

Jacobs Journal of Nursing and Care

Research Article

The Effect of an Exercise Intervention on Nursing Test Anxiety

Amy Nagorski Johnson PhD RNC-NIC-E^{1*}

¹University of Delaware, USA

*Corresponding author: Dr. Amy Nagorski Johnson, 433 Orchard Road, Newark DE 19711, USA, Tel: 01-302-379-0314;

Email: ajohnson@udel.edu

Received: 12-07-2015

Accepted: 05-24-2016

Published: 06-22-2016

Copyright: © 2016 Amy Nagorski Johnson

Abstract

Introduction: Nursing students plan to pass the National Council Licensure Examination for Registered Nurses (NCLEX-RN) on the first attempt after graduating from their nursing program. Although students learn study skills and how to review and retain essential materials throughout their nursing education, test outcomes vary markedly between students. Testing anxiety is one factor identified in literature associated with differences in academic test performance. The purpose of this study is to examine the effect of power walking as an exercise intervention to manage testing anxiety in one nursing classroom.

Methods: 31 undergraduate nursing students participated in this factorial design study. The dependent variable was the student score on the State-Trait Anxiety Inventory (STAI). The independent variable was power walking, or quick-paced walking at four miles per hour for a period of 45 minutes during the hour before an exam.

Results: There were significant differences found in test-taking anxiety between students who exercised and student who did not exercise before this exam. The state-trait analysis of the data demonstrated that students who completed the exercise intervention had significantly less testing anxiety than those who did not exercise ($p=0.001$).

Conclusion: Power walking provided students with an intervention that helped manage testing anxiety while supporting testing performance.

Keywords: NCLEX-RN; Testing Anxiety; Exercise; Nursing Students

Introduction

Test anxiety is a physiologic and behavioral response students experience before and during examinations that peak in higher education and, according to the literature, is associated with a fear of failure [1]. Although the response can be improved with better study efforts, individual anxiety experiences need management to improve test performance. Suggested approaches for reducing moderate test-taking anxiety include increasing study preparation time, practicing relaxation techniques prior to exams, and time management that includes sleep and daily exercise. While exercise is one suggested approach, there are very few studies that examine exercise strategies with nursing students. The purpose of this study is to examine the effect of

power walking as an exercise intervention to manage testing anxiety in one nursing classroom.

Literature Review

There are two types of anxiety discussed in academic literature. The unpleasant internal feelings described as fear or concern that may manifest with nervous behaviors such as an upset stomach or more is considered a normal phenomenon for college students before examinations that can improve testing performance [1]. Debilitative anxiety, or anxiety that can interfere with a students' test-taking abilities, is performance anxiety that can negatively impact a students' success in higher education [2]. It is that level of anxiety that will be examined in this review of literature.

Test Anxiety in Academia

A hallmark study comparing nursing students anxiety experience (N=94) to that of general university students (N=131) found that while all university students experience debilitating anxiety, nursing students have significantly higher levels of debilitating anxiety ($p=.000$) than the general student population [3]. Moreover, these measures of anxiety are significantly higher than previous measures over the last 50 years using the same tool. Brewer suggests that this finding may be due, in part, to the essential technological skills university students must master that was not necessary in earlier years of research [3]. While this may be one explanation, clearly university performance expectations have evolved over the last 50 years as well. Current university students are well-aware of academic performance expectations and how that success affects career and future educational plans. It is thought by some that the impact of academic performance on future professional plans explains the increase in debilitating anxiety measured across university settings.

In a study of undergraduate college students (N = 99), hourly blood pressure measures and heart rate readings were automatically recorded over the 4-day enrollment period to determine the student cardiovascular activation in response to academic stress [4]. Because the cardiovascular response to stress and anxiety may be associated to health problems later in life, a daily end-of-day survey was completed by each subject to capture stressful events as well as a brief description as to why the event was perceived as stressful. Worry, nervousness, and emotionality before and during examinations were the most common events reported, which were further divided into acute and anticipatory academic stressors. Results of the tests of covariates analyses demonstrated significant increases in systolic blood pressure readings during acute academic stressors ($p = .008$) but not diastolic readings. Moreover, anticipatory stressors did not predict any changes in blood pressure readings. The students who reported a worry component of testing anxiety were the group with perhaps the most important findings; these students had a disproportionate cardiovascular activation response (increased heart rate and blood pressure) compared to others and it is that pattern that is directly associated with increased risk of cardiovascular disease later in life [4]. Because age increases blood pressure reactivity to stress and anxiety, managing stress with interventions early in life may prevent advancing cardiovascular disease.

Nursing and NCLEX-RN Anxiety

The National Council Licensure Examination for Registered Nurses (NCLEX-RN) is a computerized standardized test that is mandated by every Board of Nursing in the United States. Because all graduate nurses are required to pass this exam to practice as a registered nurse, one aim of nursing education is to assist the student in acquiring necessary clinical skills as

well as learning to apply critical thinking skills during written examinations such as the NCLEX-RN. Over the years, a number of studies examining factors that affect and/or predict success on this exam have been published; factors range from study preparation for content mastery to past performance on university exams. It appears the students at risk for failing the NCLEX-RN are a part of every nursing program, yet predicting failure is not easy. Addressing the individual student's underlying learning needs including situational factors such as anxiety are necessary in providing interventions to improve testing performance [5]. These interventions shape a body of evidence-based strategies that include treating testing anxiety with therapy [1,2], creating a better approach to learning that is individualized to student needs [5], teaching test-taking skills [6], and offering an integrated program that enhances critical thinking skills [7]. The majority of these interventions are woven in to the undergraduate program of study in such a way that students may or may not realize these are tools to use for all examination experiences.

The holistic approach is taught across many nursing programs to promote healing and well-being by focusing on the interconnectedness of the mind-body-energy-and emotions of a person as it relates to the environment. If this approach became the student's method in caring for themselves in school, then as nurses, they are more likely to use a holistic approach in practice [8]. In this study of patients with emergent medical conditions (N = 31), a therapeutic music intervention reduced the pain and anxiety levels of the group ($p = .005$) and when combined with other holistic interventions such as relaxation, patients reported better outcomes [8]. Of interest, in a study using aromatherapy interventions to reduce testing anxiety, students reported that lavender oils reduced anxiety but diminished their focus and critical thinking abilities [9]. Although both studies offer interventions for students to consider, neither study measured the student anxiety before and after intervention.

It is known that anxiety and stress has often detrimental effects on the autonomic nervous system with observed changes in blood pressure, respiratory rate, and increases in blood glucose levels [10]. In a recent randomized, controlled study of nursing students (N=27), life stress and postprandial blood glucose levels were measured before and after a 12-week yoga and meditation training intervention [11]. The findings indicated that the stress scores and blood sugars post-intervention were significantly different than the scores prior to the intervention ($p<0.001$) and that these differences were sustained over time for many of the students. Because this study was able to demonstrate efficacy of holistic interventions to manage the stress response, it supports the need for interventions for nursing students. If debilitating anxiety interferes with problem solving strategies which are necessary in passing the NCLEX-RN exam, teaching students methods to control and/or reduce testing anxiety may improve overall test performance.

Study skills taught early in nursing education will enhance student confidence by supporting critical thinking with positive feedback while offering a method to manage testing experiences. The following is a report of a class research activity that first acknowledged testing anxiety as normal phenomena in nursing while teaching students techniques for managing anxiety with exercise.

Methods

As a research activity to test an exercise intervention on testing anxiety, all junior-level undergraduate nursing students from a single nursing course (N=58) were asked to participate in the intervention program before a major examination. After explaining the study to the students, the decision to participate or not participate was left to each individual student without effect on grades or classroom activities. Exclusion criteria included the inability to walk a distance of four miles, cardiac and/or respiratory illness, and recent surgical and orthopedic issues.

Design

The study was a factorial design. The dependent variable was the student score on the State-Trait Anxiety Inventory (STAI). The independent variable was power walking, or quick-paced walking at four miles per hour for a period of 45 minutes during the hour before the exam. Power walking, or speed walking, is a low-impact exercise with moderate intensity that raises the baseline heart rate to increase metabolism.

Sample

After obtaining University Institutional Review Board (IRB) approval to conduct the study, students self-selected power walking or non-walking, yielding a representative convenience sample of students (N=31 or 53.4%) participating in the power walking intervention; the remaining 27 or 46.6% did not power walk. Of the 58 students enrolled in the course, 54 students (93.1%) were female, 45 students (77.6%) lived on campus, and 35 students (60.3%) were employed.

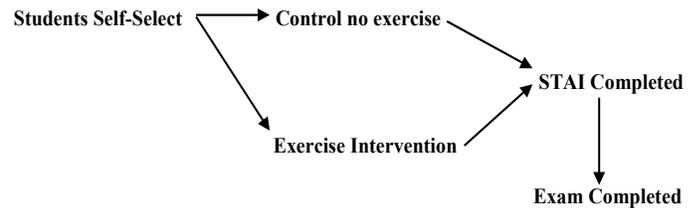
Instrument

Anxiety was measured using the 40-question State-Trait Anxiety Inventory (STAI) developed by Spielberger in 1977. The instrument has been widely used in test anxiety and stress-related research. There are two parts to this inventory: one for trait anxiety (T) or how the individual generally feels and one for state anxiety (S) or how one feels at the present moment of testing. This allows differentiation between temporary or state anxiety and the long-standing trait anxiety of the individual. The median alpha coefficient for this instrument is reported as 0.93.

Procedure

All students enrolled in the nursing course were invited to par-

ticipate in this pilot study. Every student participated in a study review the week before the exam and was asked to study and prepare for the examination using their usual study methods. On the morning of the scheduled exam, students that self-selected power walking met one hour before the exam to walk; non-walking students arrived to take the exam at the normal, scheduled time. The flow diagram below describes the collection of data:



Because literature suggests there is a difference in test-taking anxiety between students who exercise before exams and students who do not, all students were asked to voluntarily complete a tool to measure test-taking anxiety immediately before the exam. Most students (N=52 or 89.6%) elected to complete the inventory, finding that it took less than 5 minutes to complete. The inventories were submitted at the same time the students submitted their completed exams, but were deposited into a box for confidentiality of participation.

Data Analysis

Data analysis was conducted to describe the sample and test the differences of test-taking anxiety between students who exercised and student who did not before the exam. The analysis was completed using ANOVA with the level of significance set at $\alpha = .05$.

Results and Discussion

There were no statistically significant differences between the walking and non-walking student groups of this study. These groups of females shared remarkably similar hours of study, sleep, and work, and primarily lived on the University campus. The homogeneity of this sample makes it difficult to generalize the findings, but the sample is consistent with many University nursing student groups.

There were significant differences found in test-taking anxiety between students who exercised and student who did not exercise before this exam. The state-trait analysis of the data demonstrated that students who completed the exercise intervention had significantly less testing anxiety than those who did not exercise ($p=0.001$). Of interest, many students who selected not to exercise reported a need for a "routine" before testing which included certain timed preparations that would interfere with their participation in power walking. Most students reported increasing their study preparation time and time management that includes sleep and daily exercise as suggested by Edelman and Ficorelli however, the power walking students solely reported using any type of relaxation tech-

nique prior to this exam [12]. It is important to note that while individual exam scores were not considered in this project, the mean exam score was 80.2% and all students passed the exam, scoring 70% or higher on the exam. It is thought that the focus on preparing for the exam with this research intervention may have prompted better study skills across the student group.

The underlying premise of this study was to determine if a power walking exercise intervention would alter anxiety that negatively impacts nursing students' performance on exams. Because students fear failing exams and ultimately the NCLEX-RN, helping students understand situational factors such as testing anxiety and providing interventions to improve testing performance is often a part of nursing advisement [5]. This power walking intervention can be added to the body of evidence-based strategies that include treating testing anxiety with therapy [1,2], creating a better approach to learning that is individualized to student needs [5], teaching test-taking skills [6], and offering an integrated program that enhances critical thinking skills [7]. The difference with power walking, however, is that these students understand the value of using this intervention for all examination experiences.

Limitations

The primary limitation of this study is the convenience sample size. This sample is representative of the university and geographic location and, although these findings may not be generalizable to other undergraduate student populations without additional research, the data adds to the literature on interventions to manage testing anxiety.

Conclusion

Power walking provided students with an intervention that helped manage testing anxiety while supporting testing performance. The value of power walking before exams is evidenced on our campus with nursing student groups continuing to participate on walks through rain and falling snow before major exams. While many students report increased test-taking confidence with power walking, further controlled studies are needed to support these initial findings.

References

1. Markman U, Balik C, Braunstein-Bercovitz H, Ehrenfeld M. The effect of nursing students' health beliefs on their willingness to seek treatment for test anxiety. *Journal of Nursing Education*. 2011, 50(5): 248-252.
2. Damer DE, Melendres LT. Tackling test anxiety: A group for college students. *The Journal for Specialists in Group Work*. 2011, 36(3): 163-177.
3. Brewer T. Test-taking anxiety among nursing and general college students. *Journal of Psychosocial Nursing and Mental Health Services*. 2002, 40(11): 22-29.
4. Conley KM, Lehman BJ. Test anxiety and cardiovascular responses to daily academic stressors. *Stress and Health*. 2012, 28(1): 41-50.
5. Carrick JA. Student achievement and NCLEX-RN success: Problems that persist. *Nursing Education Perspectives*. 2011, 32(2): 78-83.
6. Thomas MH, Baker SS. NCLEX-RN success: Evidence-based strategies. *Nurse Educator*. 2011, 36(6): 246-249.
7. March KS, Ambrose JM. Rx for NCLEX-RN success: Reflections on development of an effective preparation process for senior baccalaureate students. *Nursing Education Perspectives*. 2010, 31(4): 230-232.
8. Sand-Jecklin K, Emerson H. The impact of a live therapeutic music intervention on patients' experience of pain, anxiety, and muscle tension. *Holistic Nursing Practice*. 2010, 24(1): 7-15.
9. McCaffrey R, Thomas DJ, Kinzelman AO. The effects of lavender and rosemary essential oils on test-taking anxiety among graduate nursing students. *Holistic Nursing Practice*. 2009, 23(2): 88-93.
10. Gibbons C, Dempster M, Moutray M. Stress, coping and satisfaction in nursing students. *Journal of Advanced Nursing*. 2011, 67(3): 621-632.
11. Kim SD. Effects of yogic exercises on life stress and blood glucose levels in nursing students. *Journal of Physical Therapy Science*. 2014, 26(12): 2003-2006.
12. Edelman M, Ficorelli C. A measure of success: Nursing students and test anxiety. *Journal for Nurses in Staff Development*. 2005, 21(2): 55-59.