Investigating the effect of coping strategies on reducing test anxiety in the third grade female high school students of Hamadan city

Nasrolah Erfani [1], Mahnaz Ahmadkhani [2]

1: Ph.D. Department of Psychology, Payame Noor University, I.R. of Iran
2: Department of Humanities, Islamic Azad University, Hamedan Branch, Hamedan, Iran
Ahmadkhanimahnaz@yahoo.com

Abstract: In this study, our goal is to investigate the effect of coping strategies on reducing test anxiety in third grade female high school students in Hamadan city. In order to do that, we have taught coping strategies to samples in eight sessions. The samples selected via multi-stage cluster sampling so that, using cluster method, two high schools have been selected among all of them followed by selecting one classroom from each and finally, 20 students randomly selected. The results showed that, teaching coping strategies have been reduced test anxiety scores in pre-test conducted on test group. Covariance analysis was used to analyze the data so that, we, initially, tested the pre-assumptions of covariance analysis such as being normal and variance homogeneousness and then, by controlling the impact of pre-test variable, results indicated that, teaching coping strategies have been reduced test anxiety. These findings were significant at $\alpha=1\%$.

1. Introduction

All of the people experience stress. It is an inevitable fact that influences our lives. Anxiety is the most common response to the stressors. Anxiety is a psychological-physiological experience which, many scholars called it as the basis of problems. Every year, 4-5 percent of all population receives cares in this field (Flett, et al., 2004).

Many students suffer test anxiety in tests. It is one of the major problems of students all over the world. Test anxiety is a general concept and is a kind of social phobia which questions individuals' abilities and its sequence is lowered coping to deal with tests. This disorder disables students to answer the tests while they know the right answer (Ergen, 2002).

Ellis (2004) showed that, in addition to the structure of classroom contents and teacher's behavior, several factors such as mental health, cognitional abilities, emotions, and familial and individual characteristics have a major role in academic performance of students.

Egan et al., (2011) showed that, most of the stresses and test anxieties are due to lack of the coping skills to deal with emotions and time management. In the field of coping strategies, there is to general strategies: problem-focused and emotion-focused coping. Former can be internal or external orientation while the latter focuses on coping with emotional problem (Culhane and Watson, 2003).

From the perspective of Camatta and Nagoshi (2006) coping is a set of actions to control and manage dangerous and stressing situations. This definition has three important features:

1. indicates the necessity of endeavor and planning;
2. Do not assumes the final results of coping reactions to be always positive,
3. Considers coping as a process which occurs over the time.

Results of Elia (2008) showed that, there is a positive relationship between coping with emotions and academic achievements.

According to the above, in order to define the concept of coping strategies we can say that, coping strategies are the process of managing demands (internal or external) to manage and control environmental, internal demands and the struggle between them (Braunstein, 2004).

Test anxiety is a particular type of anxiety including phenomenological responses and behaviors related to the fear from defeat which an individual experiences in evaluation-oriented situation. The cognitional component of this structure is worriment that includes cognitions associated with anxiety (e.g. failing in an exam). Its emotional component refers to emotional excitements which an individual experiences during a test (i.e. general fear) (Ergen, 2002). From physiological perspective it is associated with sympathetic system excitement (e.g. increased heart beat) and finally the behavioral aspect includes various coping mechanisms an individual uses to deal with anxiety and its final cognitional and behavioral consequences (Dendato and Diener, 2012).

2. Material and Methods

This study is a quasi-experimental design with unequal control group. The following table shows the design diagram.

Table 1: design diagram

Groups	Pre-test	Independent variable	Post-test
Test group	T1	X	T2
Control group	T1	-	T2

Initially, both groups were asked to participate in test anxiety (pre-test). Then, test group received eight sessions of coping strategies to deal with rest anxiety. After this period both groups were asked to take the post-test.

Statistical population in this work was all third grade female high school students in district one and two of Hamadan city at academic year of 2011-2012. According to the Department of Education, their number was 4300 students. Randomly, Farshchian high school of district two was selected. Given that the minimum size of samples' group is 15 (Balkis and Bulus, 2012), thus, using multi-stage cluster sampling, 20 students were selected among the high schools and were placed into two control and test groups.

The tool benefitted in this work was Sarason Test Anxiety Scale. This is a tool that assesses the extent of test anxiety in a scaled fashion and provides norms to inform the quality of anxiety in an individual. This method first introduced by Sarason in 1958 and revised in 1980. It has a high validity and reliability as well as easy implementation and scoring. However, since it is developed and normalized in another society, thus, we must be cautious in interpreting obtained scores based on the cut points. In this study, using Cronbach alpha, the reliability coefficient was 0.87.

In order to teach coping strategies, the test group was subject trainings such as to 16-muscle, 8-muscle, and 4-muscle relaxation along with the relationship between thoughts and emotions, identifying negative thoughts, relaxation of passive muscles, replacing negative thoughts with rational thoughts, and problem-oriented coping strategies. The length of each session was 90 minutes.

3. Results

The descriptive and inferential statistical data of the research was analyzed by SPSS software.

The following table shows the descriptive statistics such as mean, standard deviation.

Table 2: the descriptive data based on the total score of test anxiety

Group	Pre-test		Post-test	
	Mean	Standard deviation	Mean	Standard deviation
Test	14.1	1.91	11.1	2.26
Control	13.95	1.79	14.05	1.87

The data in the above table are descriptive findings associated with dependent variable.
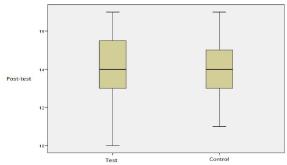

Figure 1: the box plot of test anxiety scores in pre-test for test and control group
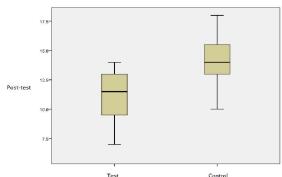

Figure 2: the box plot of test anxiety scores in post-test for test and control group

Based in the above figure, for four levels of scores in both groups, there are no irrelevant and ultimate values and the shape of the data and its scattering is almost normal and around the mean. Moreover, the length of the box which indicates the scores scattering pattern, aside the pre-test scores of test group, is identical for the rest of the scores.

Concerning the scattering of the dots around the line, the scattering and the deviations of the dots from each other is low and the data follow a normal and logical trend.
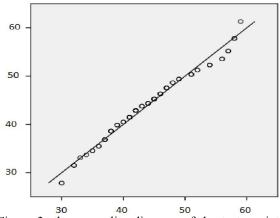
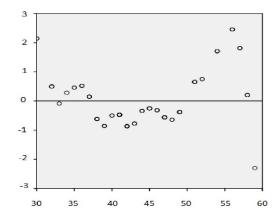Figure 3: the normality diagram of the test anxiety data using Q-Q diagram

Figure 4: the Q-Q diagram of test anxiety

The above diagram indicates that, the deviation of the dots relatively follow the normal diagram. Therefore, based on Q-Q diagram on normality of the data, this assumption is confirmed.

Table 3: normal distribution of test anxiety data by Kolmogorov–Smirnov test

Group		Normal parameters		Highest differences			K-S test	significance level
		Mean	Standard deviation	Absolute	Positive	Negative		
Test	Pre- test	14.100	1.916	0.131	0.071	-0.131	0.584	0.884
	Post- test	11.100	2.268	0.154	0.101	-0.154	0.960	0.728
Control	Pre-test	13.950	1.791	0.161	0.089	-0.161	0.721	0.677
	Post- test	14.050	1.877	0.112	0.112	-0.101	0.501	0.963

Table 4: Levene's test of homogeneity of variance of scores of both groups

F	DF$_1$	DF$_2$	P
1.47	1	38	81%

Given that in the above table, P is higher than obtained 0.05, therefore, it can be said that, the variances of test and control groups are equal and the assumption of the homogeneity of variances is complied.

Table 5: summary of covariance analysis to examine the homogeneousness of the regression slopes of pre-test and post-test scores of both groups

Source of changes	SS	df	MS	F	P
Model correction	187.988	2	187.988	54.52	0.000
Constant value	0.008	1	0.008	0.005	0.964
Main impact of pre-test	100.963	1	100.963	58.564	0.000
Main impact of group	92.360	1	92.360	53.574	0.000
Impact of interaction between training and pre-test	2.37	1	2.37	0.241	0.611
Error	63.787	37	1.724		
Total	6577	40			
Revised total	251.775	39			

The covariance analysis was used to examine the homogeneousness of the regression slopes of pre-test and post-test scores of both groups. The results of analysis indicate that, the effect of interaction between training coping strategies and post-test is P=0.241 and F=0.611. Therefore, it can be said that, the assumption of homogeneousness of the regression slopes is observed.

Table 6: correlation of random auxiliary and dependent variable and main impact of the group

Source of changes	Sum of squares	Freedom degree	Mean of squares	F	Significance level	Square of Eta
Inter group	461.32	1	461.32	21.32	0.0001	0.053
Pre-test	71.12	1	71.12	3.29	0.059	0.14
Error	411.27	19	21.64		-	-

The above table indicates that, the main effect of group is significant:
$(F_{(1, 19)} =21.32, p<0.0001, \eta^2=0.053)$
The second row of the table indicates that, one of the other assumptions of ANOVA statistical test, i.e. the necessity of the correlation between random auxiliary variable and dependent variable is observed.
$(F_{(1, 19)} =3.29, p<0.05, \eta^2=0.14)$
It means that, being in test group and the extent of test anxieties of its members has a significant effect and therefore, the null hypothesis is rejected and coping strategies have positive effect on test anxiety.

4. Discussions
This study was aimed to investigate the effect of teaching coping strategies on test anxiety. 40 female students were selected through multi-stage cluster sampling and have been randomly divided into two groups of test and control. The test anxiety was tested via Sarason's questionnaire.

According to the results, the test anxiety after implementing the independent variable of teaching coping strategies is lowered by 3 scores and therefore, considering the descriptive scientific findings' table, we realize that, the test anxiety score is lowered by 5 scores. Given that, significance level is lower that=n 0.0001, the result of covariance analysis suggests that, there is a significant relationship. Therefore, the hypothesis of the study is confirmed. Our results are in agreement with the results of Addis and Jacobson (1996) and Bockarts (2004).

According to the findings of the several studies, the prevalence of test anxiety among students is reported to be between 10 to 30 percent. In Iran, this ratio is reported to be 17.2%. Therefore, concerning the high rate of test anxiety and its negative effects on academic performance, various treatments and interventions have been developed in this field. Based on the above issues, we have investigated one of these methods.

Suggestions for future researches are:
- One of the limitations of the present work was the absence of assessing non-specific so that, one may claim that, the effects of our intervention is not related to specific factors. Therefore, future studies may be designed so that, the control group be subject to non-specific factors.
- It is suggested to investigate the test anxiety in the other fields especially mathematics and also in the male schools.
- Due to the lack of time and unwillingness of schools to cooperate, we just examined the problem-oriented strategies. Therefore, examining emotion-oriented strategies could be useful.

Corresponding Author:
Mahnaz Ahmadkhani
E-mail: Ahmadkhanimahnaz@yahoo.com

References
1. Balkis, M., Bulus., M., (2012): **Analysis of the relation between academic Presentation academic rationally irrational beliefs, time Performance to study for exam and academic achievement**: a Structural model Error Pean Journal of Psychology of education.16, PP. 27-44.
2. Bembemutty, H., (2009): **Test anxiety and academic delay gratification,** college student Journal, 43(1), p 10-12.
3. Braunstein, J.W. (2004): **An investigation of irrational beliefs and death anxiety as a function of HIV status**. *Journal of Rational-Emotive and Cognitive-Behavior Therapy*, 22(1), PP. 21-37.
4. Bridge**s**, R., Richard, J., Harnish, B., (2010): **Role of irrational beliefs in depression and anxiety:** a review. *Cognitive Therapy and Research*, 5(2), PP. 159- 173.
5. Camatta, C.D., and Nagoshi, C.T., (2006): **Stress, depression, irrational beliefs, and alcohol use and problems in a college sample.** *Alcoholism*: *Clinical and Experimental Research*, 19(1), PP. 143-146.
6. Culhane, S.E. and Watson, P.J. (2003): **Alexithymia, irrational beliefs, and the**

rational-emotive explanation of emotional disturbance. *Journal of Rational-Emotive and Cognitive-Behavior Therapy*, 21(1), PP. 57-71.

7. Dendato, K.M., and Diener. D., (2012): **effectiveness of cognitive- relaxation therapy and study-skills training in reducing test anxiety**. Journal of counseling pychologe,33, p.p 131-135

8. Egan, P.J., Canale, J.R., del Rosario, P.M. and White, R. M. (2005): **The academic irrational beliefs scale:** Development, validation, and implications for college counselors. *Journal of College Counseling*, 10(2), PP. 175- 183.

9. Elia. V., (2008): **Effect of rational – emotive therapy on test anxiety.** Source, DAI-B 58/12, PP. 68 42. Jun 2008.

10. Ellis, A. (2011): **How may therapy and practice of psychotherapy has influenced and changed other psychotherapies**. Journal of Rational-Emotive and cognitive Behavior Therapy, 22, (2), 79-83

11. Ergen, T. (2002): **Effective intervention of test anxiety reduction**. School psychology; 24:p.p 313-327.

12. Flett, G.L., Hewitt, P.L., Whelan, and Martin T.R. (2004): **The Perfectionism Cognitions Inventory: Psychometric properties and associations with distress and deficits in cognitive self-management**. Journal of Rational – Emotive and cognitive Therapy, 25(4), PP. 255-277.

12/6/2012