Indian Journal of Fundamental and Applied Life Sciences ISSN: 2231– 6345 (Online)
An Open Access, Online International Journal Available at www.cibtech.org/sp.ed/jls/2014/03/jls.htm
2014 Vol. 4 (S3), pp. 681-694/Khanehkeshi
Research Article

EFFECTIVENESS OF COGNITIVE BEHAVIOR THERAPY ON ACADEMIC STRESS AMONG HIGH SCHOOL STUDENTS

***Ali Khanehkeshi**
Department of Psychology, Behbahan Branch, Islamic Azad University, Behbahan, Iran
**Author for Correspondence*

ABSTRACT
This study investigated the effectiveness of cognitive behavior therapy (CBT) on academic stress among high school students. Initially 400 students (Boys=193 and Girls=207) from 10th, 11th, and 12th grade had given academic stress scale. Out of 400 students, 130 students (63 Boys and 67 Girls) fulfilled the *cut off score criteria* used for the study. *Cut off score criteria based on research tool for selecting subjects for intervention on academic stress was the score of 15 and above (15 to 30).*For the main study out of 130 students (who met cut off score criteria) 5 Boys and 5Girls each from 10th, 11th, and 12th grade were randomly selected and assigned to experimental group (15 Boys and 15 Girls) and control group (15 Boys and 15 Girls). Experimental group was subjected to individual CBT interventions (including problem solving training, positive thinking, cognitive restructuring, assertive training, and time management) for 13 sessions, and control group didn't receive any intervention. The design of this study was a pre-test, post-test design with control group. A scale for assessing academic stress (Sinha *et al.*, 2001) was used for collecting the data. The collected data analyzed with repeated measure analysis of variance and effect size calculation. Results showed that 1) the effects of interventions in decreasing academic stress and its subscales were statistically significant. 2) There was a significant difference between two groups in academic stress in post treatment. 3) The interaction of time*group in relation to the efficacy of CBT interventions in decreasing academic stress was significant. But, gender and grades had not significant effect on academic stress. As a conclusion, findings demonstrate the efficacy of CBT in alleviating academic stress symptoms among high school students.

Keywords: *Cognitive Behavior Therapy, Academic Stress, Academic Performance, High School Students*

INTRODUCTION
Stress is any situation that evokes negative thoughts and feelings in a person. The same situation is not evocative or stressful for all people, and all people do not experience the same negative thoughts and feelings when stressed. One model that is useful in understanding stress among students is person – environment model. According to one variation of this model, stressful events can be appraised by an individual as "challenging" or "threatening" (Lazarus, 1966). When students appraise their education as a challenge, stress can bring them a sense of competence and an increased capacity to learn. When education is seen as a threat, however, stress can elicit feelings of helplessness and a foreboding sense of loss.

A critical issue concerning stress among students is its effect on learning. The Yerkes-Dodson Low (1908) postulates that individuals under low and high stress learn the least and laboratory tests support the notion that excessive stress is harmful to students' performance.

Mechanisms explain why students perform badly under stress include "hyper vigilance" (excessive alertness to a stressful situation resulting in panic—for example, over studying for an exam) and" premature closure" (quickly choosing a solution to end a stressful situation—for example, rushing through an exam (Whitman, 1985).

Stress is associated with impairment of health and the negative emotional experiences associated with stress are detrimental to quality of life and sense of well being (Sinha, 2000). Out of number of stress faced by adolescents and young adults, academic stress emerges as significant mental health problem in recent years (Rangaswamy, 1995). It has been estimated that 10% to 30% students experience academic related stress that affects their academic performance (Johnson, 1979), psychological adjustment along

with their overall emotional and physical well being. Information load, high expectations, academic burden or pressure, unrealistic ambitions, limited opportunities, high competitiveness are some of the important source of stress which creates tension, fear, and anxiety. Poor academic performance, diminished popularity, depression, low self-efficacy, attention difficulties, somatic complaints, substance abuse are commonly observed problems among the victims of academic stress without being aware of means to cope with them (Sinha, 2000).

Academic stress is a significant source of stress for many students (Hashim, 2003), covering not only examinations but also other academically related stressors such as fear of logging behind in the homework, writing assignment, working on individual and group projects, time pressure, lack of financial support, concern about academic ability, scheduling classes and required motivation to study (Tyrrel, 1992). Some academic stress is normal for students, new stressors may arise because of exposure to new educational concepts for the first time on their life (such as mass media, internet, computer and so on), adjusting to new social setting (for example; change in medium of instruction, changing of residence, migration, peers pressure and shifting from one school to another one) and taking on a larger workload. Too much academic stress can contribute to depression, anxiety and physical illness (including headache and stomach ulcer) which can in turn negatively affect academic performance (Dedeyn, 2008).

A Cognitive Behavior Therapy (CBT) is a psychotherapy based on modifying everyday thoughts and behaviors, with the aim of positively influencing emotions. The general approach developed out of behavior modification and cognitive therapy, and has become widely used to treat mental disorders. The particular therapeutic techniques vary according to the particular kind of client or issue, but commonly include keeping a diary of significant events and associated feelings, thoughts and behaviors; questioning and testing assumptions or habits of thoughts that might be unhelpful and unrealistic; gradually facing activities which may have been avoided; and trying out new ways of behaving and reacting.

Relaxation and distraction techniques are also commonly included CBT and is widely accepted as an evidence-based, cost, effective psychotherapy for many disorders. The techniques are also commonly adopted for self-help manuals and increasingly self-help software packages (Norcross and Goldried, 2005).

Cognitive behavioral therapy interventions in high school would mainly be concerned with helping students realize three things: how their thought patterns affect their behavior; how they can take control of these thought patterns and how they can apply interventions to effect behavior change (Hall and Hughes, 1989).

Struthers *et al.,* (1988) found that stress was negatively related to academic performance among school children.

Arefi *et al.,* (2012) compared individual cognitive therapy and relaxation therapy in the treatment of high school student's academic stress. Among 90 high school students (45 boys and 45 girls) with high academic stress level 30 were randomly selected and randomly assigned to two equal groups of experimental and control ones (each group consisted of 15 students).They found that there was no significant difference between two therapeutic methods in reducing academic stress; however, both methods were meaningfully effective in reducing student's stress. Furthermore, interactional effect of sex and two therapy methods was significant. In addition, findings indicated that there was a gender difference in stress and Females were more intensively experiencing the stress.

Sharma *et al.,* (2010) examined the effectiveness of cognitive behavioral techniques including Cognitive Restructuring, Coping Skills Training, mainly Problem solving, Social Skills training and effective study habits on high school student's academic stress (30 boys and 30 girls), (aged between 13 to 16 years) for a period of three months, five days a week, and found decreased high school student's academic stress and enhanced their mental well-being. They suggested that while the academic stress of the students of experimental group decreased significantly, and a significant enhancement in well being.

Mehra and Sharma (2008) studied the effect of Yogic practices on social stress and academic stress of female students. 120 girl students (the mean age range of 16 years old) were selected randomly and assigned into two groups (experimental and control group). Social stress scale (Abha Rani Bisht Battery,

1987) and academic stress scale (Abha Rani Bisht Battery 1987) were used to collect the data. The experimental group was exposed to three months yogic practices such as Meditation, Pranayamas, and Shatkhriyas. Results showed that the students exposed to yogic practices experienced reduction in both social stress (t-ratio= 10.42, $p<0.01$) and academic stress (t-ratio=9.91, $p<0.01$).

Cormier and Nurius (2003) have used CBT interventions including stress and anxiety management techniques (for example, working with students to interrupt negative thought processes, replace those thought processes with rational, healthy thoughts while at the same time breathing through the nose and out the mouth while tensing and relaxing various muscles group) to help students prepare for testing or other stressful events. They have shown such interventions to be effective strategies to help students reduce academic related stress. Several empirical studies have supported the mediating role of cognitive processes in psychological stress.

Sapp and Farrell (1995) used cognitive behavioral interventions in both individual counseling sessions and within classroom guidance lessons to reduce anxiety and academic stress, specifically test taking. While improving academic self concept by teaching study and test taking skills, the intervention showed improved grade point averages, reduced the number of school days missed or tardy, and improved the academic self-esteem of the participants.

Studies indicates that not only do the cognitive interventions show the effectiveness of CBT in reducing stress and anxiety, but also effectiveness of CBT in improving students self-concept and positively affecting academic performance (Brigman and Campbell, 2003; Sapp and Farrell, 1995). Further this research found cognitive behavior therapy has a significant effect on improving the self-concept and academic achievement of African American and Latino students, including high school students.

Webb *et al.*, (2005) showed that CBT interventions (student, success skills such as academic, social and self management skills) can help student deal with numerous issues such as social anxiety, peer pressure, depression, problem solving, test an anxiety and other academic issues.

Hakim *et al.*, (2008) evaluated the effectiveness of cognitive behavioral therapy (involved education about trauma reactions, breathing retraining, progressive muscle relaxation training, learning self-talk exercises to manage anxiety-producing situations, prolonged imaginable and in-vivo exposure, and cognitive therapy) among adolescents exposed to the 2004 earthquake in Bam, Iran. Four months after the earthquake, 135 adolescents as a case group and 33 adolescents as a comparison group were evaluated with the Impact of Event Scale Revised (IES-R). Two therapists were trained in CBT in three-day classes according to a manual provided by mental health services. After conducting CBT in the case group which lasted 16 sessions (four sessions per week), both groups were evaluated again with IES-R. Results showed that the severity of posttraumatic stress symptoms significantly decreased among the subjects given CBT in the case group. The improvement in posttraumatic stress symptoms was attributable to improvement in each of three-symptom categories (intrusion, avoidance, and arousal) and in the total score of posttraumatic stress disorder ($p < .05$). Researchers demonstrated the efficacy of CBT in alleviating posttraumatic stress symptoms among adolescents after a catastrophic disaster.

Some researchers studied the effectiveness of CBT on academic stress and academic performance and concluded that CBT techniques decrease stress (e.g. Luchman, 1992; Lee *et al.*, 2007; Kelly and Devonshire, 2007; Reynolds and Kevin, 1986).

Statement of the Problem

Many students do not do well in school because they are suffering from school stress. This situation leads to anxiety, depression and poor academic performance in these students, so it is important to identify these children and use the suitable ways to reduce their stress. Earlier studies show that cognitive behavior interventions reduce stress, and increase the academic achievement of student in high schools (Barret, 1998).Present study was an attempt to verify the following question: Does CBT decrease academic stress?

Aim

This investigation is designed to study the effect of Cognitive Behavior Therapy on academic stress among high school students.

Objectives

1. To study the effectiveness of CBT on academic stress in high school students.
2. To study of gender differences in mediating the effectiveness of CBT on academic stress.
3. To study of grade differences in mediating the effectiveness of CBT on academic stress.

Hypotheses

1. CBT is effective in decrease of Academic stress.
2. Gender differences mediate the effectiveness of CBT on academic stress.
3. Grade differences mediate the effectiveness of CBT on academic stress.

Operational Definition of the Variables

Academic Stress

In this study academic stress is operationally defined as stress measured by Scale for Assessing Academic Stress (SAAS) – Sinha *et al.*, (2001).

Cognitive Behavior Therapy

In this study, CBT will focus on addressing the interaction between academic stress components such as: cognitive, physical, affective, motivational and interpersonal in students who are suffering from academic stress.

MATERIALS AND METHODS

Design of the Study

The present study is an experimental study with two group comparison design with pre and post assessment. Experimental group was subjected to intervention, whereas for the control group no intervention was given.

Sample

Subjects (Boys and Girls students in 10^{th}, 11^{th}, and 12^{th} grade) for the present research were selected from different high schools of Iran. Initially 400 students (Boys=193 and Girls=207) were screened based on the inclusion and exclusion criteria. Out of 400 students, 130 students (63 Boys and 67 Girls) fulfilled the *cut off score criteria* used for the study. *Cut off score criteria based on research tool for selecting subjects for intervention on academic stress was the score of 15 and above (15 to 30);* For the main study out of 130 students (who met cut off score criteria) 5 Boys and 5Girls each from 10^{th}, 11^{th}, and 12^{th} grade were randomly assigned to experimental group (15 Boys and 15 Girls) and control group (15 Boys and 15 Girls). Experimental group was subjected to intervention.

Research Tool

Scale for Assessing Academic Stress (SAAS)

A 30-item self-report measure will be used for assessing academic stress in terms of their presence or absence. Sinha *et al.*, (2001) developed (SAAS) on a random sample of 400 (Male 200, Female 200) school student. SAAS measures five independent factors of academic stress indicating expression of academic stress through different channels: cognitive, affective, physical, motivational, social and interpersonal. All the items under each factor have fairly high loading ranging from 0.60 to 0.85. The subject has to choose yes or no for each item as applies to him/her.

The test- re-test reliability of SAAS over the period of one moth is 0.88 and split-half reliability is 0.75 indicating adequate reliability of the scale. Internal consistency of the scale is also adequate being in a range of 0.30 and 0.81.

When the pattern of distribution of SAAS scores of all the subjects as analyzed, the mean score was 5.06 with standard deviation of 2.78.

Procedures

The design of the present study will be two groups pre-post test design with the following procedure.

1. Contacting and obtaining permission from the institution.
2. Establishing rapport with student parents.
3. Obtaining informed consent from student parents.
4. Screening the students for academic stress using the research tool in the counseling centers.

5. Selection of samples for research based on high score on stress, and low score in academic performance. (N=60; Experimental group 15 boys and 15 girls; Control group 15 boys and 15 girls).
6. Sample will be grouped into control and experimental group using simple random sampling technique.
7. Pre assessment of control group and experimental group.
8. Intervention for experimental group.
9. Post assessment for control and experimental group.
10. Data analysis and interpretation.

Variables

In the present study academic stress is considered as dependent variable and Cognitive Behavior Therapy, group, gender, and grades are independent variables.

RESULTS AND DISCUSSION

The purpose of the present study has been the investigation the effectiveness of cognitive behavior therapy (CBT) on academic stress among high school students. In this part the inquired data analyzed with appropriate statistical methods such as mean, standard deviation, independent t-test, repeated measure analyze of variance, and effect size calculation. Results are presented in four parts:

Section I: Pre-testing for selected variables for randomization/matching of group.
Section II: Descriptive findings
Section III: Effect of intervention on academic stress

Section I: Pre-testing for selected variables for randomization/matching of group.

Independent t-test: To confirm matching of groups, independent sample t-test was applied to selected variables. This would help us to randomize the groups on the scales obtained in pre-test sessions. Following is the result obtained in different variables.

Table 1: Pre-treatment mean scores of experimental and control groups, with results of independent sample t-test for academic stress and its subscales

Variables	Statistics / Groups	Mean	SD	Mean difference	t	df	Sig
Academic stress (Total)	Experimental	21.90	2.74	0.23	0.32	58	0.75 NS*
	Control	21.67	2.94				
Cognitive	Experimental	5.37	0.99	0.14	0.58	58	0.63 NS*
	Control	5.23	0.97				
Affective	Experimental	4.6	0.67	0.07	0.41	58	0.72 NS*
	Control	4.53	0.81				
Physical	Experimental	2.73	0.98	0.00	0.00	58	1.00 NS*
	Control	2.73	1.10				
Social/interpersonal	Experimental	4.37	0.85	0.23	0.96	58	0.47 NS*
	Control	4.07	1.14				
Motivational	Experimental	4.97	1.40	0.06	0.16	58	0.89 NS*
	Control	5.03	1.41				

**Non significant*

It may be seen from the table 1, that on none of the factors of academic stress significant differences existed between experimental and control groups as the obtained t-values indicated none-significant difference in means. In other words, it can definitely say that the allotment of subjects into two groups was matched.

Section II: Descriptive findings

In this section descriptive findings consist of mean, standard deviation and mean differences (change/gain) of variables from pre to post treatment in both experimental and control group are described. Tables 2 to 4.17 show descriptive findings such as mean and standard deviation of variables in pre-post treatment in both experimental and control groups. Comparison of means show that subjects in experimental group had better performance in post-test rather than control group.

Table 2: Mean scores of pre and post treatment for experimental and control groups on academic stress in girls with respect to grades

Groups	Grades	Pre		Post		Change
		M	SD	M	SD	
Experimental	10th	22.60	2.30	14.20	3.42	8.40
	11th	21.00	3.53	14.60	3.13	6.40
	12th	22.40	3.28	15.00	3.53	7.40
	Total	22.00	2.95	14.60	3.14	7.40
Control	10st	22.6	2.30	22.6	1.14	0.00
	11th	20.8	3.90	21.2	3.11	0.40
	12th	22.0	2.55	21.2	4.09	0.80
	Total	21.8	3.17	21.7	2.89	0.10

As shown in the table 2, the mean score and standard deviation of academic stress of 10th grade girls in pre-test was (M=22.60; SD= 2.30) and in post-test was (M= 14.20; SD= 3.42) indicating a change (decrease in academic stress) of 8.40 score from pre to post treatment in experimental group. The mean score and standard deviation of academic stress of 11th grade girls in pre-test was (M=21.00; SD= 3.28) and in post-test was (M= 15.00; SD= 3.53) indicating a change (decrease in academic stress) of 6.40 score from pre to post treatment in experimental group. The mean score and standard deviation of academic stress of 12th grade girls in pre-test was (M=22.40; SD= 3.28) and in post-test was (M= 15.00; SD= 3.53) showing a change (decrease in academic stress) of 7.40 score from pre to post treatment. Further, the total change observed in control group was 0.10. In the other words no change seen from pre to post treatment sessions in the control group.

Table 3: Mean and SD scores of pre and post treatment for experimental and control groups on academic stress in boys with respect to studying in different grades

Groups	Grades	Pre		Post		Change
		M	SD	M	SD	
Experimental	10th	21.40	3.36	14.00	1.87	7.40
	11th	21.80	2.77	13.60	2.30	8.20
	12th	22.20	2.17	14.80	1.92	7.40
	Total	21.80	2.63	14.13	1.95	7.67
Control	10st	21.00	3.53	19.8	3.83	1.20
	11th	21.60	2.79	21.0	2.82	0.60
	12th	22.00	2.91	21.8	3.34	0.20
	Total	21.50	2.80	20.9	3.23	0.60

As shown in the table 3, the mean score and standard deviation of academic stress of 10th grade boys in pre-test was (M=21.40; SD= 3.36) and in post-test was (M= 14.00; SD= 1.87) showing a change (decrease in academic stress) of 7.40 score from pre to post treatment in experimental group. The mean score and standard deviation of academic stress of 11th grade subjects in pre-test was (M=21.80; SD= 2.77) and in post-test was (M= 13.60; SD= 2.30) indicating a change (decrease in academic stress) of 8.20

score from pre to post treatment. The mean score and standard deviation of academic stress of 12th grade subjects in pre-test was (M=22.20; SD= 2.17) and in post-test was (M= 14.18; SD= 1.92) showing a change (decrease in academic stress) of 7.40 score from pre to post treatment. Further, total change (decrease in academic stress) for boys in experimental group was 7.67, whereas total change (decrease in academic stress) for boys in control group was 0.60 from pre to post treatment sessions indicating no change.

Table 4: Pre-treatment, post treatment means and SD scores for experimental and control groups on subscales of academic stress

Groups	Times	Cognitive		Affective		Physical		Social interpersonal		Motivational	
		M	SD	M	SD	M	SD	M	SD	M	SD
Exp.*	Pre	5.37	0.99	4.6	0.67	2.73	0.98	4.37	0.85	4.97	1.40
	Post	3.33	1.06	2.97	0.92	2.13	1.00	3.00	0.79	2.9	1.12
MD***		-1.9		2.04		1.63		1.63		2.07	
Ctrl.**	Pre	5.23	0.97	4.53	0.81	2.73	1.10	4.07	1.14	5.03	1.41
	Post	5.03	1.09	4.43	0.68	2.80	1.06	3.93	1.28	4.90	1.24
MD***		0.20		0.10		0.08		10		0.13	

** Experimental; **= Control; ***Mean difference; pre= Pre-treatment; Post= Post-treatment*

Table 4 indicates that there was a change observed between pre-treatment and post-treatment mean score in subscales of academic stress. 1) In Cognitive factor subscale of academic stress pre-treatment score was 5.37 which was reduced to 3.33 in post-treatment assessment (MD= 1.9). In Affective factor subscale pre-treatment score was 4.6 which was reduced to 2.97 in post-treatment assessment (MD= 2.04). In Physical factor subscale pre-treatment score was 2.73 which was reduced to 2.13 in post-treatment assessment (MD= 1.63). In Social/interpersonal pre-treatment score was 4.37 which was reduced to 3.00 in post-treatment assessment (MD= 1.63). In Motivational pre-treatment score was 4.97 which was reduced to 2.9 in post-treatment assessment (MD= 2.07) indicating a decrease in motivational symptoms of academic stress. 2) For control group Cognitive factor pre-treatment score was 5.23 which was reduced to 5.03 in post-treatment assessment (MD= 0.2). In Affective factor pre-treatment score was 4.53 which was reduced to4.43 in post-treatment assessment (MD= 0.10). In Physical factor pre-treatment score was 2.73 which was increased to 2.80 in post-treatment assessment (MD= 0.08). In Social/interpersonal factor pre-treatment score was 4.07 which was reduced to 3.93 in post-treatment assessment (MD= 0.10). In Motivational pre-treatment score was 5.03 which was reduced to 4.90 in post-treatment assessment (MD= 0.13) indicating no change.

Section III: Effect of intervention on academic stress

Table 5: Pre-treatment, post treatment means and SD scores for experimental and control groups on academic stress

Groups	Times	Academic Stress		
		M	SD	MD*
Experimental	Pre -treatment	21.9	2.75	7.53
	Post-treatment	14.37	2.57	
Control	Pre -treatment	21.67	2.94	0.50
	Post-treatment	21.17	3.03	

MD- Mean difference*

Table 5 indicates that there was a change (reduction) observed between pre-treatment and post-treatment sessions mean score in academic stress. 1) For experimental group academic stress pre-treatment score was 21.9 which was reduced to 14.37 in post-treatment assessment (MD= 7.53). 2) For control group

academic stress pre-treatment score was 21.67 which was reduced to 21.17 in post-treatment assessment (MD= 0.50).

Table 6: Results of repeated measure ANOVA for mean scores on pre-treatment and post-treatment for academic stress

Source of variation	Sum of squares	df	Mean squares	F	Sig
		Within subject effects			
Time	297.67	1	297.67	134.93	0.000*
Time*group	316.87	1	316.87	143.64	0.000*
Error	127.95	58	2.21		
Between subject effects					
Intercept	45202.09	1	45202.09	338.53	0.000*
Group	216.09	1	216.09	16.18	0.000*
Error	774.48	58	13.35		

**significant at p<0.001*

According to table 6, the effect of CBT on academic stress was statistically significant F (1, 58) =134.93, p<0.001. It indicates (table 5) that the differences in pre-post test scores (7.53) clearly showed the efficacy of CBT in decreasing academic stress. Further, the combination of time*group showed a significant effect in decreasing academic stress F (1, 58) =143.64, P<0.001).
Further, between subject effects showed that the effect of group in relation to the efficacy of CBT interventions in decreasing academic stress which was statistically significant F (1, 58) =160.18, P<0.001).

Table 7: Results of repeated measure ANOVA for mean scores on pre-treatment and post-treatment for subscales of academic stress

Components	Sources	Sum of squares	df	Mean squares	f-value	Sig
Cognitive	Time	92.75	1, 58	92.75	6.45	0.02***
	Group	67.63	1, 58	1.16	37.37	0.000*
	Time*group	67.50	1, 58	67.50	4.69	0.03***
Affective	Time	7.08	1, 58	7.08	18.13	0.000*
	Group	38.33	1, 58	0.66	68.82	0.000*
	Time*group	27.07	1, 58	27.07	20.55	0.000*
Physical	Time	3.33	1, 58	3.33	11.69	0.001**
	Group	62.27	1, 58	1.07	6.21	0.002**
	Time*group	0.133	1, 58	0.133	0.47	0.50 NS
Social Interpersonal	Time	15.41	1, 58	15.41	42.39	0.000*
	Group	65.87	1, 58	1.14	11.51	0.001**
	Time*group	14.01	1, 58	14.01	38.54	0.000*
Motivational	Time	36.30	1, 58	36.30	56.04	0.000*
	Group	81.40	1, 58	1.40	42.75	0.000*
	Time*group	16.13	1, 58	16.13	24.91	0.000*

**P< 0.001; ** P <0.01; *** P<0.05; NS= Non Significant*

Repeated measure ANOVA showed that there was a significant change (decrease) in all independent factors of academic stress namely cognitive factor F (1, 58) = 6.45, P< 0.05; Affective factor F (1, 58) = 18. 13, P< 0.001; Physical factor F (1, 58) = 11.69, p<0.01; Social/interpersonal factor F (1, 58) = 42.39, p< 0.001; and Motivational factor F (1, 58) = 56.04, p< 0.001 indicating the effectiveness of CBT in decreasing the symptoms of academic stress. Further, the between subject effects showed that there are significant differences observed between the groups in cognitive factor F (1, 58) = 37.37, p<0.001; affective factor F (1, 58) = 68.82, p<0.001; physical factor F (1, 58) = 6.21, p<0.01; social/interpersonal factor F (1, 58) = 11.51, p<0.01; and motivational factor F (1, 58) = 42.75, p<0.001.

Further, the combination of time*group showed a significant effect in decreasing academic stress on cognitive factor F (1, 58) =4.69, P<0.05); Affective factor F (1, 58) = 20.55, p< 0.001; Social/interpersonal factor F (1, 58) = 38.54, p< 0.001; and Motivational factor F (1, 58) = 24.91, p< 0.001.

Gender and Academic Stress

Table 8: Pre-treatment, post treatments mean and SD scores on academic stress and gender

Groups	Gender	Time	Academic stress		
			M	**SD**	**MD***
Experimental	Girls	Pre-treatment	22.00	2.95	7.40
		Post-treatment	14.60	3.14	
	Boys	Pre-treatment	21.80	2.62	7.67
		Post-treatment	14.13	1.96	
Control	Girls	Pre-treatment	21.80	3.17	0.13
		Post-treatment	21.67	2.89	
	Boys	Pre-treatment	21.53	2.80	0.67
		Post-treatment	20.86	3.23	

**Mean difference*

Table 8 indicates that there was a change (decrease) observed between pre-treatment and post-treatment mean score in academic stress. 1) For girls in the experimental group academic stress pre-treatment score was 22.00 which was reduced to 14.60 in post-treatment assessment session (MD= 7.40). 2) For boys in the experimental group academic stress pre-treatment score was 21.80 which was reduced to 14.13 in post-treatment assessment (MD= 7.67).

Table 9: Results of repeated measure ANOVA for academic stress and gender

Source of variation	Sum of squares	df	Mean squares	F	Sig
		Within subject effects			
Time	297.68	1	297.68	39.44	0.000*
Time*gender	7.09	1	7.09	0.93	0.34NS**
Error	437.82	58	7.55		
Between subject effects					
Intercept	45202.01	1	45202.01	265.03	0.000*
Gender	1.008	1	1.01	0.06	0.81 NS**
Error	989.48	58	17.06		

**Significant at p<0.001; ** Non Significant*

In control group academic stress pre-treatment score for girls was 21.80 which was reduced to 21.67 in post-treatment assessment (MD= 0.13) and for boys academic stress pre-treatment score was 21.53 which was reduced to 20.86 in post-treatment assessment (MD= 0.67) indicating no change from pre treatment to post treatment session.

Table 9 shows a significant difference was observed from pre to post assessment in relation to academic stress irrespective of gender, F (1,58) = 39.44, p< 0.001. When gender-wise comparison was made (time*gender), a non significant F (1, 58) = 0.93, p= 0.34 value showed pattern and amount of change between boys and girls was similar from pre treatment to post assessment session. Further, table 4.24 shows a non significant difference in between subject effects F (1.58) =0.06, p= 0.81.

Efficacy of CBT on Academic Stress and Grades

Table 10: Pre-treatment, post treatments mean and SD scores on academic stress and different grades in experimental and control groups

Groups	Grades	Pre		Post		MD*
		M	SD	M	SD	
Experimental	10th	22.00	2.83	14.10	2.64	7.90
	11th	21.40	2.9	14.10	2.71	7.30
	12th	22.30	3.23	14.90	2.73	7.40
	Total	21.90	2.98	14.37	2.69	7.53
Control	10st	21.80	2.91	21.20	2.49	0.60
	11th	21.20	3.34	21.10	1.96	0.10
	12th	22.00	2.73	21.5	3.72	0.50
	Total	21.67	2.99	21.27	2.72	0.40

**Significant at p<0.001; ** Non Significant*

Table 10 indicates that there was a change (decrease) observed between pre-treatment and post-treatment mean score in academic stress. 1) In the experimental group, for 10th grade students pre-treatment academic stress score was 22.00 which was reduced to 14.10 in post-treatment assessment (MD= 7.30), for 11th grade students pre-treatment academic stress score was 21.40 which was reduced to 14.10 in post-treatment assessment (MD=7. 30), and for 12th grade students pre-treatment academic stress score was 22.30 which was reduced to 14.90 in post-treatment assessment (MD= 7.40). In control group pre-treatment academic stress score for 10th grade students was 21.80 which was reduced to 21.20 in post-treatment assessment (MD= 0.60); for 11th grade students pre-treatment academic stress score was 21.20 which was reduced to 21.10 in post-treatment assessment (MD=0.10); and for 12th grade students pre-treatment academic stress score was 22.00 which was reduced to 21.50 in post-treatment assessment (MD= 0.50) indicating no change.

Table 11: Results of repeated measure ANOVA for academic stress and grades

Source of variation	Sum of squares	df	Mean squares	F	Sig
		Within subject effects			
Time	297.67	1	297.67	38.42	0.000*
Time*grades	3.150	2	1.58	0.20	0.82NS**
Error	441.67	57	7.74		
Between subject effects					
Intercept	45202.09	1	45202.09	270.83	0.000*
Grades	39.12	2	19.56	1.17	0.32NS**
Error	951.38	57	16.69		

For academic stress and grades analysis showed a significant change (reduced academic stress) from pre to post treatment session irrespective of grades. There was a substantial decrease in academic stress mean score which was found to be highly significant F (1.57) = 38.42, P< 0.001. Further, when grade wise comparison was made a non significant F (2. 57) = 0.20, P= 0.82 value showed pattern and amount of change observed between the grades was similar. Further, table 11 shows a non significant difference in between grades in academic stress F (2. 57) = 1.17, p= 0.32.

Effect Size Calculations

Cohen's *d* was calculated to see effect size which indicates the magnitude of change (improvement). Statistically significant difference may not reflect on the significance of change and effect size is more informative than p-value in interpreting the treatment - related response. Cohen's (1998) classification schedule was used to evaluate the magnitude of change based on the mean and standard deviation. Effect size ranges from 0.20 to 0.49 (small), 0.50 to 0.79 (medium) and >0.80 (large).

Table 12: Effect sizes on different dependent variables

Variable	Groups	Cohen's *d*	Effect Size	Interpretation
Academic stress	Experimental	2.83	0.82	Large
	Control	0.17	0.08	Small
	Between groups	2.42	0.77	Medium

Results indicate large effect size for the effect of CBT on academic stress (0.82), a medium effect size for the effect of group (experimental and control) on academic stress (0.77). In other words, 82 percent of change in academic stress is explained to the effect of CBT interventions, and the group (experimental vs. control) explained 77 percent of variance of academic stress. In control group the amount of effect size calculated to the effect of CBT on academic stress was (0.08) indicating a weak effect size.

Conclusion

This study investigated the effectiveness of cognitive behavior therapy (CBT) on academic stress among high school students. Findings are discussed as follow:

The Effects of Intervention on Academic Stress

Table 5 shows pre and post assessment mean scores on academic stress. Repeated measure ANOVA was applied to find out the effects of intervention (CBT) on academic stress. Results of within group comparison between pre and post mean scores showed significant decrease in academic stress ($p<0.001$; table, 6). Further, within group time × group interaction on academic stress shows that there was a significant change across the time (pre-to post assessment) in academic stress ($p<0.001$). The observed F-value and substantial decrease in the post mean in this outcome variable (academic stress) support the proposed hypothesis that is CBT is effective in decreasing academic stress. The interaction of time × group indicate a significant change (reduction) in academic stress ($p<0.001$).

Further, repeated measure ANOVA showed a significant change (reduction) on subscales of academic stress namely cognitive factor ($p<0.05$), affective factor ($p<0.001$), physical factor ($p<0.01$), social/interpersonal factor ($p<0.001$), and motivational factor ($p<0.001$) also indicate that CBT is effective in reducing academic stress levels (table 7). Further, the observed improvement i.e., reduced academic stress from pre to post intervention was reconfirmed by the large effect size 0.82 for CBT group (table 12). The effect size for between groups was medium (0.77), indicating CBT was effective in reducing the academic stress.

Findings of the present study are consistent to the previous studies such as (Arefi *et al.*, 2012; Sharma *et al.*, 2010; Mehra and Sharma, 2008; Sapp and Farrell, 1995; Lochman, 1992; Reynolds and Kevin, 1986; Cormier and Nurius, 2003; Webb *et al.*, 2005; Brett *et al.*, 2005; Lee *et al.*, 2007) andconfirm the efficacy of CBT in alleviation of academic stress symptoms and enhancing academic performance.

With respect to the positive effect of CBT on academic stress the following explanations are presented.

Cognitive behavioral interventions may have two distinct yet ostensibly related roles in the modulation of stress response. One is concerned with a reduction in the psycho-physiological activation that is

associated with stress management approaches (e.g. deep breathing practice was taught to subjects and they asked to practice it regularly. Using this technique regularly can reduce the physiological symptoms of stress. The other one is related to transactional model of stress, which emphasizes cognitive appraisal (how an event is interpreted by the individual) and coping (e.g. cognitive therapy). CBT focuses on the way in which a child or adolescent interprets his/her experiences and how these thoughts ultimately influence on his or her emotional and behavioral functioning. There is substantial evidence, based on randomized controlled studies, that cognitive behavioral treatment may improve the outcome and quality of life of several psychiatric and medical disorders (e.g. depression, anxiety, personality disorders, post traumatic stress disorder, etc.). Further, it may improve health-promoting behaviors, such as changing harmful lifestyle patterns and habits, and modify illness attitudes and behaviors (Menutti *et al.*, 2006).

A probable explanation for these findings is that most of students had received intervention for the first time in their life, and it is evident that they have better performance than control group because of externalizing of their inner problems and receiving some effective strategies to change.

On the other hand, since the researcher was an outsider, and there was no previous familiarity between him and students, their faith in researcher regarding keeping their secrets increased and for this reason, they revealed their problems freely that were causing affective, interpersonal and motivational disturbances. Therefore, given appropriate techniques (e.g. problem solving, stress inoculation, cognitive restructuring, assertive training, time management, and study skills training) could have resulted in decreasing of academic stress symptoms.

Lack of knowledge about how to face with the problems was the most common factors of academic stress among the majority of students. In such case, sensitizing the students in problem solving technique (PST) had an important role in decreasing their problems, because most of participants reported positive response after receiving this strategy. For example, students who had interpersonal and emotional problems with their parents and teachers, after learning about problem solving skills and breathing exercise reported that they really learned how to cope and how to control their emotions which may have resulted in reducing the academic stress.

Lack of knowledge about how to manage their time was another major factor of academic stress. Therefore, training in a suitable technique i.e. time management technique to help the student how to manage their time and to allocate enough time to each subject (Maths, English, computer), could be another way to decrease their academic stress, because allocating enough time to subjects based on their priority and importance helped to reduce time pressures and provides opportunities to other social activities, personal hobbies and interests.

One of the reasons for academic concerns among the students was their inability (especially girls) to face with their parent's request and get marry to whom that they didn't show interest. 4 of the girls and 1 of the boys in experimental group had to get married under their parent's pressures. Researcher came to know of this problem of the students during individual intervention in therapy session and also from the stress diary maintained. It should be mentioned here that in Iran there is no law regulating the minimum age for marriage of girls or boys due to this, some of them got married early. In such case, the anxiety resulted in thinking about indeterminate future disturbs their concentration and decreases their motivation to study hard. PST technique and self- assertiveness skills training were two suitable methods for reducing academic concerns and uncertain thoughts about the future by becoming assertive to politely reject some unpleasant practices (like forced marriage) and how to face with the parents in a proper manner. Learning these skills along with CBT may result in reducing and managing academic stress.

Limitations of the Study

In this study a small number of sample (5 boys and 5 girls each 10th, 11th, and 12th grade) were selected from each grade. Therefore, generalizing the results is limited due to small sample size.

In the present study intervention was carried out on subjects with high stress, high depression, low efficacy and low academic performance, whether the findings are applicable for individuals with low stress, mild depression, high efficacy needs to be investigated.

Generalization of the results to different higher age group on the outcome variables needs to be investigated.

The last session of the intervention coincided with final exam. Hence, 14 days before exams student could not attend the school. Because of time constraint using some CBT technique such as JPMR training was not possible and researcher had to teach deep breathing exercise with a instruction to practice regularly at home.

Another limitation was that, often students complained about the maintenance of confidentiality by the school counselor and reported that counselor may not maintain confidentially. Therefore, some of them behaved very cautiously in the first few sessions of intervention with the researcher.

Implications of the Study

Research indicates that CBT interventions directly affect middle and high school students' mental health and achievement (McNamara, 2004). In fact, the obtained results show that CBT can be an effective program to help the students with psychological and educational problems. In the light of the pre and post-treatment data, it is apparent that intervention has helped to reducing depression symptoms and higher student self-efficacy and achievement.

ACKNOWLEDGMENT

Hereby I would like to appreciate all the students and teachers of Behbahan's high school which collaborated in this study.

REFERENCES

Arefi KH, Momeni F and Mohsenzadeh R (2012). Comparison of individual cognitive therapy and relaxation therapy in the treatment of high school student's academic stress. *Journal of Kermansha University of Medical Sciences* **1**(1) 32-46.

Barret PM (1998). Evaluation of cognitive behavioral group treatments for childhood anxiety disorders. *Journal of Clinical Child Psychology* **27** 459-460.

Brigman G and Campbel C (2003). Helping students improve academic achievement and success behavior. *Professional School Counseling* 91-98.

Cormier S and Nurius PS (2003). *Interviewing and Change Strategies for Helpers: Fundamental Skills and Cognitive Behavioral Interventions*, 5th edition. Pacific Grove (CA: Brooks/Cole-Thomson).

Dedeyn R (2008). A comparison of academic stress among Australian and international students, *Journal of Undergraduate Research*, University of Wisconsin-La Crosse.

Hakim Shooshtary M, Panaghi L and Attari Moghadam J (2008). *Outcome of Cognitive Behavioral Therapy in Adolescents after Disaster* (Elsevier) *Journal of Adolescent Health* **42** 466 – 472.

Hall RJ and Hughes JN (1989). *Cognitive Behavioral Approaches in the Schools: A Comprehensive Handbook* (The Guilford press) New York.

Hashim IH (2003). Cultural and gender differences in perceptions of stressors and coping skill. A study of Western and African college student in China. *School Psychology International* **24** 182-203.

Johnson S (1979). Children's fear in the classroom setting. *School Psychology Digest* **8** 382 390.

Kelly J and Devonshire R (2007). *Cognitive Behavioral Therapy (CBT): Self-talk-what we say to Ourselves Affects how we Feel.* ProHealth Library, Available: http://www.prohealth.com.

Kimberly R and Smith T (2009). Predictors of academic related stress in college students: An examination of coping, social support, parenting and anxiety, *Journal of Student Affairs Research and Practice*, University of central Florida.

Lazarus RS (1966). *Psychological Stress and the Coping Process*, Available: psycnet.apa.org.

Lee SH, Ahn SC and Lee YJ (2007). Effectiveness of a meditation-based stress management program as an adjunct to pharmacotherapy in patients with anxiety disorder. *Journal of Psychosomatic Research* **62**(2) 189-195.

Lochman JE (1992). Cognitive-behavioral interventions with aggressive boys: Three-year follow-up and preventive effects. *Journal of Consulting and Clinical Psychology* **60** 426–432.

Mehra V and Sharma A (2008). Effect of Yogic practices on social stress and academic stress of female students. *Journal of Community Guidance and Research,* Hyderabad **7** 32-39.
Mennuti BR, Freeman A and Christner WR (2006*).* *Cognitive Behavioral Intervention in Educational Settings, A Handbook for Practice* (Taylor & Francis Group) LLC, New York.
Norcross JG and Goldried MR (2005). *Handbook of Psychotherapy* (Oxford University Press) USA. .
Rangaswamy K (1995). Editorial: Academic stress and mental health. *Indian Journal of Psychology* **22** 1-20.
Reynolds W and Kevin CI (1986). A comparison of cognitive behavioral therapy and relaxation training for the treatment of depression in high school students. *Journal of Consulting and Clinical Psychology* **54**(5) 653-660.
Sapp M and Farrell W (1995). Cognitive behavioral therapy applications for African –American Middle School at –risk students. *Journal of Instructional Psychology* **22**(2) 169-170.
Sharma UK, Shrivastava S, Malh Sharma UK, Shrivastava S, Malhotra S, Singh R and Singh TB (2010). Yoga and Cognitive Behavior Techniques for Academic Stress and Mental Wellbeing among School Students. *Delhi Psychiatry Journal* **13**(1).
Sinha UK (2000*).* *Academic stress and its management*, In: *Proceedings of the Orientation Course in Clinical Psychology*, edited by Gupta S (New Delhi: IAllMs).
Sinha UK, Sharma V and Mahendra K (2001). Development of a scale for assessing academic stress: A Parliamentary report. *Journal of the Institute of Medicine* **23**102-105.
Strutcher CW, Perry RP and Menec (2000). An examination of the relationships among academic stress, coping, motivation and performance in students, *Research in higher Education* **41** 582-590.
Tyrrel J (1992). Sources of stress among psychology undergraduates, *Irish Journal of Psychology* **13** 184-192.
Webb, Brigman LD and Campbell GA (2005). Linking school counselors and student stress: A replication of student success skills approach targeting the academic social competence. *Professional School Counseling* **8**(5) 407-413.
Whitman Neal A (1985). *Students Stress: Effects and Solutions. Association for the Study of Higher Education*, ERIC.