditions (APA, 2018).

Ratanasiripong, Park, Ratanasiripong, and Kathalae (2015) conducted a randomized controlled trial (RCT) to explain how anxiety is related to stress and found that prolonged or multiplied stress aggravated anxiety. Gotink et al. (2015) reported that stress results from the difference between the actual and desired outcome of an event, and that it is experienced proportionately. Worrying about the reason and results of the stress intensified the reaction (Gotink et al., 2015).

### **Development of the Clinical Question (Nursing Students)**

Context for nursing student stress and anxiety originated in the author’s first faculty role and persisted into the second faculty assignment despite different student characteristics. Students identified as academically capable of success in the nursing program were expressing concerns about academic and clinical demands, resulting in self-reported stress and anxiety. The author’s concerns persisted as students continued to display grade pressure and unreasonably high expectations of self and performance.

According to Bartlett and colleagues (2016), stress and anxiety can negatively influence the ability to care for oneself and patients. This inadequacy can carry over into a professional career and result in dissatisfaction with nursing and possible exit from the profession (de Jesus, Sena, Souza, Pereira, Thamyris, & Santos, 2015). The failure to cope with stress and anxiety, superimposed on a challenging curriculum, may be the tipping point between success and failure in nursing school.

Acceptance to the large multipurpose southern College of Nursing (CON) is extremely competitive. Students entering in fall 2017 had a 3.9 grade point average in science and other prerequisite classes (CON Administrator, personal communication, October 31, 2017). The CON received over 400 applications for 48 seats in fall 2017 (CON Administrator, personal communication, October 31, 2017). Faculty and administrators described the nursing students as “Type A,” highly motivated, and highly qualified (CON Administrator, personal communication, October 31, 2017). Nursing students hold themselves to high standards and may verbalize or demonstrate distress if they receive an assignment or exam grade less than an A and may ask for specific feedback to improve future grades (CON faculty member, personal communication, October 4, 2017). One student wept in a faculty member’s office due to a grade of 88 on a unit exam (CON faculty member, personal communication, November 28, 2017). Another student with an 89 average requested an extension on an assignment and when it was not granted, and points were deducted for late work, the student requested regrading of another assignment and that the faculty add seven points based on a perceived unfair interpretation of the rubric. Furthermore, many students plan to enter graduate school,

competitive nurse residencies, or internship programs that have additional admission or selection requirements that require higher academic performance.

### **Mindfulness.**

Though cognitive-behavioral therapy, relaxation training, and medications are common treatments for anxiety (Anxiety and Depression Association of America, 2014), mindfulness as a treatment has grown in popularity and is designed to help those with chronic illness or those suffering from increased emotional or psychological stress learn new ways to manage these issues (Kabat-Zinn, 2013).

Kabat-Zinn, founder of the Mindfulness-Based Stress Reduction Program (MBSRP), defined mindfulness as intently focusing on and accepting the experience of the present situation (Center for Mindfulness, 2014). Foundations of mindfulness include: 1) open-mindedness, 2) patience, 3) trust, 4) seeing situations in a new light, 5) contentment with the way things are, 6) acceptance of things as they are, and 7) letting go of judgmental thoughts and feelings (Kabat-Zinn, 2013). Mindfulness began in eastern traditions with Buddhist and Hindu monks; however, it has become a mostly secular and a widely practiced method for stress reduction (Joaquin, 2017).

There are two types of approaches to teaching mindfulness: mindfulness-based programs (MBPs) and mindfulness-based stress reduction (MBSR). Both types have the following critical elements: 1) informed by multidisciplinary theories of medicine, psychology, and education and 2) designed to address human distress by forming a new perception and a present focus (Crane et al., 2017). Furthermore, both encourage self-regulation and are taught in an experiential manner by a teacher with the capability to effectively demonstrate the qualities, attitudes, and skills in a collaborative way with

students (Crane et al., 2017). Instructors with knowledge of and experience with the group they are leading can tailor the structure, length, and format to match the needs of participants in an MBP (Crane et al., 2017).

MBSRP is a specific MBP developed by Jon Kabat-Zinn. The standardized education program requires certified, trained instructors to follow the curriculum without variation. Both MBPs and mindfulness training reduce worry about upcoming events and rumination about the past (Kabat-Zinn, 2013). This has an effect on how one sees the problems they face and how one copes with the problems (Kabat-Zinn, 2013). The MBSRP includes 20 hours of instruction divided into 8 weekly sessions with standardized agendas and a full-day retreat, totaling 26-28 hours. The format safeguards program fidelity so that students can be ensured that they receive what is expected (Crane et al., 2017).

Mindfulness allows the person to take a more active role in their treatment, involves little emotional or physical risk, and is easy to implement (Gotink et al., 2015). Some studies caution that meditation, a component of mindfulness, can lead to deeper depression or suicidal thoughts; however, no serious side effects were reported in the studies included in the body of evidence (PubMed Health, 2017).

All mindfulness-based programs include as foundational the following: body scans or awareness for sensations like pain or discomfort, mindful movement or walking, and seated meditation. Through discussion, participants identify patterns of thinking and behaving that are negative and practice behaviors that lead to self-understanding and the ability to change their reaction to events (Kabat-Zinn, 2013). MBPs are designed to

provide an opportunity to respond differently and with greater self-awareness during and after the program (Crane et al., 2017).

Therefore, the clinical question arises: In pre-licensure nursing students, how does participation in a short-term psycho-educational support group using mindfulness (compared to no program offered) affect reported anxiety and stress over a long semester? The purpose of the evidence reported in this paper was to explore existing evidence about how mindfulness affects anxiety and stress in nursing students.

### **Selection of the EBP Model**

The use of an evidence-based practice (EBP) model provides a systematic method for practice change and may increase the chance of project completion and sustainability (Dang et al., 2015) due to systematically addressing usual steps and challenges in implementation (Appendix A). Rosswurm and Larrabee's Model for Evidence-Based Practice Change was developed through their experience of teaching and leading nurses (Melnik & Fineout-Overholt, 2015). Using the steps in the change process model, a systematic literature search (Appendix B) identified many appropriate sources of data which began to point in the direction of mindfulness and mindfulness-based stress reduction as solutions to the problem of academic stress and anxiety. The Model for Evidence-Based Practice Change propelled the process forward while ensuring critical elements were completed.

### **Systematic Search for Evidence – Process and Results**

To answer the clinical question, a systematic search of CINAHL, Cochrane Library, PubMed, PsycINFO, and ERIC databases was conducted. Gray literature was searched in the Virginia Henderson Global Nursing e-Repository. Inclusion criteria was

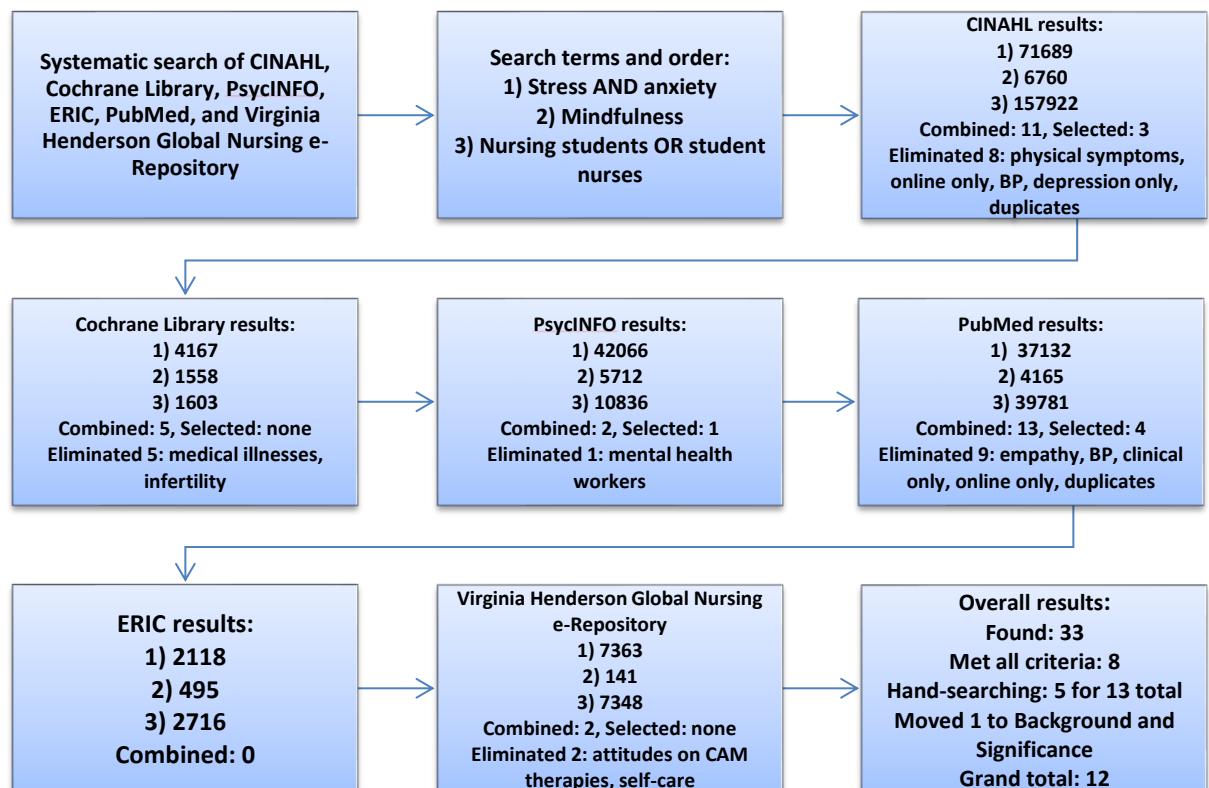
limited to peer-reviewed articles in the English language or translated to English. In addition, studies included some college age or above persons and the topics of stress and anxiety.

The search strategy was crafted based on the clinical question. Search terms were “stress and anxiety,” searched together due to the problem of interest. “Mindfulness” was searched, as was “nursing students.” “Student nurses” automatically populated when the term “nursing students” was entered when searching CINAHL and was included in all searches for consistency. The described search was repeated for all databases.

The search formula “stress” AND “anxiety” AND “mindfulness” AND “nursing students” OR “student nurses” yielded 33 articles. Of those, eight met the inclusion criteria. Hand-searching of the selected articles’ reference lists uncovered five more articles that met the search terms, bringing the total to 13. The hand-searching process ensured that no essential articles were missed. One qualitative article was later shifted to background and significance for a total of 12 articles, which included four systematic reviews, four randomized controlled trials, three literature reviews, and one descriptive pilot study. PubMed generated the most hits (n=13) and had the most selected articles (n=5). There were no Cochrane Reviews or articles in ERIC that met all the inclusion criteria. Unpublished literature through the Virginia Henderson Global Nursing e-Repository, including posters and presentations, was searched but not included as it did not meet inclusion criteria.

Exclusion criteria included articles with the following characteristics: 1) articles using any strategy for treating stress and anxiety that was not based at least partially on mindfulness, 2) articles on depression only, 3) articles dealing with illnesses other than

mental illness such as medical diagnoses if mental illness was not included, 4) articles describing online program delivery only, 5) articles describing audio-recorded program delivery only, 6) articles with any population that did not include college age or above nursing or health professional students, or 7) articles that addressed anxiety and stress as a symptom of other concepts such as decision making or resilience. Some evidence that addressed depression, stress, and anxiety in the same article was included if the analysis of impact on anxiety and stress could be separated from depression and met the other criteria. The search results are shown in Figure 1.



**Figure 1.** Systematic Search Results



## **Chapter 2: Critical Appraisal of Evidence, Model of EBP, and EPIP Plan:**

### **Part 1 (EBP Process Steps 1, 2, 3, and 4)**

#### **Critical Appraisal of Evidence to Serve as Basis of EPIP Protocol (Body of Evidence)**

The use of general appraisal overview and rapid critical appraisal processes helped to glean critical information from the articles to determine their worth to practice, together comprising the body of evidence. This review systematically evaluated the preliminary fit and usefulness of the literature in relation to project focus and exceptions.

##### **Rapid critical appraisal.**

Ethics and quality of the studies were evaluated. The active nature of the intervention can make blinding impossible, though one study used an active control of stress reduction education (Hoge et al., 2013). Other studies compared the intervention to no treatment, a waitlist, or treatment as usual. For this paper, a mindfulness intervention includes mindfulness-based stress reduction, mindfulness-based programs, and interventions using activities commonly found in either category, such as mindfulness meditation or activities. (See Appendix B and Appendix C).

##### **Evaluation of evidence.**

In a meta-analysis, Gotink et al. (2015) evaluated MBSR use with more than 8,000 individuals in 115 unique RCTs and identified significant benefits in people with a wide variety of chronic illness (cardiac disease, cancer, anxiety disorders, chronic pain, and others), and a group of adults with no medical diagnoses (Gotink et al., 2015). Most

benefits were in mental health, with significant reductions in stress and anxiety (Gotink et al., 2015).

Lo et al. (2017), McConville, McAleer, and Hahne (2017), and Regehr, Glancy, and Pitts (2013) all conducted systematic reviews with meta-analysis involving nursing students and showed that mindfulness-based programs significantly reduced stress. McConville and colleagues and Regehr and colleagues suggested that MBPs also significantly reduced anxiety. Lo et al. suggested that though anxiety was reduced, it may not have reached the level of significance due to lower pre-intervention scores leaving little room for change (2017) (see Table 1).

**Table 1.** Systematic Reviews: Mindfulness, Stress, and Anxiety Summary

Participants	Intervention & Outcome Measured	Result	Overall Effect
Mixed – healthy, illness, mental illness, all ages (Gotink et al., 2015)	MBSR on anxiety	d= 0.49, 95% CI, 0.37 to 0.61	Z= 11.72, p<0.0001
	MBSR on stress	d= 0.51, 95% CI, 0.36 to 0.67	Z= 6.57, p<0.00001
Health professions students including nursing (Lo et al., 2017)	Mindfulness on anxiety	d= -0.06, 95% CI, -0.25 to 0.12 (Not Significant)	Z=0.70, p=0.49 (Not significant)
	Mindfulness on stress	d= -0.54, 95% CI, -0.85 to -0.24, p=.0004	Z= 3.52, p=0.0004
Health professions students including nursing (McConville et al., 2017)	Mindfulness on anxiety	d= -0.44, 95% CI, -0.50 to -0.28*, p<.01	Z= 5.57, p<0.00001
	Mindfulness on stress	d= -0.44, 95% CI, -0.50 to -0.28, p<.01	Z= 6.66, p<0.00001
University students including nursing (Regehr et al., 2013)	Cognitive, behavioral, and mindfulness combined on anxiety	d= -0.77, 95% CI, -0.88 to -0.58	Z= 9.565, p<0.000
	Mindfulness alone on anxiety	d= -0.73, 95% CI, -1.00 to -0.45	Z= 5.182, p<0.000

Hoge et al. (2013) compared MBP with an active control of stress management education of the same length, delivery methods, and intensity in a sample of adults diagnosed with generalized anxiety disorder. The reported risk ratio of anxiety in the MBP response group was 1.65 (95% CI, 1.04-2.60), which means that reduced anxiety symptoms in the MBP group were over and above those symptoms mitigated by stress management education (Hoge et al., 2013).

Song and Lindquist (2015) and Ratanasiripong et al. (2015) conducted randomized controlled trials examining the effect of mindfulness on anxiety in nursing

students. Ratanasiripong et al. (2015) randomly assigned nursing students to 4 weeks of mindfulness meditation (with MBP elements), 4 weeks of biofeedback intervention, or a waitlist group. Song and Lindquist (2015) used MBP for 2 hours a week for 8 weeks with a nursing student group compared to a waitlist group with no intervention. In both studies, anxiety and stress were significantly reduced. Ratanasiripong et al. (2015) reported a significant decrease in post-intervention anxiety scores as measured by the State Anxiety Scale ( $F[1,28]=14.36, p=0.001, \eta^2=0.34$ ). Similarly, Song and Lindquist (2015) found a significant difference in mean anxiety reduction between the MBP and waitlist group ( $F=10.99, df=1, p=.023$ ) using the Depression, Anxiety, and Stress Scale (DASS-21).

Falsafi (2016) compared three groups: one using mindfulness, one using yoga only, and a control group. The mindfulness group had significant reductions in anxiety and stress symptoms ( $p<.01$ ) in the MBP of 75-minute meetings for 8 weeks, totaling 10 hours (Falsafi, 2016).

Results of the four randomized controlled trials suggest that mindfulness has practical application for nursing students, with positive effects on stress and anxiety (Falsafi, 2016; Hoge et al., 2013; Ratanasiripong et al., 2015; Song and Lindquist, 2015) (see Table 2 and Appendix D). In addition, Song and Lindquist (2015) and Falsafi (2016) reported an additional benefit of mindfulness, a non-pharmacological method, is that it can be used anywhere and anytime.

**Table 2.** Randomized Controlled Trials Results Summary

	<b>Falsafi (2016)</b>	<b>Hoge et al. (2013)</b>	<b>Ratanasiripong et al. (2015)</b>	<b>Song &amp; Lindquist (2015)</b>
Major focus  Mindfulness on...	Mindfulness-based interventions vs. yoga vs. waitlist	Mindfulness meditation (MBSR-based) vs. active control of stress management education	Mindfulness meditation (MBSR-based) vs. Biofeedback vs. waitlist	MBP vs. waitlist
Tools used in reporting	Hamilton Anxiety Scale, Student Life Stress Inventory, Cognitive and Affective Mindfulness Scale-Revised	Hamilton Anxiety Scale, Trier Social Stress Tests	State Anxiety Scale, Perceived Stress Scale	Depression Anxiety and Stress Scale, Mindful Attention Awareness Scale
Results on anxiety	Pre-mean 22.2 Pre SD-7.1 Post mean 13.8 (↓37.8%) Post SD 9.1	Pre-mean 21.46 Pre SD-7.35 Post mean 13.65(↓36.4%) Post SD 7.01	Pre-mean 25.45 Pre SD-7.8 Post mean 21.28(↓16.4%) Post SD 6.95	Pre-mean 6.7 Pre SD-12.6 Post mean 2.8 (↓58.3%) Post SD 4.1
Results on stress or stress reactivity	Pre-mean 2.4, Pre SD-0.6 Post mean 1.5 (↓37.6%) Post SD- 0.6	Pre-mean 53.9  Post mean 40.8 (↓24.3%)	Pre-mean 17.24 Pre SD-4.16 Post mean 14.9 (↓13.6%) Post SD- 3.44	Pre-mean 34.5 Pre SD-12.5 Post mean 7.4 (↓78.6%) Post SD- 4.9
Results on mindfulness	Pre-mean 20.5 Pre SD-3.6 Post mean 26.5 (↑23%) Post SD- 5.1	Not measured	Not measured	Pre-mean 69.8 Pre SD-10.6 Post mean 80.6 (↑13.4%) Post SD- 11.3

### **Narrative reviews.**

Narrative literature reviews of descriptive studies by Carmody and Baer (2009) and Smith (2014) compared and summarized results of 29 articles on the psychological effects of mindfulness and found that both traditional MBSR and programs of varying length could be helpful to nursing students to potentially decrease stress, burnout, and

anxiety. Nurses and nursing students reported increases in focus, empathy, and mood in Smith's (2014) review of MBSR interventions and the ability of nurses to cope with work-related stress.

In contrast, Turner and McCarthy (2017) duplicated an original literature review by Galbraith and Brown (2011) and reported that strategies using reappraisal (mindfulness) were effective only in combination with other strategies in their review of 26 articles. The authors indicated that small samples, wide variation in study design, and poor study quality may have affected results but still suggested adding mindfulness to support current coping measures (2017). Turner and McCarthy (2017) cautioned that more randomized controlled trials are needed to draw definite conclusions about mindfulness' effectiveness despite some statistically significant results in the articles they reviewed.

### **Qualitative results.**

As supporting evidence in two studies, nursing and midwifery students participated in mindfulness activities and reported better focus and concentration on academic activities (Schwind et al., 2017; Van der Riet et al., 2015). Students participating in 5-minute pre- and post-class meditations reported they felt less anxiety and stress in school and life and reported inner peace and feeling calm and relaxed (Schwind et al., 2017). They also described an increased ability to deal with disappointing news (Schwind et al., 2017). Students in a 7-week mindfulness stress management program reported social, personal, and professional benefits such as increased self-awareness and the ability to dismiss negative or intrusive thoughts (Van der Riet et al., 2015).

### **Format and time of MBP.**

Concerns about the length of training (26-28 hours) required for MBSR have led examiners to suggest studying shorter options that reduce the time commitment and increase adherence with home practice for those who are already pressed for time (Gotink et al., 2015; Song & Lindquist, 2015). McConville et al. (2017) reported that both longer and shorter MBSR programs were effective in increasing mindfulness and decreasing stress and mental distress. Furthermore, since MBSR requires such a considerable time commitment, shorter programs “delivered in person or online would be appropriate for university settings” (McConville et al., 2017, p. 41). Hoge et al. (2013) adjusted the MBSR schedule by reducing the series by 8 hours, which still produced significant reductions in anxiety and distress. Nursing students participating in the Ratanasiripong et al. study received only two training sessions of unspecified length in a 4-week intervention that also included home practice (2015). Despite using a briefer intervention, Ratanasiripong and colleagues (2015) noted significant reductions in anxiety and perceived stress. Song and Lindquist (2015) reduced MBSR time to eight sessions of 2 hours each for a total of 16 hours, but still found significant improvements (Appendix E). Carmody and Baer found that there was no evidence that shorter MBSR programs were less effective than standard MBSR formats in their literature review (2009).

Regehr et al. (2013) reviewed 24 trials using cognitive, behavioral, or mindfulness-based techniques lasting between 4 and 8 weeks which showed consistently reduced symptoms of anxiety throughout the grouping of studies.

## **Synthesis**

The literature shows use of mindfulness in general, even in alternative formats, has demonstrated a positive and mostly significant effect on anxiety levels and stress, which is often combined in the reviewed studies (Appendix F). Only one study in the body of evidence reported harm—muscle soreness and sleep disruption—in one person each, with no reports of other untoward or lasting effects (Hoge et al., 2013). Therefore, the benefits of reduced anxiety and stress far outweigh the mild perceived adverse outcomes. Widespread support for mindfulness lies across the body of evidence through high-level evidence, literature reviews, and qualitative reports.

## **Recommendation**

The literature search produced evidence to suggest effectiveness of mindfulness training for healthy groups, those with disease, college students, and nursing students specifically, and identified effective programmatic attributes across the body of evidence (Appendix F and Appendix G for program design information). Therefore, the recommendation was to offer an optional 2-hour, 8-week mindfulness-based program with facilitated homework and multiple strategies to all incoming pre-licensure nursing students to help them cope with stress and anxiety. (See Appendix G for specific element summary.)

## **EPIP Operationalized through EBP Model, Change Model, and Theoretical Model**

As stated, the EBP model propelled the project forward, ensuring the steps of the change process were followed in a timely and sequential manner. A change model was not necessary as this was a first-time implementation and nothing had been in its place. The theoretical model easily connected to the purpose and function of the mindfulness



implementation as one that could change the perception of stress or assist in coping when a situation was deemed beyond the student's coping capabilities.

### **Fully Operationalized Plan and Logic Model**

#### **Logic model.**

The logic model provided a graphic overview of critical resources, processes, and outcomes which guided planning and implementation. In addition, the model detailed expected support from the host institution. Ethical considerations such as approval from the Institutional Review Board (IRB), student expectations, and outcomes of the program were detailed and became a broad overview of project progress (see Appendix H).

#### **Theoretical framework.**

Folkman and Lazarus' Theory of Stress and Coping (1985) is widely used in nursing related to psychosocial concerns (see Appendix I). Folkman (2010) pointed out that improved coping is one part of stress that "lends itself to intervention" (p. 453), explaining the logical link to interventions that reduce stress and anxiety. The model defined the perception of stress as an event or circumstance that overcomes one's ability to manage the situation (Folkman & Lazarus, 1985). It requires an appraisal or assessment of an event or situation that could cause stress. If the event or situation is not deemed a threat, usual management or coping suffices. Even if the initial assessment is not alarming, the perception can change over time (Folkman & Lazarus, 1985). If the event or situation is deemed threatening, based on the affected individual's perception, a response is initiated (Folkman, 2010). The coping response serves to mitigate or resolve the concerning event. Mindfulness may help to address the troubling event, enhancing coping and management of the situation. It is feasible that increasing coping mechanisms

through mindfulness will increase a student's ability to deal with increased stressors and decrease existing stress and anxiety. The model closely followed the goals of mindfulness programs: to reduce stress and anxiety and increase the perception of one's capacity to deal with present and future challenges.

Folkman and Lazarus' Theory of Stress and Coping (1985) provides clear opportunities for applicability of mindfulness for students. As a preventative measure (Gotink et al., 2015), mindfulness can prevent appraisal of an event or situation as stressful initially. It can also help a student to cope with an event initially deemed stressful, but then managed during secondary appraisal using the skill of mindfulness. Lastly, if a student deems a situation or event stressful and needs coping mechanisms to mitigate the situation, mindfulness can be used.

## **Chapter 3 - Project Design and Methodology (EBP Process Steps 3-4)**

### **Project Design and Methodology Overview**

The use of general mindfulness-based techniques supports decreases in stress and anxiety with demonstrated effectiveness in nursing students and other populations. Similar results in the students attending the intervention described in this paper were expected. Nursing school has unique challenges of simultaneous didactic and clinical education, with personal demands and challenges (Bartlett et al., 2016; Chernomas & Shapiro, 2013). Training in mindfulness may prevent or reduce anxiety symptoms and stress severity and increase coping skills during nursing school. Therefore, an optional 8-week program totaling 16 hours including all foundations and standard activities of mindfulness was offered on campus to nursing students with assessment of stress, anxiety, and mindfulness in weeks 1 and 8 of the program.

### **Host Institution (Implementation Site)**

The host institution was a public institution awarding five health-related professional degrees in medicine, dentistry, pharmacy, veterinary medicine, and nursing. The institution's College of Nursing (CON) offers traditional undergraduate, second-degree programs, transition programs from RN to BSN, family nurse practitioner degrees, master's in nursing education and has additional graduate programs under development. For pre-licensure graduates, the pass rates on the NCLEX-RN are regularly between 97% and 100% (Texas Board of Nursing, 2017). Faculty members involved in face-to-face teaching were enthusiastic about offering the intervention to incoming students, as faculty

recognized the effects of stress and anxiety in their students. The Associate Dean of Academic Affairs gave final project approval on behalf of the host institution after the program leader presented the project to the executive council.

Due to unexpected faculty shortages, the host institution asked the program leader to implement the project during the summer 2018 term as clinical hours within the mental health course structure. Because the program leader was the faculty of record for the summer students, the planned implementation was moved to fall 2018, and summer became a pilot project. Thus, the mindfulness program was implemented twice at the host institution.

For the pilot, all traditional and second-degree BSN students enrolled in the mental health course on the main campus were eligible to participate. Students were in the third semester of nursing school. Students learned about the optional mindfulness program during the second week of school classes. The project leader presented information about nursing student stress and anxiety, definition of mindfulness, benefits of mindfulness, what to bring and wear, and a description of some mindfulness activities that would be included in the program.

For the fall implementation, all students enrolled in a first- or second-semester course in the traditional and second-degree tracks were invited to participate. Students learned about the opportunity following a regular course meeting with the same informational content as in the summer pilot project but with added emphasis on the preventative and lifelong usefulness of mindfulness.

As a convenience to both groups of students, the meeting time was selected following an early afternoon class. On exam days, the program leader began the session early, following all students' exam completion.

### **IRB review process.**

Preliminary miscommunication fostered the erroneous belief that the program leader was conducting the mindfulness-based program in the faculty role. It was determined that the fall mindfulness program would be offered by the program leader designated as a third-party doctoral student and not as part of the faculty role; therefore, preliminary IRB review by the host institution determined that full review and approval were not necessary. Doctor of Nursing Practice (DNP) program faculty reviewed program development as it occurred through academic coursework, and the final DNP project was exempt as an evidence-based implementation of best educational practices.

### **Fully Operationalized Project**

#### **Measurement of stress, anxiety, and mindfulness.**

Anxiety, stress, and mindfulness were measured pre- and post-intervention for each student with the timing of assessment following the evidence gathered (Appendix I). The State-Trait Anxiety Inventory (STAI) is a commonly used tool to assess anxiety, and it was used in five of the seven studies that specified a tool. Ratanasiripong et al. (2015) found the STAI had internal consistency of 0.89 pre-intervention and 0.92 post-intervention. In addition, Spielberger, Gorsuch, Lushene, Vagg, and Jacobs (1983) reported internal consistency coefficients from 0.86 to 0.95 based on the STAI manual. However, the STAI was not a self-report scale and required training on administration in addition to a fee per assessment (Mind Garden, 2017). Therefore, due to privacy

concerns, licensing agreements, and additional training, other assessments used in the literature were selected.

The Depression, Anxiety, and Stress Scale which measures depression, stress, and anxiety over the previous week (DASS-21) reported Cronbach's alphas of 0.72 for anxiety and 0.80 for stress (Song & Lindquist, 2015). Chernomas and Shapiro (2013) reported reliability coefficients of 0.969 for anxiety and 0.967 for stress in their descriptive exploratory study of undergraduate nursing students. The depression scale of the DASS-21 can be separated out, and student scores on that scale were not recorded because anxiety and stress were the areas of interest.

The Perceived Stress Scale (PSS) measures perceived stress over the previous month and is reliable in the college student population by showing normative results, internal consistency, and construct validity (Roberti, Harrington, & Storch, 2006). When used with nursing students, Ratanasiripong et al. (2015) reported a Cronbach's alpha of 0.62 using PSS. However, Crary (2013) reported an alpha of 0.87 in assessment of undergraduate nursing student health beliefs and behaviors. In addition, multiple studies in the body of evidence used the PSS tool for determining student stress (Crary, 2013; Lo et al., 2017; McConville et al., 2017; Ratanasiripong et al., 2015; Regehr et al., 2013).

In this project mindfulness was assessed with the Mindful Attention Awareness Scale (MAAS), which evaluates individual differences over time (Barajas & Garra, 2014). Of the three studies specifically measuring mindfulness, two used the MASS. When using MAAS, Song and Lindquist (2015) found a Cronbach's alpha of 0.93 in their sample of Korean nursing students.

### **Timing of assessment.**

The pre-intervention assessments were completed after the information session but before any program content was introduced. Although time was included as a component in one of the search guiding questions (evaluation over a long semester), there were no articles located in the body of evidence that documented measuring the effect of mindfulness over a 16-week period. A few articles included in the systematic reviews evaluated the effect of mindfulness 2-4 weeks after the final meeting, but most evaluated effects at the end of the 8-week program (Falsafi, 2016; McConville et al., 2017; Regehr et al., 2013). Thus, the post-intervention assessment followed the last class meeting at 8 weeks.

### **Stakeholders.**

Stakeholders in this project included students, faculty, administration, industry advisors, potential employers in health care facilities, and patients. It was important to consider students as the primary stakeholders, with attention to their limited time availability as a barrier. Administration, faculty, the industry advisor, and site advisors supported project development and progression. Potential problems and pitfalls were avoided through support and guidance along with consideration of the availability of the student stakeholders.

### **Barriers.**

As part of the triple aim, student preferences regarding the time commitment required for standard MBSR (26-28 hours) seemed unrealistic. Adjustments, as detailed in the literature, were made to account for the students' demanding academic schedules and the possibility that students would not participate knowing the total hours necessary

(McConville et al., 2017; Carmody & Baer, 2009). Ethically, it would have been wrong to exclude students from the benefit of this evidence-based program because the outcomes were reduced stress and anxiety for students. Therefore, all participants attended a reduced-hour MBP. Student non-attendance based on competing time commitments was considered the primary barrier; therefore, the benefits of MBP were clearly defined for the students in the information sessions.

### **Process Indicators and Planning**

Planning for development of the question of interest and implementation of the intervention began immediately upon admission. Process markers were developed and assisted in evaluating progress. Following evidence-based practice steps (Melnik & Fineout-Overholt, 2015) ensured the process followed established criteria. Detailed information on the planning process is shown in Appendix H, including a table which presents an overview of planning and implementation process

#### **Workflow and process markers.**

Rosswurm and Larrabee's Model for Evidence-Based Practice Change (Appendix A) which is integrated into the process planning table (Appendix H), the Logic Model (Appendix J) which provided a graphic representation of the essential functions, and the QI Metrics (Appendix K) served to facilitate progress while minimizing errors and omissions, and maintaining quality (Melnik & Fineout-Overholt, 2015). Month-by-month planning brought a mid-level layer of specificity, while weekly planning of the session agendas kept the implementation phase moving forward and provided guidance on implementation.



## **Mindfulness Program Sessions**

Summary of the body of evidence suggested that this MBP should be offered over 8 weeks for approximately 2 hours per weekly class (Appendix L). Classes included three essential elements of MBP: the body scan, sitting meditation, and mindful movement, with homework to encourage skill development (Gotink et al., 2015; Lo et al., 2017; McConville et al., 2017; Regehr et al., 2013; Falsafi, 2016; Hoge et al., 2013; Ratanasiripong et al., 2015; Song & Lindquist, 2015). Regular practice improves mindfulness (Kabat-Zinn, 2013).

Literature described MBP activities or abilities as including beginner yoga poses, stretching, sitting positions, lying down on mats or blankets, walking, breathing, listening, talking, drinking, and eating (Falsafi, 2016; Kabat-Zinn, 2013; Ratanasiripong et al., 2015; Song & Lindquist, 2015). Activities took place in an indoor classroom with capacity for 15-20 students with movable furniture. The student group and instructor sat in a circle on the floor, so they could see each other for introductions, instruction, practice, and discussions of homework. They will sat or laid in a position of comfort for meditations, yoga, and breathing. Students unable to sit on the floor used a chair. Mindful walking occurred indoors or in an adjacent outdoor area with a lighted, maintained gravel walking path. To ensure quality, MBP critical elements were included in the programs and are described in Table 3.

**Table 3.** Essential Elements of MBP (Kabat-Zinn, 2013)

<b>Core Activities</b>	<b>Definition</b>	<b>Example</b>	<b>Demonstrated Benefit</b>
Body Scan	Tuning in to sensations the body generates associated with life with non-intentional breathing	Feeling the belly or chest rise with breathing, feeling stiffness in ankle joints with legs crossed	Feeling more real and alive; Developing concentration; Allowing stillness and silence
Sitting meditation	Observing the mind dispassionately for thoughts, habits, and reactions; Calming the heart and mind to find an inner balance	Allowing the self just to be (a time of non-doing) after bringing attention to breathing; Dismissing entering thoughts as they are noticed	Developing present awareness; Identifying persistent striving and activity of the mind
Mindful movement	Reminding oneself to be fully awake, to pay attention, and be present in the body, to inhabit the body with full awareness	Performing basic yoga poses; Engaging in mindful walking; Feeling the body move	Moving consciously to focus concentration; Feeling present where you are

### **Student responsibilities.**

The information session included meeting location, time, and suggested attire (athletic wear). No preregistration was required; students simply attended the first meeting. Different strategies were covered in each class; therefore, students were encouraged to attend all classes. All class materials were provided. Assessment tools of stress, anxiety, and mindfulness were introduced.

### **Assessment tools.**

Lo et al. (2017) reported that PSS and DASS were some of the most commonly used tools in systematic review. They also appeared in other evidence (McConville et al., 2017; Ratanasiripong et al., 2015; Regehr et al., 2013; Song & Lindquist, 2015). Details

of the tools identified in decision making for this study are contained in Appendix G. Students completed three assessments about current stress, anxiety, and mindfulness levels including MAAS, DASS-21 stress and anxiety subscales (Lovibond & Lovibond, 1995), and PSS. (See Appendix L weekly agendas.) All measures were self-reported and were scored by the individual completing them. It was expected that results would be similar to results in the systematic reviews and RCTs presented in the literature review. Thus, stress and anxiety was anticipated to be reduced, and mindfulness to be increased.

### **Week-by-week program agenda.**

The week-by-week plan was supplemented by the process markers or QI metrics (Appendix K). They provided detailed information about the expected timeframe, task description, and necessary completion date for program management and operation. This “blueprint” of project tasks is sufficiently detailed so that an alternate program leader could pick it up and implement the project to completion. Activities were based on the evidence that described the mindfulness intervention and provided data showing reductions in stress and anxiety. A detailed description of the long semester program activities is provided in the following sections.

### **Data Collection, Analysis, and Safety Monitoring:**

Students signed a Mindfulness Participant Agreement (Appendix M) which included a general statement of risks and benefits and acknowledged understanding of the program precautions. The signed agreements were explained at the first class with an opportunity for students to ask questions. The agreements were collected separately from any assessments. Agreements were stored off campus and will be shredded following completion of the program and doctoral requirements.

Primary data collected were the three assessments completed at the first session. No demographic data were collected other than the program leader's knowledge of the student's class level. Students received paper and pencil assessments and a scoring template which assisted in proper scoring, as some instruments used negative scales. Completed assessments were recorded on a form in pencil and given back to the student. Students were advised to keep their individual assessments so they could compare their pre- and post-course scores. Because no personally identifying information appeared on the assessments and they were returned to the student, there was minimal to no risk of a breach in confidentiality.

During the eighth class (post-intervention), students completed the same three assessments with the same process. Data were summarized and analyzed using Excel® software. Results from the three measures were examined for raw and mean differences and reviewed against results shown in the body of evidence. Major flaws of this single-group pretest and post-test design are the confounding issues of time and experience. Data collection and analysis were used to confirm expected results demonstrated in the body of evidence and to demonstrate expected improvements to students. All participating students signed a release allowing aggregate data and results to be shared through reports, publications, or presentations.

Results, including but not limited to a description of the survey results and program events, were submitted to the University of Texas at Tyler in partial completion of the Doctor of Nursing Practice degree expected in May 2019. Analyzed data will be utilized to inform future program development for the CON.

### **Risks and benefits.**

The program leader did not anticipate any risk beyond what is encountered in the everyday life of an active college student. The only concerns reported in the literature search were muscle soreness and sleep disturbance (Hoge et al., 2013). Students could opt out of any activity in the rare instance of concerns about their physical ability, but none did. Students benefited by development of skills and strategies that are suggested to reduce stress and anxiety, and increase mindfulness, which led to individual advantages such as increased coping, increased satisfaction with the nursing school experience, and spillover advantages into personal life and relationships, though these benefits are difficult to quantify. Institutional benefits may include stable or increased retention, stable or improved NCLEX results, increased satisfaction with the nursing school experience, and increased student coping abilities.

### **Resources and costs.**

Personnel costs comprised the majority of the budget and included the time and skill of the program leader. All activities were coordinated and led by the program leader, who served as the equivalent of the principal investigator in a research study. The program leader completed an 8-week MBSR course and engaged in the practice of mindfulness for 2 years. (Note that certification is required for MBSR but not MBP offerings.) The budget included personnel costs for future implementation had the course been taught by a paid instructor, rather than a volunteer (Appendix N). Further discussion of this issue appears in the sustainability section.

The host institution provided indoor and outdoor meeting space, phone and internet services, copy service for course materials, access to student emails and post-

class time, and a classroom for information session. These items were not factored into the budget.

Multiple studies reported that methods to encourage student completion of homework were essential (Falsafi, 2016; Hoge et al., 2013; and McConville et al., 2017) and suggested that zip drives or electronic delivery of practice activities may increase homework compliance. Zip drives were removed from the budget based on student preference.

The assessment tools and scoring keys were freely available for download. To increase student comfort, refreshments were served during each class. The total was \$94 for snacks and \$98 for food served during the mindful eating activity. Yoga mats were provided for student use, but some students brought their own pillow, blanket, or yoga mat for practice.

#### **Projected cost and savings.**

Reductions in stress and anxiety which result in enhanced feelings of well-being are intangible and individualized. For comparison, a regional commercial course in mindfulness costs between \$325 and \$400 per person (see Appendix N for full budget). For 12 students, the total commercial cost would surpass \$3,900. For this course, taught by a volunteer program leader, the total cost was \$262 for a savings of almost 93% and still saving 68% when program leader costs were included.

Gotink et al. (2015) reported that mindfulness-based interventions may prevent symptoms from becoming clinical conditions, have negligible risks, and are relatively low cost. Furthermore, mindfulness is added to the student's toolbox, enhancing

student's coping skills as a strategy which may be practiced anywhere and anytime (Song & Lindquist, 2015).

Furthermore, if this MBP prevented even one nursing student from failing, withdrawing, or falling out of sync in progression, the student saves tuition and living expenses in addition to potential student debt. The emotional toll on the student, along with future lost career path and wages, can also be considered. In addition, the Student Counseling Center may benefit by regaining service hours that may have gone to these students prior to the implementation.

### **Approvals.**

Approvals from the DNP graduate faculty occurred at multiple points. The host institution and the industry advisor approvals were completed by written agreement prior to program implementation in June 2018.

### **Evaluation of EBP Model, Change Model, and Logic Model Function within EPIP**

Integration of all models facilitated planning, problem identification and mitigation, and guided the overall implementation. Employing a systematic method approach allowed anticipation of problems and preemptive adjustments.

## **Chapter 4 – Project Outcomes, Impact and Results (EBP Process Step 5)**

### **Summer Pilot Program**

Seven of the 23 students eligible participated in the summer pilot program, which was offered as mental health nursing clinical credit due to emergent faculty shortages. The summer students chose between a mindfulness course or viewing a popular video series on teen suicide for the same amount of clinical credit. Students selecting the video suggested that flexibility in home viewing rather than attending a scheduled program impacted their choice. Nursing students' schedules tend to be challenging with standard academic loads and some students found it impossible to add another 2-hour course to their week.

### **Completion Outcomes: Data Collection, Measurement, and Analysis (Summer Pilot)**

Pre- and post-mindfulness course means were calculated and compared on each instrument (see Table 4). Two scales from the Depression Anxiety and Stress Scale were reported—anxiety and stress. No data on depression were collected or reported.

On the DASS Anxiety scale, students scored in the middle of the moderately anxious category of 10-14 pre-intervention. The post-program mean was 7.14; on the border of mild (8-9) to normal (0-7) anxiety level and represented a 44% decrease in anxiety. The DASS Stress scale revealed a 19% decrease, changing from mild stress (15-18) to 13.14 which was within the normal range (Lovibond & Lovibond, 1995).



**Table 4.** Summer Pilot Results

	<b>DASS Anxiety</b>	<b>DASS Stress</b>	<b>PSS</b>	<b>MAAS</b>
Pre-intervention mean	12.857	16.285	17.571	56.142 (3.74)
Interpretation	Moderate anxiety	Mild stress	Above mean stress	Below mean
Post-intervention mean	7.142	13.142	15.428	60 (4)
Interpretation	Mild-Normal anxiety	Normal stress	Above mean for college aged 14.2	Above mean for college aged 3.83
Percent change	↓ 44%	↓ 19%	↓ 12%	↑ 6%

Summer post-test results on the Perceived Stress Scale showed a modest decrease of 12%. The norm for traditional college-aged adults (18 to 29 years old) was 14.2 (Cohen, 1994). Summer pilot students still scored above the college mean both in pre- and post-scores, indicating higher stress levels. As further comparison, the Perceived Stress Scales norm for females of all ages was 13.7 (Cohen, 1994).

Students scored a mean of 3.74 pre-program on the Mindfulness Awareness Attention Scale. This was lower than the reported mean for college students of 3.83 (N=2277) (Carlson & Brown, 2005). Post-test scores showed a small increase in mindfulness with a group mean of 4, which was higher than the college mean of 3.83 (Carlson & Brown, 2005). Higher scores indicate increased mindfulness.

The reduction in anxiety scores reported on the DASS was the most significant finding and assessed that the nursing student group dropped nearly two categories from moderate to normal anxiety. The results did not deviate from results demonstrated in the evidence with nursing students or general college-aged students.

## Fall Implementation

Minimal changes that did not impact program fidelity were made following the summer pilot. Changes were made based on student preferences and correction of minor schedule incongruences. Detail is provided in the Key Lessons Learned section. Student recruitment, administration of assessments, and program content remained consistent. Students in the fall program received no course credit for participation but did receive a yoga mat on program conclusion. Seven of the 48 students eligible to participate attended. The participants had no other courses instructed by the program leader.

## Completion Outcomes: Data Collection, Measurement, and Analysis (Fall)

On the DASS Anxiety scale, students scored near the top of the moderately anxious category of 10-14. The post-program mean was 6.8, a dramatic 49% reduction which reached normal anxiety levels. The DASS Stress scale revealed a 32% decrease, changing from severe stress (26-33) to 17.6 in the mild range (Lovibond & Lovibond, 1995). (see Table 5.)

**Table 5.** Fall Results

	<b>DASS Anxiety</b>	<b>DASS Stress</b>	<b>PSS</b>	<b>MAAS</b>
Pre-intervention mean	13.33	25.33	22.5	55 (3.66)
Interpretation	Moderate anxiety	High Moderate stress	Above mean stress	Below mean
Post-intervention mean	6.8	17.6	17.2	57.4 (3.83)
Interpretation	Normal anxiety	Mild stress	Above mean for college aged 14.2	At mean for college aged 3.83
Percent change	↓ 49%	↓ 32%	↓ 24%	↑ 4%

Fall post-test results on the Perceived Stress Scale showed a modest decrease of 24%. This group reported significantly more perceived stress in pre- and post-scores at levels well above college norms (Cohen, 1994). Mindfulness scores increased and reached the norm for college aged students (Carlson & Brown, 2005). One student did not complete the post assessments due to illness; that student's pre-intervention assessment was included in the pre-intervention mean as no identifiers were collected to exclude it.

### **Overall Project Results and Impact**

Fall participants reported higher levels on stress and anxiety scales and lower beginning mindfulness levels. It is important to note that fall students were enrolled in first and second semesters of the nursing curriculum, and summer students were in third and fourth semester courses. Fall students reported more significant reductions in stress and anxiety but had a smaller increase in mindfulness. Results in this and all measures were consistent with expectations identified in the body of evidence referenced in prior sections.

## **Chapter 5: Project Sustainability Discussion, Conclusions, and Dissemination**

### **Recommendations (EBP Step 6)**

#### **Discussion of Project Results and Impact**

Clearly, the mindfulness program was effective in reducing stress and anxiety as demonstrated on the evaluation instruments. In the current health care climate, employment in nursing or other health careers will not become easier or less stress-invoking. It is an educator's responsibility to equip students to cope with the challenges they will encounter (Ratanasiripong et al., 2015; Regehr et al., 2013). Once equipped, students can then mobilize the skills learned in mindfulness whenever they are needed in clinical practice. Faculty and/or administration interest in replication of mindfulness programs indicates a concern for academic performance, but perhaps more importantly, for the mental health of their students.

#### **Discussion of Project Sustainability Plans and Implementation**

Several viable options were considered for supporting continuation of the mindfulness program. One summer pilot student commented that they “hope this becomes a permanent part of future courses—both nursing and non-nursing, as mental health is an important thing that society needs to focus more on” (Student A, 2018). Another student remarked that the mindfulness series allowed her to learn techniques for reducing stress throughout nursing school (Student B, 2018). These comments indicated this was a practical option as part of the required clinical hours with little disruption to class time. Mindfulness programming would count as clinical hours and experiential

learning and would be funded through the College of Nursing in faculty workload calculations, resulting in no additional personnel costs. Students would receive 16 hours of clinical credit for participation.

Several studies in the body of evidence suggested that interprofessional groups also benefit from mindfulness training (Lo et al., 2017; McConville et al., 2017; Regehr et al., 2013; Schwind et al., 2017). The program could be offered to interprofessional student groups, as many studies used the intervention with medical, public health, psychology, or other health profession students combined (Lo et al., 2017; McConville et al., 2017; Regehr et al., 2013). Therefore, the second option considered was seeking funding through the Interprofessional Education office to offer mindfulness courses for medical, pharmacy, public health, and nursing students together. Funds would allow students from differing educational tracks to be instructed together, looking for comparisons and changes within and between disciplines. Collaboration with other health professional faculty, administration, and students increases the reach of this evidence-based program. Because mindfulness instruction is low-cost and easy to implement, it is reasonable to assume that adequate funding could be secured through either option.

At this time, offering the mindfulness course as an option to meet clinical requirements is most feasible because students get instruction and experience in using the techniques with little impact on budgets. In addition, this approach aligns best with the body of evidence and programmatic recommendations.

A joint statement of the National Academies of Medicine by Chappell, Holmboe, and Remondet Wall (2018) suggested that health profession education programs'

accrediting agency visitors collect information on efforts to promote the health and well-being of health profession students while in school and on into practice. The authors suggested interprofessional education as a “systems approach” for coordinated efforts and improvements across professional programs (2018, p. 10). In response, interprofessional offerings of mindfulness courses remain a future route.

### **Implications of EPIP Results to Stakeholders**

The key stakeholders, nursing students, received the most benefit from program implementation. Results of assessments revealed important reductions in nursing student stress and anxiety and small gains in mindfulness. Student comments provide further evidence of program impact. Though not measured, resulting relationships showed participating students formed collegial and trusting relationships with the program leader which resulted in philosophical discussions of nursing careers and the future of nursing practice.

Further impact may be seen as students enter the workforce and can summon mindfulness skills for stressful events involving patient or self-care (Smith, 2014). Smith (2014) also remarked that mindfulness could be a tool to manage nurses’ stress with potential to impact patient care and clinical environments.

### **Key lessons learned.**

The informal summer implementation of the model MBP series revealed several issues. Concerns about timing, approach, recruitment, homework compliance, and facilities were identified during the mindfulness pilot.

First, because evidence determined the program should last 8 weeks, timing in the semester is critical. This is even more pronounced in a summer session when weeks are

reduced. Therefore, sessions began the first full week of summer classes. This reduced the time available for recruitment and publicity and pushed the last class to the week before final exams, which may have affected student attention. In a long semester, mindfulness programs began in the second or third week of school and continued for 8 weeks, ending well before “dead week,” end of semester projects, and finals. Recommendations include holding mindfulness in the long semesters or adaptations in number of weeks for the summers. Some studies in the body of evidence were as short as 4 weeks but still maintained positive results (Ratanasiripong et al., 2015).

The introductory/recruitment session presentation for all eligible students included data on college and nursing student stress and anxiety: signs, symptoms, and consequences. The presentation was convincing but may have been too heavy-handed for students with milder or moderate symptoms who thought they did not have enough symptoms to benefit from a mindfulness program. Mindfulness has preventive qualities and may be employed when encountering future stressful or anxiety provoking situations (Kabat-Zinn, 2013). The second information presentation included information on the preemptive benefit of mindfulness.

Participating students requested reminders to complete “homework” during the week. A group email message mid-week served as a prompt to complete daily activities. All students opted in to the email and reported that this was helpful especially in weeks containing exams. Though evidence showed that recorded homework aided in homework compliance, the students verbalized preference for live links to homework. For future programs, two email reminders a week with links to recorded materials will be provided to participants.

Securing an appropriate space is essential as meditations require sitting or lying down, space to walk or practice basic yoga, and space large enough for all participants to form a circle, either on the floor or seated at a table. In addition, audio-visual equipment is needed for music or video-guided activities. Having dimmable lighting was especially useful for setting a calming atmosphere. Student or instructor provided yoga mats or cushions enhanced student comfort. An area that is mostly quiet and free from distraction facilitates a positive practice environment. Therefore, space selection contributes to successful implementation.

### **Recommendation for dissemination.**

A review of current literature on mindfulness and nursing students has been submitted to Nursing Education Perspectives, a publication of the National League for Nurses (NLN). Required revisions are underway. All participants gave their written permission to publish or present program assessment results.

In addition to print articles, a live presentation proposal at a national nursing education conference was prepared and accepted for July of 2019. The results suggest that mindfulness, when tailored to nursing students, appears to aid in coping with stress and anxiety as shown on the assessment results. Therefore, nursing educators are an appropriate audience for this information. Continuing efforts to inform higher education faculty also include a poster presentation accepted for a local teaching and learning conference in May 2019.



## **Conclusions**

### **Role impact.**

Doctorally prepared educators are expected to lead educational change. The evaluation of programs they design and implement could hence be linked to improved student and/or patient care outcomes (NLN, 2013). Of special note, two of the NLN recommendations for doctoral education which speak directly to this construct are: to “translate and implement findings from nursing education research” and to “manage learning environments with increasing student diversity” (NLN, 2013, p. 4). In this case, increasing diversity is found in the numbers of nursing students entering school experiencing mental health concerns and/or stressful challenges in nursing school. In addition, the NLN recommendations value evidence-based educational and teaching strategies to improve educational practices (NLN, 2013). The body of evidence supports mindfulness programming for college students. Furthermore, opportunities for interprofessional collaboration increase the reach of the knowledge and skills of DNP nurses.

As a DNP nurse, the process of validating the need for change, designing an intervention from available evidence, then implementing and evaluating the intervention is a process that will be used consistently as a way to effect change in the landscape of nursing education. It is not enough to understand why students should learn a particular concept or piece of information, but educators should also strive to determine which evidence-based information is best and which evidence-driven method most effectively evaluates the instruction. The process used in the evidence-based project implementation

plan will guide future efforts and facilitate a positive impact on nursing students and nursing education.

### **Organizational issues.**

Widespread support for the mindfulness series was given by the 2017 executive team of the College of Nursing. Increasing mental health concerns in students created a need and opportunity for such an offering. Student counseling services, available to all students including nursing, operate at near capacity despite a healthy budget. One-time and short-term sessions (<6) are offered as space is available. Several ongoing groups also operate for stress reduction; however, mindfulness series were not available at the time of this nursing implementation. Thus, mindfulness classes filled a gap for nursing students by providing active assistance in reducing or helping students cope with stress and anxiety.

Since then, major leadership changes have occurred in the College of Nursing. However, support for student well-being and for students with mental health concerns remained stable. The mindfulness course represents an overt symbol of that interest.

Faculty, who also succumb to stress and anxiety for various reasons, have expressed interest in a modified faculty series. Efforts to offer online resources and in-person instruction are in development for faculty.

### **Final Result**

Evidence suggests that mindfulness will reduce stress and anxiety in nursing students incurring additional stressors and challenges related to concurrent classroom and clinical instruction (Bartlett et al., 2016; Chernomas & Shapiro, 2013). The experiential nature of mindfulness with instruction and guided practice ensures that students learn and

become skilled in multiple strategies which can be utilized when needed. Randomized controlled trials are recommended to ascertain specific benefits for nursing students, but enough literature support exists to offer mindfulness as a solution for nursing student stress and anxiety.

The potential advantages outweigh any concerns, as mindfulness is relatively inexpensive to implement, low risk, can be tailored to the participating students, is non-pharmacological, and can be used anywhere and anytime. Therefore, mindfulness could address the mental health concerns of college and nursing students as a cost-effective, flexible, and self-directed solution provided by the school. Indeed, mindfulness may facilitate successful coping in nursing school and beyond in the transition to professional practice.

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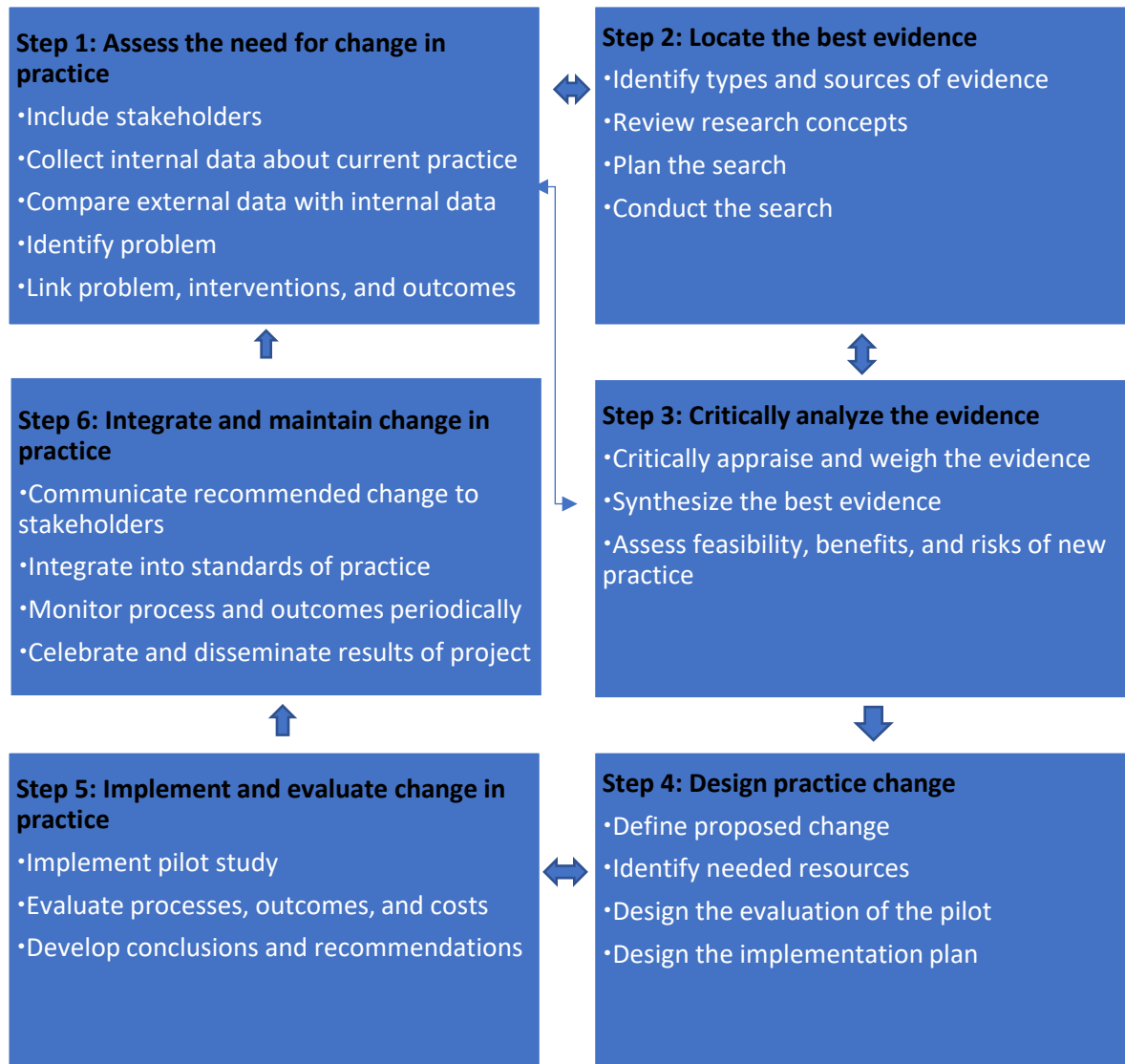
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## Appendix A: Rosswurm & Larrabee Model for Evidence-Based Practice Change



## Appendix B: Evaluation Table

Citation: author(s), date of publication& title	Purpose of Study	Conceptual Frame work	Design/ Method	Sample/Setting	Major Variables Studied and Their Definitions	Measurement of Major Variables	Data Analysis	Study Findings	Appraisal of Worth to Practice Strength of the Evidence (i.e., level of evidence + quality [study strengths and weaknesses]) <b>RECOMMENDATIONS</b>
Gotink, 2015.  Standardised mindfulness- based interventions in healthcare: An overview of systematic reviews and meta-analyses of RCTs.  <i>PLoS One</i> .  Netherlands  No funding - internal grant	SR and meta- analysis- evidence of effectiveness of MBSR and MBCT in different PT categories	None	299 considered, used 23.  PRISMA guidelines.  Included only RCT – risk of overlap - a priori maximum of 10% per PT category.  Results pooled by outcome  RCT results – intergroup – intervention vs. WL, TAU, or AT.	23 reviews including 115 unique RCTs & 8683 unique individuals.  Pts with mental and physical disorders, added treatment for PTs with cancer, CV disease, chronic pain, DEP, ANX disorders, and in prevention in healthy adults and children	IV1-MBSR (standardized 8- week course)  IV2- MBCT (standardized 8- week course)  DV1- DEP  DV2- ANX  DV3- Stress  DV4- QOL  DV5- Physical functioning  DVs not defined	Data synthesis by random effect analysis.  Instruments varied by RCT.	SMD – Cohen’s d & Hedges’ g combined  Weighted mean difference, t-value, odds ratio, hazard ratio, and risk ratio.	MA results:  95% CI  ANX - sig beneficial effect on ANX. -0.48 = moderate effect that favors mindfulness. 95% CI, test for overall effect: Z=11.72 (P<0.00001)  Stress – sig beneficial effect on stress. - 0.51= moderate effect that favors mindfulness. 95% CI, test for overall effect: Z=6.57 (P<0.00001)	Level I- SR/MA  Worth to practice: Confirms effect of M on large/diverse population  Strengths: •Large/diverse population increases generalizability. •Beneficial effects seen in DEP, ANX, stress and QOL after MBSR or MBCT. •Dose response relationship+ more minutes of practice and class attendance = larger reduction of stress and mood complaints. •Quality of RCT provides relevant estimate for clinical practice.  Limitations: •Mixed population – interpretation of this group’s effect is difficult. •Unblinded treatment groups present risk of bias, may lead to placebo effect. •Some overlap in studies (8% in meta-analysis). •Risk of publication bias. •Possible false impression of homogeneity at the meta-meta level. •Lower quality RCTs reported more effect than high- quality RCTs.  Benefits to adding MBSR/MBCT to TAU: •Easy to implement •Allow PTS to take more active role in treatment.  •Little physical or emotional risk involved. •Cost relatively low with just one trainer. •Does require pts to practice/spend time •Difficult to pinpoint which part helped the most as several activities included.  Feasibility: •SR shows effectiveness of MBSR/MBCT with minimal risk and moderate positive significant effect on

**Key:** ANX= anxiety; AT= active treatment; BAI= Beck Anxiety Inventory; BF= biofeedback; btw= between; CG = Cochrane Guidelines; CGI-I= Clinical Global Impression of Improvement; CGI-S= Clinical Global Impression of Severity; CVD= cardiovascular disease; DEP= depression; DS= depressive symptoms; DX= diagnosis; GAD= generalized anxiety disorder; HAM-A= Hamilton Anxiety Scale; M= mindfulness; MB= mindfulness-based; MBI= mindfulness-based interventions; MBSR=Mindfulness-based stress reduction; MBCT=mindfulness-based cognitive therapy; MM= mindfulness meditation; NS= non-significant; NSG= nursing; NTT= Needed to treat; PT= patient or patients; RCT= randomized controlled trial(s); RESP= respiratory rate; RR= risk reduction; QOL= Quality of life; SAS= State Anxiety Scale; SD= standard deviation; SE= significant effect; SI= significant improvement; SIG= significantly; SIGD= significant difference; SMD= standardized mean difference; SME= Stress management education; SR= Systematic review; STAI= State-Trait Anxiety Inventory; STU= student or students; SUDS= Subjective Units of Distress Scale; TAU= treatment as usual; TSST= Trier Social Stress Tests; UG= undergraduate; WL= wait list or wait listed; #\_ = number in sample

Citation: author(s), date of publication & title	Purpose of Study	Conceptual Frame work	Design/ Method	Sample/Setting	Major Variables Studied and Their Definitions	Measurement of Major Variables	Data Analysis	Study Findings	Appraisal of Worth to Practice Strength of the Evidence (i.e., level of evidence + quality [study strengths and weaknesses]) <b>RECOMMENDATIONS</b>
									ANX and stress. •Practical for NSG student population.  Note: Overlap of Song & Ratanasiripong articles
Lo, 2017.  Group interventions to promote mental health in health professional education: A systematic review and meta-analysis of randomized controlled trials  <i>Advances in Health Science Education</i>  Australia  No funding or conflicts noted	Identify the evidence that supports interventions suitable for embedding in usual health professional curriculum and that could be delivered to groups of learners  Secondary aim: describe the program elements	None	Searched 6 databases through April 2016  11,744 articles down to 24 meeting full criteria (process shown)  Considered bias using PEDro scale  PRISMA Guidelines  Results pooled by outcome	UG or PG health professional students	IV 1 Psycho-educational/cognitive-behavioral compared to alternative education  IV 2 Mindfulness or relaxation compared to control conditions  DV 1 Anxiety DV 2 Depression DV 3 Burnout DV 4 stress  Not defined	STAI for anxiety most common  DASS for depression most common  PSS for stress most common	Grouped interventions then used Cochrane Collaboration guidelines.  Hedges g for effect size reported in SMD and SD  95% CI	Mindfulness and no intervention:  ANX- SMD -0.16; 95% CI, -0.25 to 0.12; p=.49. Test for overall effect Z=0.70(P=0.49) not significant  Stress – SMD -0.54; 85% CI, -0.85 to -0.24; p=.0004. Test for overall effect Z= 3.52 (P=0.0004)	Level I – SR/MA  Worth to practice: •Found sig effect of M on stress, but not ANX – may be due to low baseline – no room to reduce ANX level  Strengths: •Total of 2491 students. •Specific to health professions  Limitations: •English language limited articles •Not that many RCTs available – some low quality with risk of bias and problems with internal validity  Implications: •Most studies in USA and Canada. •Duration of activity mean 79 minutes; mean number of sessions was 11  •Educational interventions varied.  Feasibility: •Could be implemented •Similar to others
McConville, 2017.  Mindfulness training for health profession students – The effect of mindfulness training on psychological	SR to assess effect of M training in medical & other health professions students & compare effectiveness of different MB programs.	None	Used RCT and parallel prospective cohort trials with comparison and intervention groups assessed at the same time.	19 studies with 1815 participants (12 actual RCT).  UG or PG students in medicine, psychology, social work, NSG, occupational	IV1- M (not transcendental meditation or relaxation – only MBI)  DV1-DEP DV2- ANX DV3- Stress DV4- Wellness	All pre/post intervention with 7 of 19 having more follow-up between 3 weeks & 9 months  Instrument depends on study (STAI,	<i>NOTE: Negative SMD values used for favoring group receiving M (Inverse variance methods)</i>  95% CI calculated	<b>MA results:</b>  ANX - SE favoring M (SMD=-0.44; 95% CI: -0.59 to -0.28; p < .01) Test for overall effect: Z= 5.57 (P<0.00001)  Stress - SE favoring M (SMD= -0.44; 95% CI: -0.57 to -	Level I – SR/MA  Worth to practice: •Standard MBSR, shorter MBSR, & Mindful Gym effective  Strengths: •Blinding of outcome assessment, selective reporting and clear eligibility criteria •Risk of bias (chart) reported – some high risk •Decrease in stress and ANX across all student groups  Limitations: •STU with higher ANX and stress may self-select (may be more motivated and engaged) •Moderate

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well-being, learning and clinical performance of health professional students: A systematic review of randomized and non- randomized controlled trials.  <i>EXPLORE.</i>  Australia.  No external funding reported.	Identify effect of M in reducing stress, improving psychological well-being, enhancing student learning & clinical performance  Secondary aim: describe the interventions and how they were integrated into the curriculum and which components seemed most effective.		PRISMA review of 6 databases through 6/2016.  Peer- reviewed. English.  Search strategy based on PICO model.  Meta-analysis evaluating the effect of M, ANX, DEP, stress, mood, self- efficacy and empathy	therapy, podiatry, dietetics, and physical therapy.  Medical DX excluded.  Interested in normal/healthy student population.	DV5- Study engagement  DV6- Empathy  DV7- Self- compassion  DV8- Self- regulation  DV9- Self- efficacy  DV10- Reflective practice  DV11- Academic achievement  Also, nature, frequency, length, content, part of core curriculum or elective.  DVs not defined.	POMS, Symptom Checklist, PSS, DASS and more)	using Hedges-g SMD with mean & pooled SD  Standard values of 0.2, 0.5 and 0.8 for small, moderate and large effects.  Funnel plots used to test for publication bias with 10 or more studies.  Inverse variance methods	0.31; $p < .01$ ) Test for overall effect: $Z = 3.75$ ( $P = 0.0002$ )  M – Small effect favoring M ( $SMD = -0.24$ ; 95% CI: -0.30 to -0.09; $p < .01$ ) Test for overall effect: $Z = 3.09$ ( $P = 0.002$ )	methodological quality •No blinding due to nature of intervention •Only 6 with allocation concealment, 7 with randomization •MBSR requires trained staff, large time commitment, and cost of running groups •Can't compare timing of intervention in curriculum •Positive outcomes of MBI in decreasing ANX, stress and DEP, increasing + mood states, self-efficacy, M, and empathy. •△ in ANX & stress maintained at follow up. •MBSR had larger effect than mindful meditation alone •Activities of MBSR gave STU options to practice •Discussing application and sharing use in group gives range of ways to engage •No qualitative data on experience  Implications: •Half based on MBSR, but still had variation in length and time of sessions. •Shorter or DVD delivered program also decrease stress and mental distress •M meditation alone had no effect in 1 study, non-sig in 2 others  •Allow self-selection of STU with higher perceived stress to target STU most in need •Need to identify barriers to home practice – possible use of apps  Feasibility: •Effectiveness of MBSR/MBI with minimal risk and moderate positive significant effect on ANX. •Included NSG student population. •Decrease in stress and ANX in all student groups
Regehr, 2013  Interventions to reduce stress in university	SR on effectiveness of interventions aimed at reducing stress among	None	Reviewed 9 databases by Cochrane Collaboration Handbook for UG, grad, or professional students who	24 in meta- analysis with 1431 students  Majority women.	IV1 – Arts based interventions (using drumming, poetry to express thoughts and feelings)	Pre-post program assessment  Varied by study (STAI,	<i>NOTE: Negative SMD values used for favoring group receiving M</i>	Cog/beh/M on ANX - $SMD -0.77$ , 95% CI, -0.88 to -0.58. Test for overall effect $Z = -9.565$ ( $p = 0.000$ )	Level I – SR/MA  Worth to practice: •Focused on university students •Significant reduction in ANX •Strong support that mindfulness reduces the effects of stress including reduced anxiety

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students: A review and meta-analysis  <i>Journal of Affective Disorders</i>  No conflicts or funding  Canada	university students		participated in stress reduction programs.  Excluded medication only or medication combined.  No single group designs.  Peer reviewed, English  Reviewed random allocation or parallel cohort design at the same time	Various majors including health sciences	IV2 – Psycho- educational intervention (online stress management program)  IV3 – Cognitive/ behavioral/ MBI (control of physical reactions - breathing, identifying neg or dysfunctional beliefs, relaxation, coping skills, awareness of body/breath, yoga, acceptance of self & others)  Mindfulness practices (body scan, mindful breathing, hatha yoga postures)  DV1 Stress – not defined  DV2 ANX – not defined	PSS, BDI, POMS, DASS and others)	(Inverse variance methods)  Pooled change in primary outcome – ANX  SMD using Hedges g  95% CI  computed using random effects model	M specifically on ANX - SMD: - 0.73, 95% CI, -1.00 to -.45. Test for overall effect Z= - 5.182 (p=0.000)  Meta-analysis: Cognitive, behavioral, mindfulness interventions focused on stress reduction significantly reduced symptoms of ANX	Limitations: •Only 24% males •English language only •Limited cultural generalizability  Strengths: •Included NSG STUs •Majority in US  Implications:  •Included shorter interventions that were still effective •Interventions may have widespread benefits in enhancing student experience and reducing mental health costs and problems  Feasibility:  •Interventions between 4-8 weeks, as few as 1 session •College/university specific
Falsafi, 2016  A randomized controlled trial of mindfulness versus yoga: Effects on depression and/or anxiety	To compare the effectiveness of 2 interventions and a non- intervention in mitigating the effects of depression and/or anxiety	None	Repeated measure design with random assignment to 3 groups with stratification for gender (2 intervention and 1 control)	Sample of 90 students with DX of DEP and/or ANX over age of 18 from mid-sized university 30 in each group	IV1 - M (state of being aware in the present moment, observing every moment without judgement, non- sectarian. Included self- compassion)	BDI, HAM, Student-Life Stress Inventory, Self- compassion scale, and Cognitive and Affective	Descriptive state with multivariate analysis of variance  2-sided P values less than .05	HAM from 22.2 to 11.8 (p<.01) significant decrease  CAMS from 20.5 to 26.5 (p<.01) significant increase	Level II – RCT  Worth: •Guide to class meetings •Practical for student's schedules •Saw results in as little as 4 weeks, with full result at 8 weeks •Yoga also decreased anxiety (yoga is part of mindfulness)  Limitations: •86% female and white •Did not separate out social support effect of

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in college students  <i>Journal of the American Psychiatric Nurses Association</i>  No conflict  Funding through nursing school grant  North Carolina	in university students		8 weeks of training for 75 minutes each (total 10 hours) with 20 minutes daily practice at home  Students continued normal treatments (medication and/or psychotherapy)	Used mass emails and flyers to recruit  Approved by IRB  Excluded certain diagnoses, any with active substance abuse, those currently or recently practicing yoga, and those with physical disabilities that prevented the activity  80% retention	IV2 – Yoga (Hatha yoga only)  DV1 – symptoms of DEP (no def)  DV2 – symptoms of ANX (no def)  DV3 – levels of stress (no def)  DV4 – mindfulness (no def)  DV5 – self- compassion (no def)	Mindfulness Scale-Revised  All self-report, measured pre, mid-point at 4 weeks, post at 8 weeks, and follow up at week 12	were significant  Bonferroni correction to reduce chance alone changes  Statistical power for the test was 0.42 for 67 subjects with medium effect	Compared to control group, ANX, DEP and stress symptoms in M group significantly decreased  M scores significantly increased	group •Small sample size •Self-report, subject to recall bias •25% attrition rate  Strengths: •Included nursing students •Included control group •12 week follow up •Report form for home practice at each meeting  Implications: •Easy to learn practices, then practice on their own •Collected data over 2 semesters  Feasibility: •Cost-effective for college students •8 weeks, 75 minutes each class (10 hours total) works for busy student schedule •Mean age like my student group  Notes: •Detailed schedule of classes on page 485 – potential model •Received book on mindfulness, thumb drive with music and guided meditations and journal to record home practice •Yoga group received a mat, yoga strap, and journal to record home practice •\$20 gift certificate after completion
Hoge, 2013  Randomized controlled trial of mindfulness meditation for generalized anxiety disorder: Effect on anxiety and stress reactivity	First RCT comparing MBSR with an active control for generalized anxiety disorder (chronic worry and physiological hyperarousal symptoms)	None	Adults (18+) responding to ad and referrals to “stress reduction” study  Accepted if met DSM-IV criteria for current primary GAD, GAD is primary problem,	89 adults qualified after screening and exclusions.  48 in MBSR Males #25, females #23, mostly White, mean age 41  41 in SME	IV1- MBSR  8-week 2-hour classes, full day retreat, homework, with breathing, body scan, gentle yoga  IV2- SME  8 week 2-hour class, 20 minutes of homework, 4- hour class	Analysis with STRATA 11.1 for modified intent to treat sample for participants in at least 1 session.  ANX Symptoms:  HAM-A (@ baseline and 8-week	ANX – ANOVA and HAM- A scores (F(1,87)=2. 86, P<0.001)  ANX ANOVA and BAI scores (F(1,79)=4. 31, P=0.041)	HAM-A decreased SIG in MBSR and SME  HAM-A No SI in treatment arm and time interaction  BAI – SI for both MBSR and SME, greater decrease for MBSR. SIG	Level II – RCT  Worth to practice: Brief MBSR reduced anxiety symptoms in patients with GAD even when compared to active control condition  Strengths: •Careful design and randomization minimized bias •Independent review of course content and delivery consistency •Learning MM improved coping during stress – may raise resilience for stressful challenges  Limitations: •Small sample •Co- morbidities reported btw ANX and DEP may be low, affecting generalizability

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<p><i>Journal of Clinical Psychiatry</i></p> <p>One author serves on pharmaceutical advisory board, but no commercial or financial relationships</p> <p>Boston</p>	<p>Designed to correct deficits in past research</p> <p>Hypothesized that MBSR would have greater reduction in ANX symptoms and stress reactivity than SME (stress reduction education)</p>		<p>scored 20 or more on Hamilton Anxiety Scale (HAM-A)</p> <p>Multiple and specific exclusion criteria</p> <p>IEs blinded to treatment assignment did assessments</p>	<p>Males #19, females #22, mostly White, mean age 37</p> <p>3 quit, 1 was disqualified after start</p>	<p>Didactic format on stress, stress physiology, effect of stress on body systems, time management, sleep physiology, insomnia, optimal nutrition, effect of stress on diet, exercise, stress hardness, buffering factors humor, altruism, and volunteering. Gentle stretching instead of yoga. NO PARTS OF MBSR. Matched time and structure of MBSR</p> <p>DV1- Anxiety (worry that is difficult to control and symptoms like poor sleep, muscle tension, and irritability)</p> <p>DV2 – Stress reactivity (not defined)</p>	<p>endpoint) defines a priori as the primary &amp; CGI-S and BAI as secondary</p> <p>ANX during stress event assessed by STAI and SUDS.</p> <p>All instruments widely used</p> <p>ANOVA for <math>\Delta</math> in clinical symptoms and psychometric measures</p> <p>Level of SIG set to 0.05 (two-tailed)</p>	<p>ANX ANOVA and CGI-S</p> <p>(F(1,84)= 4.51, P=0.0366)</p> <p>ANX ANOVA and CGI-I: Used very much improved or much improved.</p> <p>MBSR= 66%, SME= 40% (P=0.025)</p> <p>Risk ratio for MBSR was 1.65 (95% CI, 1.04-2.60)</p> <p># NTT was 3.9 (95% CI, 2.23-26.19)</p>	<p>Treatment arm and time interaction</p> <p>CGI-S SIG for both groups, greater for MBSR SIG treatment arm and time interaction</p> <p>CGI-I greater response for MBSR than SME</p>	<p>•Some participants taking psychotropic meds •Lacked a clinical assessment at endpoint</p> <p>Adverse events: muscle soreness (1 person) and sleep disruption (1 person)</p> <p>Some inconsistency in early data collection</p> <p>Feasibility: •Cost-effective, low stigma, accessible treatment option for anxiety (p. 2)</p> <p>Notes:</p> <p>•Adapted MBSR to 2-hour sessions, half day retreat, and 20 minutes of homework</p> <p>•Used CD for lovingkindness meditation</p> <p>•MBSR had greater effect on sleep</p>
<p>Ratanasiripong, 2015</p> <p>Stress and anxiety management in nursing students: biofeedback and</p>	<p>Investigate effect of BF and MM interventions on levels of anxiety and stress in 2nd year NSG students</p>	<p>Lazarus and Folkman's Theory of Stress and Coping for background</p>	<p>Randomly assigned after consent to BF, MM (Vipassana), or control group</p>	<p>2nd year NSG STU 90 invited, 89 participated</p> <p>Only female students</p>	<p>IV1- BF (info on physiologic response from a device, learning to modify them)</p> <p>IV2- MM (focusing one's mind in the present moment,</p>	<p>Pre and post intervention survey</p> <p>Perceived Stress Scale (PSS) – Cronbach's alpha was 0.62 pre and</p>	<p>PSS – MM group</p> <p>MM group</p> <p>Pre-Mean - 17.24</p> <p>Post mean – 14.90</p>	<p>PSS – MM group SIG ↓ from preintervention</p> <p>PSS control – no SE</p> <p>SAS – MM group SIG ↓ from preintervention</p>	<p>Level II – RCT</p> <p>Worth to practice: mindfulness meditation significantly reduces anxiety and perceived stress in nursing students</p> <p>Strengths: •Contributes that mindfulness meditation is effective in reducing ANX and stress in nursing students •Detailed</p>

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mindfulness meditation.  <i>Journal of Nursing Education.</i>  Completed in Thailand, written by California PhD  Denied conflicts  No funding	To provide coping interventions  Provide nurse educators with intervention programs	und and significa nce		18-21 years old  Public nursing college in Thailand  G*Power needed 66 participants, had 89.	maintaining non- judgmental attitude, detached from destructive thoughts and feelings)  DV1- Perceived stress (level of perceived stress in the last month)  DV2- State anxiety (temporary situational anxiety)  Anxiety – state of apprehension and out of proportion response to perceived threat	post intervention  STAI State Anxiety Scale (SAS) – Cronbach’s alpha was 0.89 pre and 0.92 post intervention  ANOVA for demographics and pretest variables – no SD in demographics or measures	Pre SD – 4.16  Post SD – 3.44  SAS-  MM group  Pre-mean – 25.45  Post mean – 21.28  Pre SD – 7.8  Post SD 6.95  SAS effect  F[1,28] = 14.36, p = 0.001, $\eta^2$ = 0.34)  ANOVA of 3 groups at postinterven tion – no SIGD (F[2, 86] = 1.48, p>0.05)	SAS control – no SE  SIG interaction effect - Decreases in ANX greater in MM & BF groups. No decrease in control.  BF SIG ↓ ANX, maintains stress level  MM SIG ↓ ANX and perceived stress in NSG STU	process and elimination of participants •SE for BF and MM with ANX  Limitations: •Female only •Traditional college age only •Lack of long-term follow up •Studies MM, not MBSR (MM is part of MBSR)  Feasibility: •Nursing student population  Notes: •Two training sessions for BF or MM, then home practice 3x a day for 4 weeks •Suggests nurse educators become more concerned about NSG student health and aid those in distress  •Integrate into NSG curriculum  •Mindfulness meditation alone or a brief program  •Shows that MM part of mindfulness- based interventions is effective in reducing stress and anxiety
Song, 2015.  Effects of mindfulness- based stress reduction on	To examine the effects of MBSR on depression, anxiety, stress, and	None	2 group RCT, pretest- post-test design	UG NSG students invited through website and flyers	IV1- MBSR (not standard program)  DV1-DEP	Depression, Anxiety and Stress Scale - 21 (DASS- 21).	SPSS – chi square and t-tests to compare baselines and	Mean ANX reduced by 3.9 in MBSR, unchanged in WL group (F=5.61, df=1, p=.023). 6.7 to 2.8 in	Level II - RCT  Worth to practice: Briefer MBSR program increases mindfulness and decreases

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depression, anxiety, stress and mindfulness in Korean nursing students.  <i>Nurse Education Today</i>  Korea   Funded by National Research Foundation of Korea, Ministry of Education, Science and Technology	mindfulness in Korean NSG students		MBSR group – 8-week course for 2 hours each (16 total hours)  Other group - WL	Randomized after consent, no contact between groups  No previous exposure to MBSR  No active psych symptoms  G*power3 analysis required 26 per group, got 25 each group  Completed - 21 in MBSR and 23 in WL  Withdrawals explained  No SD between groups before study	DV2- ANX  DV3- Stress  DV4- M  No definitions, but author showed link between issues and NSG students	7 items per scale. Range 0-42 – higher scores = more DEP, ANX and stress.  Cronbach's alphas were .81 DEP, .72 ANX and .80 for stress  Mindfulness Attention Awareness Scale (MAAS) – 4 scales, 20 items. Higher score = more M. Cronbach's alpha was .93	demographics  ANCOVA using pretest as the covariate to compare DEP, ANX, stress and M between MBSR and ML groups	MBSR group pre to post test.  Mean stress in MBSR group down 27.1 and 16.3 in WL group (F=15.31, df=1, p<.001).  M in MBSR increased 10.8, 1.3 in WL group (F=5.03, df+1, p=.010)  .	depression, anxiety and stress of nursing students  Strengths: •Baseline similarities •Significantly greater decreases in MBSR than WL for DEP, ANX and stress  Limitations: •Single university with small, non-representative sample; limits generalizability •Only female students •“Homework” not confirmed  Feasibility: •NSG student population •Briefer standard MBSR 8-week program Suggest duration of at least 1.5 hours to have SE •“Reasonable” approach to managing DEP, ANX and stress in NSG students •Non-pharmacological approach that can be practiced anywhere and anytime  Notes:  Agenda on page 88
Carmody, 2009  How long does a mindfulness-based stress reduction program need to be? A review of class contact hours and effect sizes for	Systematically study the effects of variation on the standard 26-hour MBSR program  Relationship between degree of change with treatment and	None	Searched Medline and Psych Info for MBSR effect on psychological distress, including neg mood and affect, stress and ANX  Hand searched reference lists	30 studies identified – populations varied greatly.  Effect sizes calculated for comparison  When no mean or SD reported, used effect size	IV1 – Effect from MBSR  DV1- Number of sessions (4-10)  DV2 – Length of session (60 to 150 minutes)	Varied by study  POMS,  BAI, BDI, HADS, STAI, PSS, etc.	Studied between group effect size (d) at post-treatment  Calculated single mean effect for each study even when several	Pre MBSR-mean d: .63  No difference in clinical and non-clinical samples in effect size for psychological distress  No difference in effect for full day, half day or no retreat  MBSR compared to wait list or mean	Level V – Lit Review  Worth to practice: No evidence that shorter version of MBSR was less effective than the standard form in reducing psychological distress  Strengths: •Included students in studies  Limitations: •Some categories had small number of effect sizes – use caution in interpretation •Other factors like instructor skill may obscure time factor  Implications: •Most frequent number of sessions was 8 •Most frequent number of

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psychological distress.  <i>Journal of Clinical Psychology</i>  No Conflict or funding noted  Massachusetts	number of hours		Included English, with adults, pre/ post comparisons, means and SD for the change in distress  Not included: Unpublished, reporting only %↓, and other therapies	calculated from t values or statistical significance (Rosenthal formulas)	DV3 – Total in class hours  DV4 – ANX  DV5 - Stress		factors were studied	effect size .54 (SD=.47) medium effect  Effect size across all programs – no significant difference in length of program except 1 outlier	minutes per week was 120 minutes •Total in class hours from 6 to 28 with mean of 17.7  Feasibility: •Standard MBSR still has the most evidence, but briefer program could work for those unable to commit to full program  Notes: •Eligible participants refused an MBSR program based on time required in previous research •Time can create significant strain on already overcommitted schedule (p. 628)
Smith, 2014  Mindfulness- based stress reduction: An intervention to enhance the effectiveness of nurse’ coping with work related stress  <i>International Journal of Nursing Knowledge</i>  USA  No conflict or funding noted	Explore the current state of MBSR intervention to help nurses effectively cope with stress	None	Six databases  Standardized search terms  Empirical articles on nurses or NSG STU are included  MBSR or modified MBSR  Excluded if not based on MBSR  13 articles included  matrix method for recurring themes	Vary – review of 13 articles	IV1 – MBSR  10 used standard 8-week format  3 used 4-week format  Sessions from 30 minutes to 2.5 hours. Some used retreat  Most required homework  Defined stress – biopsychosocial response to negative or positive factors in one’s environment  Defined anxiety – fear, dread and	Varies by study  ANX measures – Hopkins Symptom Checklist SCL-90-R, STAI, POMS	Summary of data provided in table by study – not aggregated	Benefits by recurring themes  MBSR has the potential to improve patient care and nurse clinical environments  MBSR decreased anxiety in studies reviewed	Level V  Worth to practice: As demands on nurses grow, M is a tool to help manage stress  Strengths:  •Grouped benefits by theme  •Shows MBSR can help nurses’ ability to cope with stress  Limitations:  •Limited demographic information but reported ones mostly White females  •Age mostly 20s for students, 40s for working nurses •No study validated the length of participation to create optimal results •No direct comparison bwt traditional and short length MBSR – what dose if effective? •No studies examined impact of trainer •Most conclusions based on student nurses  Feasibility:

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Citation: author(s), date of publication & title	Purpose of Study	Conceptual Framework	Design/ Method	Sample/Setting	Major Variables Studied and Their Definitions	Measurement of Major Variables	Data Analysis	Study Findings	Appraisal of Worth to Practice Strength of the Evidence (i.e., level of evidence + quality [study strengths and weaknesses]) <b>RECOMMENDATIONS</b>
			11 quant, 2 qual, 7 RCT		nervousness associated with perceived or actual stressors				<ul style="list-style-type: none"> <li>•More than half of the articles used a nursing student population</li> </ul> Notes: •Similar student population
Turner, 2017  Stress and anxiety among nursing students: A review of intervention strategies in literature between 2009 and 2015  <i>Nurse Education in Practice</i>  USA  No conflict of interest noted  No funding given	Update Galbraith and Brown's original study of effective interventions to manage stress in nursing students  Identify most effective methods of non-pharmacologic stress management  Report the current status of research	Transactional model of stress and coping	Searched Medline, CINAHL, and PsychINFO  English only btw 2009 and 2015  Qual or quant results, targeting stressors, coping strategies, or reappraisal of stressors (stress or ANX)  BSN level in US, UK, or Canada  Initial search 783 articles, 26 remained	Vary – review of 26 articles	DV1 – Reducing number or intensity of stressors  DV2 - Coping responses  DV3 - Reappraisal of stressors  DV4 – Combinations of approaches	DV1 – related to curriculum development  DV2- physiologic or psychological coping methods or stress mgmt. to alleviate consequences of stress  DV3 – changing the interpretation of stressors, changing stress response  DV4 – 4 studies combining approaches	Summary of data provided in table by study – not aggregated	DV1 – Stressor reduction alone inconsistent  DV2 – Alleviate consequences of stress by improving coping had conflicting results  DV3 – Reappraisal – positive result  DV4 – decreased stressors and increased coping had SIG results  Interventions using reappraisal either alone or with other method were consistently positive	Level V – SR of qualitative or descriptive studies  Worth to practice: •Reappraisal alone or with other measures was consistently positive (non-judgmental attitude in MBSR)  Strengths: •Updates original study of interventions •10 additional studies from original article – more “research”  Limitations: •Studies varied greatly in design, sample size and outcome measures •Samples lacked diversity, not representative •Most studies quasi-experimental – low methodological rigor •No long-term follow up  Feasibility: •Call for more research  Notes: •Still need more RCT with larger sample sizes
Schwind, 2017  Mindfulness practice as a teaching-learning strategy in higher education: A	Explore how UG and GRAD STU experience brief instructor-guided M practice in relation to feelings of	None	8-week program with 5-minute Breathing and lovingkindness meditation at beginning and end of class.	UG/GRAD STU at urban university  Recruited through classes  Included 52 eligible nursing, child and youth care, and early	IV1- M  DV1 – feelings of stress  DV2 – feelings of anxiety  DV3 – feelings about M	Questions: Describe your experience in M practice.  How did brief M practice impact your academic work, your	Interview results STU:  Feelings of calm/ inner peace  Allowed me to focus	Self-reported decrease in anxiety and stress  Sense of relaxation and well-being, slowed the pace	Level VI – qualitative exploratory pilot  Worth to practice: STU reported increased sense of calm and decreased ANX  Strengths:  •Included nursing students •Instructor given a script to follow for interventions (standardization) •Format makes it more accessible for students •All students can

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<p>qualitative exploratory pilot study.</p> <p><i>Nurse Education Today</i></p> <p>Canada</p> <p>No conflict of interest information</p> <p>Funding from Teaching and Learning Office of Teaching Enhancement Fund at host university</p>	<p>stress and ANX, and sense of well-being</p> <p>Direction on how to integrate M into higher education</p>		<p>Homework (5-15 minutes) 4-5 X a week kept in log</p> <p>Feedback in individual or small group interviews</p> <p>Open ended questions and standard prompts</p> <p>Analyzed with qual content analysis approach to capture perception of M</p> <p>Decided to collect instructor experience too with permission</p>	<p>childhood studies students</p> <p>Received information and if consented, collected data</p>	<p>DV4 – sense of well-being</p> <p>No definitions</p>	<p>clinical practice, your sense of well-being?</p> <p>What were facilitators or barriers to engaging in M practice?</p> <p>Included instructor perspectives</p>	<p>Helped decrease my ANX and deal with disappointing news</p> <p>Felt more relaxed</p> <p>Helped with managing stress</p> <p>Instructor:</p> <p>STU focused better</p> <p>See tension melting away.</p> <p>Helped everyone become more grounded and focused</p>	<p>Increased capacity to focus on academic tasks</p> <p>Instructors had decreased stress and increased ability to engage students in more M way</p>	<p>participate •M has potential to reduce reactivity, stress and anxiety</p> <p>Limitations: •Brief intervention (10 minutes total) •All students participated, even without consent – some non-participants were disruptive •No in-depth training for instructor •Small % participated – 25% (13/52) •Disruption by late arrivals</p> <p>Feasibility: •Carried out within a semester</p> <p>•Instructors guided intervention in regular classes = 5 minutes at beginning and 5 at end</p> <p>Notes: •Instructors tone of voice and pacing affected student experience</p> <p>•Challenge of completing homework</p> <p>•STU wanted recording for lovingkindness meditation</p> <p>•Perhaps link to course content •Some giggling reported •Suggest comprehensive information session before program •Provide resources and links, audio recordings</p>
<p>van der Riet, 2015.</p> <p>Piloting a stress management and mindfulness program for undergraduate</p>	<p>Explore impact of 7-week stress mgmt. and M program as learning support and stress reduction</p>	None	<p>Descriptive qualitative</p> <p>Used 60-minute semi-structured focus group interview to gather data post-</p>	<p>First year UG NSG and midwifery students recruited by flyer, email, and Blackboard message</p>	<p>IV1 – stress mgmt. and M program</p> <p>No identified dependent variables – themes developed</p>	<p>Hour long focus group led by 2 researchers with no prior contact with participants – 1 led discussion with standard prompts, the</p>	<p>Identified 3 themes – attending to self, attending to others, &amp; attending to stress mgmt. and M program</p>	<p>Students reported positive impact on personal, academic, and professional functioning</p> <p>Reported ability to recognize and let go of intrusive thoughts</p> <p>Described impact of program as beneficial</p>	<p>Level – VI qualitative descriptive</p> <p>Worth to practice: Enhanced sense of well-being</p> <p>Strengths: •Participants learned skills with potential personal and professional self-care benefits •Limited attendance with positive effects suggest shorter program may also be beneficial</p>

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Citation: author(s), date of publication & title	Purpose of Study	Conceptual Frame work	Design/ Method	Sample/Setting	Major Variables Studied and Their Definitions	Measurement of Major Variables	Data Analysis	Study Findings	Appraisal of Worth to Practice Strength of the Evidence (i.e., level of evidence + quality [study strengths and weaknesses]) <b>RECOMMENDATIONS</b>
nursing students: Student feedback and lessons learned  <i>Nurse Education Today</i>  Australia  No info on funding or conflicts	Examine if the program would build resilience, reduce stress, and improve concentration		intervention using thematic analysis  7 one-hour sessions using MBSR interventions  Encouraged to practice regularly at home	14 students agreed, 10 completed  All female, 19- 53 years old  Large regional university  Focus group 2 weeks after completion.  Recorded and transcribed with 2 independent researchers doing thematic analysis. Themes reviewed, and cross checked. Field notes and audit trail to increase trustworthiness	during focus group	other observed and recorded  Questions – what things worked and why? & What did not work and why?  Did you practice at home?  Did the program assist your learning?  Did the program assist you personally?		to intimate relationships, social network, and clinical work  Enhanced ability to “be with” others (p. 48)  Linked decrease in insomnia to more effective study behaviors and ability to focus	Limitations: •Attendance was irregular – only 1 person attended all sessions •Students attending 5 or more considered completers  •Students had trouble finding time and motivation to practice •Pilot study not validated in other settings limits generalizability •Student’s self-report of impact – no objective data •Authors suggest mixed method design  Feasibility: •Potential for shorter sessions – 1 hour  Notes: •Didactic and experiential parts with understanding of the impact of stress  •Included sitting meditation, breathing, body sensations, mindful walking and body scan

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### Appendix C: Levels of Evidence

	1	2	3	4	5	6	7	8	9	10	11	12	Total
Level													
I – SR	X		X						X			X	4
II – RCT		X		X		X				X			4
III – CT, not random													
IV – Case control or cohort													
V- SR of Qual or descriptive study					X Desc		X Desc				X Desc		3
VI – Qual or descriptive study								X Desc					1
VII – Expert opinion													

KEY: 1 – Gotink; 2 – Hoge; 3 – McConville; 4 – Ratanasiripong; 5 – Smith; 6 –

Song; 7 – Turner; 8 – van der Riet; 9 – Regehr; 10 – Falsafi; 11 – Carmody; 12 - Lo.



## Appendix D: RCT Results

	Falsafi/RCT	Hoge/RCT	Ratanasiripong/RT C	Song/RCT
Major focus	Mindfulness-based interventions v. yoga	Mindfulness meditation (MBSR based) v. active control of stress management education	MM v. BF v. WL	MBSR v. WL
Finding on stress and anxiety	SIG↓ in depression, ANX, and stress symptoms	SIG ↓ ANX in patients with GAD, less stress reactivity	SIG↓ in ANX and stress	SIG↓ in depression, ANX, and stress
Finding on mindfulness	SIG ↑ in mindfulness	NE	NE	SIG↑ in mindfulness
Program described	Yes, 8 weeks x 75 minutes = 10 contact hours, home practice	Yes, 8 weeks x 2 hours = 16 contact hours, home practice, short retreat	Yes, 2 trainings, unknown hours, unknown total hours, home practice	Yes, 8 weeks x 2 hours = 16 contact hours, home practice
Program can be duplicated	Yes – schedule with description of classes	Yes, list of included activities, no schedule	Yes – no specific information	Yes, schedule with description and activities of each class
Major measurements	BDI, HAM-A, SLSI, SCS, CAMS-R	HAM-A, CGI-I, BAI, STAI (for stress)	STAI, PSS	DASS, MAAS
Results - ANX	Pre-mean 22.2 Pre-SD 7.1 Post mean 13.8 (↓37.8%) Post SD 9.1	Pre-mean 21.46 Pre-SD 7.35 Post mean 13.65(↓36.4%) Post SD 7.01 (HAM-A)	Pre-mean 25.45 Pre-SD 7.8 Post mean 21.28(↓16.4%) Post SD 6.95	Pre-mean 6.7 Pre-SD 12.6 Post mean 2.8 (↓58.3%) Post SD 4.1
Results – Stress or stress reactivity+	Pre-mean 2.4, Pre-SD 0.6 Post mean 1.5 (↓37.6%) Post SD 0.6	+ Pre-mean 53.9 Pre-SD NR Post mean 40.8 (↓24.3%) Post SD NR	Pre-mean 17.24 Pre-SD 4.16 Post mean 14.9 (↓13.6%) Post SD 3.44	Pre-mean 34.5 Pre-SD 12.5 Post mean 7.4 (↓78.6%) Post SD 4.9
Results - Mindfulness	Pre-mean 20.5 Pre-SD 3.6 Post mean 26.5 (↑23%) Post SD 5.1	NE	NE	Pre-mean 69.8 Pre-SD 10.6 Post mean 80.6 (↑13.4%) Post SD 11.3

## Appendix E: Results

	1	2	3	4	5	6	7	8	9	10	11	12
Program type	SR	RCT	SR	RCT	V	RCT	V	VI Desc	SR	RCT	V	SR
MBSR on ANX (standard 26-28 hours)	SIG ↓		SIG ↓		SIG ↓				SIG ↓		SIG ↓	
Brief MBSR on ANX - (10-26 hours)		SIG ↓	SIG ↓		SIG ↓	SIG ↓			SIG ↓	SIG ↓	SIG ↓	↓ but not SIG
MBSR based on ANX/Stress/DEP	SIG ↓	SIG ↓	SIG ↓	SIG ↓				SIG ↓	SIG ↓	SIG ↓	SIG ↓	
Mindful Gym on ANX			SIG ↓									
Mindfulness interventions on ANX			SIG ↓				↓ but not SIG		SIG ↓		SIG ↓	
Mindfulness interventions on stress			SIG ↓						SIG ↓		SIG ↓	SIG ↓
BF on ANX				SIG ↓								
Yoga on Dep or ANX										SIG ↓		
Meditation (unspecified) on ANX				SIG ↓			SIG ↓		SIG ↓			
Mindfulness meditation on ANX							SIG ↓					
Mindfulness on mindfulness			SIG ↑			SIG ↑				SIG ↑		

KEY: 1 – Gotink; 2 – Hoge; 3 – McConville; 4 – Ratanasiripong; 5 – Smith; 6 –

Song; 7 – Turner; 8 – van der Riet; 9 – Regehr; 10 – Falsafi; 11 – Carmody; 12

– Lo

## Appendix F: Program Type

Program type	1	2	3	4	5	6	7	8	9	10	11	12	Total
MBSR – standard 8 weeks, 26-28 hours	X		X		X				X		X		5
Brief MBSR format 8 weeks - 10-26 hours		X	X		X	X	X		X	X	X	X	9
MBSR based, but not standard, hours vary		X	X	X	X			X	X	X	X	X	9
Mindful Gym			X										1
Mindfulness interventions			X				X		X		X	X	5
BF				X									1
YOGA										X			1
Med (unspecified)				X			X		X				3
MM Only							X						1

KEY: 1 – Gotink; 2 – Hoge; 3 – McConville; 4 – Ratanasiripong; 5 – Smith; 6 – Song; 7 – Turner; 8 – van der Riet; 9 – Regehr; 10 – Falsafi; 11 – Carmody; 12 - Lo

## Appendix G: Programmatic Decisions Table – Detailed

Topic	Gotink - SR	Lo- SR	McConville SR	Regehr - SR	Falsafi - RCT	Hoge - RCT	Rat. - RCT	Song - RCT	Trend
Weeks	8	Mean 11 Range 1-56	7-10 common Range 4-10	Most 4-8 weeks Range 1-15	8	8	4	8	8
Minutes per week	150	Mean 79 Range 20-300	90 - 150	30 - 150	75	120	Not specified	120	120 (Range 20 min – 300)
Home work	Yes, not specified	Yes, 15 min, 13/24 required	yes, not specified 15/19 required	Yes, not specified, with audio support	20 minutes daily	20 minutes daily with CD	3 times per day for 4 weeks	Not specified	Yes – 15-20 minutes
Mandatory	no	no	no	no	no	no	no	no	no
Tools	Not specified	STAI, DASS, PSS	STAI, DASS, PSS, MAAS, etc.	Varied but included STAI, PSS, BDI	BDI, HAM-A, SLSI, SCS, CAMS-R	HAM-A, CGI-I, BAI, STAI (for stress)	STAI, PSS	DASS, MAAS	STAI, DASS, PSS, MAAS
Measured results	Varied by study – all reported data	Post intervention mean difference (compared with control)	Post intervention mean difference (compared with control)	Post intervention mean difference (compared with control)	Pre, mid (4), post (8) and follow up at 12 weeks	Baseline and post (8 weeks)	Pre and post (4 weeks)	Pre and post (8 weeks)	Baseline and post intervention (8)

## Appendix H: Overview of Planning and Implementation Process

Date	Intervention	Evidence	Stakeholders/ People	Process Marker & Data collection
<b>6/2016 to 5/2017</b>  Preparation, assessment, and planning the search, locating the best data phase	<ul style="list-style-type: none"> <li>•Identify stakeholders, begin evidence collection, identify problem, formulate question</li> <li>•Investigate anxiety and stress in nursing students.</li> <li>•Search for evidence about reducing it.</li> </ul>	<p>Internal data – highly driven students.</p> <p>Chernomas &amp; Shapiro, 2013; Crary, 2013; ACHA, 2016; Bartlett, Taylor &amp; Pitts, 2016; Van der Riet et al., 2015</p>	Students (prelicensure). Nursing faculty, administration, and Industry mentor	<ul style="list-style-type: none"> <li>•Completed initial search and synthesis.</li> <li>•Current iterative process of refining communication of data.</li> </ul>
<b>6/2017 to 5/2018</b>  Critical appraisal Planning phase	<ul style="list-style-type: none"> <li>•Continue synthesizing data.</li> <li>•Presentation to faculty.</li> <li>•Agreements and arrangements with host.</li> <li>•Determine program agenda from evidence.</li> <li>•Select measures from evidence.</li> <li>•Design publicity.</li> <li>•Obtain supplies and resources.</li> <li>•Invite students.</li> <li>•Confirm arrangements.</li> <li>•Complete session planning per Process Marker schedule.</li> </ul>	<p>Gotink et al., 2015; Lo, 2017; McConville, McAleer &amp; Hoge, 2017; Regehr, Glancy &amp; Pitts, 2013; Falsafi, 2016; Hoge et al., 2013, Ratanasiripong, et al., 2015; Song &amp; Lindquist, 2015</p>	Students Industry mentor Nursing faculty and administration DNP Faculty	<ul style="list-style-type: none"> <li>•Synthesis tables complete.</li> <li>•Chapters 1-3 submitted.</li> <li>•Host approval.</li> <li>•Mentor MOU.</li> <li>•DNP approval.</li> <li>•Session agendas complete.</li> </ul>
<b>6/2018 to 7/2018</b>  Design practice change and Implement practice change	<ul style="list-style-type: none"> <li>•Summer semester May 29 to July 20 - Sessions on Monday for 8 weeks</li> <li>•Start time dependent on student schedule.</li> </ul>	<p>Falsafi, 2016; Hoge et al., 2013, Ratanasiripong et al., 2015; Song &amp; Lindquist, 2015; Carmody &amp; Baer, 2009; Crane et al., 2017; Kabat-Zinn, 2013</p>	Students Industry mentor Nursing faculty and administration Program Leader	<ul style="list-style-type: none"> <li>•Baseline data collected week 1</li> <li>•End data collected week 8.</li> <li>•Student attendance</li> </ul>
<b>7/2018 to 8/2018</b>  Integrate and maintain change – evaluation	<ul style="list-style-type: none"> <li>•Analyze baseline and end data results.</li> <li>•Evaluate process markers.</li> <li>•Document lessons learned.</li> </ul>	<p>Gotink et al., 2015; Lo, 2017; McConville, McAleer &amp; Hoge, 2017; Regehr, Glancy &amp; Pitts, 2013; Falsafi, 2016; Hoge et al., 2013, Ratanasiripong</p>	DNP faculty Nursing faculty and administration Students	<ul style="list-style-type: none"> <li>•Prepare graphics and report of data results.</li> </ul>

		et al., 2015; Song & Lindquist, 2015		
<b>9/2018 to 10/2018</b>	•Repeat eight-week MBP	Falsafi, 2016; Hoge et al., 2013, Ratanasiripong et al., 2015; Song & Lindquist, 2015; Carmody & Baer, 2009; Crane et al., 2017; Kabat-Zinn, 2013	Students Industry mentor Nursing faculty and administration Program Leader	•Baseline data collected week 1 •End data collected week 8. •Student attendance
<b>8/2018 to 5/2019</b> Integrate and maintain change - Dissemination phase	•Prepare poster or podium presentation. •Edit course submissions for publication.		All stakeholders	•Presentation or publication.

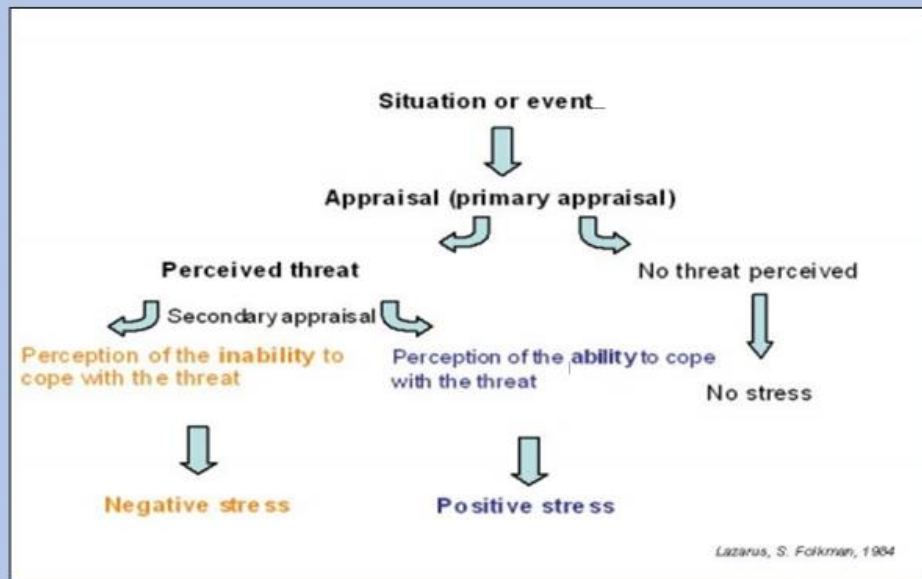
## Appendix I: Theoretical Framework

### Theoretical Framework

#### Lazarus and Folkman's Theory of Stress and Coping

##### Beliefs:

1. Stressful encounter is dynamic, not static
2. One may have contradictory emotions
3. Coping is a complex process
4. There are individual differences in cognitive appraisal and coping



Lazarus, R. S., & Folkman, S. (1984). *Stress, appraisal, and coping*. New York, NY: Springer Publishing.

## Appendix J: Logic Model

Toward Reducing Stress and Anxiety in Nursing Student: Implementing an Evidence-based Mindfulness Program				
<b>Assumptions and acknowledgements:</b> 1. College of Nursing (CON) faculty and administration support and desire that this project is offered to incoming students. 2. CON will provide indoor and outdoor meeting space, publicity, copies, phone and internet, office space, and supplemental materials. 3. CON will provide mentor, required training when engaging with students or publishing results, and assistance completing the IRB process. 4. CON includes many high stakes simulations and exams in their curriculum. 5. The students are my “patients” for whom I plan to improve care. 6. Mindfulness activity is offered free to all incoming students (Beneficence/Justice).				
Resources/needs	Activities	Outputs	Short and Long-Term Outcomes	Impact
What do I need to accomplish my activities	What activities will I do to address the problem	What will change because of the activities	Accomplishing these activities will result in 1-3 year and 4-6-year changes	What lasting results will be accomplished
<ul style="list-style-type: none"> <li>♦Solid body of evidence about proposed intervention (E1/E2)</li> <li>♦IRB fast track approval or waiver (E1)</li> <li>♦Student information document if IRB required (E1, Autonomy)</li> <li>♦All advisors in place</li> <li>♦Final agenda for program (E3)</li> <li>♦Publicity for program (orientation demonstration &amp; flyer using body of evidence) (E5/E6/E7 Teaching)</li> <li>♦Desirable time, day and location for program (E3)</li> <li>♦Access to outdoor space for mindful movement</li> <li>♦Blankets and cushions (students provide)</li> <li>♦Music and sound system</li> <li>♦Student copies of instructions/homework</li> <li>♦Instruments – anxiety, stress, and mindfulness</li> </ul>	<ul style="list-style-type: none"> <li>♦Assess stress and anxiety in nursing students (E4)</li> <li>♦Select and record home practice activities</li> <li>♦Lead students through mindfulness activities (E4/E7 Teaching)</li> <li>♦Encourage home practice</li> <li>♦Provide resources and instructional materials</li> <li>♦All nursing students invited (Justice/Equitable)(E7)</li> </ul>	<ul style="list-style-type: none"> <li>♦Students attend 1.5 to 2-hour sessions weekly for 8 weeks (Approx. 16 contact hours)</li> <li>♦Stress and anxiety measures will be reduced after the activity (E2/E7)</li> <li>♦Students will feel calm and present during activities (E2/E7)</li> <li>♦Mindfulness measures will be increased after the activity (E2/E7)</li> </ul>	<ul style="list-style-type: none"> <li>♦Students will feel less stress and anxiety through nursing school (E7 – patient care)</li> <li>♦Students will be able to use mindfulness to cope with any stress or anxiety provoking event (E2/E4/E7)</li> <li>♦Results of activity will be shared through presentation or publication regardless of outcome (E5)</li> <li>Share results of measures with stakeholders and students attending (E5, Teaching)</li> <li>♦Students will successfully transition to the workplace or graduate program</li> <li>♦Other health professions students may participate in the activity (E6, new funding sources and wider access)</li> </ul>	<ul style="list-style-type: none"> <li>♦Students/Nurses will use mindfulness to cope with challenging work situations</li> <li>♦Patients benefit by calm and present nurses</li> <li>♦Mindfulness training will be offered to all entering health professional students at College (E6)</li> </ul>

Key for addressing Ethics (E): E1 of research conducted – IRB; E2 of translating evidence into practice; E3 of project planning; E4 of implementation; E5 of dissemination; E6 of sustainability; E7 of DNP role



### Appendix K: QI Metrics for Summer Pilot

Projected completion	Activity/event	Actual completion
11/13/17	Revise and send IRB to review	not met 11/28/17
11/27/17	Select final schedule from best results. Select final tools.	11/18/17
11/30/17 (Est)	Revise proposal for IRB if needed	IRB not required by College, Exempt through DNP IRB Review
3/7/18	Revised paper to DNP faculty	3/8/18
3/8/18	Draft of publicity flyer ready. Sent to CON CIO	4/9/18
3/30/18	Room reservations complete	Pending course schedule
3/30/18	Publicity flyer approved by CIO and sent to Student Affairs electronically for distribution	Complete
4/15/18	Select "homework exercises", seek permission if necessary. Buy zip drives/yoga mats.	Complete
4/30/18 (week of)	Print schedule, copies of information and activities	Complete
4/30/18	Confirm final arrangements. Identify sources of external funding	Complete
May – date TBD	Visit nursing orientation. Describe mindfulness and present brief sample activity. Provide information flyer on student responsibilities.	Complete
5/12/18	Final arrangements. Respond to student questions.	Complete
5/25/18	Prep for first 3 classes complete. All materials ready. Get snacks. Test sound system.	Complete
6/4/18	Class 1. Assessments complete – recorded and returned to students. (See program agenda)	Complete
6/11/18	Class 2.	Complete
6/18/18	Class 3	Complete
6/21/18	Prep for next 3 classes complete.	Complete
6/25/18	Class 4	Complete
7/3/188	Class 5	Complete
7/9/18	Class 6	Complete
7/14/18	Prep for last 2 classes complete. Grocery shop for mindful eating complete.	Complete
7/16/18	Class 7	Complete
7/23/18	Class 8. Assessments completed - & evaluation complete	Complete
7/30/18	Assessments scored and entered into spreadsheet	Complete

### Appendix L: Mindfulness Session Weekly Agendas

Week	Who	Where	Activity (time in minutes)
1 9/11/18	Program leader	Indoor classroom	Introductions (20), Baseline assessments – MAAS, PSS, DASS-21) (25), Introduction to and benefits of mindfulness (15), Explanation and practice of mindful breathing and body scan (20), share reactions (25), and discuss homework (15)
2 9/18/18	Program leader	Indoor classroom	Discuss homework (20), Examining perceptions, assumptions, and world views (20), practice with sitting/breathing and mindful eating - raisin (30), body scan (15), share reactions (20), and discuss homework (10)
3 9/25/18	Program leader	Indoor classroom and outdoor space	Discuss homework (20), breathing meditation (15), body scan (20), paired walking outdoors (20), share reactions (20), and discuss homework (20)
4 10/2/18	Program leader	Indoor classroom	Discuss homework (20), mindful sitting (15), focus on concentrating (20), unguided sitting and breathing – they estimate time (15), discuss responding in positive and mindful ways, rather than reacting (10) introduce the metta (5) and discuss homework (15)
5 10/9/18	Program leader	Indoor classroom and outdoor space	Discuss homework (20), mindful walking outdoors (20), paired walking (10), applying mindfulness in discomfort (15), body scan (15), share reactions (20), chocolate meditation (5), and discuss homework (10)
6 10/16/18	Program leader	Indoor classroom	Discuss homework (20), video and discussion on joy (30), share reactions (10), body scan (15), applying presence to communication (15), share reactions (15), and discuss homework (20)
7 10/23/18	Program leader	Indoor classroom	Discuss homework (20), mindful sitting or lying – student's choice (15), discuss mindfulness integration in decision making processes and fitting in daily practice (15), mindful eating – see food list in budget (40), share reactions (10), and discuss homework (10)
8	Program leader	Indoor classroom	Discuss homework (20), lovingkindness meditation (15), resources for mindfulness

10/30/18			(10), post intervention assessments - MAAS, PSS, DASS-21 (25), student's choice (15), review of course (25) sitting closure (10)
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## **Appendix M: Mindfulness Participant Agreement\***

You will gain the most from this program if you agree to the following:

1. Attend all of the weekly sessions
2. Complete the practice/homework assignments
3. Approach yourself with kindness, self-compassion, openness and non-judgment

In any self-improvement or self-awareness program, there are some risks and benefits.

**Risks:** Do not over-exert yourself in physical activities. Do not work to the point of pain. Know your boundaries and do not cross them. Sometimes mindfulness can heighten fear, sadness, grief, and anxiety because you are paying attention to them. A pre-existing psychological illness may worsen this. Mindfulness can help but is not a substitute for psychological care. Special arrangements have been made with the Student Counseling Service for referrals. Please notify the instructor immediately about current or past conditions or the need for referral.

**Benefits:** Mindfulness has been shown to be effective in many groups including college students and nursing students. It can lead to increased coping ability and reduced stress and anxiety. It also increases your ability to care for yourself. There is no guarantee that these benefits will apply to all participants.

I have read and understand these statements and agree to participate in the mindfulness-based program.

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Name and signature

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Date

\*Adapted with permission from Dr. Sydney Kroll, PsyD

## Appendix N: Budget

Item	Use/purpose	Supplier	Estimated cost	Actual Cost
DASS-21	Depression, anxiety and stress assessment	<a href="http://www2.psy.unsw.edu.au/Groups/Dass/down.htm">http://www2.psy.unsw.edu.au/Groups/Dass/down.htm</a>	Free	Free
PSS	Stress assessment	<a href="http://www.mindgarden.com/documents/PerceivedStressScale.pdf">http://www.mindgarden.com/documents/PerceivedStressScale.pdf</a>	Free	Free
MAAS	Mindfulness assessment	<a href="http://ppc.sas.upenn.edu/sites/ppc.sas.upenn.edu">http://ppc.sas.upenn.edu/sites/ppc.sas.upenn.edu</a>	Free	Free
Snacks	Student comfort	Items – nuts, pretzels, granola bars, crackers, cookies	\$20 per meeting (\$160)	\$94
Food (meal)	Mindful eating activity	Sweet items, salty items, differing textures – smooth, crunchy, spicy foods, hummus (Uncommon items) Water	\$100	\$98
Yoga mats	Sitting activities	Discount store	\$8 each	\$70
Future cost (Program leader)	Mindfulness leader	\$40.00 per hour for 16 hours of instruction and 8 hours prep	(\$960)	\$262 (\$1222 including personnel)