

The Effects of Mindfulness on Test Anxiety in Nursing Students

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Abstract

Test anxiety in nursing students is a common problem that greatly affects individual performance in nursing school. The purpose of this quasi-experimental evidence-based practice improvement project is to reduce test anxiety in nursing students through mindfulness practices. A convenience sampling of approximately 40 students from the first semester cohort of a midwestern university pre-licensure nursing program participated. Faculty-led mindfulness-based strategies of body scanning, mindful breathing, and guided imagery took place prior to tests to determine effectiveness of mindfulness techniques on test anxiety reduction. The Test Anxiety Inventory tool measured test anxiety before the first course exam prior to the implementation of the mindfulness intervention and was repeated prior to the final exam. Data analysis of the pre- and post-intervention scores demonstrated a significant decrease in test anxiety post-intervention. Through the mindfulness intervention, nursing students gained coping skills they may utilize while finishing school and once in the professional field of nursing during high anxiety times.

Keywords: Test anxiety, mindfulness, coping, stressors, adaptation, stimuli

The Effects of Mindfulness on Test Anxiety in Nursing Students

The life of a college student can be challenging. New-found freedom from parental control, financial worries, changes in social support, and increases in academic responsibilities often result in high levels of stress with an inability to cope. Anxiety is a state in which individuals can feel paralyzed and unable to complete simple tasks or formulate thoughts (Hunot et al., 2007). Specific subgroups of the general population may be at increased risk of developing anxiety; however, specific occurrences may also spur higher anxiety levels in every individual. Academic settings amplify stress levels for students, who are already struggling to adjust to the realities of adulthood and independence. Thus, incorporation of methods to reduce anxiety and increase coping skills in students is vital to the individual's overall well-being and academic performance.

Significance

Pursuit of a nursing degree is a challenging process in which students must perform well academically and in the clinical setting to ensure success and competence post-graduation. However, the high stress environment in which nursing students must flourish does not end with the completion of nursing school. Health care settings offer a high-stakes, high anxiety work environment in which nurses must perform to ensure patient care needs are adequately addressed. The nursing shortage is a high priority issue in health care of recent years. Relevance of the problem is based on high demand, with nurses serving as the single largest profession in the United States (United States Department of Health Human Services Health Resources and Services Administration [HRSA], 2017, p. 3). The aging population continues to grow, with the Baby Boomer generation continuing to retire and develop chronic diseases that require frequent medical care. Along with increased demand, nursing continues to be a highly stressful profession

(Ghawadra et al., 2019). Coping strategies are a necessity to promote job satisfaction and increase personal stress management.

To address the growing need for nurses at the bedside, new nursing education programs continue to appear, and current programs have increased their class sizes and number of graduating classes. The United States Department of Health Human Services Health Resources and Service Administration (HRSA) reports the number of nursing graduates from 2001 to 2015 grew from 68,800 to 158,000 (2017, p. 8). Positive growth addresses the rising need for increasing numbers of nurses to meet demand while the large generation of nurses in retirement age leaves the field. Additionally, the HRSA estimates the demand for registered nurses (RNs) will grow to 3,601,800 by 2030 (HRSA, 2017, p. 8).

To fulfill the growing need for RNs, schools of nursing must successfully educate students, and students must meet minimum standards set by nursing programs to pass not only nursing school exams, but also the licensure exam, the NCLEX. The rigors of nursing school require students to ingest, digest, and retain copious amounts of information in a short period. Assessments and educational tools designed to determine if course objectives have been adequately met are the standard by which faculty judge whether students are successful in courses. However, in preparing to complete assessments, students may have additional challenges beyond understanding the course material.

Test anxiety is a common problem in college students because it negatively affects memory and clear thought, regardless of preparation practices for the test (Duraku & Hoxha, 2018). High levels of test anxiety are directly connected to poor academic success (Barrows et al., 2013; Gosselin et al., 2016). High stakes tests, such as those in nursing school, serve as a benchmark that students must meet to progress within the academic programs (Roykenes et al.,

2014). The anxiety of taking the test is compounded by the awareness of the high stakes, which places nursing students at a distinct disadvantage if they have not developed relaxation strategies to overcome test anxiety (Cho et al., 2016; Song & Lindquist, 2015). Additionally, test anxiety reduces a student's ability to concentrate and express clear thought, resulting in poor test scores even if the student is well-prepared (Piroozmanesh & Imanipour, 2018). Reducing test anxiety through adaptive practices is imperative to ensure nursing students have clear thought and memory to complete tests that reflect knowledge rather than poor coping.

Local Issue

The setting of the evidence-based improvement initiative is a rural midwestern state university. The university's school of nursing produces an average of 40 graduate nurses at the end of the Fall and Spring semesters each academic year. Exit interviews are conducted in each graduating class to determine unmet needs expressed by nursing students and offer program improvement strategies. In recent exit interviews conducted by the chair of the nursing school, graduating students expressed stress, anxiety, and depression as common challenges they faced during the nursing program. Nursing faculty reported increasing numbers of student referrals to counseling services over the past two academic years related to students' inability to cope with the academic rigor and stresses of life during nursing school.

Diversity Considerations

Through a mix of races, genders, and ethnic backgrounds, the university generally draws traditional college students. Nursing students at the university continue to be predominantly female and Caucasian. The school of nursing included six international students during the 2019-2020 academic year.

Problem and Purpose

Problem Statement

Test anxiety in college students is linked to negative outcomes in students' physical, psychological, and social well-being.

Purpose Statement

The purpose of the mindfulness project is to determine if the evidence-based mindfulness-based stress reduction strategies intervention decreases test anxiety in nursing students at a midwestern school of nursing.

Intended Improvement with Purpose

With the emergence of the COVID-19 pandemic and the nursing shortage, nurses and nursing students must find ways to reduce anxiety in health care and academic settings. Nursing students need to learn coping strategies during times of acute stress while completing nursing education programs, such as tests, to ensure successful completion of nursing preparation and licensure requirements. However, the coping strategies nursing students apply in the academic setting may assist them in their future high-anxiety experiences as registered nurses to ensure the nursing shortage can be met with satisfied, healthy nurses.

Facilitators, Barrier, Sustainability

There are a few potential barriers to the study. Mindfulness stress reduction, the intervention in this study, relies on the openness of the individual to be efficacious. Student motivation to fully participate and be open to the intervention could potentially be a barrier. Additionally, faculty buy-in is a potential barrier. Setting aside the 15 to 20 minutes for mindfulness practice prior to the test may be a challenge without faculty support and prioritization of activity. Thus, faculty buy-in will be a must prior to implementation.

With faculty buy-in as an important component to the success of the study, faculty serve as a vital facilitator. Additionally, the chair of the nursing program served as a facilitator and mediator between the faculty and researcher. Counseling services served as a resource and facilitator in the anxiety reduction strategies for the student intervention.

Successful implantation and research support of the intervention as an effective method to reduce test anxiety in students can be easily adapted to all cohorts within the nursing program. Sustainability relies on support from the chair of the nursing department to prioritize the continued implementation of mindfulness methods to reduce stress in nursing students. All pre-licensure faculty will be aware of this study, including the results, and thus are more likely to support implementation on a larger scale across the program. The need for stress reduction in nursing students at the midwestern university school of nursing has already been identified as a problem by faculty across the program, so successful strategies to reduce test anxiety renders support (See Appendix G, Logic Model).

Review of the Evidence

Inquiry

Among nursing students, does the implementation of faculty-led mindfulness-based stress reduction strategies reduce test anxiety within one 16-week semester at a four-year university undergraduate nursing program?

Search Strategies

University of Missouri-Kansas City Health Sciences Library, CINAHL, ERIC, EBSCOhost, and Cochrane Library were utilized to complete the search for evidence to support the inquiry. Key search words and phrases included test anxiety, nursing student stressors, anxiety and mindfulness, Mindfulness-Based Stress Reduction and college students, Cognitive

Behavioral Therapy and mindfulness, and effects of anxiety on nursing students. A broad search was conducted and yielded 319 results, 22 of which were through the Cochrane database (See Appendix C, PRISMA Diagram). The results were subsequently stratified for inclusion and exclusion. Studies were excluded if they were not written in English. Inclusion criteria consisted of interventions to reduce anxiety within the educational setting, college student anxiety reduction, and effective interventions for anxiety reduction. The results were 28 articles to be included in the synthesis of evidence (see Appendix D, Synthesis of Evidence Table).

Within the 28 included articles, one evidence-based practice guideline and three systematic reviews were found with a Level of Evidence of I (Melnyk & Fineout-Overholt, 2019). There were nine randomized controlled trials at Level of Evidence II. Quasi-experimental studies were 9 with a Level of Evidence III. Additionally, two case control, three cross-sectional, and one correlational study fell into Level of Evidence IV. Three studies were included at a Level of Evidence VI.

Evidence by Themes

An extensive search of available research studies suggests there is ample evidence to support the use of mindfulness to address test anxiety (See Appendix B, Definition of Terms). Several themes emerged in examining the literature: College students and stressors, the effects of test anxiety, the impact of test anxiety on academic performance, and Mindfulness-Based Stress Reduction (MBSR) techniques for anxiety reduction (See Appendix E, Evidence Grid).

College Students and Stressors

While gathering evidence to support the inquiry, the theme of college students and stressors consistently emerged. Seven studies were found to identify common stressors of college students. The inability to cope with the added stress of college leads some students to develop

unhealthy habits and interactions such as dysfunctional social relationships, alcohol and drug use, avoidance of stressors, and ineffective eating and sleeping patterns (He et al., 2018; Horgan et al., 2016; McCarthy et al., 2018; Rith-Najarian et al., 2019; Schwind et al., 2017).

Nursing students face high levels of academic stress, including difficult relationships with instructors, heavy academic workloads, and financial responsibilities that plague the students' psyche (He et al., 2018; Horgan et al., 2016; McCarthy et al., 2018; Torabizadeh et al., 2016). Professional expectations for nursing students in the clinical setting include handling emotionally charged situations in which death and dying, human suffering, and making difficult, high impact decisions are the norm (Prasad et al., 2016). One study associated nursing student stress with that of professional nurses working in the field; the evidence supported the same level of coping skills needed in nursing regardless of setting. Those who do not develop coping mechanisms in nursing school are vulnerable to burnout, if not while in the academic setting, then later in the professional role (Ghawadra et al., 2019). The impact of anxiety and development of coping mechanisms is vital to address the negative consequences of stress and decrease the likelihood of maladaptive behaviors and burnout (Horgan et al., 2016).

Test Anxiety on Physical, Social, Cognitive Well-Being

Another theme that emerged in the literature was the impact of test anxiety on physical, cognitive, and social well-being. Eight supporting studies identified common manifestations and long-term effects of test anxiety on the individual. High levels of stress have numerous effects on the body, mind, and emotions of an individual. When facing an examination, college students are at one of the most elevated levels of stress (Ghawadra et al., 2019). Research suggests physical manifestations of anxiety produce elevated heart rate, blood pressure, and decreased immune response, leaving the student susceptible to various diseases (He et al., 2018; Kanji et al., 2006).

Additional immediate effects of anxiety include tense muscles, headaches, tightened jaw, trembling, nausea, and diaphoresis (Dundas et al., 2016; Farner et al., 2019; Gosselin et al., 2016; Ratanasiripong et al., 2015).

The physical experience of an anxious state can be a major distraction for test-takers, but it is the cognitive and emotional changes that are seemingly debilitating when facing an exam. Difficulty focusing, decreased efficiency, mood swings, and inability to concentrate are experiences anxious students face (Ghawadra et al., 2019; Gosselin et al., 2016). Negative self-talk may ensue, lowering student's self-confidence (Dundas et al., 2016). One randomized controlled trial compared test anxiety to social phobias, which create an untrue perception of one's self and a fear of others' reactions (Reiss et al., 2017). The distorted sense of reality self-perpetuates and may incapacitate the test-taker. An overwhelming sense of worry and low self-worth may overtake the student, leading to feelings of inadequate preparation and doubt of abilities (Duty et al., 2016). Overall, research found that students' cognitions and emotions during times of increased test anxiety resulted in lack of clarity of thought and high levels of emotion, thus affecting test-taking ability.

Additionally, students tend to develop ineffective coping mechanisms related to stress affecting their overall well-being such as mental health disorders such as severe anxiety and depression, insomnia, extreme alcohol use, and unhealthy social relationships (Dundas et al., 2016; Dvorakova et al., 2017; Horgan et al., 2016; Song & Lindquist, 2015). An overall dissatisfaction with life, loss of motivation, dysfunctional sleeping habits, and burnout symptoms manifest in the individual (Augner, 2015). The consequences of test anxiety increased depression incidence, emotional instability, and decreased cognitive clarity overall (Augner, 2015; Horgan et al., 2016; Kanji et al., 2006). Thus, the long-term impact of anxiety, even related to test-taking,

may result in devastating effects on a student's physical, emotional, and cognitive well-being (Augner, 2015; Dundas et al., 2016; Dvorakova et al., 2017; Song & Lindquist, 2015).

Text Anxiety on Academic Performance

Another facet of the research associated the impact of anxiety on academic performance. Five studies explored the association between anxiety and exam scores. With effects on cognition, anxiety is likely to reduce clear thought while completing an examination or clinical performance. One study found students with high test anxiety scored markedly lower than their counterparts, who took part in deep breathing prior to examination (Khng, 2016). Many studies supported the need for intervention related to test anxiety to improve academic performance, as control groups without a cognitive behavioral intervention consistently performed lower on tests and reported more elevated stress levels before and after examination (Barrows et al., 2013; Duty et al., 2016; Kauts & Sharma, 2009; Yuksel & Yilmaz, 2020).

Mindfulness-Based Stress Reduction on Anxiety Reduction

Lastly, the theme of mindfulness and effects on anxiety were common to eight research studies, including one evidence-based practice guideline and two systematic reviews. The high levels of evidence found to support mindfulness in a treatment method for anxiety set the foundation for this inquiry (Hunot et al., 2007; Melnyk & Fineout-Overholt, 2019). Mindfulness-Based Stress Reduction (MBSR) techniques are relaxation strategies based on Buddhist principles of meditation (Kabat-Zinn, 2003). The practice brings the individual's focus to the here and now, allowing for re-evaluation of their current state and situation. It calms the body and mind, allowing for clearer thoughts and a relaxed physical state. Implementation of MBSR techniques can be completed in a variety of settings and is easily adaptable to the needs of the individual. Brought into an academic setting, the implications for use are expansive.

Implications of MBSR in Practice Guidelines. Mindfulness as a method of stress reduction is readily accepted as an effective strategy to treat anxiety under the umbrella of Cognitive Behavioral Therapy (CBT). In a search of the Cochrane Library database, a systematic review of 25 randomized controlled trials found mindfulness-based cognitive therapy as a more effective treatment for anxiety than other forms of therapy in a private counseling setting (Hunot et al., 2007). Additionally, established treatment protocol guidelines by the National Institute for Health and Care Excellence (NICE) identify cognitive based therapy as a first-line treatment for those experiencing anxiety and anxiety disorders (2019). Mindfulness CBT is widely accepted as best practice internationally to treat anxiety.

MBSR Strategies. Many relaxation strategies fall under the umbrella of MBSR. Several research studies used faculty-led meditation, progressive muscle relaxation, deep breathing, and yoga to induce a reframing of the mind and calming effect on the body over several sessions of training with students (Cho et al., 2016; Phang et al., 2016; Ratanasiripong et al., 2015; Reiss et al., 2017; Torabizadeh et al., 2016). Students could practice the techniques at home and while on campus, allowing for implementation at times of high stress. In a randomized controlled trial, researchers found the use of relaxation techniques such as muscle relaxation more efficacious in reducing stress than support groups in which students were able to verbalize their feelings to one another for encouragement (Torabizadeh et al., 2016).

Effects of MBSR Techniques. The literature supports the use of MBSR to reduce the negative effects of anxiety on the individual. Research suggests physical manifestations of anxiety improve with MBSR technique use such as a decrease in blood pressure, heart rate, respiration rate, and diaphoresis (Chen et al., 2013). One systematic review found the association between MBSR strategies and increases in student resilience and life satisfaction, with decreases

in rates of burnout, stress, depression, and compassion fatigue (Ghawadra et al., 2019).

Additionally, research supports MBSR use to increase optimism and reduce helplessness in nursing students (Karaca & Sisman, 2019). The positive impact of using MBSR as an effective strategy to decrease anxiety and boost an overall sense of well-being in students is well supported in the literature.

Evidence Discussion

Stress is an irrefutable part of life; however, an individual's ability to cope with stressors directly impacts their physical, emotional, and cognitive health. The evidence demonstrates a strong correlation between college students and high levels of stress, particularly in the nursing student population. Maladaptive coping mechanisms compound with particularly stressful times such as course examinations to create high levels of anxiety in the nursing student. Interventions based on the tenants of mindfulness are effective in reducing test anxiety and improve overall well-being. Evidence-based practice guidelines support mindfulness interventions as a form of CBT to reduce anxiety (Hunot et al., 2007).

Evidence Strengths

Many strengths are found within the literature related to improving test anxiety and thus test performance through mindfulness relaxation practices. Consistently, there was a strong correlation between relaxation techniques and reduction of anxiety, improved sense of well-being, and test performance. Additionally, measurement tools were proven highly statistically reliable, leading to higher confidence in the evidentiary support. The majority of the studies fell into evidence levels one through four, demonstrating strength in the research support (Melnik & Fineout-Overholt, 2019).

Limitations and Gaps

Though the strength of evidence overall is encouraging, there remain some gaps and limitations. Research focused on the stress of nursing programs on the students relied on a specific population, and most subjects were predominantly female (Karaca & Sisman, 2019). A limitation of the research shows females and males handle stress and interventions directed at anxiety reduction differently (Carsley & Heath, 2018). Though historically a female-dominated profession, there continue to be a growing number of males going into the field of nursing. More research should be completed that addresses gender-specific interventions related to stress and coping.

Another consistent limitation within the literature is the small sample size in most studies. Because most studies utilized convenience sampling in a single nursing program, large generalizations cannot be guaranteed (Cho et al., 2016; Ghawadra et al., 2019; Reiss et al., 2017; Vidic & Cherup, 2019). Increased diversity and larger studies with greater sample sizes in various settings would strengthen the support of mindfulness anxiety reduction strategies and the effectiveness of anxiety reduction in increasing academic performance. Additionally, larger sample sizes will be more inclusive of students from different backgrounds, which could impact the effectiveness of intervention strategies and reasons behind anxiety.

Gaps in the evidence related to mindfulness exist. Research demonstrates mindfulness as an effective form of CBT to reduce anxiety, but much of the evidence is from studies conducted outside of the United States. It is imperative to continue to research the effects of mindfulness cross-culturally to determine if the results are as effective in students from a variety of backgrounds across the globe. Additionally, more longitudinal studies are needed on the effects of mindfulness.

Theory

Roy's Adaptation Model applies well to the research of using mindfulness stress reduction strategies to reduce test anxiety in nursing students. Nursing students, just like patients, utilize both innate and acquired coping mechanisms to adapt to stimuli or stressors in their lives (Roy, 2011). Serving in the role of the nurse within Roy's Adaptation Model, nursing faculty may assist students in coping by teaching mindfulness strategies of stress reduction prior to a test.

Within Roy's model, there are several applicable components. Test anxiety serves as a focal stimulus to the student immediately before the test, staying at the forefront of their mind and causing racing thoughts, physiological effects, and cognitive congestion (Gosselin et al., 2016). The test environment acts as a contextual stimulus, as other students nervously discussing what they will likely see on the exam may be in the background. Harsh lighting, the buzzing from the ceiling fan, the cool temperature of the room, and the sound of computer keys tapping in the background may all affect the individual experiencing test anxiety, though their thoughts are focused on the impending test.

Adaptation to the stimuli requires the student to cope, which may occur from acquired or innate skills. For example, the body reacts to the initial extreme test anxiety by invoking the fight or flight mode of the autonomic nervous system (Gosselin et al., 2016). The body's innate reaction to extreme test anxiety is to increase the heart rate, increase the respiration rate, and the person may become diaphoretic as a result. This reaction stems from the physiological mode of adaptation in Roy's model (Roy, 2011). However, the student might utilize the deep breathing exercise they practiced in a mindfulness class to relax the body and slow the racing thoughts, also utilizing acquired coping skills to reduce the effects of test anxiety and thus adapt to the stimuli they face (Roy, 2011).

Overall, Roy's Adaptation Model translates well in addressing test anxiety in nursing students through the facilitation of acquired coping through mindfulness stress reduction practices. Adaptation through coping mechanisms helps the individual positively move forward and turns the body and mind back to homeostasis, thus freeing the person to face other stimuli they may encounter (Roy, 2011). Therefore, adaptation leads to overall well-being for the individual and a better quality of life. (See Appendix F, Diagram of Roy's Adaptation Model).

Methods

IRB Approval

The university's Institutional Review Board (IRB) approved this Evidence-Based Practice (EBP) project as exempt research during summer 2020 (See Appendix H, Project Timeline Flow Graphic).

Site Approval

Site approval to conduct the EBP project at the school of nursing was obtained in April of 2020. Support was expressed by both nursing faculty and administration for the EBP improvement project.

Ethical Issues

Student privacy was of the utmost concern during the project, as anxiety may be a sensitive issue that students may prefer was not disclosed to their peers or professors. Students are a vulnerable population, so protecting them is of the utmost importance. To protect privacy of the students, no names were associated with any document or data collected. Students self-generated all relevant data collection with a six-number unique sequence for the purposes of data collection alignment. All confidential information remained protected and anonymous. Beyond

the assigned number and self-reported gender, personally identifiable information that could breach confidentiality was not collected in this study.

Each student approached test anxiety reduction in a different manner prior to the intervention. Additionally, they may have had pre-conceived ideas about mindfulness and its effectiveness. It was important to introduce the intervention of mindfulness techniques that respect the diverse backgrounds from which the students originated. Several students attend the university from other countries, so they may also have had differing views on mindfulness strategies. As much of the existing research identifies, males and females also approach coping differently. While most nursing students are females, there were several males in the study cohort. Understanding the variety of backgrounds from which students approached this was vital to introducing the intervention and evoking an openness to the mindfulness stress reduction techniques.

Funding

Several funding sources were explored to support the evidence-based practice initiative. However, due to the financial impact of the COVID-19 pandemic, external funding was not secured. Monetary funding for the measurement tool and intervention workbook was the primary need (See Appendix A Cost Table).

Setting and Participants

This project took place at a school of nursing located in the Midwest. The nursing program is located on a satellite campus, approximately 40 miles from the main campus. There are four cohorts within the program, each consisting of 40 undergraduate, pre-licensure, Bachelor of Science in Nursing students. A convenience sample of the first semester cohort of 40

pre-licensure nursing students will participate in the study. Inclusion criteria was a registered nursing student in the first semester cohort at the university's school of nursing.

EBP Intervention

To provide a coping strategy to decrease test anxiety in nursing students, mindfulness-based stress reduction strategies were implemented. Mindfulness is a strategy developed by Jon Kabat-Zinn that includes bringing one's attention back to the present and away from stressors to a state of relaxation of the body, mind, and spirit (2003). Kabat-Zinn uses Buddhist meditation principles to guide the development of mindfulness-based stress reduction strategies such as deep breathing, guided meditation, body scanning, and yoga (Ghawadra et al., 2019). When applied to populations with high levels of stress, the strategies effectively improve personal, social and psychological well-being (He et al., 2018). However, opposing claims found that the effectiveness of the implementation of mindfulness techniques is purely up to the individual, and results may vary depending on personal openness to the strategies (Goldberg et al., 2020). Within the EBP improvement initiative, mindfulness techniques were introduced to nursing students, a population identified to have high levels of test anxiety, to determine effectiveness at reducing stress.

Protocol

Mindfulness strategies were led by nursing faculty, who participated in a series of group study training sessions. Utilizing the Body Scan Meditation, Basic Relaxation Breathing, and Flowing Stream activities as described in "Mindfulness Skills Workbook for Clinicians and Clients" (Burdick, 2013), faculty led students in three separate mindfulness activities (See Appendix I, Intervention Flow Diagram and Appendix J, Intervention Materials).

Initial steps included IRB approval and faculty training on mindfulness interventions. Next, informed consent and pre-intervention test anxiety measurement occurred prior to the first test of the semester in the Nursing Assessment course. Prior to each of the subsequent weekly quizzes during the semester, faculty led mindfulness intervention strategies with students. Before the fourth and final cumulative test of the Nursing Assessment course, students engaged in faculty-led mindfulness interventions and then completed the post-intervention test anxiety tool. Data analysis occurred to determine whether the mindfulness intervention strategies affected test anxiety in first semester nursing students.

EBP Model, Change Process

Utilizing the Iowa Model, this EBP project addressed the identified problem of lowering anxiety levels in nursing students at the school of nursing (Schaffer et al., 2012). Increasing mental health concerns among current nursing students in the program led to the faculty-driven inquiry of methods to assist students in reducing anxiety during testing and across the curriculum. Discussions with the chair of the nursing program confirmed that finding anxiety-reduction strategies is a priority within the program. Thus, both steps one and two of the Iowa Model have been addressed. A synthesis of evidence confirmed that mindfulness stress reduction strategies effectively reduce test anxiety in nursing students, which completed steps three and four of the Iowa Model.

Along with the Iowa Model for EBP, Kotter and Cohen's Model for Change was utilized to lead organizational change at the school of nursing through the EBP project (Teixeira et al., 2017). Organizational buy-in and an increasing sense of urgency to address anxiety related to nursing school were prioritized by key stakeholders, nursing faculty, and leadership. Continued involvement and support from the stakeholders were vital to the successful implementation of

the change. Thus, updates on the status of the project and its success were an important component of the project. Goal-setting and motivational updates helped sustain enthusiasm for the implemented change proposed by this project. Implementation of the mindfulness techniques to reduce anxiety may occur at both the university level and across the professional nursing discipline. Though anxiety related to testing specifically may occur more often at the university-level, situational anxiety is a chronic issue professional nurses must endure (Ghawadra et al., 2019). Therefore, mindfulness as an effective strategy to cope with anxiety may be a technique incorporated into daily nursing practice.

Project Design

The quasi-experimental design included one cohort with a pre- and post-intervention without random assignment. This design allowed for a baseline assessment of test anxiety levels. The intervention was implemented over the semester, and then a post-intervention test was administered prior to the final test of the semester. The design method demonstrated whether the intervention was effective in reducing test anxiety, as it illustrated pre-intervention test anxiety levels in the participants and then test anxiety levels after the mindfulness training.

Validity

Internal Validity

Several aspects promoted internal validity within the project. The intervention was grounded in theory and conceptualized using evidence-based methods of research to ensure support for effectiveness of mindfulness to reduce test anxiety. Temporal sequencing occurred, allowing for intervention implementation prior to outcome data collection. Study variables were clearly defined to demonstrate the direct impact of mindfulness on test anxiety. Also, data

collection procedures were consistent and clearly defined prior to implementation. Lastly, the instrument for data collection was consistent throughout the project to ensure data validity.

External Validity

External validity is important when approaching evidence-based practice projects. This project contained many aspects that ensure transferability may easily occur within other populations of college students and nursing schools alike. Mindfulness is a timeless technique that effectively reduces anxiety, particularly when addressing specific moments of high anxiety such as facing a test. Also, the characteristics of the population of nursing students are not likely to change over time due to the high-stakes nature of the nursing profession and licensure requirements. While used in a specific population of nursing students in first semester, the concept of mindfulness to reduce test anxiety may be easily applied to other groups of college students.

Outcomes

The primary outcome of the mindfulness intervention was to reduce test anxiety. Reduction in test anxiety occurred after practicing mindfulness and before starting the test. Students may see a reduction in overall anxiety through use of mindfulness during high stress times.

Measurement Instrument

The Test Anxiety Inventory (TAI) was used to measure anxiety levels in nursing students related to an impending test (Spielberger, 1980). TAI is a self-report, 20-item inventory using a four-point Likert scale in which students may respond using four options: (1) *Almost Never*, (2) *Sometimes*, (3) *Often*, and (4) *Almost Always*. Within the tool, there are two subscales including Test Anxiety-Worry and Test Anxiety-Emotionality along with a Total Test Anxiety score. The

original reliability measures of alpha coefficient for the subscale were as follows: Test Anxiety-Total was 0.96, for Test Anxiety-Worry was 0.91, and Test Anxiety-Emotionality was 0.91 (Spielberger, 1980). To avoid any false fluctuations in participants, Spielberger terms the inventory “Test Attitude Inventory” (See Appendix N, Permission for Use of Tool).

The consistent procedure for completion of the TAI included distributing a one-page paper copy of the inventory to participants prior to the first test of the semester and completing the tool through self-report at that time. Collection of the TAI occurred once all inventories were completed. Participants were assigned a number at the time of agreement to participate, and the number was the only identifiable data on the TAI to use in comparing pre- and post-intervention results. Permission to use occurred when purchasing the license for use before the study commenced (See Appendix N, Permission for Use of Tool). Mindfulness interventions were implemented weekly before in-class quizzes, and the post-intervention TAI was assessed prior to the final cumulative test of the semester.

Quality of Data

Several methods were used to ensure quality of data. Using an a priori power analysis via the G*Power (Faul et al., 2009), it was determined that a minimum sample size of 28 was needed for a power of .8, effect size of 0.5, alpha .05, and paired t-test, one tailed. Data was collected over a 16-week semester with initial pre-intervention baseline data collection at the beginning of the semester and post-intervention data collection at the end of the semester. Baseline data of test anxiety occurred immediately prior to the first test of the semester. Post-intervention TAI scores were collected prior to the fourth final test of the semester.

Comparative studies utilize the TAI to measure anxiety in differing student populations (Khng, 2016; Stephens, 1992). Results from the present study were analyzed and compared to the published studies (See Appendix P, Data Collection Table).

Statistical Analysis

Descriptive statistics were used to report the data. The paired t-test was used to compare the paired test anxiety scores from the pre- and post-intervention data sets. Demographic data collected included gender of participants (See Appendix O, Data Collection Template).

Results

Setting and Participants

The study took place at a midwestern university's school of nursing in the first semester cohort of Fall 2020. Of the 40 students in the class, 39 chose to participate in the study. Five male and 34 female nursing students joined the study, participating in mindfulness-based stress reduction strategies throughout their Nursing Assessment course. All 39 students completed the study, filling out both the pre- and post-intervention TAI for data collection.

Intervention Course, Actual

Prior to the start of the Fall 2020 semester, faculty in the Nursing Assessment course at were led through a series of mindfulness-based stress reduction activities within "Mindfulness Skills Workbook for Clinicians and Clients" (Burdick, 2013). Burdick provides step-by-step instructions on implementing various mindfulness activities, and a group-study format of the book with practice sessions ensued in the three weeks prior to the start of the semester. By group consensus, the faculty members chose basic relaxation breathing, guided imagery, and body scanning as the three types of mindfulness interventions to teach students.

At the start of the semester, students were provided informed consent to participate in the study and 39 out of 40 students opted for participation. Though participation in the study with completion of the Test Anxiety Inventory was optional, all students in the Nursing Assessment course were taught the mindfulness-based strategies. No mindfulness activities were introduced prior to the pre-intervention data collection. In week five of the semester, students began to participate in faculty-led mindfulness-based stress reduction activities at the beginning of class. Faculty verbally led students through the activities as described in Burdick's workbook, choosing one to focus on each week. As the semester progressed, students practiced mindfulness strategies of relaxation breathing, guided imagery, or body scanning each week in class.

Immediately prior to the final test of the semester, a cumulative exam, students were led through a relaxation breathing activity and then completed the post-intervention TAI (Spielberger, 1980). All 39 students who opted to participate in the study at the beginning of the semester chose to complete the final data collection inventory.

Outcome Data by Subtopic

Data collected through the TAI supported mindfulness-based stress reduction strategies as an effective method to reducing test anxiety in nursing students. All items on the TAI supported the overarching construct of test anxiety with emotionality and worry as subcomponents. Spielberger's TAI was originally reported as reliable with Cronbach's alpha of Test Anxiety Total as 0.96, Test Anxiety-Worry as 0.91, and Test Anxiety-Emotionality as 0.91. In this study, internal consistency scales for total test anxiety and subscales for worry and emotionality were high, further supporting evidence of validity and reliability in a population of pre-licensure nursing students. Total test anxiety scales were 0.942 on both pre- and post-intervention data. The subscale of worry had Cronbach's alpha of 0.895 (pre) and 0.902 (post).

Similarly, the subscale of emotionality showed Cronbach's alpha of 0.90 (pre) and 0.902 (post) (See Appendix P, Statistical Analysis Results Tables).

Test Anxiety

Test anxiety was measured both pre- and post-intervention by the total score of all 20 items on the TAI (Spielberger, 1980). A paired-sample t-test was conducted to determine the significance of the change. There was a significant decrease in test anxiety between the pre-intervention total test anxiety scores ($M = 53.92$; $SD = 12.86$) and the test anxiety scores post-intervention ($M = 44.67$; $SD = 12.33$); $t(39) = 7.00$, $p < .001$; See Appendix P for Statistical Analysis Results Table 4). The 95% confidence interval for the difference between pre-intervention and post-intervention scores was 6.58.

Worry

Spielberger incorporated worry as a component of test anxiety (Spielberger, 1980). Within the TAI, eight responses contribute to the worry subscale total. Analysis of the worry subscale totals showed a statistically significant decrease from pre-intervention ($M = 18.58$; $SD = 6.07$) to post-intervention ($M = 15.82$; $SD = 5.63$). A paired-sample t-test demonstrated a decrease in worry post-intervention, $t(39) = 4.20$, $p < .001$; See Appendix P for Statistical Analysis Results Table 4. The 95% confidence interval for the difference between pre-intervention and post-intervention worry subscale was 1.44.

Emotionality

Emotionality was an additional component of test anxiety identified by Spielberger (1980) and incorporated into the TAI. Participants completed eight responses contributing to the emotionality subscale total. As reflected in both the total test anxiety score and the worry subscale scores, there was a significant decrease in emotionality scores from pre-intervention (M

= 23.90; SD = 5.59) to post-intervention (M = 19.46; SD = 5.20). A paired-sample t-test showed a decrease in emotionality post-intervention $t(39) = 6.03, p < .001$; See Appendix P for Statistical Analysis Results Table 4. The 95% confidence interval for the difference between pre-intervention and post-intervention emotionality subscale scores was 2.95.

Discussion

Successes, Most Important

Within the study, the statistical analysis of the pre- and post-intervention data demonstrated a decrease in overall test anxiety, worry, and emotionality. Students also reported anecdotally to faculty leaders of the mindfulness interventions that they had been practicing the mindfulness strategies learned in this study during clinical experiences in the hospital setting and during simulation activities. Though not statistically relevant, the informal participant feedback supports the transference of mindfulness to other settings and may indicate nursing students could utilize mindfulness techniques in their professional, post education experiences

Study Strengths

Several elements of the study supported the intervention. The classroom setting of the intervention provided an environment conducive to teaching mindfulness to participants. Additionally, faculty who led the intervention are trained educators, which assisted in effectively communicating the steps of the mindfulness activities. Participants in the study were also encouraged to be open and honest due to the anonymity within the data collection process, supporting accuracy of the scores from the TAI.

Results Compared to Evidence in the Literature

A review of the literature showed many studies that support mindfulness as an effective method to reduce test anxiety. Similar to the participants and setting of this project, one study

used MBSR to reduce overall anxiety in second-year nursing students (Karaca & Sisman, 2019). Data analysis showed reduction in educational stress and increased coping skills in nursing students who participated in the MBSR intervention.

Additional findings of the literature review showed several studies applying mindfulness in different settings and sample groups. A study explored using MBSR strategies to reduce anxiety in practicing nurses and found a reduction in anxiety, stress levels, and occupational burnout (Ghawadra et al., 2019). Ghawadra's study supports the transferability of mindfulness practice from the academic setting to the professional practice environment of nurses. Other studies found mindfulness as an effective reducer of test anxiety in adolescent public-school students and general college students (Carsley & Heath, 2018; Vidic & Cherup, 2019). Both studies, like this one, found MBSR strategies reduced stress and test anxiety in the participants.

Limitations

Internal Validity Effects

Though every effort was made to ensure the validity of the study, there were a few factors that serve as potential limitations. Each participant in the study brought a unique level of experience with mindfulness activities. Some students may have already been practicing mindfulness prior to introduction of the techniques in the study. Additionally, participants in the study completed the TAI pre-intervention immediately before their first test in the nursing program, which could have resulted in higher-than-normal test anxiety scores. The effectiveness of the intervention was also determined by the openness of the individual to the mindfulness techniques offered. Participation and true mindfulness take place in the mind of the individual and thus is not open to the monitoring of any external source.

External Validity Effects

External validity may have affected generalization of the results of the study. The majority of the participants in the study were female. There were five male students out of 39 participants in the study. Also, due to the specific population in the study, results may not be generalizable to college students as a whole. Participants were solely nursing students in their first semester of the nursing program. Study results may vary in different populations and settings.

Sustainability of Effects and Plans to Maintain Effects

Though mindfulness interventions to reduce test anxiety were supported in this study, there is a risk that nursing student participants will not continue to utilize these skills in the future. A lack of continued training in mindfulness activities could cause participants to forget the steps within the mindfulness activities and thus forgo mindfulness activities prior to tests. The potential risk for loss of mindfulness skills combined with the results of this study support more widespread use of mindfulness across the nursing program to ensure students maintain their skill set. Also, continued faculty and school leadership support will be necessary to ensure more faculty are trained in mindfulness techniques and teach their students how to utilize them across the curriculum. A plan to present the findings of this study for all faculty within the nursing program and subsequent training sessions on mindfulness activities will ensure faculty have the skill set to continue the efforts to decrease test anxiety across the nursing program. Lastly, as mindfulness interventions continue within the nursing classrooms from this study forward, nursing school leadership and faculty will monitor feedback from recent graduates related to whether stress reduction strategies have been effective long-term through the program.

Efforts to Minimize the Study Limitations

Many efforts were made to reduce the likelihood of study limitations affecting the results. Participation in the study was voluntary, though mindfulness interventions became a part of the curriculum for all nursing students in the first semester cohort. Because anxiety and mental health can be a sensitive subject for participants to self-disclose to faculty members, anonymity within the data collection process was protected. Participant identification was completely anonymous, and paired scores were only matched through participant-generated unique numbers. Furthermore, faculty were trained on mindfulness interventions using the same workbook, ensuring consistency and accuracy in the intervention.

Interpretation

Expected and Actual Outcomes

The expected outcome was a reduction in total test anxiety scores. Results of the actual outcome of the study demonstrated a decrease in test anxiety, along with the subcomponents of worry and emotionality in participants.

Intervention Effectiveness (Inferences)

The project was aimed at reducing test anxiety in nursing students utilizing mindfulness-based stress reduction strategies. Analysis of the data confirmed the mindfulness activities effectively reduced test anxiety in participants. Utilization of nursing professors to lead mindfulness activities in the classroom was effective due to their experience at teaching unfamiliar concepts to students. Also, first semester nursing students within the participant cohort were open to learning mindfulness techniques and practicing them prior to test-taking. The mindfulness strategies learned may be useful in other environments to reduce anxiety.

Intervention Revision

Mindfulness activities are available in a variety of formats. There are software applications that provide pre-recorded mindfulness activities for individuals and many pieces of literature that provide procedures for practicing mindfulness. Additionally, there are various mindfulness activities to choose from, some requiring more time than others. To allow for consistency within this study, the researcher chose to utilize three mindfulness activities from the same workbook led by faculty. Future use of mindfulness as an intervention to reduce test anxiety could be more effective outside of the classroom in a more individualized and private setting by providing a software application for participant use and allowing for choice of mindfulness activities.

Expected and Actual Impact to Health System, Costs, and Policy

Nurses are in high demand in health care as the nursing shortage continues. Producing well-qualified, prepared, and healthy nursing graduates is vital to successfully fill the nursing gap in health care. Additionally, nursing is a profession filled with stress and emotionally intense situations (Ghawadra et al., 2019). Mindfulness intervention strategies serve as an effective strategy to reduce anxiety in academic and professional settings, leading to lower stress and increased job satisfaction for nurses across the lifespan. Participants in this study may utilize the MBSR techniques in their personal lives, future academic career, and experiences as a professional nurse post-graduation.

Conclusions

While stressors continue to exist in the lives of students, nursing students face an exceptionally high demand curriculum. Because of the high-stakes nature of nursing programs, students are at a higher risk of developing test anxiety when facing performance evaluation. The development of coping techniques such as MBSR strategies is vital to avoidance of the negative

repercussions of acute anxiety whether in the academic setting or as a future professional nurse. The introduction of mindfulness prior to nursing school tests benefits the student's sense of well-being, overall cognitive function, and health.

Practical Usefulness of Intervention

Mindfulness interventions may be easily implemented in college classrooms. MBSR activities within the study required only five to ten minutes of class time to introduce the relaxation technique and practice. Participants were then able to transition into testing quickly after MBSR activities. Through study of MBSR strategies, available in a variety of formats, faculty can quickly learn how to implement MBSR activities within their classes. Additionally, participants may use mindfulness techniques in their lives outside of academia, providing a coping strategy when facing stressors, whether as a student or nurse professional in the health care setting.

Further Study of Intervention

Though MBSR is supported as an effective form of CBT, more research is needed in the effectiveness of mindfulness strategies within the classroom. Greater diverse samples will strengthen current research findings that support MBSR as an effective strategy to reduce test anxiety. Additionally, data regarding long-term benefits of MBSR skills developed during this initiative once participants transition into the professional nursing role will be sought after the participant cohort completes the nursing program. Continued usefulness of mindfulness strategies will be assessed during future semesters of the nursing program and post-graduation.

Dissemination

The EBP improvement initiative will be disseminated to the school of nursing faculty for more wide-spread implementation. The team leader presented at a national virtual conference in

Fall 2020. Further opportunities to disseminate the findings of this project are currently underway.

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Appendix A

Cost Table for Project

Item	Item Description	Quantity	Unit Cost	Anticipated Cost
Print materials	Test Anxiety Inventory Measurement tool (Spielberger, 1980)	85	\$2.50/copy	\$212.50
Mindfulness techniques book: "Mindfulness skills workbook for clinicians and clients" (Burdick, 2013).	Descriptions and instructions for mindfulness techniques used with students	3	\$21.99	\$65.97
Presentation Poster	Poster to present research (Printing cost)	1	\$200	\$200
Student Time/Faculty Time	DNP student donated time; BSN student (research assistant) donated time; Faculty time for wide-spread implementation	N/A	\$0 \$0 \$30/hour	\$0 \$0 \$180 (not included in the cost of this EBP project)
Total				\$478.47

Appendix B

Definition of Terms

Test anxiety: Physical, cognitive, and behavioral reactions to a test due to the intense fear of failure and the negative outcomes associated with it (Roykenes, 2014, p. 350).

Mindfulness: Bringing attention back to the present and away from stressors to a state of relaxation of the body, mind and spirit (Kabat-Zinn, 2003, p. 145).

Coping: Effectively responding and adapting to a changing environment through innate and acquired skills that allow for survival, growth, and transcendence (Roy, 2011, p. 316).

Stressors: Challenges that may impact a person's cognitive, physical, and mental processes (American Psychological Association [APA], 2020).

Adaptation: The ability to return to homeostasis or normal functioning to allow for growth, a sense of well-being when faced with challenges from the environment (Roy, 2011, p. 316).

Stimuli: An individual's interaction with circumstances and conditions that causes an external or internal reaction (Roy, 2011, p. 316).

Appendix C

PRISMA Diagram



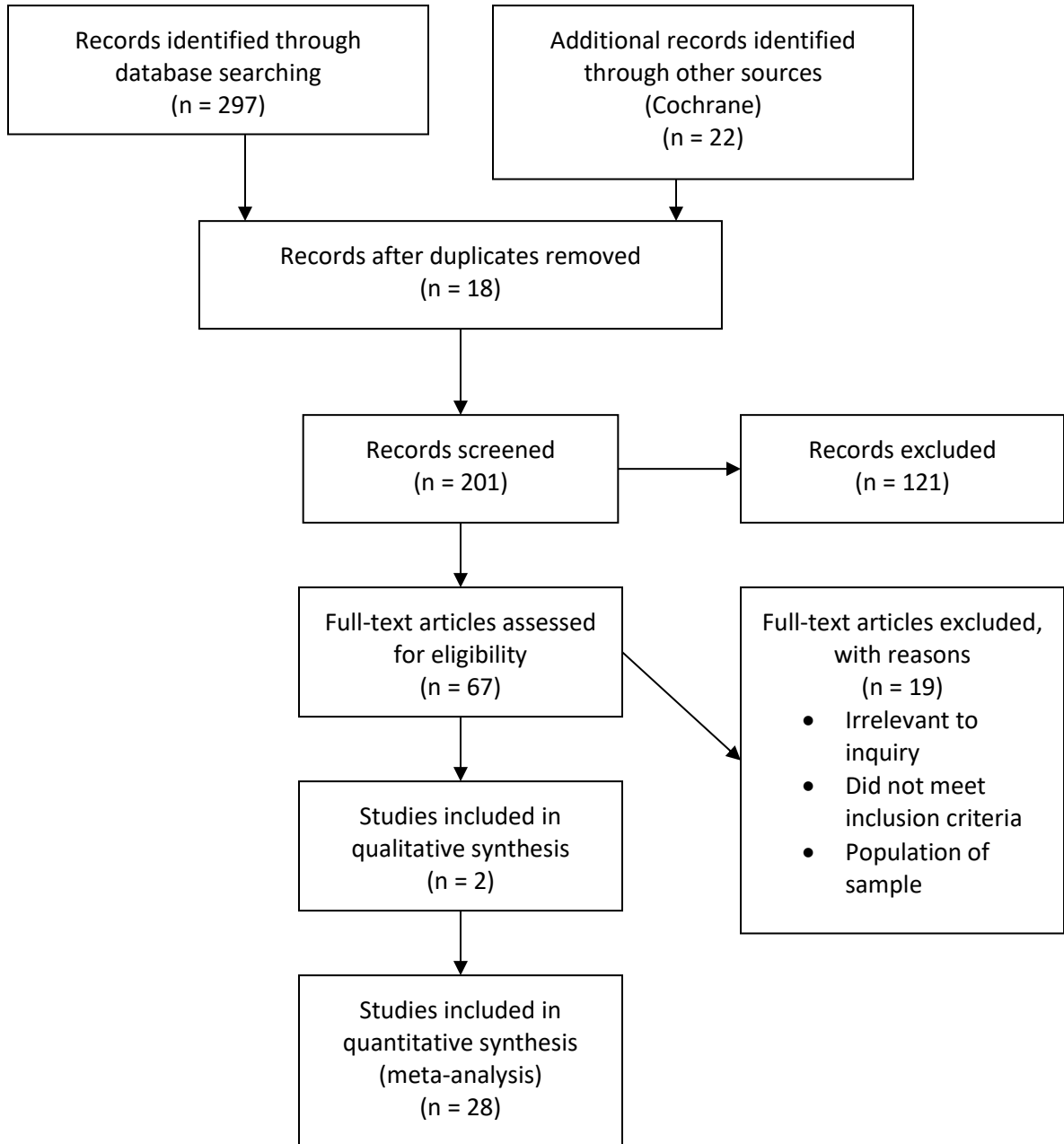
PRISMA 2009 Flow Diagram

Identification

Screening

Eligibility

Included



Appendix D

Synthesis of Evidence Table

Among nursing students, does the implementation of faculty-led mindfulness-based stress reduction strategies reduce test anxiety levels and improve performance within one 16-week semester at a four-year university undergraduate nursing program?

First author, Year, Title, Journal	Purpose	Research Design¹, Evidence Level² & Variables	Sample & Sampling, Setting	Measures & Reliability (if reported)	Results & Analysis Used	Limitations & Usefulness
Mindfulness-based stress reduction on anxiety reduction						
Ghawadra (2019) Mindfulness-based stress reduction for psychological distress among nurses: A systematic review; <i>Journal of Clinical Nursing</i>	Explore the MBSR strategies used to reduce anxiety in practicing nurses	Systematic review of Quantitative Studies: Level I , variables are MBSR strategies' effect on psychological well-being of nurses	Articles (n=9)	The Quality Assessment Tool for Quantitative Studies (QATFQS) used, Reliability determined by Cohen's kappa (0.61-0.74)	Overall, MBSR strategies improve anxiety, prevent burnout, reduce stress levels, and increase life satisfaction in practicing nurses.	Sample size was consistently small in studies, ranging from 12-94 participants; dropout rate from the studies not identified; participants not randomly selected
Karaca (2019) Effects of a stress management training program with	Evaluate the effectiveness of a mindfulness-based stress reduction (MBSR)	RCT; Level II; variables mindfulness-based stress reduction program,	Second year nursing students (n=190); Convenience sampling; Turkish university	Nursing Education Stress Scale (Cronbach's alpha=0.81-0.93)	MBSR programs reduce nursing education-related stress, increased mindfulness, increased self-	Limited to one nursing school, majority of participants female, data collected was

<p>mindfulness-based stress reduction; <i>Journal of Nursing Education</i></p>	<p>program applied to a sample of Turkish nursing students.</p>			<p>Mindfulness Scale (Cronbach's alpha=0.80 and 0.86 respectively) Stress Management Styles Scale (Cronbach's alpha=0.47-0.80)</p>	<p>confidence and optimistic attitudes, and increased students' ability to cope with stress. It also decreased their helpless approach. Descriptive analysis (Repeated measurements variance analysis)</p>	<p>based on self-report Realistic use.</p>
<p>Carsley (2018) Effectiveness of mindfulness-based colouring for test anxiety in adolescents; <i>School Psychology International</i></p>	<p>Compare the effectiveness of a mindfulness art activity with a free drawing/coloring activity on test anxiety in adolescents</p>	<p>RCT: Level II Variables: Structured mandala coloring, free drawing/coloring, anxiety levels and test performance</p>	<p>8th graders (n=193); Convenience sampling; Public elementary schools in Canada</p>	<p>State Trait Anxiety Inventory (Cronbach's alpha= 0.86-0.96) Mindful Attention Awareness Scale (Cronbach's alpha 0.74-0.84) Child and Adolescent Mindfulness Measure (Cronbach's alpha 0.84)</p>	<p>Test anxiety decreased and state mindfulness increased with both coloring activities; descriptive analysis (ANOVA)</p>	<p>Interventions assisted with anxiety and mindfulness in females more than males; students' prior experience with mindfulness mandala coloring technique may have influenced the overall effectiveness Realistic use with further examination of gender roles in research needed</p>
<p>Cho (2016). The effectiveness of daily mindful</p>	<p>Examine the effectiveness of daily mindful breathing</p>	<p>Quasi-experimental, Level III, Variables include</p>	<p>36 participants chosen of 233 volunteer participants who were determined highly anxious through</p>	<p>Revised Test Anxiety (RTA) Cronbach's alpha .73</p>	<p>Mindfulness-based breathing practices were positively correlated with</p>	<p>Small sample size, dependent on self-report of anxiety for</p>

<p>breathing practices on test anxiety of students; <i>PLoS One</i></p>	<p>practices on test anxiety of university students</p>	<p>a training in mindful breathing, a training in cognitive reappraisal condition, and a non-intervention group</p>	<p>scale of test anxiety (Revised Test Anxiety tool); college students enrolled in a psychology class at Yeungnam Univ in South Korea</p>	<p>Automatic Thoughts Questionnaire-Positive (ATQ-P) Cronbach's alpha .92 Positive and Negative Affect Schedule (PANAS) Cronbach's alpha .76</p>	<p>reducing test anxiety; one-way ANOVA analysis</p>	<p>selection in the study and thus a sampling bias occurred.</p>
<p>Reiss (2016). Effects of cognitive behavioral therapy with relaxation vs. imagery rescripting on test anxiety: A randomized controlled trial; <i>Journal of Affective Disorders</i></p>	<p>Determine the effect of imagery rescripting, cognitive behavioral therapy and relaxation techniques on test anxiety</p>	<p>Quantitative experimental, Level II, cognitive behavioral therapy including imagery rescripting and relaxation techniques (independent variable) and test anxiety (dependent variable)</p>	<p>180 participants, random sampling, one U.S. public university</p>	<p>Prüfungsangstfragebogen (test anxiety questionnaire) (PAF) used in which students self-reported pre- and post- intervention, Cronbach alpha of .80</p>	<p>All three cognitive behavioral therapy, imagery rescripting, and relaxation techniques assisted with reducing test anxiety, A repeated-measures ANOVA analysis used</p>	<p>Small sample size, students only included if they had a clinical level of test anxiety so may not capture full levels of test anxiety in all students</p>
<p>Phang (2015) Effects of brief group mindfulness-based cognitive therapy for stress reduction among medical students in a Malaysian University; <i>Mindfulness</i></p>	<p>Determine if mindfulness-based cognitive therapy will reduce stress in medical students at a Malaysian University</p>	<p>Quasi-experimental study: Level III; variables mindfulness-based cognitive therapy four-week course, perceived stress, and general psychological distress</p>	<p>Medical students in their Psychiatry rotation (n=135); Convenience sampling; Samples from Universiti Putra Malaysia</p>	<p>The Perceived Stress Scale (Cronbach's alpha=0.88) The General Health Questionnaire (Cronbach's alpha=0.82-0.90) The Mindful Attention Awareness Scale (Cronbach's alpha=0.82-0.87)</p>	<p>Significant reductions were found in perceived stress and general psychological distress with increased mindfulness after attending the mindfulness-based cognitive therapy Descriptive analysis (Kolmogorov-Smirnov test determined normality)</p>	<p>Study lacked control group, no longitudinal effects measured; instructor was a co-investigator in the study, which could cause bias Realistic use</p>

<p>Chen (2013) A randomized controlled trial of the effects of brief mindfulness meditation on anxiety symptoms and systolic blood pressure in Chinese nursing students; <i>Nurse Education Today</i></p>	<p>Evaluate the effects of brief mindfulness meditation on the anxiety and depression symptoms and autonomic nervous system activity in Chinese nursing students</p>	<p>RCT: Level II; Variables: Meditation and control group, anxiety, depression, blood pressure, and heart rate</p>	<p>Nursing students (n=60); Random sampling; A medical university in Guangzhou, China</p>	<p>Self-Rating Anxiety Scale (no reliability reported) Self-Rating Depression Scale (no reliability reported) Autonomic Measurements: BP, Pulse by electronic sphygmomanometer</p>	<p>Mindfulness meditation program effectively reduced anxiety and autonomic symptoms of anxiety including blood pressure and heart rate. Descriptive analysis (ANOVA)</p>	<p>Small, predominantly female sample; control group lacked the social support and anticipatory effect from the meditation group, so pure meditation effect cannot be distinguished from placebo effect Realistic use</p>
<p>Hunot (2007) Psychological therapies for generalized anxiety disorder; <i>Cochrane Database of Systematic Reviews</i></p>	<p>Examine the efficacy of CBT as a treatment compared with other treatments for anxiety</p>	<p>EBPG/Systematic Review: Level I Variables: CBT, other therapies, anxiety</p>	<p>25 RCTs; 1305 participants across the studies; studies took place in the US (n=9), Canada (n=3), UK (n=10), other European countries (n=3)</p>	<p>Most commonly used outcome measurement tools were Hamilton Anxiety Scale and Spielberger State-Trait Inventory</p>	<p>Evidence showed CBT is effective treatment method for anxiety. Majority of studies high quality (rated well with QRS score of 2)</p>	<p>Dated study, but supported by updated practice guidelines that continue to identify CBT as front-line treatment for anxiety</p>
<p>College students and stressors</p>						
<p>Rith-Najarian (2019) A systematic review of prevention programs targeting depression,</p>	<p>Examination of effective prevention programs to prevent excessive stress, anxiety and depression in</p>	<p>Systematic review of RCTs: Level I. Variables include intervention strategies such as psychoeducation, relaxation, and</p>	<p>Articles (n=62), RCTs</p>	<p>PracticeWise Clinical Coding System, Reliability (Cohen’s kappa mean inter-rate reliability=0.69)</p>	<p>Effective prevention strategies included psychoeducation related to symptoms, relaxation strategies, cognitive behavioral therapy, coping skills education, and</p>	<p>Data did not measure how extensively an intervention was covered in each trial, non-inclusion of ineffective</p>

anxiety, and stress in university students; <i>Journal of Affective Disorders</i>	university students	cognitive monitoring on depression, anxiety and stress			mindfulness techniques. Descriptive analysis (Chi-Square)	prevention programs Realistic use
He (2018) Assessing stress, protective factors and psychological well-being among undergraduate nursing students; <i>Nurse Education Today</i>	Examine predictors of psychological well-being among nursing students	Cross-sectional study: Level IV Variables: Positive psychological well-being, negative psychological well-being, perceived stress, resilience, self-efficacy, support from significant others, support from family, support from friends, mindfulness	538 responses, Convenience sampling from Australian regional university nursing program	Six scales used: Perceived Stress Scale (Cronbach's Alpha=0.89), General Self-Efficacy Scale (Cronbach's Alpha=0.89), Connor Davidson Mindfulness Awareness Scale (Cronbach's Alpha=0.90), Multi-Dimensional Scale of Perceived Social Support (Cronbach's Alpha=0.94), Psychological Wellbeing Scale with two factors (Positive and negative well-being) (Cronbach's Alpha=0.79, 0.54 respectively), Mindfulness Awareness Scale (Cronbach's Alpha=0.91)	Level of stress negatively correlated with psychological well-being, resilience strongest predictor for psychological well-being, mindfulness strongly correlates with psychological well-being; self-efficacy has no effect on psychological well-being; positive relationship between social support and psychological well-being.	Response rate lower than expected; reliance on self-report; limited snapshot of data rather than longitudinal study
McCarthy (2018) Coping with stressful events: A pre-post-test of a psycho-educational intervention for undergraduate	Evaluate the effectiveness of a psycho-educational intervention on stress levels of nursing students	Quasi-experimental: Level III; variables are psycho-educational interventions on stress and coping	First year undergraduate nursing and midwifery students (n=197) Non-probability convenience sample, from a communication/psychology course in a university in Ireland.	COPE Inventory Questionnaire (CIQ); reliability score not reported	Psycho-educational interventions have a positive effect on coping and stress reduction; Descriptive statistical analysis used (Chi-Square and one-way ANOVA)	Convenience sampling used; self-report data relies on honesty of individual to report; predominantly female

nursing and midwifery students, <i>Nurse Education Today</i>						population with significant differences in outcomes of male students Realistic use, shows need for further research
Schwind (2017) Mindfulness practice as a teaching-learning strategy in higher education: A qualitative exploratory pilot study; <i>Nurse Education Today</i>	To explore how undergraduate and graduate students experience brief instructor-guided mindfulness practice as it relates to their feelings of anxiety, stress, and their sense of well-being	Qualitative Study: Level VI; Variables mindfulness practice on feelings of stress, anxiety and sense of well-being	52 graduate and undergraduate students in different disciplines; convenience sampling; urban university	Small group interviews: open-ended questions (no reliability reported)	Mindfulness meditation was a positive experience, helping to mitigate anxiety, stress in school and overall well-being. It also increased their capacity to focus on academic tasks. The biggest challenge they found was finding time to do it at home.	Variations in instructor comfort in leading the mindfulness activities existed Realistic use.
Horgan (2016) Depressive symptoms, college adjustment and peer support among undergraduate nursing and midwifery students	Identify association between depression, adjusting to college life, and social support in nursing students	Quantitative Cross-sectional design: Level IV; Variables depressive symptoms, social adjustment, personal adjustment, peer support	417 undergraduate nursing students from a university in Ireland; stratified random sampling	Centre for Epidemiological Studies Depressive Scale (CES-D) Cronbach's alpha=0.90 Social Adjustment Scale (SA) Cronbach's alpha=0.84 Personal Adjustment Scale (PA) Cronbach's alpha=0.86	Strong correlation between depression, financial stress, poor familial relationships, high alcohol consumption, low peer support, and low personal adjustment to college. Pearson Correlations Coefficient used for analysis	Mostly females in sample, completed during winter months when there is a higher likelihood of depressed mood Realistic use

				Supportive Functions subscale of the Peer Support Evaluation Inventory; Cronbach's alpha=0.95		
Prasad (2016) Medical students' stress levels and sense of well-being after six weeks of yoga and meditation; <i>Evidence-Based Complementary and Alternative Medicine</i>	Determine the effects of six weeks of yoga, meditation and deep breathing on medical students' perceived stress and feelings of well-being	Quasi-experimental study: Level III; Variables: yoga/meditation/deep breathing biweekly classes, perceived stress, feelings of well-being	Medical students (n=27),	Perceived Stress Scale Survey (No reliability reported) Self-Assessment Survey (No reliability measure reported)	Yoga, meditation and deep breathing reduced perceived stress and improved overall sense of well-being in medical students prior to exams Descriptive analysis	Reliability of measures not reported; small sample size, absence of a control group, outside factors such as diagnosis and treatment of anxiety and depression may affect results Realistic use, but larger sample size necessary for generalizability
Torabizadeh (2016) Comparison between the effects of muscle relaxation and support groups on the anxiety of nursing students: A randomized controlled trial; <i>Complementary Therapies in</i>	Compare the effects of the two methods of muscle relaxation and support groups on the anxiety levels of nursing students	RCT; Level II; Variables: muscle relaxation, support group, and control group on levels of anxiety	Nursing students (years 2-4) (n=150); permuted-block randomization; from a university in Iran	Spielberger's State-Trait Anxiety Inventory (Cronbach's alpha=0.94)	Muscle relaxation and support groups both reduced anxiety over the control group; muscle relaxation had a greater effect on anxiety reduction than support groups. Descriptive statistics number, percentage, mean, standard deviation, and descriptive tables (Chi Square test)	Control group aware they had no interventions, which could have affected their report on the questionnaire. Realistic use

<i>Clinical Practice</i>						
Test anxiety on physical, social, cognitive well-being						
Farner (2019) Aromatherapy hand massage for test anxiety and self-efficacy in nursing students: A pilot study; <i>Teaching and Learning in Nursing</i>	Determine if aromatherapy hand massage could improve test anxiety and self-efficacy in nursing students	Quasi-experimental: Level III; variables: aromatherapy hand massage, test anxiety and self-efficacy	14 senior-level undergraduate nursing students; Convenience sampling; large urban university in the mid-western United States	Westside Test Anxiety Scale (Cronbach's alpha=0.78) General Self-Efficacy Scale (Cronbach's alpha=0.86 and 0.71 respectively)	Aromatherapy decreased test anxiety along with increasing self-efficacy. However, results were not significantly higher than non-intervention control group changes throughout the semester. Descriptive analysis (ANOVA)	Small sample size, female-only participants, lack of diversity in race of participants Realistic use, but larger sample size would show more statistical proof of intervention effect
Dvorakova (2017) Promoting healthy transition to college through mindfulness training with first-year college students: Pilot randomized controlled trial' <i>Journal of</i>	Evaluate the effectiveness and feasibility of mindfulness training aiming to promote first-year college students' health and well-being	RCT: Level II; Variables: Mindfulness course, anxiety, life satisfaction, depression, anxiety, sleep, and alcohol use	109 first-year undergraduate students, volunteer sampling, large public university in Pennsylvania	Primary Health Questionnaire (Cronbach's alpha=0.90) Generalized Anxiety Disorder Scale (Cronbach's alpha=0.91) Satisfaction with Life Scale (Cronbach's alpha=0.88)	Mindfulness training program increased students' life satisfaction, decreased depression and anxiety, and decreased incidence of sleep issues and alcohol consequences. Descriptive analysis (ANCOVA)	Small sample size, lack of active control group, self-report measurements rely on honesty, motivation may be an external factor critical to effectiveness of intervention

<p><i>American College Health</i></p>				<p>Mindfulness Attention Awareness Scale (Cronbach’s alpha=0.90)</p> <p>Self-Compassion Scale (Cronbach’s alpha=0.86)</p> <p>Social Connectedness Scale (Cronbach’s alpha=0.89)</p> <p>Compassion Scale (Cronbach’s alpha=0.91)</p> <p>Pittsburgh Sleep Quality Index (no reliability noted)</p> <p>Young Adult Alcohol Problems Screening Test (no reliability reported)</p> <p>L2B Acceptability Questionnaire (no reliability reported)</p>		<p>Realistic use</p>
<p>Dundas (2016) Mindfulness based stress reduction for academic evaluation anxiety: A naturalistic longitudinal study; <i>Journal of College Student Psychotherapy</i></p>	<p>Examine the use of MBSR on anxiety, self-esteem, and self-efficacy in college students</p>	<p>Case-control study: Level IV; Variables: MBSR courses, trait anxiety, state anxiety, self-esteem, academic self-esteem, self-efficacy</p>	<p>College students (n=55) compared to a control group of college students from same institutions (n=90)</p>	<p>Revised Test Anxiety Scale (Cronbach’s alpha=0.94)</p> <p>State and Trait Anxiety Inventory (Cronbach’s alpha= 0.94 for State/Cronbach’s alpha=0.90 for Trait)</p> <p>Self-Description Questionnaire II (Cronbach’s alpha=0.81)</p>	<p>Mindfulness-based stress reduction courses caused a decrease in evaluation anxiety, a decrease in trait anxiety, an increase in self-esteem, and an increase in self-efficacy</p> <p>Descriptive analysis</p>	<p>Lack of randomization of procedures and control group; did not measure academic abilities or performance on exams; dependent on self-report</p>

				General Self-Efficacy Scale (Cronbach's alpha=0.89)		Realistic use
Gosselin (2016) Music for anxiety reduction and performance enhancement in nursing simulation; <i>Clinical Simulation in Nursing</i>	Examine the effect of music listening on anxiety, self-efficacy, and performance among baccalaureate nursing students undergoing simulation testing	RCT: Level II Variables: music-listening interventions, anxiety, mean arterial pressures (MAPs), heart rates	42 baccalaureate nursing students; Convenience sampling; Second semester of a college campus four-year nursing program at a university	State Trait Anxiety Scale (Cronbach's alpha=0.82) Noninvasive finger pulse oximeter and blood pressure cuff (Accuracy assessed through comparison of manual blood pressure and pulse readings by experienced nurse evaluators) General Self-Efficacy Scale (Cronbach's alpha=0.78) Nursing Simulation Performance Scale (Cronbach's alpha=0.89)	Students that listened to music experienced a significant reduction in anxiety with increased performance. Descriptive Analysis (RM-MANOVA)	Small convenience sample, short length of study, may be impractical for some schools of nursing Realistic use, but length of intervention (30 minutes in duration prior to every test) may be impractical
Augner (2015) Depressive symptoms and perceived chronic stress predict test anxiety in nursing students; <i>Central European Journal of Nursing and Midwifery</i>	Identify predictors of test anxiety in nursing students	Cross-sectional study: Level IV; variables: test anxiety, psychological variables, physical symptoms	112 nursing students; Convenience sampling; nursing school at Linz General Hospital	PAF Test Anxiety Questionnaire (Cronbach's alpha= 0.77 and 0.87 respectively) WHO-5 Well-Being Questionnaire (no reliability reported) Ten-Item Personality Inventory (no reliability reported) Trier Chronic Stress Inventory (no reliability reported)	There is a high prevalence of chronic stress and test anxiety in nursing students. Depressive symptoms and perceived chronic stress are strongly related to test anxiety. Descriptive and reliability analysis	Small sample size Realistic use

<p>Ratanasiripong (2015) Stress and anxiety management in nursing students: Biofeedback and mindfulness meditation; <i>Journal of Nursing Education</i></p>	<p>Investigate the efficacy of two brief intervention programs, biofeedback and mindfulness meditation, on levels of state anxiety and perceived stress in Thai nursing students</p>	<p>RCT; Level II; variables: biofeedback, mindfulness, anxiety, perceived stress</p>	<p>Second-year nursing students (n=89); Random sampling; a public nursing college in Thailand</p>	<p>Perceived Stress Scale (Cronbach's alpha=0.62) State Anxiety Scale (Cronbach's alpha=0.89)</p>	<p>Biofeedback helped reduce anxiety levels while maintaining stress levels. Mindfulness meditation reduced anxiety and perceived stress levels. Descriptive analysis (Repeated-measures ANOVAs)</p>	<p>Sample from one nursing college, all participants were female, lack of follow-up for long-term impact of programs on anxiety and stress levels Realistic use.</p>
<p>Song (2015). Effects of mindfulness-based stress reduction on depression, anxiety, stress and mindfulness in Korean nursing students; <i>Nurse Education Today</i></p>	<p>Examines the effects of MBSR on depression, anxiety, stress, and mindfulness in Korean nursing students</p>	<p>Quasi-experimental randomized controlled trial, Level III, MBSR strategies (independent) and anxiety, depression, stress and mindfulness (dependent)</p>	<p>50 nursing students, random sampling, KN University College of Nursing in South Korea</p>	<p>Depression, Anxiety, and Stress Scale-21 (DASS-21) comprised of three scales: Depression (DASS-D), anxiety (DASS-A) and stress (DASS-S) Reliability by Cronbach's alphas of .82, .90, and .93 respectively and also the Mindfulness Attention Awareness Scale (MAAS). Reliability of MAAS determined by Cronbach's alpha of .93</p>	<p>Depression, anxiety, and stress reduced in all three intervention groups. Analysis of covariance (ANCOVA)</p>	<p>Small sample size, all female students, extraneous life stressors that may affect student's mindful state</p>
<p>Kanji (2004) Autogenic training to reduce anxiety in nursing students: Randomized controlled trial; <i>Issues and Innovations in</i></p>	<p>Determine the effectiveness of autogenic training on reducing anxiety in nursing students</p>	<p>RCT-Level II; Variables: autogenic training group, laughter therapy group, no intervention control group, effect on anxiety, blood pressure,</p>	<p>Nursing students (n=93); Convenience sampling; from year three of the Diploma in Higher Education in Nursing program and years two through four of the Bachelor of Arts in Nursing and Bachelor of Science in Nursing programs in United Kingdom</p>	<p>State Trait Anxiety Inventory (reported as reliable, but no measure given) Electronic sphygmomanometer</p>	<p>Autogenic training reduces anxiety, blood pressure, and pulse rates in nursing students. It has no effect on burnout. Descriptive analysis (ANCOVA)</p>	<p>High dropout rate in the study in all stages; compliance is dependent on personal motivation of the individual Realistic use</p>

<i>Nursing Education</i>		pulse rate, and burnout				
Text anxiety on academic performance						
Yuksel (2020) The effects of group mindfulness-based cognitive therapy in nursing students: A quasi-experimental study, <i>Nurse Education Today</i>	Determine the effects of group mindfulness-based cognitive therapy on mindfulness, stress, anxiety and depression.	Quasi-experimental: Level III; variables include the effect mindfulness stress reduction strategies taught in a group setting on depression, anxiety and stress	Sample size (n=120), non-randomized control group of nursing students from a state university in Central Anatolia of Turkey	Mindful Attention Awareness Scale (MAAS), (Cronbach’s Alpha=0.78); The Depression, Anxiety, and Stress Scale (DASS) (Cronbach’s Alpha=0.95)	Group cognitive therapy related to mindfulness has a positive effect on students’ coping abilities, lowers stress levels, but has no effect on anxiety and depression, Descriptive Statistical Analysis used (Chi-Square)	Small, non-randomized sample size and thus cannot be generalized to the population Realistic use, shows need for further research
Khng (2017) A better state-of-mind: Deep breathing reduces state anxiety and enhances test performance through regulating test cognitions in children; <i>Cognition and Emotion</i>	Examine the effects, mechanisms, and moderators of deep breathing on anxiety and test performance	Case Control: Level IV Variables: Deep breathing, anxiety levels, test performance	Fifth grade students (n=122); Convenience sampling, Four elementary schools	Trait Test Anxiety (Cronbach’s alpha= 0.79-0.90) State test anxiety (Cronbach’s alpha= 0.91-0.92) Wechsler Individual Achievement Test	Deep breathing prior to test reduces anxiety, increases performance, Descriptive Analysis used (ANOVA)	Excluded outside factors may have also affected anxiety levels Realistic use
Duty (2016) Is cognitive test-taking anxiety associated with academic performance among nursing	Describe the distribution of CTA scores among nursing students and explore the relationship	Cross-sectional survey: Level Level IV; variables: CTA score (anxiety) and exam scores	183 nursing students; Convenience sampling; pre-licensure nursing program	Cognitive Test Anxiety (CTA) (Cronbach’s alpha=0.91)	An association exists between high levels of test anxiety and lower test scores. Descriptive statistics (ANOVA)	Findings from a single institution, degree of association could be stronger to

students? <i>Nurse Educator</i>	between low, average, and high CTA scores and nursing examination scores.					support evidence of correlation, outside factors may have also affected test anxiety Realistic use
Barrows (2013) Anxiety, self-efficacy, and college exam grades; <i>Universal Journal of Educational Research</i>	Evaluate how test anxiety and level of self-efficacy directly preceding an exam will affect exam score.	Correlational Study: Level IV; variables test anxiety and self-efficacy on test performance	110 college students for various majors; random sampling; small university in rural Midwest	Motivated Strategies for Learning Questionnaire (no reliability reported) Single Test Grade (obtained from various professors; no reliability reported)	A correlation exists between higher self-efficacy and higher exam scores. Higher test anxiety correlates with lower exam performance. Descriptive statistical analysis (one-way ANOVA and MANOVA)	Because the test performance varied based on the individual student's course exam, inconsistencies in the difficulty levels of the tests might exist. Realistic use.
Kauts (2009) Effect of yoga on academic performance in relation to stress; <i>International Journal of Yoga</i>	Assess the effect of yoga on academic performance in relation to stress	Quasi-experimental study: Level III; Variables yoga module intervention, stress levels, academic performance	14-15-year-old public school students (n=800); Convenience sampling; Samples from eight public schools in Jalandhar, Punjab	Bisht Battery of Stress Scale (No reliability measure reported) Academic Performance Test (No reliability measure reported)	Students who experienced the yoga module performed better academically Descriptive analysis (ANOVA)	Reliability of measure not reported; self-report of results relies on individual's honesty Realistic use

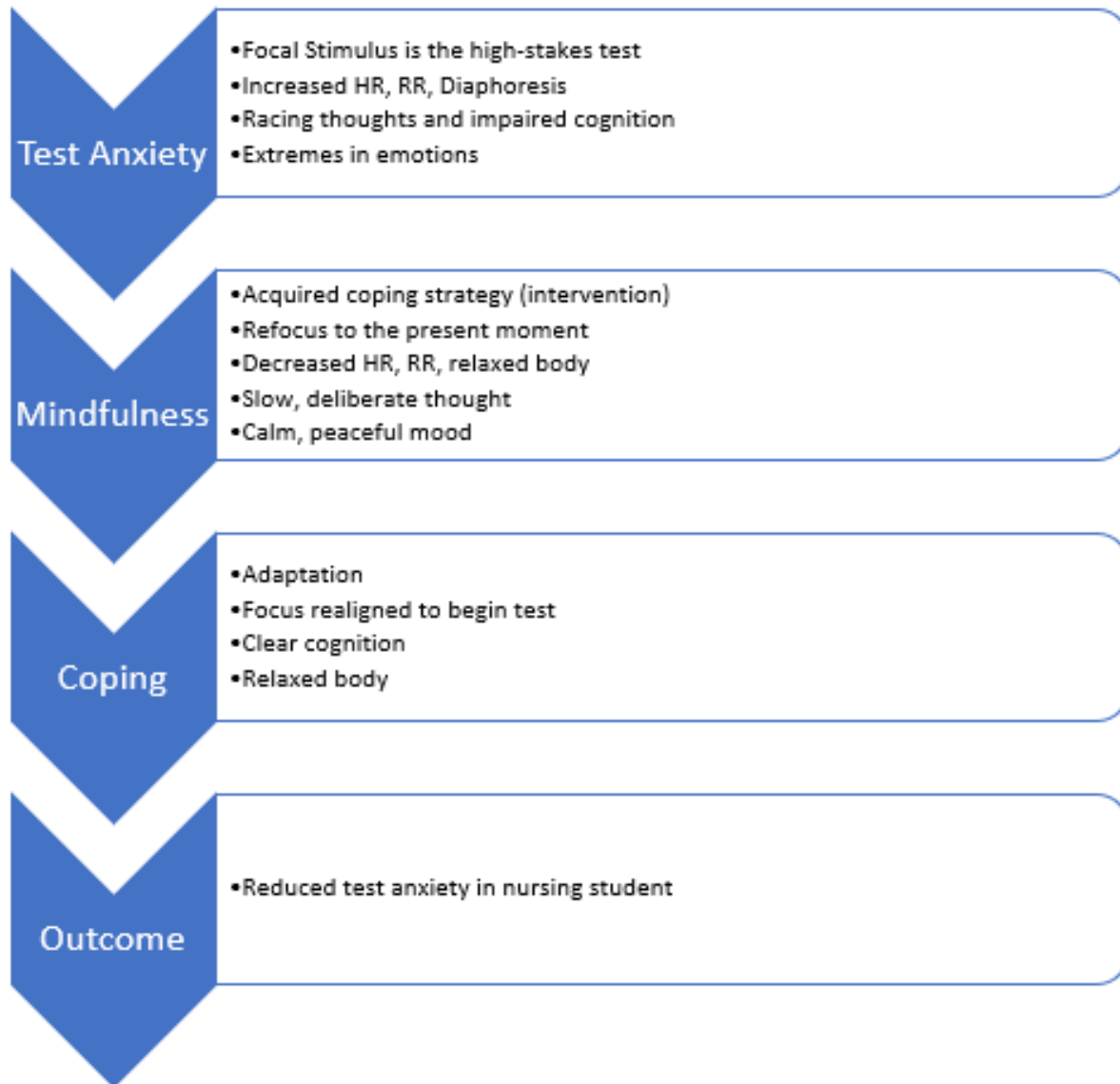
Appendix E
Evidence Grid

	Theme	Theme	Theme	Theme
Article (last name of first author, date)	College students and stressors	Mindfulness-based stress reduction on anxiety reduction	Test anxiety on physical, social, cognitive well-being	Text anxiety on academic performance
Hunot, 2007		X		
Rith-Najarian, 2019	X			
Song, 2015			X	
Gosselin, 2016			X	
Ghawadra, 2019		X		
He, 2018	X			
Yuksel, 2020				X
McCarthy, 2018	X			
Cho, 2016		X		
Kanji, 2006			X	
Chen, 2013		X		
Torabizadeh, 2016	X			
Barrows, 2013				X
Ratanasiripong, 2015			X	
Duty, 2016				X
Dvorakova, 2017			X	
Phang, 2016		X		
Schwind, 2017	X			
Karaca, 2019	X			
Farner, 2019			X	
Augner, 2015			X	
Kauts, 2009				X
Reiss, 2017		X		
Prasad, 2016	X			
Dundas, 2016			X	

Carsley, 2018		X		
Khng, 2016				X
Horgan, 2016	X			

Appendix F Theory to Application Diagram

Roy's Adaptation Model Diagram



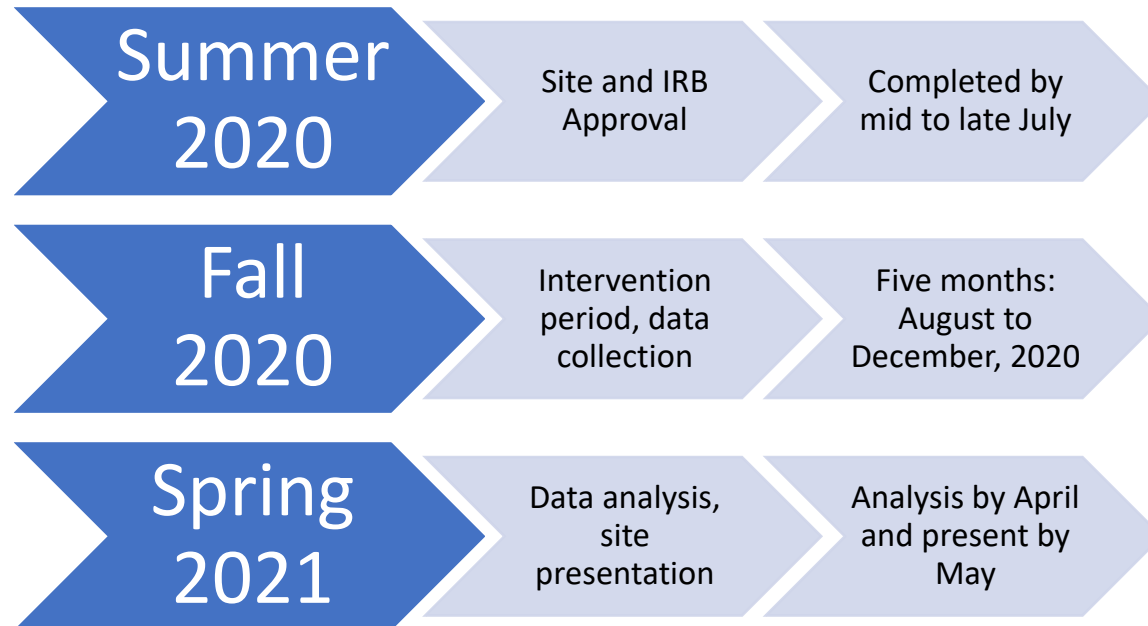
Appendix G

Logic Model for DNP Project					
Student: Jaime Dodson					
Inquiry, PICOTS: Among nursing students, does implementation of faculty-led mindfulness-based stress reduction strategies reduce test anxiety within one 16-week semester at a four-year university undergraduate nursing program?					
Inputs	Intervention(s)		Outcomes -- Impact		
	Activities	Outputs Participation	Short	Medium	Long
<p>Evidence, sub-topics</p> <ol style="list-style-type: none"> College students and stressors Test anxiety on physical, social, cognitive well-being Test anxiety on academic performance Mindfulness-based stress reduction on anxiety reduction <p>Major Facilitators or Contributors</p> <ol style="list-style-type: none"> Chair of school of nursing Nursing Faculty of BSN Program <p>Major Barriers or Challenges</p> <ol style="list-style-type: none"> Openness of students to intervention Class time to implement intervention 	<p>EBP intervention which is supported by the evidence in the Input column (brief phrase)</p> <p>Mindfulness-based stress reduction strategies reduce test anxiety in nursing students.</p> <p>Major steps of the intervention (brief phrases)</p> <ol style="list-style-type: none"> Identify problem Determine if inquiry is an organizational priority Synthesize evidence Judge sufficiency of evidence Implement intervention in a pilot study Evaluate success of intervention If successful, wide spread implementation across program 	<p>The participants (subjects)</p> <p>First Semester Nursing Students</p> <p>Site</p> <p>School of nursing in a midwestern university</p> <p>Time Frame</p> <p>Fall Semester 2020</p> <p>Consent or assent Needed: Yes</p> <p>Other person(s) collecting data: No</p> <p>Others directly involved in consent or data collection: No</p>	<p>(Completed during DNP Project)</p> <p>Outcome(s) to be measured</p> <p>Test Anxiety Total, sub score worry and emotionality</p> <p>Measurement tool(s)</p> <ol style="list-style-type: none"> Speilberger's Test Anxiety Inventory (TAI) <p>Statistical analysis to be used</p> <ol style="list-style-type: none"> paired sample t- test 	<p>Test Anxiety Total</p> <p>*Sub score Worry</p> <p>*Sub score Emotionality</p>	<p>Reduced test anxiety throughout nursing school</p> <p>Tools to reduce anxiety in professional nursing role</p>

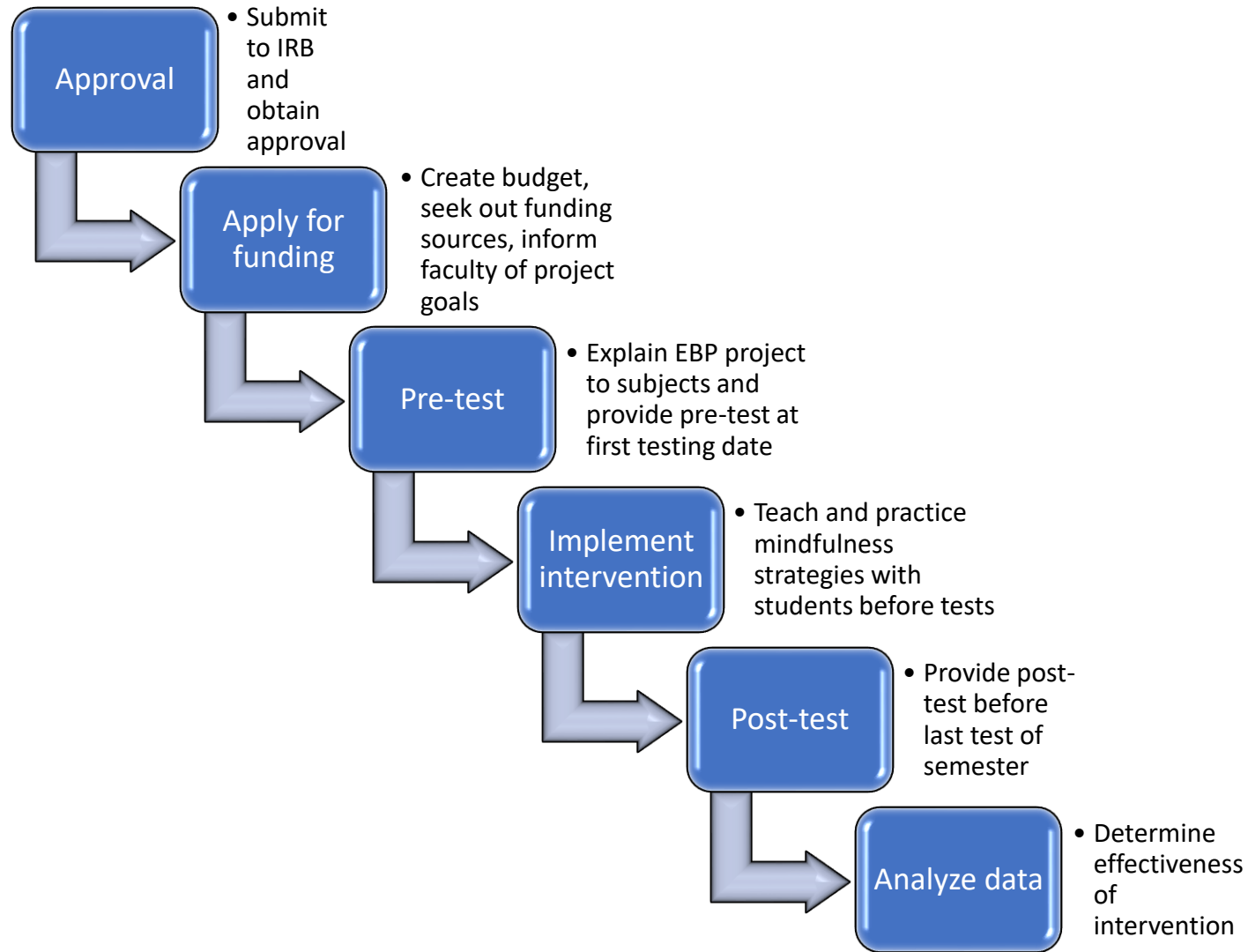
Rev. 7/09, 1/2015 http://www.uwex.edu/ces/lmcourse/interface/coop_M1_Overview.htm Logic-Model Worksheet content revisions by Lyla Lindholm for DNP Project. Not to be placed on web for public use. For UMKC DNP coursework only.

Appendix H

Project Timeline Flow Graphic



**Appendix I
Intervention Flow Diagram**



Appendix J**Intervention Materials**

“Mindfulness Skills Workbook for Clinicians and Clients” (Burdick, 2013)	Test Anxiety Inventory (40 printed copies)
Classroom	Pencils (40)

Appendix K

Faculty DNP Project Proposal Approval Letter



June 26, 2020

UMKC DNP Student, Jaime Dodson

Congratulations. The UMKC Doctor of Nursing Practice (DNP) faculty has approved your DNP project proposal, *The Effects of Mindfulness on Test Anxiety in Nursing Students*.

You may proceed with IRB application

Sincerely,

A handwritten signature in purple ink that reads "Lyla Lindholm".

Lyla Lindholm, DNP, RN, ACNS-BC
Clinical Assistant Professor, DNP Faculty
MSN-DNP Program Coordinator
UMKC School of Nursing and Health Studies lindholml@umkc.edu

A handwritten signature in black ink that reads "Cheri Barber".

Cheri Barber, DNP, RN, PPCNP-BC, FAANP
Clinical Assistant Professor
DNP Program Director
UMKC School of Nursing and Health Studies barberch@umkc.edu

DNP Faculty Mentor Dr. Lindholm, DNP
UMKC School of Nursing and Health Studies

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Appendix L

IRB Approval Letter



UCM Research Compliance Committees
Administration 102
Warrensburg, MO 64093
Office: 660-543-8562
researchreview@ucmo.edu

Exempt Review

8/6/2020

Protocol Number: 1739

Dear Jaime Dodson:

Your research project, 'The Effects of Mindfulness on Test Anxiety in Nursing Students', was approved by the University of Central Missouri Human Subjects Committee (IRB) on 7/20/2020.

If an adverse event (such as harm to a research participant) occurs during your project, you must IMMEDIATELY stop the research unless stopping the research would cause more harm to the participant. If an adverse event occurs during your project, notify the committee IMMEDIATELY at researchreview@ucmo.edu.

The following will help to guide you. Please refer to this letter often during your project.

- If you wish to make changes to your study, submit an "Amendment" to the IRB committee. You may not implement changes to your study without prior approval of the IRB committee.
- If the nature or status of the risks of participating in this research project change, submit an "Amendment" to the IRB committee. You may not implement changes to your study without prior approval of the IRB committee.
- When you have completed your collection of data, please submit the "Final Report" to the IRB committee.

If your protocol contained a consent form and the consent form was approved, you will receive an additional email. The email will contain a copy of your consent form with an approval stamp in the top right corner. Do not begin data collection until you receive a copy of your consent form with an approval stamp. Note: One year after your protocol's approval date, a request for renewal OR a final project report is required.

Resources: <https://www.ucmo.edu/offices/sponsored-programs-and-research-integrity/forms-and-resources/index.php>

If you have any questions, please feel free to contact the IRB committee at researchreview@ucmo.edu.

Sincerely,

Institutional Review Board
University of Central Missouri

Appendix M

IRB Approved Consent Letter

Approved 8/6/2020

CONSENT FORM

This research is being done by Jaime Dodson with the University of Central Missouri.

The purpose of this study is to find out if mindfulness stress reduction techniques reduces test anxiety in nursing students.

I am inviting you to participate in a study on test anxiety reduction. It is up to you whether you would like to participate. If you decide not to participate, you will not be penalized in any way and participation will have no bearing on your course grade. This study is entirely independent of the NUR3307 course. However, all students will participate in mindfulness stress reduction techniques as a part of the NUR3307 course.

Should you choose to participate in this study, you can also decide to stop at any time without penalty. If you do not wish to answer any of the questions, you may simply skip them. You may withdraw your data at the end of the study. If you wish to do this, please tell us before you turn in your materials. Once you turn in the materials, we will not know which survey or test is yours.

This study involves completing a short survey. The survey will ask you about how you are feeling prior to a test. The test inventory will ask you about your current feelings of worry, emotion and physical symptoms. This study will take about 10 minutes to finish. After you finish, we will explain the purpose of the study in more detail. You will also have a chance to ask questions.

All of the information we collect will be anonymous. We will not record your name, student number, or any information that could be used to identify you. We will also provide you with a blank sheet of paper so that you can cover your responses as you write them down. This will prevent other research participants from seeing your answers.

The risks associated with participating in this study are similar to the risks of everyday life. There is no compensation associated with this study.

You will benefit from participating in this study by developing stress reduction strategies you may use in all areas of your life and before future stress-provoking tests in nursing school. Additionally, you will obtain experience in participating in quality improvement research, which you will continue to experience throughout your nursing career.

If you have any questions about this study, please contact Jaime Dodson. If you have any questions about your rights as a research participant, please contact the UCM Research Compliance Officer at (660) 543-8562.

If you would like to participate, please sign a copy of this letter (via insertion of unique code) and return it to me. The other copy is for you to keep.

I have read this letter and agree to participate.

Participant's Birth Month (Two digits) + Mother's Birth Month (Two digits) + Father's Birth Month (Two Digits):

_____ (Should be six digits)

Date:

Person obtaining consent: _____

Appendix N

Permission for Tool and Sample Items

For use by Jaime Dodson only. Received from Mind Garden, Inc. on July 15, 2020



www.mindgarden.com

To Whom It May Concern,

The above-named person has made a license purchase from Mind Garden, Inc. and has permission to administer the following copyrighted instrument up to that quantity purchased:

Test Anxiety Inventory

The two sample items only from this instrument as specified below may be included in your thesis or dissertation. Any other use must receive prior written permission from Mind Garden. The entire instrument form may not be included or reproduced at any time in any other published material. Please understand that disclosing more than we have authorized will compromise the integrity and value of the test.

Citation of the instrument must include the applicable copyright statement listed below.

Sample Items:

I feel confident and relaxed while taking tests.
Thinking about my grade in a course interferes with my work on tests.

Copyright ©1980 Charles D. Spielberger. All rights reserved in all media. Published by Mind Garden, Inc., www.mindgarden.com

Sincerely,

Robert Most
Mind Garden, Inc.
www.mindgarden.com

Appendix O

Data Collection Template

Table 1. Pre-Intervention

Gender
Pre Q1
Pre Q2
Pre Q3
Pre Q4
Pre Q5
Pre Q6
Pre Q7
Pre Q8
Pre Q9
Pre Q10
Pre Q11
Pre Q12
Pre Q13
Pre Q14
Pre Q15
Pre Q16
Pre Q17
Pre Q18
Pre Q19
Pre Q20
Total Pre
Total
Worry
Total
Emotion

Table 2. Post-Intervention

Gender
Post Q1
Post Q2
Post Q3
Post Q4
Post Q5
Post Q6
Post Q7
Post Q8
Post Q9
Post Q10
Post Q11
Post Q12
Post Q13
Post Q14
Post Q15
Post Q16
Post Q17
Post Q18
Post Q19
Post Q20
Total Post
Total
Worry
Total
Emotion

Appendix P
Statistical Analysis Results Tables

Inquiry: Among nursing students, does the implementation of faculty-led mindfulness-based stress reduction strategies reduce test anxiety levels within one 16-week semester at a four-year university undergraduate nursing program?

Table 1. Descriptive Statistics Pre-Intervention Scores

	N	Minimum	Maximum	Mean	Std. Deviation
Total Pre-Intervention Score	39	30.00	75.00	53.9231	12.85831
Total Pre-Intervention Worry	39	8.00	30.00	18.5897	6.07288
Total Pre-Intervention Emotionality	39	12.00	32.00	23.8974	5.58567
Valid N (listwise)	39				

Table 2. Descriptive Statistics Post-Intervention Scores

	N	Minimum	Maximum	Mean	Std. Deviation
Total Post-Intervention Score	39	24.00	75.00	44.6667	12.32740
Total Post-Intervention Worry	39	8.00	29.00	15.8205	5.62827
Total Post-Intervention Emotionality	39	11.00	31.00	19.4615	5.19537
Valid N (listwise)	39				

Table 3. Tests of Normality

	Kolmogorov-Smirnova			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Difference total	.128	39	.109	.971	39	.414
Difference worry	.164	39	.010	.936	39	.028
Difference emotionality	.110	39	.200 *	.973	39	.468

*. This is a lower bound of the true significance.

a. Lilliefors Significance Correction

Table 4. Paired Samples T-Tests

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Total Post-Intervention Score	44.6667	39	12.32740	1.97396
	Total Pre-Intervention Score	53.9231	39	12.85831	2.05898
Pair 2	Total Post-Intervention Worry	15.8205	39	5.62827	.90125
	Total Pre-Intervention Worry	18.5897	39	6.07288	.97244
Pair 3	Total Post-Intervention Emotionality	19.4615	39	5.19537	.83193
	Total Pre-Intervention Emotionality	23.8974	39	5.58567	.89442

Table 5. Paired Samples Correlations

		N	Correlation	Sig.
Pair 1	Total Post-Intervention Score & Total Pre-Intervention Score	39	.785	.000
Pair 2	Total Post-Intervention Worry & Total Pre-Intervention Worry	39	.755	.000
Pair 3	Total Post-Intervention Emotionality & Total Pre-Intervention Emotionality	39	.639	.000