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**Test Anxiety in Undergraduate Nursing Students: Implementation of a Brief Mindfulness
Exercise**

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NURS 8501: Doctor of Nursing Practice Scholarly Paper

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April 24, 2023

Abstract

Nursing students experience test anxiety that may compromise their performance on class examinations, affecting their trajectory through their prelicensure nursing program. Nurse educators significantly impact student outcomes throughout the curriculum and are integral in supporting students with test anxiety. It is imperative to recognize precipitating factors of test anxiety and appoint prophylactic interventions for alleviating stressful situations. In turn, this will provide nursing students with practical and supportive strategies to alleviate testing-induced stress. This scholarly paper discusses the implementation of a brief mindfulness exercise before class examinations to combat test anxiety in undergraduate nursing students at a small midwestern college. Both quantitative and qualitative data were collected to determine the effectiveness of the brief mindfulness activity before tests. This paper discusses methods, interventions, and results from the quality improvement project.

Keywords: test anxiety, examinations, mindfulness, nursing students, stress

Test Anxiety in Undergraduate Nursing Students: Implementation of a Brief Mindfulness Exercise

Test anxiety is prevalent in undergraduate nursing students. A study conducted by Poorman et al. (2019) revealed that nursing students have significantly higher reported test anxiety (56%) than students of other college disciplines (35%). Shapiro (2014) also stated test anxiety affects 30% of nursing students. Test anxiety derives from multiple factors. Nursing programs offer a unique set of curriculum standards leading to student stress, including expansive nursing knowledge across the lifespan, various clinical experiences, and high-stake exams (Chernomas & Shapiro, 2013; Turner & McCarthy, 2015).

The significance of test anxiety in undergraduate nursing students is anecdotal and personal. At a small, midwestern prelicensure program, the author has first-hand experience of student anxiety that interferes with undergraduate nursing students' ability to achieve academic excellence. In particular, the COVID-19 pandemic has amplified students' mental health struggles along with the potential negative impact of isolation protocols (Aloufi et al., 2021). Test anxiety can also harm overall success in nursing courses and the nursing program. Since nursing is a professional program, feelings of incompetence and testing failure hinder the student's progress through the program and ultimately jeopardize passing the licensure examination (Shapiro, 2014).

Available Knowledge

Class examinations are identified as a top-academic stressor because they are so heavily integrated into the curriculum and needed to complete nursing education (Brodersen, 2017). According to Brodersen (2017), "test anxiety is a common response of academic examinations" (p. 131). Many studies reported high levels of test anxiety were inversely related to academic

performance (see Appendix A). Students may find recall of information difficult or be distracted by various environmental factors during the test. Stress and negative emotions hinder the appropriate focus on information needed for the class examination. Nurse educators are imperative in the student's learning experience. Equipping nurse educators with the resources and strategies to support students through examinations is vital.

Rationale

The mindfulness-to-meaning theory (MMT) guided this project (see Appendix B). The MMT utilizes the concept of mindfulness to promote healthy psychological well-being. Mindfulness is the psychological capability to exhibit nonjudgment and nonreactive awareness of one's thoughts and emotions (Garland et al., 2017). Mindfulness is rooted in the practice of attentional control to promote long-term increases in positive affectivity, broadening self-awareness, and stimulating a healthy mindset while test-taking (Garland et al., 2017). If the mind deviates from the focus, the students can acknowledge the distracting thought, notice the response to the thought, then shift their focus back to the present task. Mindfulness stimulates positive psychological responses to disruptions in focus and handles distractions in a positive manner to cultivate a more intentional mindset while taking an exam.

Aim

The project aimed to implement an anxiety-reduction technique, such as a five-minute guided mindfulness breathing exercise, to reduce test anxiety that negatively impacts a student's academic performance on class examinations. The desired outcome was the overall reduction in scores from the depression, anxiety, and stress scale (DASS-21) administered at baseline compared to after four consecutive exams in the course throughout the semester (see Appendix

C). The decrease in DASS-21 scores indicates students are self-reporting less anxiety and stress after the proposed intervention; thus, beneficial for future practice and sustainability.

Social justice implications were also addressed for the purpose of this project. When creating the DASS-21 for students to complete, language was gender-neutral and appropriate for students who identify as English as a second language. It was also recognized that students might have outside stressors of socioeconomic status that heighten their stress levels. Chernomas and Shapiro (2013) discuss nursing students identifying coping and personal issues as an indicator of anxiety. Students may need to work outside nursing school to support a family or financial means.

Methods

The project's population was nursing students enrolled in a traditional four-year undergraduate midwestern nursing program. Nursing students were in their first semester of junior year, completing one entire semester in the nursing program. The intervention was introduced in their Pathopharmacology course, comprising 24 nursing students. The setting was a traditional classroom with nursing theory content. Examinations and assignments are the primary evaluation methods in the course.

Intervention

A guided mindfulness exercise was the evidence-based method used for the project. The intervention included nursing students participating in a five-minute YouTube pre-exam mindfulness meditation exercise focusing on breath work and attentional focus (Butlas et al., 2021). Six different mindfulness videos were used before giving the class examinations. The DASS-21 was distributed to Junior students after all four class examinations. A baseline DASS-21 was obtained on the mindfulness exercise orientation day at the beginning of September.

Additionally, the DASS-21 was distributed at the end of December to compare individuals' overall results of anxiety reduction.

The DNP student completing the project implemented a 20-minute baseline training in mindfulness at the beginning of September. The training included rationale and a guided mindfulness exercise. The DNP student is an Instructor of Nursing at St. Olaf College and was the sole collector, documenter, and data manager. The data source was Junior-level nursing students enrolled in a private, mid-western nursing program and taking Pathopharmacology examinations in the classroom. A five-minute mindfulness intervention was presented to all students who took classroom examinations throughout the semester. To ensure fidelity and validity, the students who took examinations in the classroom signed in on an attendance sheet with their student identification number and date. The attendance sheet was loaded into a password-protected Excel spreadsheet to maintain the confidentiality of the participating students.

Study of Interventions

This project used a five-minute mindfulness intervention before each class examination to reduce student anxiety. Mindfulness is a reflective strategy that utilizes the psychological capability to exhibit nonjudgmental and nonreactive awareness of one's thoughts and emotions (Butlas et al., 2021; Garland et al., 2017). According to Chen et al. (2021), mindfulness-based interventions "have been studied, and scientific evidence has been generated demonstrating that they can have a profound benefit via mind-body connection; the practice of mindfulness results in an increased awareness by purposefully paying attention to the present moment" (p. 87). Nursing students must have strategies to produce an intentional mentality while taking examinations. Traditional mindfulness programs require a significant time investment of eight

sessions, totaling 16 hours of training (Song & Lindquist, 2014). However, brief mindfulness interventions are effective as a method of stress reduction and can be threaded throughout nursing curricula (Butlas et al., 2021). Brief mindfulness exercises are less than five minutes and are transferable to other stress-inducing settings, such as clinicals and simulations.

Measures

The DASS-21 is a 21-item, Likert-type scale for evaluating depression, anxiety, and stress (see Appendix C). The tool utilized a 0-3 scale ranging from “did not apply to me at all” to “applied to me very much.” Each of the DASS-21 scales contained seven items that were divided into subscales of depression, anxiety, and stress. The DASS-21 examined three separate but interrelated areas: depression, anxiety, and stress. The questions in the DASS-21 served each of these subscales with a corresponding normal, mild, moderate, and severe category of relevance. The anxiety range was 0-20+, the stress range was 0-34+, and the depression range was 0-28+, with scores on the higher end indicating higher levels of symptom acceptance (Lovibond & Lovibond, 1995). To reach the mechanism of emotional disturbance and discriminate between the three interrelated areas of depression, anxiety, and stress, scores of the DASS-21 were examined separately and together.

The DASS-21 was in paper format and provided for students to complete at the end of their class examinations. The qualitative question embedded in the DASS-21 at the end of the semester stated, “What can mindfulness help with?” Students had the opportunity to handwrite a response with the objective of mindfulness understanding. Fidelity and validity were ensured as students who missed the examination could reschedule tests with the DNP student. Students must take examinations to complete the course successfully; therefore, tests could not be missed and

must be rescheduled. The DNP student guided students through a mindfulness exercise if class examinations needed to be rescheduled, which aligns with the project's feasibility.

Data Input and Management

Secure input and storage were essential to the fidelity of the data analysis to protect student's privacy, security, and confidentiality. The DASS-21 tool was a paper copy with the student's college-issued identification number and completed evaluation. The students handed in their completed DASS-21 as they exited the nursing classroom in a manila envelope. The DNP student gave the manila envelope to the site mentor, who kept the results in a locked file cabinet behind a locked office door. To maintain the integrity of the results, the scales remained locked until data collection was completed. Data was transcribed into a password-protected Excel spreadsheet which was also in a password-protected university-issued laptop to maintain the confidentiality of the students' names and DASS-21 results. Project data will be kept for two years in a password-protected format.

To ensure the anonymity of the DASS-21 results, the DNP student waited to evaluate and analyze DASS-21 scores and sub-scores until after final grades were submitted in December 2022. Certain student's scores could not be included due to irregularities in the data. The analysis and quantitative results are based on 19 of the 24 nursing students who completed all DASS-21 surveys. The qualitative results are based on 15 of the 24 nursing students who provided a hand-written response.

Analysis

After the raw DASS-21 scores from the paper forms were transferred to Excel spreadsheets, and double checked for accuracy, the data could then be analyzed for statistical significance. Descriptive statistics were used to determine the normality of the data. Then

correlation data examined how the numeric scores of each post-intervention anxiety, stress, and depression score related to the baseline DASS-21 scores. Although depression was interrelated with stress and anxiety in this scale, depression scores were omitted from the project results so as not to skew the reliability and validity of the measurement tool (Song & Lindquist, 2014). A paired t-test was completed to understand whether there is a difference in the nursing students' test anxiety from baseline to end-of-semester scores. Statistical significance was a *p*-value less than 0.05. Qualitative data was entered into Excel to summarize data and reviewed by the DNP student, mentor, and site mentor for consensus (Butlas et al., 2021).

Ethical Considerations

At the beginning of the semester, the issue of voluntary participation, anonymity, and confidentiality were addressed in the consent letter. The informed consent letter was provided to all students with each DASS-21 survey outlining contact information and continued assurance of confidentiality. There was also no conflict of interest or financial gain. Anonymity was ensured throughout the entirety of the data collection process so as not to compromise the students' final grade in the class.

Results

The initial steps of the project began with submitting the project proposal for peer review (refer to Appendix D). During the project implementation, there was one modification made to the study process, which was rescheduling a test date because of the DNP student's unforeseen illness. The Institutional Review Board was notified of the change and approved the change timeline. This modification did not alter the intervention implementation, only the date the students took the examination. Contextual elements that interacted with the intervention were

unexpected students' illness and unforeseen stress from outside factors, such as work or family circumstances.

Quantitative Results

A paired t-test was completed to understand whether there is a difference in the nursing students' test anxiety from baseline to end of semester score. When comparing baseline anxiety scores to end-of-semester anxiety scores, the t-test score was 1.3352 with a t critical value of 2.1, making the critical value greater. This indicates no statistical significance. Similarly, with the stress scores at baseline compared to end-of-semester scores, the t-test score was 1.1308 with a critical value of 2.1. This also indicates no statistical significance in baseline DASS-21 results compared to the end of semester results. An ANOVA was performed to determine the p-value for both anxiety ($p=0.1617$) and stress ($p=0.1617$), indicating statistical insignificance of the baseline and end of semester DASS-21 surveys.

Qualitative Results

The qualitative data aimed to evaluate the students' understanding and perception of mindfulness exercises (Butlas et al., 2021). 15 students provided written responses that were entered manually into an Excel spreadsheet to summarize data. Analysis of the student's comments revealed themes such as mindfulness, "helped with relaxing, which helps you think more clearly," "can help with anxiety - both test and non-test anxiety," and "helps with centering myself and calming down." Keywords identified were "calm," "relax," "center," and "focus."

Process Measures

The first outcome measure was evaluated via analysis of the quantitative data. By December 31, 2022, nursing students taking Pathopharmacology (NURS 310) will show an overall reduction in scores on the DASS-21 assessment scores administered at baseline, after

four consecutive exams in the course throughout the semester, and end of the semester. The objective of the DASS-21 was to utilize a reliable, quantitative tool to measure interrelated constructs of depression, anxiety, and stress levels in nursing students after implementing a mindfulness exercise with the hopes of reducing self-reported anxiety and stress scores (see Appendix C). For the purposes of this project, emphasis was placed on stress and anxiety. The process measures, or means of measuring the intended outcome measure, were as follows:

- The DNP student instructor will guide students 100% through a mindfulness deep breathing exercise at the beginning of September and before all four class examinations. 100% of the nursing students participated in the brief mindfulness exercise at the beginning of the semester.
- 80% of nursing students will participate in the mindfulness intervention and survey after each exam. 24 students did participate, however due to data entry irregularities only 19 participants data was useable.
- 80% of nursing students will participate in the mindfulness intervention and survey at the end of the semester. 19 of the 24 students participated in the mindfulness exercise, resulting in 79.17% participation.

The second outcome measure was evaluated via the analysis of the qualitative data. By December 31, 2022, undergraduate nursing students will answer “what can mindfulness help with?” after four consecutive class examinations throughout the semester. The process measures were as follows:

- The DNP student instructor will provide a 30-minute mindfulness training during orientation in September 2022. The mindfulness training was completed on September 8, 2022.

- 80% of nursing students will participate in a brief mindfulness exercise before each of the four class examinations throughout the semester, as measured by the number of students who complete the DASS-21. 19 of the 24 students participated in the mindfulness exercise, resulting in 79.17% participation.
- 80% of nursing students will provide at least one handwritten response to the question after each class examination that demonstrates an understanding of mindfulness benefits. 15 of the 24 students handwrote responses to the qualitative question, resulting in 62.5% participation.

Discussion

Summary

Mindfulness is an evidence-based method that stimulates a positive psychological mindset and the ability to handle distracting thoughts while taking class examinations. The purpose of this project was to implement an anxiety-reduction technique to reduce test anxiety that negatively impacts a student's academic performance on class examinations. The desired outcome of anxiety and stress reduction was not statistically significant from baseline, after examinations, and at the end of the semester.

Qualitative data encouraged increased knowledge and understanding of mindfulness as a skill used for stressful situations. One student wrote, "mindfulness helps with centering myself and calming down so that I can think clearly on exams and in everyday life. It allows me to slow down and make rational decisions." This is a significant statement due to the transferability of mindfulness into various stressful situations. Another student wrote, "throughout this semester, mindfulness helped me to take a moment to relax rather than just jumping into things too

quickly.” The qualitative data suggests that mindfulness increased students’ awareness and ability to focus on the examination content to achieve optimal outcomes.

Interpretation

Overall, the sample size limited the generalizability of this project. The quantitative data was insignificant from baseline and end of semester DASS-21 surveys. Primarily, the project suggests that students learned ways mindfulness can help with managing stress and anxiety in testing situations and in life. Qualitative results provided insight into relaxation and calming nerves as the students took examinations. Similar studies showed a positive correlation between mindfulness and test anxiety. Butlas et al. (2021) showed results favorable with students experiencing a decrease in examination anxiety with more feelings of control and less helplessness. Song and Lindquist (2015) also report a positive benefit of mindfulness on nursing student stress and anxiety. Contextual elements may factor into the results of this particular project. Unexpected circumstances that play a role in anxiety are stressors of socioeconomic status or mental health concerns. Students may need to work outside nursing school to support a family or financial means (Chernomas & Shapiro, 2013). Overall, students will benefit from anxiety-reduction methods as mindfulness is a transferable skill in stressful situations. Nurse educators must be equipped with techniques to reduce stress in nursing students to achieve optimal examination outcomes.

Limitations

The sample size was a major limitation of this project. There were 24 students who filled out the baseline DASS-21 survey; however, many factors led to the final number of students who completed the entirety of the project. Some students were unable to complete the tests in the nursing classroom. Others had illegible writing that potentially skewed the results of one or more

of the surveys. Also, one semester of examinations limits the generalizability of the results. The analysis may be more robust with multiple course examinations to determine the effectiveness of a brief mindfulness intervention.

Conclusion

Test anxiety hinders undergraduate nursing students from performing optimally on class examinations. Song and Lindquist (2015) report anxiety is a psychosocial factor in the educational process that may influence academic performance and overall student well-being. Though quantitative results displayed no statistical significance, qualitative data presented evidence of increased relaxation, calmness, and focus while nursing students take examinations. A universal stress-reduction theme exhibits interchangeability with various anxiety-provoking environments in nursing school. Further studies call upon the transferability of mindfulness to other settings, such as simulation, clinical, and transition into practice as a new graduate nurse (Butlas et al., 2021; Song & Lindquist, 2015). The novelty of this project's quick and timely intervention allows nurse educators the feasibility to incorporate and sustain a five-minute mindfulness intervention before all class examinations. It is imperative that nurse educators provide students with evidence-based methods for anxiety reduction, such as mindfulness techniques, so that nursing students can take examinations with a positive mindset while combatting distracting thoughts.

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Appendix A

Evidence Table

Citation	Purpose of Study	Design/ Method	Sample/Setting	Major variables and their definitions	Measurement of major variables	Data Analysis	Study Findings	LOE/quality/feasibility/limitations conclusion/ recommendation	Significance to Practice and DNP Project
Aloufi, M.A., Jarden, R.J., Gerdtz, M.F., and Kapp, S. (2021). Reducing stress, anxiety and depression in undergraduate nursing students: Systematic review. <i>Nurse Education Today</i> , 102. https://doi.org/10.1016/j.nedt.2021.104877	The purpose of this article was to identify interventions that target stress, anxiety or depression in undergraduate nursing students during their undergraduate coursework.	Quantitative systematic review of randomized control trials and quasi-experimental studies that included a pretest and posttest.	Undergraduate/ prelicensure nursing students throughout their course of their enrolled nursing program. Sample sizes ranged from 14 to 483 students.	The article included interventions targeted to reduced stress, anxiety, or depression. Expert role modeling was a peer-mentoring program for students to have a consistent nurse preceptor. A structured clinical program that allowed students to receive education specific to their site and clinical standards. A mindfulness meditation training was also studied for students coping with stressors from clinical or coursework.	The most commonly used measurement instruments were the Perceived Stress Scale (PSS) and the State-Trait Anxiety Inventory, both instruments well-known for reliability and validity.	Data was extracted from studies using Joanna Briggs Institute System for the Unified Management of the Assessment and Review of Information (JBI-SUMARI). Data components included study method, interventions, population, limitations, outcomes, and significance.	18 out of the 22 articles included in the review reported interventions were effective at reducing stress, anxiety, or depression among nursing students.	Level II – good quality. The majority of the articles reviewed had consistent results of anxiety, stress, or depressed mood reduction. The sample size was sufficient but limitations suggest time constraints of publishing and broadening research articles to other languages to strengthen the results. The article also considers studies were variable in follow-up and limited in sample size.	This article aids in the literature review as it addresses anxiety, stress, and depression. It also separates interventions for each category with supporting randomized control trials and quasi-experimental designs.

<p>Brodersen, L.D. (2017). Interventions for test anxiety in undergraduate nursing students: An integrative review. <i>Nursing Education Perspectives</i>, 38(3), 131-137.</p>	<p>The purpose of this article is to determine and assess interventions for test anxiety in undergraduate nursing students.</p>	<p>Integrative/systematic review of peer-reviewed literature.</p>	<p>Studies ranged from undergraduate nursing student groups from 14 to 483 participants enrolled in any year of the nursing program at single institutions.</p>	<p>Interventions included both intratest and peritest interventions. Peritest interventions include relaxation training, desensitization, stress inoculation, and guided imagery.</p>	<p>Self-reported anxiety levels were categorized into state, trait, or test anxiety. State anxiety refers to anxiety in a particular situation. Trait anxiety is defined as a personality characteristic. Test anxiety refers to anxiety precipitated by an examination with one or more self-reported measurement tools.</p>	<p>After exclusion criteria of articles, publications were reviewed with inclusion of undergraduate nursing students only and studies or projects that used interventions to test anxiety and didactic course examinations.</p>	<p>Review of 33 publications revealed 19 interventions for test anxiety in undergraduate nursing students to target test anxiety. Results included both experimental and non-experimental evidence supporting cognitive behavioral interventions such as systematic desensitization, relaxation training, and guided reflection.</p>	<p>Level III – good quality. Sample size ranged from 14-483 participants. 19 articles reviewed displayed consistent results of stress and anxiety reduction related to test anxiety. Limitations noted that dissertations and single-reviewer publications were excluded from the literature search.</p>	<p>This article is helpful and relevant to the DNP project in supporting cognitive interventions for reducing test anxiety prior to didactic examinations for undergraduate nursing students.</p>
<p>Bultas, M.W., Boyd, E., & McGroarty, C. (2021). Evaluation of brief mindfulness intervention on examination anxiety and stress. <i>Journal of Nursing Education</i>,</p>	<p>Evaluation of the effect of a brief mindfulness intervention to decrease perceived stress and anxiety before class examinations.</p>	<p>Mixed methods design with randomized control trial.</p>	<p>49 sophomore nursing students enrolled in a traditional 4-year baccalaureate nursing program at a medium-sized University.</p>	<p>The control group consisted of treatment as usual; participants in the control group did not participate in the mindfulness exercise prior to the five examinations for the two courses and followed</p>	<p>-10-item Perceived Stress Scale (PSS) measures the degree to which situations in one's life are appraised or perceived as stressful. -10-item Connor-</p>	<p>Quantitative data were entered into SPSS® version 26 for analysis, and a statistician was consulted. Mann-Whitney U was used to compare participants'</p>	<p>Results indicate students had some decrease in examination anxiety over the course of the semester and experienced more feelings of control and less helplessness over their situation as displayed in the</p>	<p>Quantitative - Level I - good quality; Qualitative – low quality - This study presented as a mixed-method design. Quantitative results were good quality (B) with reasonable consistent results, sufficient sample</p>	<p>A brief mindfulness/ meditation exercise supports the project as an evidence-based intervention in anxiety and stress reduction with pretest and posttests administered.</p>

60(11), 625-628.				their own usual activities before the examination. The experimental group participated in a brief YouTube Pre-Exam Mindfulness Meditation exercise in a separate, quiet room approximately 20 minutes prior to the examination; participants then were moved to the examination room and started the examination.	Davidson Resilience Scale measures resilience with higher scores reflecting greater resilience. -The Mindfulness Attention Awareness Scale is a 15-item tool designed to measure the unique quality of consciousness related to well-being	self-rating of anxiety between the control and mindfulness groups due to concerns of whether the data were consistent. Qualitative data analysis used qualitative description. Data was analyzed by the three researchers independently and then as a group to achieve consensus.	PSS Helplessness subscale. Qualitative results support the notion that students understand mindfulness as a construct for greater awareness and attentional control.	size, definitive conclusions, and a comprehensive literature review. The qualitative research scored a category level C. There was lack of clarity in reporting methods and poor interpretation of the data in the discussion and conclusion that gained little insight to mindfulness interventions in nursing students. Limitations included a small sample size of 49 students and recommends repetition with a larger population.	
Chen, X., Zhang, B., Jin, S.X., Quan, Y.X., Zhang, X.W., & Cui, X.S. (2021). The effects of mindfulness-based interventions on nursing students: A meta-analysis.	The purpose of this article is to determine the effect of mindfulness interventions on levels of depression, anxiety, stress and mindfulness for nursing students.	Meta-analysis of randomized controlled trials.	The sample sizes ranged from 32 to 488, and 1204 nursing students were recruited in all included studies. 604 participated in experimental groups, and	Studies included interventions based on mindfulness: mindfulness, meditation, mindfulness yoga or mindfulness cognitive training.	The following information was extracted: author, year, country, research design, sample size (experimental group/control group), participants,	Data analysis was conducted by two researchers using a pre-designed Excel table. The statistical analyses were calculated using chi-square test to	The article suggests that mindfulness meditation significantly reduced levels of stress, anxiety, depression and life satisfaction while improving	Level II evidence – high quality. Article displayed consistent results that mindfulness exercises reduce negative emotions and cultivate a healthy mindset in stress management. Sample size was sufficient with	This article supports mindfulness exercises as an anxiety-reduction technique specifically in nursing student who experience clinical and academic stress.

<i>Nurse Education Today</i> , 98.			600 in control groups. The research subjects were all nursing students, including undergraduate and master's students as well as nursing students in practice.		intervention, intervention period/week, outcomes and measurement scale.	determine <i>p</i> values.	mindfulness levels across the meta-analysis of randomized control trials.	1204 nursing students. Randomized control trials concluded adequate control and experimental groups. Literature review was extensive with current research in the last eight years. Limitations revealed only three randomized control trials with unclear methods of measurement. Uniform measurement would strengthen the results of the review. There was also only one study published in another language.	
Chernomas, W.M., Shapiro, C., 2013. Stress, depression, and anxiety among undergraduate nursing students. <i>International Journal of Nursing Education</i>	The purpose of this article is to examine the prevalence of stress, depression, and anxiety in undergraduate nursing students.	Cross-sectional descriptive exploratory study.	437 participants in three years at a university-based program from a midwestern Canadian undergraduate nursing program.	Variables included stress, anxiety, and depression. Stress is identified as a persistent feeling of over arousal making it difficult to meet life demands. Depression is defined as a sad mood, loss of	The depression, anxiety, and stress scale (DASS) was used as a reliable and valid level of measurement via Survey Monkey. There was one qualitative question at the	A research assistant entered all data into the SPSS and a sample <i>t</i> -test was used to compare means in the sample with the normative sample. Qualitative data was	Nursing students experience stress, depression, and anxiety scores that negatively affect their quality of life due to high academic and clinical demands.	Quantitative data – Level I, high quality. DASS scores were supported by statistical analysis and <i>p</i> -values. Results were consistent and generalizable with a sufficient sample size. Limitations include cross-	The article is cited in many of the articles in this review. This particular study provides both quantitative and qualitative data in depression, anxiety, and stress among undergraduate nursing students. It allows for

<i>Scholarship, 10</i> (1), 255-266.				self-esteem or altered perception hindering an individual's life goals. Anxiety is characterized by feelings of fear while facing challenging life situations.	end of the survey.	analyzed independently by recurrent themes.		sectional study and data collection from one university. Qualitative data – Level III, high quality. An open-ended question provided consistent results with self-reported keywords with adequate description of results.	foundational knowledge in student perceptions to introduce interventions that target test anxiety.
Poorman, S.G., Martorovich, M.L., & Gerwick, M. (2019). Interventions for test anxiety: How faculty can help. <i>Teaching and Learning in Nursing, 14</i> (3), 186-191.	The purpose of this article is to present pragmatic interventions to help students who suffer from test anxiety.	Literature review.	No sample size noted. Participants include students enrolled in an undergraduate nursing program.	Test anxiety was described before, during, and after tests based on literature reviews.	No measurements were used in the collection of this literature review.	Since there were no measurement in data collection, there is no data to analyze in this literature review.	The article was written to provide faculty with evidence-based methods to help students who suffer from test anxiety. Findings suggest nursing faculty should implement these strategies to cultivate a healthy mindset in nursing students while taking tests.	Level V – high quality. Expertise in nursing education was clear and concise. Definitive conclusions and scientific rationale were provided with corresponding interventions for faculty to use for test anxiety in nursing students. No limitations were noted in the article.	This article supports the DNP project by providing expertise and evidence-based methods for nursing faculty to utilize for undergraduate nursing students.
Quinn, B.L., & Peters, A. (2017). Strategies to reduce nursing student test anxiety: A	The purpose of this article is to identify helpful interventions to decrease test anxiety in undergraduate	Systematic review using PRISMA (Preferred Reporting Items for Systematic	Sample sizes of nursing student participants ranged from 20 to 156. A total of 245 prelicensure	Articles described the testing of strategies aiming to reduce test anxiety in prelicensure	Variables and interventions were correlated to self-reported anxiety tools such as	Articles were then analyzed to identify effective test anxiety reducing interventions	Two categories of interventions identified following a review of the seven included sources were	Level III Evidence – good quality. The systematic review of the literature within the last ten years with	This article reinforces relaxation techniques in reducing anxiety experienced by

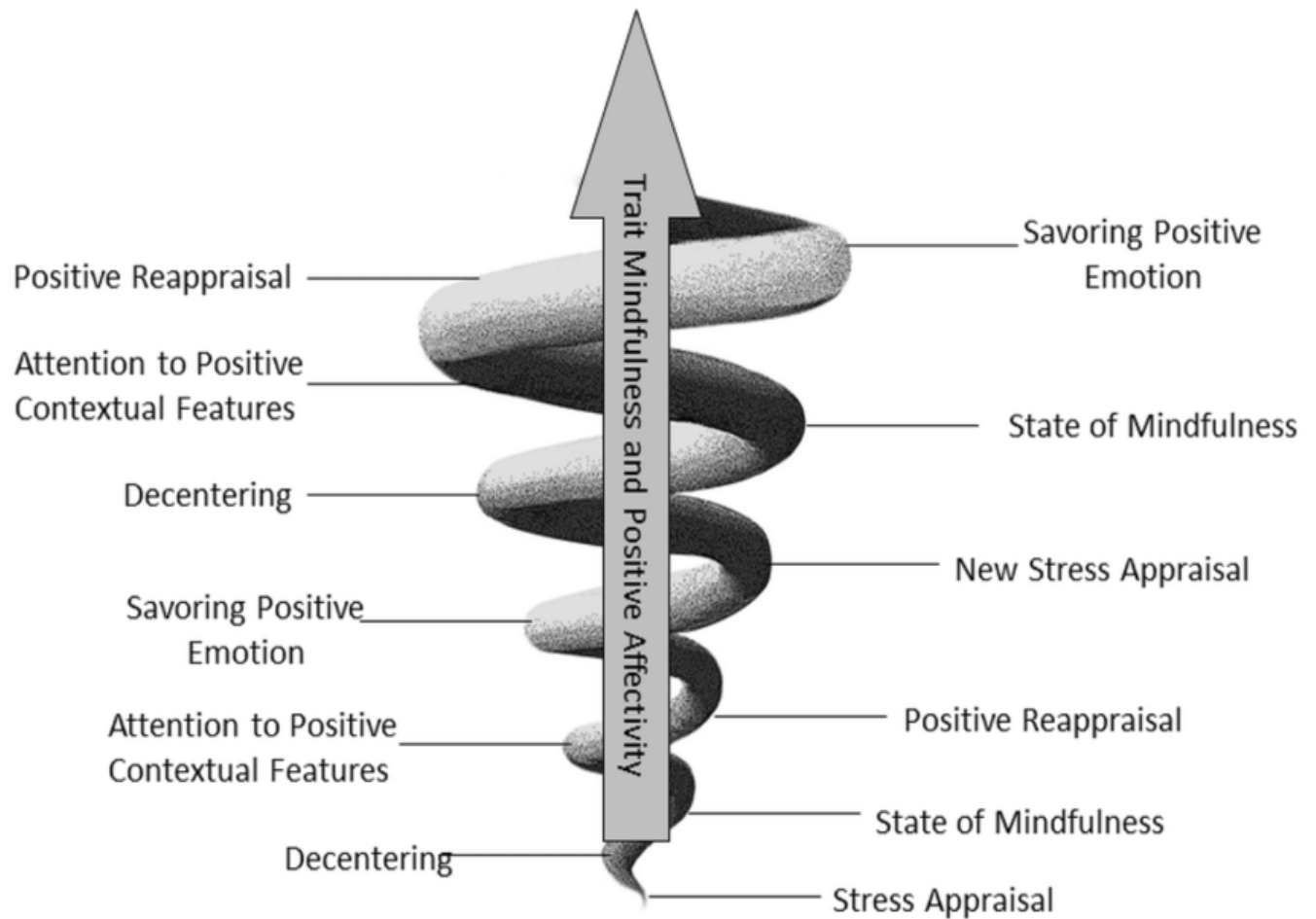
literature review. Journal of Nursing Education, 56(3), 145-151.	nursing students.	Reviews and <u>Meta-Analysis</u>) guidelines.	nursing students were studied between seven articles.	nursing students. Interventions included magic pen, lemon essential oil, classical music therapy, biofeedback-assisted relaxation techniques, animal therapy, and progressive muscle relaxation.	subjective reports, Cognitive Test Anxiety Survey, Spielberger State-Trait Anxiety Inventory, anxiety biomarkers, and the Sarason Test Anxiety Questionnaire.	among nursing students using electronic databases: Cumulative Index to Nursing and Allied Health Literature (CINAHL®), Education Research Complete, Education Resources Information Center (ERIC™), and Medline/Pub Med®. Search terms included <i>nurs*</i> , <i>anxiety</i> , <i>test</i> , <i>NCLEX</i> , <i>strategies</i> , and <i>exam*</i> .	environmental adjustments and student behavior modifications. Nurse faculty must commit to helping test anxiety in nursing students. Implementing interventions discussed in this review is one way to improving this dilemma.	inclusion and exclusion criteria. Sample size was sufficient of 245 prelicensure nursing students between seven articles. Results were consistent in anxiety reduction of relaxation techniques and categorized relaxation in two categories of environmental and behavioral factors. Limitations included time and financial constraints and allergies to essential oils.	undergraduate nursing students.
Shapiro, A.L. (2014). Test anxiety among nursing students: A systematic review. <i>Teaching and Learning in</i>	The purpose of this article is to explore aspects associated with test anxiety among nursing students and provide understanding in the	Systematic review of both quantitative and qualitative studies were included.	Sample sizes gathered from nursing schools varied from 8 to 769 nursing students enrolled in a nursing program. Mean ages spanned	Test anxiety occurred as the dependent variable of the nine articles.	Test anxiety inventory (TAI) involves a 20-item Likert-type scale. Some studies used the Westside test anxiety scale which is	The literature search included CINAHL, Education Research complete, ERIC, MEDLINE, PsycARTICL	There are numerous evidence-based interventions to reduce test anxiety in nursing students such as relaxation training,	Level III – good quality. Sample size of 769 is sufficient in data collection. Results are consistent throughout each intervention with reasonable conclusions in	This review reinforces test anxiety in nursing students and provides evidence-based interventions for faculty to implement in the

<i>Nursing</i> , 9, 193-202.	psychological distress of the testing experience.		from 19.4 to 26 years old. Seven of the nine articles used reported gender with the majority of female participants.		a brief, ten-item scale measuring anxiety levels. The achievement anxiety test was also used as an inventory to collect test anxiety levels. Qualitative studies were also performed via interviews.	ES, and PsycINFO databases. Key search terms included test anxiety, exam anxiety, and examination anxiety with nursing students.	hypnotherapy, and aromatherapy. Various relaxation methods have been shown effective in reducing test anxiety symptoms leading to academic success.	anxiety reduction. Literature used is relevant and published within the last fifteen years. No limitations were noted in this review.	classroom environment.
Song, Y. & Lindquist, R. (2015). Effects of mindfulness-based stress reduction on depression, anxiety, stress and mindfulness in Korean nursing students. <i>Nurse Education Today</i> , 35(1), 86-90.	The purpose of this study was to examine the effects of mindfulness-based stress reduction (MBSR) on depression, anxiety, stress and mindfulness in Korean nursing students.	Randomized control trial.	460 eligible participants of undergraduate nursing students in their first through fourth year of enrollment in the nursing program from KN University College in South Korea.	The treatment group participated in an 8-week MBSR course. The control group comprised of a waitlist (WL) group that did not receive the MBSR training. Participants in the treatment group had not been previously exposed to MBSR, did not practice yoga or meditation regularly, no psychiatric disorders, and no contraindications to exercise.	The depression, anxiety, and stress scale – 21 (DASS-21) uses a Likert-type tool to measure stress, anxiety and depression. The mindfulness attention awareness scale (MAAS) was also used to measure perceived mindfulness. DASS-21 and MAAS pretests were given to both treatment and control groups.	Data analysis used the SPSS, or statistical, program. Chi-square and t-tests compared the baseline measurement of the demographic and dependent variables between the control and experimental groups. Covariance was used in comparing depression, anxiety, stress and	This study revealed a standard MBSR program had beneficial effects on depression, anxiety, stress, and mindfulness. This improved nursing students' psychosocial status and mindfulness attention.	Level I – high quality. Sample size included 460 nursing students, a sufficient sample size. Results were definitive supported by statistical analysis. The study mentioned limitations and need for further studies to determine reliability and validity. Literature review was comprehensive with research within the last ten years.	This article provided high-level evidence supporting a specific mindfulness intervention. The DASS-21 was also used for quantitative measurement for reliable and valid data collection.

					After the treatment group completed the MBSR eight-week training, posttests were given to both control and treatment groups.	mindfulness scores between control and experimental groups.			
Turner K., McCarthy V.L., (2017). Stress and anxiety among nursing students: A review of intervention strategies in literature between 2009 and 2015. <i>Nurse Education in Practice</i> , 22, 21-29.	The purpose of this review is to examine current literature from 2009-2015 in non-pharmacologic stress-reduction techniques for nursing students.	Systematic review of randomized control trials, quasi-experimental designs, qualitative, mixed methods, and single-study experimental designs.	Participants included undergraduate students enrolled in any level of the nursing program. Sample sizes ranged from 11-314 participants.	Interventions researched target stressors, coping, and appraisal. Interventions included mindfulness, meditation, and reflection.	Measurements utilized pretests and posttest including the State Trait Anxiety Inventory, Cognitive Test Anxiety Survey, and Perceived Stress Scale.	Databases searched were Medline, CINAHL, and PsychINFO. After duplicates and exclusion criteria removed, 26 articles were reviewed.	Studies showed mixed results but studies focused on strategies to reduce stress and increase coping showed favorable results when comparing pretests and posttests.	Level III – good quality. The 26 articles revealed mixed results but consistent results in anxiety-reduction methods. Limitations include four studies failing to find statistical significance in outcomes and low sample sizes. Literature review is within the last 15 years.	This article supports interventions supported by evidence-based methods of anxiety reduction specific to undergraduate nursing students.

Appendix B

Mindfulness to Meaning Model



Note. (https://www.researchgate.net/figure/The-mindfulness-to-meaning-model-Garland-et-al-2015_fig3_337226090). In the public domain.

Appendix C

Depression, Anxiety, and Stress Scale

DASS21		Name:	Date:			
Please read each statement and circle a number 0, 1, 2 or 3 which indicates how much the statement applied to you over the past week. There are no right or wrong answers. Do not spend too much time on any statement.						
The rating scale is as follows:						
0	Did not apply to me at all					
1	Applied to me to some degree, or some of the time					
2	Applied to me to a considerable degree or a good part of time					
3	Applied to me very much or most of the time					
1 (s)	I found it hard to wind down	0	1	2	3	
2 (a)	I was aware of dryness of my mouth	0	1	2	3	
3 (d)	I couldn't seem to experience any positive feeling at all	0	1	2	3	
4 (a)	I experienced breathing difficulty (e.g. excessively rapid breathing, breathlessness in the absence of physical exertion)	0	1	2	3	
5 (d)	I found it difficult to work up the initiative to do things	0	1	2	3	
6 (s)	I tended to over-react to situations	0	1	2	3	
7 (a)	I experienced trembling (e.g. in the hands)	0	1	2	3	
8 (s)	I felt that I was using a lot of nervous energy	0	1	2	3	
9 (a)	I was worried about situations in which I might panic and make a fool of myself	0	1	2	3	
10 (d)	I felt that I had nothing to look forward to	0	1	2	3	
11 (s)	I found myself getting agitated	0	1	2	3	
12 (s)	I found it difficult to relax	0	1	2	3	
13 (d)	I felt down-hearted and blue	0	1	2	3	
14 (s)	I was intolerant of anything that kept me from getting on with what I was doing	0	1	2	3	
15 (a)	I felt I was close to panic	0	1	2	3	
16 (d)	I was unable to become enthusiastic about anything	0	1	2	3	
17 (d)	I felt I wasn't worth much as a person	0	1	2	3	
18 (s)	I felt that I was rather touchy	0	1	2	3	
19 (a)	I was aware of the action of my heart in the absence of physical exertion (e.g. sense of heart rate increase, heart missing a beat)	0	1	2	3	
20 (a)	I felt scared without any good reason	0	1	2	3	
21 (d)	I felt that life was meaningless	0	1	2	3	

DASS-21 Scoring Instructions

The DASS-21 should not be used to replace a face to face clinical interview. If you are experiencing significant emotional difficulties you should contact your GP for a referral to a qualified professional.

Depression, Anxiety and Stress Scale - 21 Items (DASS-21)

The Depression, Anxiety and Stress Scale - 21 Items (DASS-21) is a set of three self-report scales designed to measure the emotional states of depression, anxiety and stress.

Each of the three DASS-21 scales contains 7 items, divided into subscales with similar content. The depression scale assesses dysphoria, hopelessness, devaluation of life, self-deprecation, lack of interest / involvement, anhedonia and inertia. The anxiety scale assesses autonomic arousal, skeletal muscle effects, situational anxiety, and subjective experience of anxious affect. The stress scale is sensitive to levels of chronic non-specific arousal. It assesses difficulty relaxing, nervous arousal, and being easily upset / agitated, irritable / over-reactive and impatient. Scores for depression, anxiety and stress are calculated by summing the scores for the relevant items.

The DASS-21 is based on a dimensional rather than a categorical conception of psychological disorder. The assumption on which the DASS-21 development was based (and which was confirmed by the research data) is that the differences between the depression, anxiety and the stress experienced by normal subjects and clinical populations are essentially differences of degree. The DASS-21 therefore has no direct implications for the allocation of patients to discrete diagnostic categories postulated in classificatory systems such as the DSM and ICD.

Recommended cut-off scores for conventional severity labels (normal, moderate, severe) are as follows:

NB Scores on the DASS-21 will need to be multiplied by 2 to calculate the final score.

	Depression	Anxiety	Stress
Normal	0-9	0-7	0-14
Mild	10-13	8-9	15-18
Moderate	14-20	10-14	19-25
Severe	21-27	15-19	26-33
Extremely Severe	28+	20+	34+

Lovibond, S.H. & Lovibond, P.F. (1995). Manual for the Depression Anxiety & Stress Scales. (2nd Ed.) Sydney: Psychology Foundation.

Note. (<https://maic.qld.gov.au/wp-content/uploads/2016/07/DASS-21.pdf>). In the public domain.

Appendix D

Timeline

