ORIGINAL RESEARCH

Evaluation of meditation and reported test anxiety in bachelor of science nursing students

Annette Lynn Ferguson *, Natalie Perry

Marshall University, United States

Received: October 21, 2022 **Accepted:** December 5, 2022 **Online Published:** December 12, 2022
DOI: 10.5430/jnep.v13n4p1 **URL:** https://doi.org/10.5430/jnep.v13n4p1

ABSTRACT

Anxiety is a growing concern among college students and often surrounds the required testing that assesses a student's knowledge and ability to apply this knowledge to situations in nursing. If nursing students' anxiety is not addressed, this may impact their ability to perform well on exams and be successful in their nursing program. Research supports the idea that anxiety reduction strategies can lower levels of test anxiety for those in nursing programs. The purpose of this study was to assess the level of test anxiety of students in a pre-licensure Bachelor of Science in Nursing program and to examine the use of a brief meditation video on students' anxiety levels. A pre-test/post-test design was utilized to assess the test anxiety levels of sophomore and senior nursing students at the beginning of the semester and before their first and second exams. The results of this study found that 79.8% of the students (n = 52) reported a moderate to an extremely high level of test anxiety. In addition, there was a statistically significant ($p < .000$) reduction in anxiety levels at the first and second exams after implementing the meditation video compared to scores at the beginning of the semester. Based on these findings, nursing programs should consider including meditation as a strategy to reduce test anxiety in students. The program was cost-effective and would be easy to implement into a nursing program's curriculum.

Key Words: Test anxiety, Nursing students, Anxiety-reducing strategies, Meditation

1. INTRODUCTION

Nursing is known for its demanding curriculum which requires high-stakes testing to prepare students for graduation and success on NCLEX. Frequently, nursing students must enroll in two to three nursing courses each semester to be able to complete the program in the allotted time. This requires that students be able to manage their time studying and preparing for exams as well as complete clinical rotations and clinical paperwork. In addition, some students must work or care for family members while attending school. All these factors can cause nursing students to experience anxiety and stress. Regardless of the reason, students must learn how to manage their anxiety to be able to perform well on exams so they can be successful in their nursing program.[1]

2. BACKGROUND/LITERATURE REVIEW

Test anxiety involves the physical, psychological, behavioral, and cognitive components of a person.[2] Although test anxiety can be a normal response to the demands of a nursing program, high levels of anxiety can significantly disrupt the student's life making it difficult to learn new concepts and retain knowledge.[1] According to Poorman et al.,"Students with test anxiety may experience generalized uneasiness, diaphoresis, mild nausea, heart palpitations, severe gastrointestinal distress, and blurred vision."[3] In addition, students may worry either before, during, or after an exam which

*Correspondence: Annette Lynn Ferguson; Email: rn_nettie@yahoo.com; Address: Marshall University, United States.

can impair their working memory and concentration.[4] One study found that a high level of cognitive test anxiety (worry) caused a decline in academic performance.[5]

Several research studies have assessed the impact of various interventions on test anxiety in nursing students. A study examined the effects of relaxation techniques on first-year bachelors of science in nursing (BSN) students' academic stress, test anxiety, and intention to stay in the nursing profession.[6] Forty-five students participated in a six-week relaxation program and focus group interview. The relaxation program consisted of interventions such as breathing retraining, guided imagery, stretching exercises, listening to music, adult coloring, and aromatherapy. Students who used relaxation techniques had a significant decrease in both academic stress and test anxiety ($p < .001$). The themes from the focus group interview found that relaxation techniques before the examination helped to reduce mental and physical stress and fear of failure and increased the likelihood, that the student would stay in the nursing program.[6]

Another study examined the individual and combined effects of aromatherapy and music therapy on test anxiety, state anxiety, stress, and fundamental nursing skills.[7] Ninety-eight sophomore female nursing students participated in the study. The students were randomly assigned into one of three groups: aromatherapy, music therapy, or aromatherapy combined with music therapy. Interventions were performed for twenty minutes before the examination. The results found that aromatherapy combined with music therapy has a significant effect on test anxiety ($p = .012$), state anxiety ($p = .011$), stress ($p = .012$), and performance of nursing skills ($p = .001$) compared with the use of only aromatherapy or only music therapy.[7]

A systemic review was conducted on strategies to reduce prelicensure nursing students' test anxiety.[8] Seven articles were selected that met the review focus. The review of literature found two categories of test anxiety interventions for nursing students. The first category was environmental adjustments that included strategies such as diffusing essential oil, playing classical music, or animal therapy. The second category was behavioral modifications that included relaxation or guided reflection. Both categories were found to reduce test anxiety and positively affect participants. Possible limitations identified with pet therapy and essential oils were the risk of allergens and cost. Limitations of relaxation or guided reflection included the active participation of faculty and students and training on proper techniques.

A randomized control study was conducted on the effect of animal-assisted therapy on nursing students' anxiety and test performance.[9] Ninety nursing students were randomly assigned to either the control group (n = 44) or the intervention group (n = 45). The intervention group completed 35-to-45-minute interaction with a therapy dog before a medication drug calculation exam. The results of this study found a statistically significant difference in both state anxiety ($p < .001$) and trait anxiety ($p < .012$) between the intervention and control groups. The intervention was found to reduce the anxiety of the students before taking their exam but did not impact their pass rates on the drug calculation exam.

One study examined the impact that test anxiety can have on nursing students' performance on exams. The retrospective study focused on academic and nonacademic predictors of BSN student success on the HESI exit exam.[10] This study measured students' test anxiety, academic motivation, and academic demographics (age, SAT/ACT scores, final GPA, and scores on other HESI exams). A total of 486 student records were reviewed. Results found that students with low test anxiety scored significantly higher on their HESI exit exam than students with high test anxiety ($p < .001$). In addition, it was found that students with higher HESI exit exam scores were statistically more likely to pass the NCLEX-RN examination on the first attempt ($p = .001$).

Based on the literature the purpose of this study was two-fold: a) to assess the level of test anxiety in prelicensure BSN students, and b) to examine the effects of a brief meditation video on sophomore and senior nursing students' level of anxiety. The intervention of meditation was selected based on cost, efficiency, and ease for the faculty and students to learn.

3. METHODS

3.1 IRB submission process

Before the implementation of the test anxiety study, approval from the institutional review board (IRB) was received from the university where the School of Nursing was located. Students were invited to participate in the study via face-to-face and/or email voluntarily. Before starting the study, each student was provided with information that explained the purpose, potential benefits/risks, and procedure for the study. Once participants consented to the study, they were provided with the survey questions. At any time, the participants were able to withdraw from the study by simply not completing the survey questions. The survey results were kept in a secure location with the researchers being the only individuals to have access to the results.

3.2 Sample and setting

The study participants were selected from a convenience sample of 109 pre-licensure BSN students at a medium-sized university in the eastern United States. All sophomore and

senior-level students in the BSN program were invited and encouraged to participate in the test anxiety study. Nine participants were removed from the study due to incomplete survey data. A total of fifty-two (52) students participated in the study with a response rate of 47.7% of students that were invited to participate.

3.3 Design and intervention

The test anxiety study intervention was one of two brief (5-minute) meditation videos presented in class. The meditation videos were located on YouTube and selected by the researcher with a background and expertise in mental health. The videos were self-directed with progressive muscle relaxation, deep breathing, and positive affirmations. The sophomore nursing students viewed one of two meditation videos at the beginning of class each day. The class was scheduled two days a week for 10 weeks. The senior nursing students viewed one of two meditation videos (same videos as the sophomore students) only on the day of the exam 10 minutes before taking the exam. During the meditation video the lights were dimmed, and students were asked to be quiet and focus on the video.

A pre-test/post-test design was utilized for this study. Before the implementation of the meditation video, students were invited to participate in the study and to complete the demographic survey and the Westside Test Anxiety Scale. The demographic survey included six items related to age, gender, years in college, year (level) in the nursing program, number of credit hours currently taken in the semester, and if the participant worked a job. The Westside Test Anxiety Scale is a brief, ten-item instrument that is designed to identify students with test anxiety who may benefit from interventions to reduce anxiety. The instrument is self-administered and takes only five to eight minutes to complete. The Westside Test Anxiety Scale combines six items that assess impairment and four items on worry and dread. Participants were asked to rank each item on a Likert scale of 5 to 1 (with 5 being extremely or always true and 1 being not at all or never true) with total scores ranging from 10 to 50. The sum of the total is then divided by ten. Based on the test anxiety score of the participants who score 1.0-1.9 they are comfortable with low-test anxiety, 2.0-2.5 have normal test anxiety, 2.6-2.9 have high normal test anxiety, 3.0-3.4 moderately high level, 3.5-3.9 high test anxiety, and 4.0-5.0 have extremely high anxiety.[11]

The Westside Test Anxiety Scale is available for personal/institutional use; therefore, no permission was required to utilize the instrument. The Westside Test Anxiety Scale has been used in various settings and is demonstrated to be a reliable and valid measure of test anxiety.[11] The Westside Test Anxiety Scale was utilized in a study conducted in the United States on medical students with internal consistency reliability of a Cronbach alpha = 0.84, which is considered excellent.[12] In a study on reducing test anxiety in pharmacy students, the Westside Anxiety Test Scale had an alpha reliability of 0.89.[13] In the current study, the Cronbach alpha coefficient was calculated at 0.89, therefore was determined to have good reliability.

Before taking exam 1 and exam 2, students were asked to take a Pre-Exam Survey and the Westside Test Anxiety Scale again. The Pre-Exam survey was a six-item instrument that included the number of lectures missed before the exam, feelings/thoughts regarding the helpfulness of meditation, use of meditation before studying, number of hours studied before the exam, and use of practice questions to prepare for the exam. The Westside Test Anxiety Scale was the same 10-item instrument taken before the beginning of the study.

3.4 Data collection

A demographic survey, Westside Test Anxiety Scale, and Pre-Exam Survey were distributed and collected via Qualtrics©, an online survey tool. The demographic survey and baseline test anxiety scores were collected during the first week of class for all students interested in participating in the study. The follow-up surveys (Pre-Exam and Westside Test Anxiety Scale) were collected immediately before the start of exam 1 and exam 2. Participants were asked to use the last four digits of their phone number as a numerical identifier for data collection while still preserving participants' confidentiality. Data were collected for analysis at the end of the semester by the researchers.

3.5 Data analysis

Data were analyzed using IBM SPSS® version 26 software. The demographic information, Westside Test Anxiety scores, and pre-exam data were analyzed using descriptive statistics. The differences between the pre-test and post-test total Westside Test Anxiety scores were analyzed using paired sample *t*-test. An alpha of $p < .05$ was used to determine statistical significance.

4. RESULTS

4.1 Participant demographic characteristics

A total of 52 students completed the demographic survey. The mean age of the participants was 20.73 years with the age range between 18 and 41. The majority of the participants were female at 90.4%. Eighty-six and half (86.5) percent of the students were at the sophomore level in the program with 13.5% at the senior level. Most of the students (96.2%) were registered for 12 credit hours or more (full-time study)

during the semester. Over 25% of the students worked over 20 hours a week at a job and 23% of the students did not have a job.

4.2 Participant baseline test anxiety score

Students were asked to complete the Westside Test Anxiety Scale during the first week of the semester to retrieve baseline data on the level of test anxiety. This data was collected at the same time as the demographic characteristics. Participants with a score of 3.0-5.0 were considered to have some degree of test anxiety. The results of the Westside Test Anxiety Scale found that 79.8% of the students reported their level of test anxiety from moderate to extremely high. Only 7.6% reported their level of test anxiety as normal (see Table 1).

Table 1. Westside test anxiety scale baseline scores

Characteristic	Number (N)	Percentage (%)
Low	1	1.9
Normal	4	7.6
High Normal	5	9.5
Moderate High	9	17.1
High	13	24.7
Extreme High	20	38.0

Note. $N = 52$

4.3 Pre-exam student information

Results of the pre-exam student information were measured before exam 1 and exam 2. For exam 1, 63% of the students felt the meditation before the exam was helpful. Only 7.7% reported practicing meditation before studying for their exam. Most students, 61.5%, studied at least 16 hours before taking the exam. Over 90% completed practice questions before taking the exam. For exam 2, 61.5% of the students felt meditation was helpful and 13.5% practiced meditation before studying. Almost twice as many students practice meditation before exam 2 compared to the number of students practicing meditation before exam 1. Slightly fewer students (57.7%) studied at least 16 hours before exam 2. Over 94% completed practice questions before taking exam 2, slighter more than before exam 1.

4.4 Comparison of test anxiety before and after meditation

A paired sample *t*-test was conducted to evaluate the impact the brief meditation exercise had on students' total test anxiety scores on the Westside Test Anxiety Scale. There was a statistically significant decrease in Westside Anxiety Test Scores from baseline (M = 36.50, SD = 7.982) to exam 1 (M = 21.96, SD = 7.599), $t(51) = 7.074$, $p < .000$ (two-tailed). The mean decrease in Westside Anxiety Test Scores was 14.519 with a 95% confidence interval range from 10.399 to 18.640. The eta squared statistic (.49) indicated a large effect size (see Table 2).

Table 2. Westside Test Anxiety Scores Exam 1: Paired sample *t*-test comparison of mean westside test anxiety scores before and after the intervention

Variable Group	Mean ± SD	*t*	*df*	*p*
Before Intervention (n = 52)	36.5 ± 7.98	7.074	51	.000
After Intervention (n = 52)	21.98 ± 7.60			

Note. Magnitude of effect was large, eta-square = .49

Another paired sample *t*-test was conducted to evaluate the impact the brief meditation exercise had on students' total test anxiety scores on the Westside Test Anxiety Scale before exam 2. There was a statistically significant decrease in Westside Anxiety Test Scores from baseline (M = 36.50, SD = 7.982) to exam 2 (M = 21.96, SD = 7.674), $t(51) = 7.248$, $p < .000$ (two-tailed). The mean decrease in Westside Anxiety Test Scores was 14.731 with a 95% confidence interval range from 10.651 to 18.811. The eta squared statistic (.50) indicated a large effect size (see Table 3).

Table 3. Westside Test Anxiety Scores Exam 2: Paired sample *t*-test comparison of mean westside test anxiety scores before and after the intervention

Variable Group	Mean ± SD	*t*	*df*	*p*
Before Intervention ($n = 52$)	36.5 ± 7.98	7.248	51	.000
After Intervention ($n = 52$)	21.77 ± 7.67			

Note. Magnitude of effect was large, eta-square = .5

5. Discussion

Research studies support that anxiety in college students is prevalent.[2,8,14] Of particular interest to this study was test anxiety. Test anxiety is a problem that is affecting millions of students throughout the world and is an undesirable emotional reaction.[15] In some students, test anxiety can impact their academic performance. One study found that test anxiety was significantly higher in nursing students (56%) compared to students in other disciplines (35%).[16] Another study found similar results with nursing students having a higher level of anxiety than other college students.[17] A study conducted during the COVID-19 pandemic found that over 45% of nursing students reported moderate or severe levels of anxiety.[18]

The results from this study found that 79.8% of the nursing students reported their level of test anxiety from moderate to extremely high and only 7.6% reported their level of test

anxiety as normal. The level of anxiety between the sophomore and senior nursing students was compared with no significant differences between the two groups. The results of this study found that nursing students' level of anxiety was much higher than in previous studies. Therefore, it is recommended that further research be conducted to determine the possible underlying cause(s) for the high levels of anxiety in this sample of students. It should be noted that this study was conducted post-Covid pandemic, which may have impacted the results.

Many studies have implemented a variety of strategies such as aromatherapy, music, pet therapy, guided imagery, and relaxation to reduce anxiety in nursing students.[1,6–9,14] The purpose of this study was to find an easy, inexpensive way to help students reduce their anxiety before nursing exams. A brief 5-minute meditation video was utilized in the classroom with nursing students. The results of this study found that test anxiety scores of the sophomore and senior nursing students decreased statistically ($p < .000$) from the pre-intervention to the post-intervention. Sophomore students viewed the video two days a week at the beginning of class and before exams 1 and 2. Senior students viewed the video only on the day before exam 1 and exam 2. A comparison of the level of anxiety between the two groups (sophomore and senior students) was completed. There was no significant difference between the two groups in relation to their change in the level of anxiety before and after the intervention. Therefore, showing the video only before exam 1 and exam 2 to the seniors had the same effect on students' anxiety levels as showing the video two days a week for 10 weeks to the sophomore students.

Compared to other methods identified in the research to reduce test anxiety, the brief meditation video had very few drawbacks. The video was brief and was easily embedded into the online learning environment. This allowed students to have access to the video in the classroom as well as at home or work. Unlike some of the other therapies, allergies (pets or essential oils) were not a concern. There was no cost or training to the faculty or students. Many senior students commented they found the videos to be relaxing and enjoyed the calming effect of the intervention. One researcher was contacted by senior students before the exam to make sure the video would be shown before the exam. Some students in the sophomore class reported they preferred a different type of meditation video such as one with more positive affirmations versus guided imagery. Therefore, an additional video was selected midway through the semester and was added to the study. The sophomore students did become more resistant to watching the video since they watched the video twice a week for 10 weeks.

Without the use of anxiety reduction strategies, students' anxiety levels could remain high which could affect their ability to concentrate to study or be able to perform adequately on exams. When students perform poorly on their exams this can result in a course failure.[6] When students are unsuccessful in nursing courses, they are unable to graduate and take their NCLEX to become a nurse. Considering the nursing shortage and the need for nurses in the next twenty years in the United States, nursing faculty must implement strategies that will retain, strengthen, and encourage nursing students to complete their program of study. By developing and implementing strategies to reduce test anxiety, nursing faculty can help students be successful.

There were a few limitations identified in this study. First, students self-reported their level of anxiety, and symptoms of anxiety were not verified by the researchers. While this was identified as a limitation, it is fair to say that many students naturally have generalized anxiety before any test. Next, study participants were selected through a convenience sample of prelicensure BSN students in a single nursing program. Another limitation is the generalization of the results may be limited to medium-sized, public university settings in the eastern United States. The meditation video was changed midway through the study per request by the sophomore students. The change in the video may have impacted the results of the study. Finally, the study only provided a snapshot of the student's level of anxiety immediately after the intervention, so no long-term results were measured.

6. Conclusion

In conclusion, nursing students are found to have higher levels of anxiety than other college students. This can partially be contributed to the high-stakes testing required of nursing programs to prepare students for the NCLEX. This study found similar results with high levels of test anxiety in nursing students. Through this study, a brief 5-minute meditation video before lectures and/or exams reduced the reported anxiety level of prelicensure BSN students before taking exams. This intervention was found to be inexpensive, time-efficient, and easy to implement (no training required for students or faculty). Hopefully, students will continue to apply this learned technique of relaxation to help reduce their anxiety during nursing school whether it be in the classroom, laboratory, or the clinical setting. Finally, further research is needed on whether this intervention, which was found to reduce anxiety, would result in higher test scores and student success.

Acknowledgements

The authors express their appreciation to the nursing students

who participated in this study and were willing to complete the survey tools.

CONFLICTS OF INTEREST DISCLOSURE

The authors declare that there is no conflict of interest.

REFERENCES

[1] Brodersen LD. Interventions for test anxiety in undergraduate nursing students: An integrative review. Nursing Perspectives. 2017; 38(3): 131-137. https://doi.org/10.1097/01.NEP.0000000000000142

[2] Gibson HA. A conceptual view of test anxiety. Nursing Forum. 2014; 49(4): 267-277. PMid:24417589 https://doi.org/10.1111/nuf.12069

[3] Poorman SG, Mastorovich ML, Gerwick M. Interventions for test anxiety: How faculty can help. Teaching and Learning in Nursing. 2019; 14 : 186-191. https://doi.org/10.1016/j.teln.2019.02.007

[4] Kamel OM. The relationship between adaptive/maladaptive cognitive emotion regulation strategies and cognitive test anxiety among university students. International Journal of Psycho-Educational Studies. 2018; 7(1): 100-105.

[5] Duty SM, Christian L, Loftus J, et al. Is cognitive test-taking anxiety associated with academic performance among nursing students? Nurse Educator. 2016; 41(2): 70-74. PMid:26312822 https://doi.org/10.1097/NNE.0000000000000208

[6] Manansingh S, Tatum ST, Morote E. Effects of relaxation techniques on nursing students' academic stress and test anxiety. Educational Innovations. 2019; 58(9): 534-537. PMid:31461522 https://doi.org/10.3928/01484834-20190819-07

[7] Son HK, So WY, Kim M. Effects of aromatherapy combined with music therapy on anxiety, stress, and fundamental nursing skills in nursing students: A randomized controlled trial. International Journal of Environmental Research and Public Health. 2019; 16(21): 1-10. PMid:31671873 https://doi.org/10.3390/ijerph16214185

[8] Quinn B, Peters A. Strategies to reduce nursing student test anxiety: A literature review. Journal of Nursing Education. 2017; 56(3): 145-151. PMid:28263352 https://doi.org/10.3928/01484834-20170222-05

[9] Anderson D, Brown S. The effect of animal-assisted therapy on nursing student anxiety: A randomized control study. Nurse Education in Practice. 2021: 52: 1-7. PMid:33839594 https://doi.org/10.1016/j.nepr.2021.103042

[10] Moore LC, Goldsberry J, Fowler C, et al. Academic and nonacademic predictors of BSN student success on the HESI exit exam. Computers, Informatics, Nursing. 2021; 39(10): 570-577. PMid:33935207 https://doi.org/10.1097/CIN.0000000000000741

[11] Driscoll R. Westside test anxiety scale validation. 2007; (ED495968), ERIC. Available from: https://eric.ed.gov/?id=ED495968

[12] Green M, Angoff N, Encandela J. Test anxiety and United States medical licensing examination scores. Clin Teach. 2016; 13: 142-146. PMid:26037042 https://doi.org/10.1111/tct.12386

[13] Rajiah K, Saravanan C. The effectiveness of psychoeducation and systematic desensitization to reduce test anxiety among first-year pharmacy students. American Journal of Pharmaceutical Education. 2014; 78(9). PMid:25525278 https://doi.org/10.5688/ajpe789163

[14] Bultas MW, Boyd E, McGroarty C. Evaluation of a brief mindfulness intervention on examination of anxiety and stress. Journal of Nursing Education. 2021; 60(11): 625-628. PMid:34723741 https://doi.org/10.3928/01484834-20210913-04

[15] Sharif F, Dehbozorgi R, Mani A, et al. The effect of guided reflection on test anxiety in nursing students. Nursing and Midwifery Studies. 2013; 2(3): 16-20. PMid:25414871 https://doi.org/10.5812/nms.11119

[16] Driscoll R, Evans G, Ramey G, et al. High test anxiety among nursing students. 2009; (ED506526). ERIC. Available from: https://eric.ed.gov/?id=ED506526

[17] Wedgeworth M. Anxiety and education: An examination of anxiety across a nursing program. Journal of Nursing Education and Practice. 2016; 6(10): 23-32. https://doi.org/10.5430/jnep.v6n10p23

[18] Savitsky B, Findling Y, Ereli A, et al. Anxiety and coping strategies among nursing students during the covid-19 pandemic. Nurse Education in Practice. 2020; 46: 1-7. PMid:32679465 https://doi.org/10.1016/j.nepr.2020.102809