The Effects of Stress-Reducing Interventions on Perceived Test Anxiety and Achievement of Nursing Students

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Introduction

Students who major in nursing may experience stress and anxiety from a variety of sources including academic issues, clinical experiences, family commitments, and work life.[1] Within the context of academic issues, nursing students experience test anxiety, which is a situational event that can be mild to debilitating. Students often are required to take standardized examinations in order to progress in the curriculum or exit from the program. Because the consequences of failing a standardized examination are substantial, students can experience high test anxiety. Students often recognize that they feel anxious about test taking, but feel powerless to deal with the anxiety.[2] Thus, instructing students on techniques which lower anxiety may be useful in improving the collegiate experience and academic performance.

Review of Literature

Test anxiety, also referred to as performance anxiety, is experienced by students majoring in every academic discipline including the arts, natural sciences, and mathematics.[3] It affects students of virtually all demographic groups and is negatively correlated with student success.[4] Hembree found certain concerning patterns: females, lower-ability students and ethnic minorities experience test anxiety at higher levels than males or academically talented students.[4] Test anxiety is believed to be comprised of emotionality and worry (cognitive test anxiety) and is characterized by physiological signs and symptoms such as increased heart rate, increased galvanic skin response, sweating and feelings of panic, nausea, and dizziness.[5] Cognitive test anxiety is thought to be associated with "comparing self performance to peers, considering the consequences of failure, low levels of confidence in performance, excessive worry over evaluation, causing sorrow for their parents, feeling unprepared for tests, and loss of self-worth". [5,p. 272] Stober added that test anxiety occurs when there are interfering thoughts during the testing session.[3] These interfering thoughts are typically negative self-evaluative thoughts and worry that competes for recall of pertinent information needed by test takers.[5]

The effects of stress-reducing interventions such as the use of physical activity, cognitive behavioral therapy (CBT), and meditation have been investigated to determine the most effective method to reduce anxiety. In patients with depression, physical activity (minimum of 30 minutes daily) was correlated with reduced scores on the Hamilton Depression Scale.[6] The use of cognitive behavioral therapy, a psycho-therapeutic approach that addresses and subverts dysfunctional emotions and behaviors, has been investigated in nursing students, with statistically significant reductions on anxiety levels, as measured by the State-Trait Anxiety Inventory.[7] Meditation, the act of engaging in a mental exercise to reach a heightened state of self awareness, has been investigated in cancer patients with findings of improvements in mood.[8]

Purpose of the Study

The purpose of this study was to assess the effectiveness of cognitive-behavioral and exercise interventions on self-reported test anxiety and on grades on course examinations. Research questions examined in the study are:

Do cognitive-behavioral, exercise or healthy eating awareness interventions improve test anxiety at the end of a 5-week period?

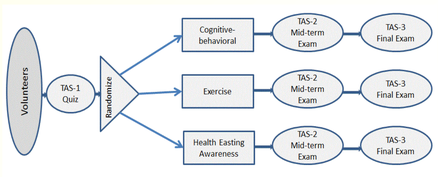

Figure 1. Repeated measures design.

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Methods

After approval by the Institutional Review Board of the University of Alabama in Huntsville was received, undergraduate nursing students enrolled in a Scholarly Inquiry in Nursing were invited to participate in the study on the first day of the course. An experimental, repeated measures design was used to conduct the study (Figure 1). After the description of the study by the Primary Investigator, students were asked to review the consent form and sign if they agreed to participate. Students were randomized to one of the three groups: CBT, physical activity, and health eating awareness. On the second day of class, the Test Anxiety Scale (TAS) was administered immediately prior to the first class quiz. This measurement served as the baseline because it was administered prior to intervention. Participants began their activities according to a protocol developed for each group after the second day of class, and these activities continued for a 4-week period. At the mid-term and end of the summer semester, the TAS was administered immediately prior to the exams. Grades on the mid-term and final were obtained through self-report.

Sample Characteristics

The sample is composed consisted of undergraduate nursing students (aged 19 or older) who were enrolled in a Bachelor of Science in Nursing program at a university in the southeastern part of the United States. Participants were enrolled in one of four sections of *Scholarly Inquiry in Nursing*, a required course in the curriculum. There were two exclusions for participation in the study: (1) already in treatment for test anxiety or (2) reported use of medications to treat anxiety. These exclusions were described in the on the consent form. Students were randomly assigned into groups using Random Allocation Software (Saghaei, 2004). The groups were: (1) cognitive-behavioral group, (2) exercise group, and (3) healthy eating awareness group.
Slightly over 200 undergraduate nursing students were invited to participate in the study; of those, 101 agreed to participate and signed a consent form. Students were randomly assigned into one of three treatment groups: 34 in cognitive-behavioral, 34 in exercise, and 33 in healthy eating awareness. There were more females (74%) than males (14%); 13% omitted the answer. The majority of students were white (61%), and the next largest group was African American (22%). Five percent of the sample was Asian, American Indian or other; whereas, 12% did not provide a response. Eight of the 101 students responded that English was their second language. Fifteen of the students had previous bachelor or higher degrees. The average age of students in the study was 26 (SD = 8.3) with the youngest being 19 and the oldest 58. The self-reported GPAs ranged from 1.75 to 4.00 (*M* = 2.99, *SD* = 0.45

Results

Table 1. Descriptive statistics for TAS derived from the 3 groups.

Group	TAS	Mean	Std. Error	95% Confidence Interval	
				Lower	Upper
Cognitive	TAS1	22.58	2.36	17.85	27.32
	TAS2	22.33	2.26	17.79	26.87
	TAS3	15.92	2.25	11.40	20.43
Exercise	TAS1	19.74	1.70	16.32	23.16
	TAS2	19.17	1.63	15.90	22.45
	TAS3	14.83	1.62	11.56	18.09
Diet	TAS1	17.22	1.93	13.35	21.09
	TAS2	16.44	1.85	12.74	20.15
	TAS3	15.17	1.84	11.48	18.85

Table 2. Repeated ANOVA for test anxiety in 3 groups.

Source	Sum of Squares	df	Mean Square	F	Sig.
TAS	270.02	1.00	270.02	11.78	0.00
TAS * GPA	165.71	1.00	165.71	7.23	0.01
TAS * Group	109.54	2.00	54.77	2.39	0.10
Error(factor1)	985.40	43.00	22.92		

Table 3. Test anxiety for males and females.

TAS	Gender	Mean	SD
TAS1	Female	21.64	8.36
	Male	16.71	6.24
TAS2	Female	19.47	8.06
	Male	15.10	7.03
TAS3	Female	16.09	7.48
	Male	12.18	7.22

Table 4. Comparison of test anxiety scores by gender.

Source	Sum of Squares	df	Mean Square	F	Sig.
Intercept	4137.26	1.00	4137.26	31.87	0.00
GPA	1070.64	1.00	1070.64	8.25	0.01
Gender	482.17	1.00	482.17	3.71	0.06
Error	5712.82	44.00	129.84		

Discussion

The scored level of anxiety, measured by TAS, of Nursing students decreased over the course of the study. Female students scored higher than males in the beginning. This suggests that women may have a higher perception of stressors than men. But by the end of the study both genders were fairly close in score. The statistics appear to show that all methods are effective at reducing the perceived stress of nursing students. This reinforces other studies that show that perceived stress can be reduced with treatment. For example, Heaman (1995) investigated the effects of cognitive behavioral therapy on 40 nursing students. The finding reported to have significantly reduced the state anxiety levels measured by the State-Trait Anxiety Inventory (STAI) while the control group remained largely unchanged (Heaman 1995).

Application/Suggestion

Stress and anxiety has a negative impact on nursing students' performance and academic success, thus casing patient care to diminish. Student nurses need methods of reducing anxiety to perform proficiently in all settings. These stress-reducing skills will carry over from the academic setting to the professional healthcare environment. Although this study was able to focus on three interventions to relieve test anxiety, there are many more that could be explored. Some different interventions that could be used include specific types of exercise such as yoga, biofeedback training, and time management courses. Suggested further research could also include more participants to increase the power of the study. Studies could be directed towards specific age groups, cultures, and varied chosen college majors of students for comparison.

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