PEOPLE: International Journal of Social Sciences
ISSN 2454-5899

Abdul-Kareem M. Jaradat, 2019

Volume 5 Issue 2, pp. 408-418

Date of Publication: 14th September 2019

DOI- https://dx.doi.org/10.20319/pijss.2019.52.408418

This paper can be cited as: Jaradat, A. K. M., (2019). A Comparison of Two Methods for Reducing Test-Anxiety and Improving Academic Performance. PEOPLE: International Journal of Social Sciences, 5(2), 408-418.

A COMPARISON OF TWO METHODS FOR REDUCING TEST-ANXIETY AND IMPROVING ACADEMIC PERFORMANCE

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Abstract

This study examined the effectiveness of cognitive behavioral therapy (CBT) and study skills training (SST) in reducing test-anxiety and improving academic performance. Eighty one high test-anxious male students in the tenth grade were randomly assigned to three groups: CBT, SST and waiting-list control (WLC). CBT aimed to help participants become aware of the anxiety-producing self-statements they emitted both before and during exams, and to train them to develop positive self-statements that would facilitate task attending; whereas SST aimed to teach participants the skills necessary for effective learning, namely SQ3R method of studying, techniques of time management, note-taking methods, test preparation techniques and test-taking techniques. All participants receiving treatment met for a total of six 50-minute treatment sessions spanning over six weeks. The data was analyzed using one-way ANOVA and one way MANOVA. The results indicated that both treatment groups made significant improvements from pretest to posttest in test-anxiety when compared to the WLC group. However, only the CBT group was superior to the WLC group in improving academic performance. Overall, the results were interpreted as giving support to the interference model of the debilitating effect of anxiety on performance.

Keywords

Cognitive Behavioral Therapy, Study Skills Training, Test-Anxiety, Academic Achievement

1. Introduction

Test anxiety is a common problem among school students. Some students usually find anxiety interferes with their learning and test taking to such an extent that their achievement is seriously affected. These students may study hard, but because they may engage in anxiety-provoking thoughts, such as desire for perfectionism or fear of failure, they perform poorly. Moreover, these same negative thoughts may result in other consequences such as dissatisfaction with study that may in turn lead to detrimental academic achievement. On the other hand, test-anxious students may have poor study habits and skills such as poor time management or reading without understanding, which may also lead to test-anxiety and low performance as reactions of the lack of knowledge.

Anxiety has been conceptualized as a response to a stressful condition and as a probability of a harmful future outcome (Shechter & Zeidner, 1990). The phenomenon of anxiety can be characterized by feelings of threat, anticipation, danger, uneasiness and distress (Rost & Schermer, 1989). In the following are some of the major attributes of anxiety listed by I. G. Sarason and Sarason (1990): The anxious person appraises a situation as difficult, threatening, or challenging; the anxious person perceives himself or herself as being inefficient or inadequate to the task at hand; the anxious person focuses on undesirable consequences of personal inadequacy or on undesirable outcomes; the anxious person is preoccupied with self-related thoughts that compete with cognitive task-related activity; the anxious person expects loss of self-esteem and failure.

The term test in test anxiety refers to the anxiety-producing situation (Rost & Schermer, 1989). The term test anxiety refers to the cognitive, physiological, and emotional responses that accompany concern about possible negative consequences or failure on an exam or similar evaluative situation (Sieber, O'Neil & Tobias, 1977). Thus, test anxiety has manifestations. It may be reasonable to differentiate between high test-anxious and low test-anxious students through these manifestations.

Research shows that the cognitive elements of test anxiety may be manifested as worry, not noting the mistakes, misunderstanding the task, thought blocking, poor concentration, forgetting, poor listening, unclear thoughts, clinging to the same thoughts, task irrelevant thoughts, not understanding the questions, reduced attention (Rost & Schermer, 1997), self-focused attention or negative performance expectations (Deffenbacher, 1980).

Autonomic arousal is the most dominant response for the expression of anxiety in stressful situations. It may manifest during testing in a variety of physiological responses, such as rapid heartbeat, feelings of nausea, sweating, need to pass urine, cold and clammy hands, and shaking and trembling (Suinn, 1984). Galassi, Frierson and Sharer (1981) found that the most frequently reported bodily sensations experienced by university students, in descending order, were hands or body perspiring, dryness in mouth, stomach tense, heart beating fast, and hands or body trembling. Studies by Holroyd, Wetbrook, Wolf, and Badhorn (1978), and Hollandsworth, Glazeski, Kirkland, Jones and Van Norman (1979) found that high-compared to low-test-anxious students did not differ in physiological arousal levels both prior to and during a test, but instead differed in the appraisal and interpretations made about their arousal (e.g., test-anxious students defined their arousal as debilitative, whereas low-test anxious students viewed their arousal as a cue to exert greater effort toward the test).

Emotionality is defined as one's perception of the physiological-affective elements of the anxiety experience. This includes awareness of indications of autonomic arousal and unpleasant feeling states such as tension and nervousness (Morris, Harris, & Rovias, 1981). Emotionality rises sharply immediately before the test and typically wanes as the examinee progresses on the exam (Doctor & Altman, 1969). It has been found that emotionality is elicited mainly by external cues (e.g., walking into the exam hall, appearance of examiner, distribution of test booklets), which indicate the initiation of evaluation (Morris et al., 1981). The emotional elements of anxiety can be expressed as feelings of restriction, sadness, loneliness, disappointment or helplessness (Rost & Schermer, 1989).

2. Literature Review

A review of the literature indicates that there are two models for explaining the relationship between test anxiety and performance: The interference model and the skills-deficit model. From the interference model point of view, the effect of test anxiety on performance occurs in the testing situation. That is, anxiety during tests interferes with the student's ability to retrieve and use information that is known well (Culler & Holahan, 1980). Accordingly, anxiety hinders the student from utilizing or developing task-relevant knowledge or skills (Hodapp & Henneberger, 1983). Wine (1971) suggested that the debilitating effects of test anxiety on performance might have an attentional explanation. Task performance is impaired by negative self-statements, worry, and task-irrelevant thoughts. Researchers who support the skills-deficit model (e.g., Culler & Holahan, 1980) assume that poor performance in exams is mainly attributed to inefficient preparation caused

by poor study-related behavior. Students characterized by poor study habits and skills are well aware of their poor preparation for the exam, and thus adapt low self-expectations for success. This increases anxiety relating to the exam, which, in turn, impairs performance.

A wide variety of treatment methods have been developed for test anxiety (e.g., Putwain & Pescod, 2018; Shen, Yang, Zhang, & Zhang, 2018; Prinz, Bar-Kalifa, RafaeliSened, & Lutz, 2019), some of which were effective in reducing test anxiety and/or improving academic performance, and some of which were not. However, so far there is no method or program to be recommended to counselors, as highly effective for achieving both aims. Therefore, there is still a need for developing new programs to be easily implemented by counselors. As suggested in the literature of test anxiety, programs developed to teach test-anxious students how to challenge anxiety-provoking self-statements and/or help them acquire good study skills may be effective in treating their anxiety and improving their grades.

3. Research Objectives

The purpose of the present study is to compare the effectiveness of a cognitive behavioral therapy program and a study skills training program in reducing test anxiety and improving academic performance in high school male students. The following two hypotheses are tested:

(1) Cognitive behavioral therapy is more effective in reducing test anxiety than either study skills training or a waiting-list control group.

(2) Study skills training is more effective in improving academic performance than either cognitive behavioral therapy or a waiting-list control group.

4. Method

4.1 Participants

Participants were 81 male students in the tenth grade at a public school in Jordan. The participants were selected based on their high scores on the test-anxiety scale. The participants' mean age was 16.03 years (SD= 0.72).

4.2 Instruments

4.2.1 Test-Anxiety Scale

Test anxiety was measured using the test anxiety scale, developed by Rost and Schermer (1997). This scale consists of three subscales: Cognitive, emotional and physiological manifestations. Each subscale consists of 8 items. The author translated this scale from German into Arabic, and used it as a measure of test anxiety in this study. An example item: "When I get

anxious my hands sweat." Responses were rated along a five-point scale from 1 (almost never true) to 5 (almost always true). The higher the participants' scores the higher the participants' anxiety levels. In this study, reliability was evaluated in 184 tenth grade students. Cronbach alpha for the scale was .86. Corrected item total correlations ranged from 0.32 to 0.56.

4.2.2 Grade Point Average (GPA)

Academic achievement was assessed by the GPAs of participants. They were asked to report their cumulative GPA. It's noteworthy that the grading scale in Jordanian schools is from 0 to 100.

4.3 Procedure

The questionnaire was administered to tenth grade students at a Jordanian school, after receiving approval from the Jordanian ministry of education. Participants with high scores on the test anxiety scale were selected to participate in the study. They were then randomly assigned to three groups: Cognitive behavioral therapy group, study skills training, and waiting-list control group. Each group consisted of 27 participants. The author served as a therapist for both treatment conditions. Each group was divided into two sections and each section received six 50-minute weekly sessions. No participant missed more than one session.

4.3.1 Cognitive Behavioral Therapy (CBT)

The CBT program was designed to help anxious participants become aware of the anxiety-producing self-statements they emitted both before and during exams, and to train them to develop new, positive self-statements that would facilitate task attending in stressful situations. The CBT group members were informed that they could master their anxiety by learning to control task-irrelevant self-statements that generate anxiety and distract attention from the task at hand. They learned to replace negative self-statements with positive alternatives.

During the first session, some preliminary questions about test anxiety were asked, such as why do some students get anxious during exams?, what are the manifestations of anxiety?. Then the goals of the program were explained, followed by asking the group members about their expectations related to the program. Additionally, examples were offered to illustrate how our feelings can be affected by our self-statements. As a homework assignment, the group members were asked to keep a diary of their self-statements, feelings, and behaviors in stressful situations. In the second session, anxiety was explained to the group as resulting from their negative self-statements. Then, the ABC model of Rational Emotive Behavior Therapy was presented, and the group members used it in disputing three anxiety-producing self-statements. Each statement was discussed first in small groups and then there was a general discussion. Three other self-statements

were discussed in the third session, and another three in the fourth session. Most of the statements discussed during the sessions were assigned by the therapist, one of the statements given by one of the group members is that "my parents will kill me, if I don't get a good grade." During the fifth session, other techniques for inhibiting task irrelevant thoughts were offered, these techniques are: Using positive self-talk, convincing oneself that test score is not a measure of self-worth, distinguishing between demands and preferences and practicing thought stopping. In the sixth session, the group was taught how to develop procedures to attend fully to the task. Handout entitled "attention-focusing procedures" was given to the group. At the end of the session, there was a general discussion about the program.

4.3.2 Study Skills Training (SST)

The SST group was informed that test anxiety is often related to poor study skills. In addition, poor academic performance is not caused completely by an insufficient amount of time spent in study. It also depends on the quality of the time spent. There is evidence that low performing students use inadequate, incorrect, and ineffective methods of study. Therefore, they understand little of what they study and remember little of what they understand. The active participation in the SST program would lead to more effective study skills and habits, which may be helpful in reducing test anxiety, considering that test anxiety is probably a natural reaction resulting from ineffective study methods.

The group members were asked to monitor their study behaviors and record which problems they experience while studying. Topics covered in the sessions were SQ3R method (Survey, Question, Read, Recite and Review), techniques of time management, note-taking methods, test preparation techniques and test-taking techniques. Specifically, during the first session, the goals of the program were explained and a general idea about the training sessions was given. The group members were taught the SQ3R method of studying. They were informed that they should first survey the chapter by glancing quickly through the headings, tables and illustrations. Then, they should question by turning headings into questions to be answered while reading. They should read actively, focusing on completion of the main ideas of the passage. They should recite the material in the section they have just finished. Finally, they should review main points, concentrating on passages not yet completely understood. At the end of the session, the group was asked to review at home the five steps of the SQ3R method.

It is worth mentioning that the importance of using underlining was emphasized. The group was told that the purpose of underlining is to reduce the amount of material to be studied for exams. If one underlines everything, one might as well underline nothing. On the other hand, if one

underlines almost nothing, it will not be of much help either. It will be sufficient if one indicates the key words or key phrases within a sentence. Of great importance is that underlining should follow and not precede understanding.

In the second session, the group applied the SQ3R method to a history textbook chapter. They were asked to apply the steps of "survey and question" to the whole chapter, and the steps of read, recite and review only to one or two passages. During the third session, the group members were taught how to develop a time schedule and were informed that each one of them should follow their time schedule until they habitually turn from one activity to another. Also, they should follow the rules of study time. For instance, they should not wait until they are in a suitable mood before studying. The fourth session was devoted to explain the basic techniques of note-taking, the group was informed that there are steps to be followed, when taking notes. A student should record during class as many meaningful ideas as possible, then they should reduce these ideas into key words listed in the recall column, recite the main ideas, reflect on the material, and periodically review the notes. During the fifth session, principles relating to the timing of reviews were discussed. The sixth session was devoted to test preparation and test-taking strategies. First, the group discussed techniques relating to essay exams, then they turned to objective exams. Handouts were distributed to the group during the sessions.

With respect to the waiting-list control group, participants received no treatment. They were seen only at the pre- and post-tests. Posttests were administered to all groups, two weeks after a six-week treatment period, while final exams began three weeks after treatment had ended. Participants' grades were obtained from the registrar's records for the semester during which treatment was conducted.

5. Results

To assess differences in students' scores on the subscales of the test-anxiety scale by group one-way MANOVA was conducted. Additionally, one-way ANOVA was conducted for the students' total scores on the test-anxiety scale as well as for their GPAs as a function of group. There were no significant differences ($p < .05$) between groups on the pretest scores. However, significant differences ($p < .05$) were found between the groups on the posttest scores. Posttest results are presented in Table 1.

Results of the study didn't support any of the two hypotheses. MANOVA indicated significant main effects of group on the cognitive manifestation subscale, $F(2,78) = 17.204$, $P <$

0.0001, partial η^2 = .306; on the emotional manifestation subscale, F(2,78) = 17.893, P < 0.0001, partial η^2 = .314; and on the physical manifestation subscale, F(2,78) = 11.234, P < 0.0001, partial η^2 = .224. With regard to the total scores on the test-anxiety scale, One-way ANOVA showed a significant main effect of group on test-anxiety, F(2,78) = 22.233, P < 0.0001, partial η^2 = .363. Also, ANOVA revealed a significant main effect of group on the GPA, F(2,78) = 4.829, P < 0.0001, partial η^2 = .110. The Tukey post hoc multiple comparison procedure revealed that both experimental groups had significantly lower scores than the WLC group on all manifestations of test-anxiety, and that the CBT group had significantly higher academic achievement than the WLC group.

Table 1: *Means and Standard Deviations by Group*

Dependent Variables	CBT (n=27)		SST (n=27)		WLC (n=27)		*F*	η^2
	M	*SD*	*M*	*SD*	*M*	*SD*		
CM	17.11_a	5.35	18.30_a	4.81	24.96_b	5.71	17.204	.306
EM	16.81_a	4.78	17.26_a	5.05	24.63_b	6.23	17.893	.314
PM	16.78_a	5.08	15.30_a	5.21	21.96_b	5.95	11.234	.224
TA	50.70_a	12.16	50.85_a	12.39	71.56_b	14.93	22.233	.363
GPA	79.25_a	10.94	75.81_{ab}	10.31	69.71_b	12.88	4.829	.110

Note: CM = Cognitive Manifestation; EM = Emotional Manifestation; PM = Physical Manifestation; TA = Test-Anxiety; GPA = Grade Point Average. Different superscripts indicate post-hoc significant differences ($p < .05$) within rows.

6. Discussion

Cognitive behavioral therapy and study skills training have been widely used for test anxiety and other academic problems. In this study, these methods were used in two treatment programs, but with new designs. The components of each program were organized in a way that was easy for the participants to understand. All procedures, activities and techniques relating to each program were divided into six weekly sessions to give participants enough time to practice what they learn during the sessions. The number of sessions was equal for both experimental groups, so that the differences in the effects between the treatment groups attribute only to the different methods. The study examined the effects of the treatments not only on test anxiety, but

also on academic performance. Regarding the effectiveness of these treatments, it was measured through a test anxiety scale and the GPAs of participants. The results of this study showed that cognitive behavioral therapy was very beneficial for treating test anxiety and enhancing academic achievement, while study skills training was only helpful for reducing test anxiety.

Thus, study skills training can help test-anxious students study efficiently, improve their motivation to study, use their time well, increase their satisfaction with study, and reduce their anxiety, but since it does not cope with the negative thoughts that interfere with their concentration, it may not be effective for improving performance. In contrast, cognitive behavioral therapy can help these students not only be aware of anxiety-evoking thoughts and self-statements, but also teach them how to focus their attention fully on the task at hand rather than to attend to self-oriented thoughts. In other words, when the negative self-statements of test-anxious students are replaced with positive ones, this will help them be relaxed prior to and during exams. Being relaxed can help them learn the material better, and remember it more easily. Therefore, Cognitive behavioral therapy can reduce anxiety and increase grades.

The experimental design of the present study did not include follow up tests, and thereby it is unclear whether the short term effects of the interventions on test anxiety and academic achievement can be maintained over time. In addition, replication of the study using multiple therapists would also be highly desirable. Perhaps the treatment programs used in this study have significant effects on other variables such as self-esteem, general anxiety, obsessive-compulsive disorder, depression, self-acceptance or locus of control. This is left for future research.

7. Conclusion

These results support the interference model of the effect of anxiety on performance, but do not support the skills-deficit model of the effect of anxiety. Also, the results give further support to the general conclusion that almost any type of treatment seems to be effective in reducing self-reported test anxiety, but changing academic performance is another issue. Hence, counselors should work on teaching students how to study effectively and how to focus their attention on the tasks at hand.

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