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Effectiveness of Cognitive Behavior Therapy on Depression among High School Students

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ABSTRACT

This study investigated the effectiveness of cognitive behavior therapy (CBT) on depression among high school students. The sample of the study includes 60 high school girl and boys students that selected from a large poll of high school students (N=400) randomly. Out of 400 students, 130 of them fulfilled the cut off score criteria used for the study. Out of 130 students, 60 of them selected randomly and divided into two groups (30 of them in experimental and 30 of them in control group). Subjects in experimental group received individual CBT interventions (including problem solving, positive thinking, cognitive restructuring, assertiveness training, time management) for 13 sessions, and control group subjects didn't receive any intervention. The design of this study is a pre-test, post-test with control group. Data was analyzed with appropriate statistical methods such as Mean, Standard deviation, repeated measure analysis of variance, and effect size. Results showed a significant change (reduction) from pre-test to post test in depression and its subscales. Further, results demonstrated that the effects of new combined variable (that is group) on depression and its subscales was statistically significant. Comparison of mean scores of two groups in post-test showed a significant difference in depression. But, the effects of gender and grades on depression were not significant. Further, the mutual interactions of group, gender and grades in relation to the effectiveness of CBT on depression were not significant. As a conclusion, findings demonstrate the efficacy of CBT in alleviating depression symptoms among high school students.
KEYWORDS: cognitive behavior therapy, depression, high school students.

INTRODUCTION

Depression may be described as feeling sad, blue, unhappy, miserable, or down in the dumps. Most of us feel this way at one time or another for short periods. True clinical depression is a mood disorder in which feelings of sadness, loss, anger, or frustration interfere with everyday life for an extended period of time (Ballas, 2009). A mood disorder, also referred to as an affective disorder, is a condition impacting mood and related functions. In a mood disorder, moods range from extremely low (depressed) to extremely high or irritable (manic).

Mood disorders can lead to changes in sleeping and eating patterns. Some people, especially children, may have physical symptoms of depression, like unexplained headaches or stomachaches (APA, 2000).

Adolescent depression is a disorder that occurs during the teenage years, and involves persistent sadness, discouragement, loss of self-worth, and loss of interest in usual activities such as hobbies and games. Adolescents are at the greatest risk for depression, with community prevalence ranging from 2.9% to 8%, and as many as 25% of youth meeting criteria for a diagnosis of major depression by late adolescence (Lewinsohn et al, 1993).

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 & 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 & Hughes, 1989).

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Utilizing cognitive behavioral interventions in middle schools may not only positively affect academic achievement, but also reduce stress and anxiety which negatively impact peer popularity, increase depression, and exacerbate attention deficits and loneliness (Barbabasz & Barabasz, 1981). Brigman & Campbell, (2003); Sapp & Farrell, (1995) found cognitive behavior therapy has a significant effect on improving the self-concept of African American and Latino students, including high school students. Sung Kim (2006) found that CBT interventions such as cognitive restructuring and cognitive self-instruction improve student's adaptive self-statements about their school and academic performance. Further, result showed that cognitive self-instruction is more effective than cognitive restructuring.

Self-management techniques (e.g. relaxation training, time management and thought stopping) have been found effective to decreasing emotional and behavioral disorders including: academic stress and anxiety (Lee, Ahn, & Lee, 2007); depression (Antoni & Weaver, 2005); academic problems (Redwood & Pollack, 2007). Gitlin (1995) found that cognitive behavioral therapy has been effective in treating various types of depression, such as unipolar, major, minor and acute depression. Diane et al. (1997) investigated the response to cognitive-behavioral therapy (CBT) for depression. Level of cognitive dysfunction and the occurrence of negative life stress have been theorized as patient variables, which may account for differences in response to CBT. The relationship between response to CBT and the interaction of cognitive dysfunction with negative life events was examined in a sample of 53 depressed outpatients. Overall, there was little support for the prediction of a difference in acute outcome between patients with or without pretreatment cognitive dysfunction and negative stressors. Strachowski et al (2008) used CBT interventions to reduce depression in patients with elevated cardiovascular disease (CVD) risk. Results showed, at post treatment, the CBT subjects were significantly less depressed than control group subjects on the Hamilton depression inventory ($F=52.8$; $p<\%5$; ES= 1.85) and the Beck depression inventory ($F=17.1$; $p<0/001$; ES= .85). Treatment subjects reported less stress on the perceived stress scale ($F=23.2$; $p<0/001$). CBT significantly improved mean positive effect during the day ($F=12.7$; $p<0/001$) but there were no significant differences in mean negative affect ($F=1.8$; $p=.19$). CBT significantly reduced negative affect ($F=7.1$; $p<\%1$) during psychological stress testing. Chen et al (2006) compared the effectiveness of CBT on depression and self esteem of adolescents with a control group. Results showed, one month after intervention, the depressive symptoms and self-esteem of the experimental group remained slightly but significantly better than those of the comparison group subject. Hamdan, Puskar and Bandak (2009) in the study of use of CBT with students suffering from depressive symptoms showed that students had lower scores on perceived stress, lower depressive symptoms, less use of avoidance coping strategies, and more use of approach coping strategies after intervention. Hakimian (2006) investigated the effect of cognitive behavior group therapy (problem solving skills training) on high school students' depression and test anxiety. 88 girls and boys had been placed in experimental and control group randomly. Subjects in experimental group had received 12 sessions group PSST for three months. Results showed that PSST decreased depression symptoms (affective, interpersonal, cognitive and negative self-esteem) and test anxiety symptoms (worry and emotionality), but the effect of PSST on physical symptoms of test anxiety was not significant. Shirk, Kaplinski, & Gudmundsen (2009) evaluated cognitive-behavioral therapy (CBT) for adolescent depression. Fifty adolescents diagnosed with depressive disorders were treated by eight doctoral-level psychologists who followed a manual- -based, CBT adapted for adolescents and evaluated by Rosselló and Bernal (1999), received 12-sessions, individual CBT protocol included relaxation training, activity scheduling, and social problem- solving training. Results suggest that school-based CBT is a relatively robust treatment for adolescent depression across gender, age, and ethnic groups as well as for adolescents with varied patterns of co-morbidity. Jasmine (2010) found that CBT has a positive impact on reducing irrational beliefs, enhancing self-esteem, and self-acceptance, and reducing the level of depression among the late adolescent students. She revealed that there was no significant difference between males and females in irrational beliefs, self-esteem, but the difference between the males and females in depression scores was significant, and CBT has been found to be more effective in reducing depression levels in the females compared to that of the males.

METHODS AND MATERIALS

Statement of problem

Many students do not do well in school because they are suffering from depressive symptoms. This situation leads to anxiety and poor academic performance in these students, so it is important to identify these children and use the suitable ways to reduce their depression. Earlier studies (e.g. Sung Kim (2006) show that cognitive behavior interventions are effective techniques to reduce depression in the adolescents. Present study was an attempt to verify the question: Does CBT decrease depression?

Need for the present study

Ages between 15- 17 are the age of adolescence. The individual faces many factors that each of them individually or in combination play an important role to determine the present state and also shape his/her personality in the future about various aspects of academic, interpersonal, cultural and the personality.

Bodily changes due to chemical and hormonal mechanisms such as face acne, base voice, release of sexual hormones (androgen and estrogen) and activation of sexual interests;

Psychological factors such as psychological crisis of ego identity versus role confusion and how to solve this conflict;

Interpersonal reasons such as seeking new modes, tendency to peers, seeking independency, and disturbed interpersonal relationships with parents;

Academic reasons such as type of school, type of teacher, change in medium of instruction, expose to new educational subjects for the first time, ambiguous thinking about future academics and job situations;

Technological factors including increased interest and excessive use of internet, mass media, mobile, spending more time on these and less time on study;

Parental pressures and expectations, namely to excel in the class.

The above factors can change the individual psychological environment and affecting his/her thought processes; can influence their mood, interpersonal relationships, self concept, self esteem and self efficacy. It means that inappropriate coping to the above factors and inability to solve conflicts leads to depression which in turn result in negative self concept, self esteem (e.g. I'm ugly) and low in self efficacy(e.g. I cannot continue my studies). These factors may create pessimism towards the self, education, and future and as a result the individual shows depressive symptoms that appear as academic failure and drop out. if the students who are suffering from depression can be identified, and if preventive efforts to help them in effective coping with problems to overcome on depression, not only will it help their academic achievement, but will also affect their attitude towards the present and future, and in turn prevent the negative symptoms of thinking that are predisposing factors for many psychological and personality disorders.

Since the expressions of depression appears in two ways: 1) cognitive (e.g. negative thoughts and thought ruminations) and 2) behavioral (i.e. unable to make a decision, disturbed sleep and appetite, etc), CBT can be used as a suitable therapeutic technique for decreasing depressive symptoms, and increase mental well-being. Empirical research suggests positive outcome between Cognitive Behavior Therapy (CBT) intervention and decreased depressive symptoms of students in high schools. Thus, in this study, an attempt has made to examine the effect of Cognitive Behavior Therapy on depression among high school students.

AIM

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

OBJECTIVES

1. To study the effectiveness of CBT on depression in high school students.
2. To study of gender differences in respect to the efficacy of CBT on depression.
3. To study of grades differences in respect to the efficacy of CBT on depression.

HYPOTHESES

1. CBT is effective in decrease of depression.
2. Gender of students is effective in decrease of depression due to CBT.
3. Grade of students is effective in decrease of depression due to CBT.

Participants

Subjects (Boys and Girls students in 10th, 11th, and 12th 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 (the score of 20 and above) used for the study. For the main study out of 130 students (who met cut off score criteria) 5 Boys and 5 Girls each from 10th, 11th, and 12th 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.

Table 1 Showing the numbers of Boys and Girls in each group (10^{th}, 11^{th}, 12^{th}) in experimental (n=30) and control (n=30)

Groups		**Experimental**		**Control**		**Total**
Gender		**boys**	**girls**	**boys**	**girls**	
Grades	10^{th} grade	5	5	5	5	20
	11^{th} grade	5	5	5	5	20
	12^{th} grade	5	5	5	5	20
Total		15	15	15	15	**60**
		30		**30**		

Inclusion criteria

1. Student between 15 and 17 years of age.
2. Student studying in government schools.
3. The students regularly attending the school.
4. Both boys and girls.

Exclusion criteria

1. Students below 15 and above 17 years old.
2. Students who exposed to similar intervention earlier.

Research Tool

Children's Depression Inventory

The children's depression inventory (CDI, kovacs, 1992) is appropriate for children and adolescents aged between 7 to 17 years. The instrument quantifies a range of depressive symptoms, including disturbed mood, problems in hedonic capacity and regulative functions, low self evaluation, hopelessness ,difficulties in interpersonal. The CDI consists 27 self report items and each items includes of three choices, (keyed 0 -absence of symptoms, 1-mild symptoms or 2 -definite symptoms), with higher scores indicating high depression. The total scale score can range from 0 to 54. Besides of the total score, the CDI yields scores for five factors or subscales: negative mood, interpersonal problems, and ineffectiveness, anhedonia, and negative self esteem. Among these questions 14 of them are scored directly and 13 of them indirectly. In direct questions score of 0 to the item (a); 1 to the item (b) and 2 to the item (c) are belonged. Indirect questions are scored versus. That is, 2 for item (a); 1 for item (b), and 0 for item (c). Indirect questions are: 2- 5-7-8-9-10-11-13-15-16-18-21-25 and the rests are direct.

Interpretation of the scale:

The scores between 0 - 8 refer that the person is healthy.

The scores between 9 -19 refer that the person is prone to depression.

The score of 20 and over refer to depression.

Reliability: estimates of internal consistency of the CDI and its subscales.

Procedure

The design of the present study was two groups pre-post test design with the following phases.

Phase1. Pre assessment of control group and experimental group

Phase2. Carrying out Interventional programs for the experimental group for 10 sessions with the following details: session 1: establishing rapport with students, session 2: identifying the current problems, session 3: self-observation, sessions 4 and 5: positive thinking training and stress inoculation, sessions 6, 7: cognitive restructuring, session 8: problem solving training, session 9: assertive imaginary training, session, 10: assertive imaginary training, session 11: time management training, and sessions 12, 13: conclusion.

Phase3. Post assessment for control and experimental group.

Findings

The purpose of the present study has been the investigation of the effectiveness of cognitive behavior therapy (CBT) on depression among high school students. In this part the inquired data was analyzed with appropriate statistical methods such as mean, standard deviation, independent t-test, repeated measure analysis of variance, and effect size.

Pre-assessment analysis

Independent t-test

Table 2 Independent t-test for dependent variable in pre- test

variables	statistics / groups	Mean	SD	MD*	DF	t	Sig
Depression	Experimental	27.53	3.47	1.23	58	1.33	0.189 NS **
	Control	26.30	3.71				

***Means difference ** Non significant**

As mentioned earlier, 60 subjects divided randomly into experimental and control groups. According to high scores in depression subjects matched together as two by two and then one of them placed in the experimental and the other one placed in the control group randomly. To sure that the means of variables in two groups are not statistically different, independent t-test was used. Results show that there is no significant difference between two groups in relation to dependent variable.

Findings

Table 3 Showing means, standard deviation and mean difference of depression and its subsets in pre-post test.

Groups	Times	Depression		Neg. mood		Inter. Per*		Ineffective		Anhedonia		Neg. s. Est**	
		M	SD	M	SD	M	SD	M	SD	M	SD	M	SD
Exp.	Pre	27.53	3.47	6.60	2.12	5.43	1.59	4.83	1.46	5.07	1.14	5.57	1.76
	Post	20.90	2.93	4.70	1.93	4.33	1.09	3.30	1.10	4.47	1.86	3.90	1.24
MD* **		-6.63		-1.9		-1.10		-1.53		-.60		-1.67	
Ctrl.	Pre	26.30	3.70	6.53	1.98	5.23	1.77	4.33	1.71	5.03	1.56	5.43	2.07
	Post	25.90	3.97	6.33	1.92	5.20	2.09	4.30	1.62	5.30	1.70	5.23	2.09
MD		-.40		-.20		-.03		-.03		.27		-20	

*Interpersonal problems; **Negative self esteem; ***Mean difference

Table 4 Total mean scores of experimental and control group on depression and its subscales in post-test

Groups / Variables	experimental		control		Mean difference	Sig
	Mean	SD	Mean	SD		
Depression	20.90	2.93	25.90	3.96	5.00	0.000
Neg. mood	4.70	1.93	6.33	1.92	1.63	0.000
Interpersonal problems	4.33	1.09	5.20	2.09	0.87	0.000
ineffectiveness	3.30	1.08	4.30	1.62	1.00	0.000
Anhedonia	4.47	.86	5.30	1.70	0.83	0.000
Neg. self-esteem	3.90	1.24	5.23	2.10	1.33	0.000

Table 4, shows mean differences of depression between two groups in post-assessment. As has shown, the mean differences of depression and it's all subscales are statistically significant ($p<0.001$). Further, this table indicates that the mean scores of depression and its subscales in experimental group noticeably are less than control group in post-assessment.

Table 5 Results of repeated measure ANOVA for the efficacy of CBT on depression

Source of variation	Sum of squares	df	Mean squares	F	Sig
Within subject effects					
Time	255.21	1	255.21	106.34	0.000
Time*group	285.21	1	285.21	118.84	0.000
Error	139.08	58	2.40		
Between subject effects					
Intercept	22027.38	1	22027.38	2612.98	0.000
Group	284.44	1	284.44	33.74	0.000
Error	489.18	58	8.43		

Regarding to hypothesis 2, table 5 shows that the effect of CBT on depression was statistically significant, $F(1, 58) = 106.34$, $p<0.001$. It indicates that the differences of pre-post test scores (-6.63) clearly showing the efficacy of CBT in decreasing depression. Further, the combination of time*group showed a significant effect in decreasing depression $F(1, 58) = 118.84$, $P<0.001$.

Further, the between subject effects cleared that the effect of group in relation to the efficacy of CBT in decreasing depression was statistically significant $F(1, 58) = 33.74$, $P<0.001$.

Results according to the graph

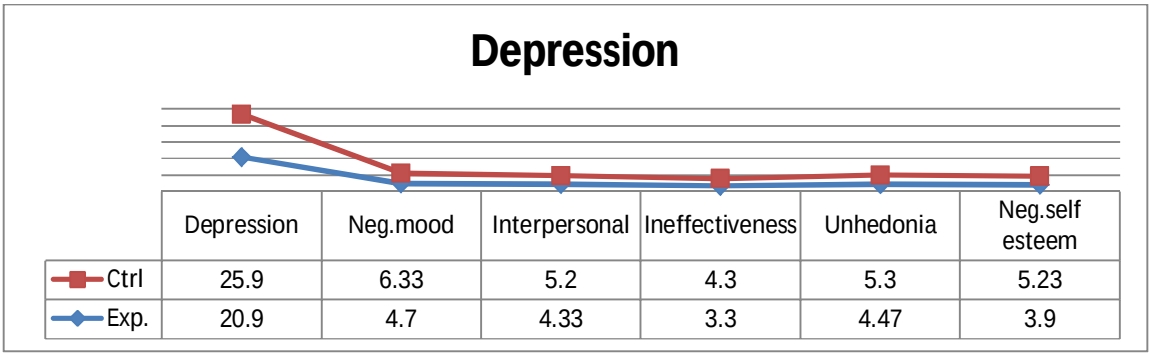

Fig 1 Mean scores on different subscales of depression between experimental and control group in post-test.

Figure.1 shows significant differences between two groups in respect to depression and its subscales in post-test. Graph indicates that subjects in experimental group had tangible decrease in depression in post-test.

Figure 2: Mean scores on different subscales of depression from pre-test to post-test session of experimental group.

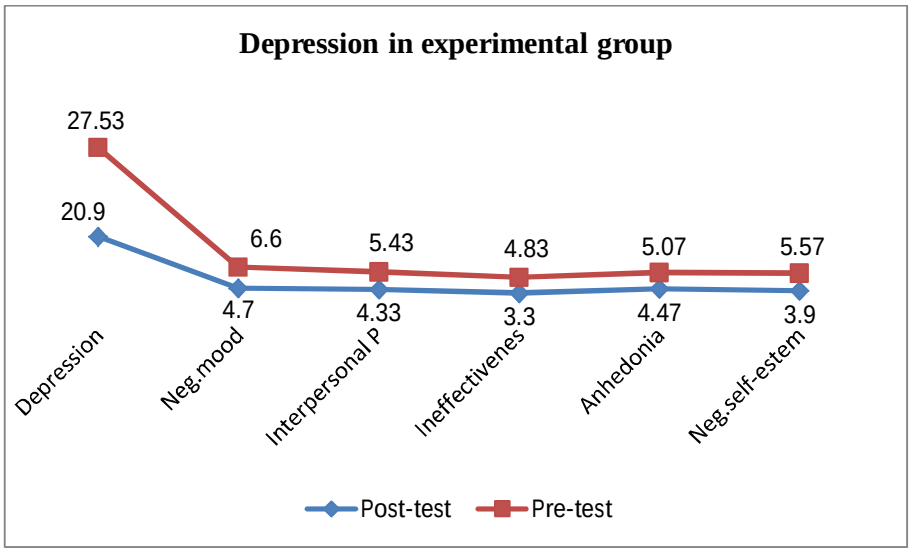

Figure 2: Mean scores on different subscales of depression from pre-test to post-test session of experimental group.

Table 6 Results of repeated measure ANOVA for mean scores on pre-treatment and post-treatment for subscales of depression

Components	Sources	Sum of squares	df	Mean squares	F-value	Sig
Negative mood	Time	21.67	1, 58	21.67	37.92	0.000*
	Group	214.97	1, 58	3.71	10.78	0.002**
	Time*group	12.67	1, 58	12.67	22.17	0.000*
Interpersonal Problems	Time	5.63	1, 58	5.63	7.75	0.007**
	Group	161.47	1, 58	2.78	4.05	0.04***
	Time*group	19.20	1, 58	19.20	26.41	0.000*
Ineffectiveness	Time	16.13	1, 58	16.13	24.16	0.000*
	Group	110.60	1, 58	1.91	7.87	0.007**
	Time*group	26.13	1, 58	26.13	39.13	0.000*
Anhedonia	Time	3.68	1, 58	3.68	6.13	0.02***
	Group	105.77	1, 58	1.82	5.71	0.02***
	Time*group	9.08	1, 58	9.08	15.15	0.000*
Negative Self-esteem	Time	3.33	1, 58	3.33	7.59	0.008**
	Group	172.07	1, 58	2.97	8.99	0.004**
	Time*group	19.20	1, 58	19.20	43.73	0.000*

*P< 0.001; ** P <0.01; *** P<0.05

Repeated measure ANOVA showed that there was a significant change (decrease) in all symptoms of depression namely Negative mood F (1, 58) = 37.92, P< 0.001; Interpersonal problems F (1, 58) = 7.75, P< 0.01; Ineffectiveness F (1, 58) = 24.16, p<0.001; Anhedonia F (1, 58) = 6.13, p< 0.05; and Negative self-esteem F (1, 58) = 7.59, p< 0.01 indicating the effectiveness of CBT in decreasing the symptoms of depression. Further, the between subject effects showed that there are significant differences observed between the groups in Negative mood F (1, 58) = 10.78, P< 0.01; Interpersonal problems F (1, 58) = 4.05, p<0.05; Ineffectiveness F (1, 58) = 7.87, p<0.01; Anhedonia F (1, 58) = 5.71, p<0.05; and Negative self-esteem F (1, 58) = 8.99, p< 0.01.

Further, the combination of time*group showed a significant effect in decreasing depression on Negative mood F (1, 58) =22.17, P< 0.001); Interpersonal problems F (1, 58) = 26.41, p< 0.001; Ineffectiveness F (1, 58) = 39.13, p< 0.001; Anhedonia F (1, 58) = 15.15, p< 0.001; and Negative self-esteem F (1, 58) = 43.73, p< 0.001.

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. Effect size ranges from 0.20 to 0.49 (small), 0.50 to 0.79 (medium) and >0.80 (large).

Table 7 Between subject effects of depression' subscales

Dependent Variables		Type III Sum of Squares	DF	Mean Square	F	Sig
Negative mood	Intercept	40.02	1	40.02	10.78	0.002
	Group	214.97	58	3.71		
	Error	254.98	59			
Interpersonal Problems	Intercept	11.27	1	11.27	4.05	0.049
	Group	161.47	58	2.78		
	Error	172.73	59			
Ineffectiveness	Intercept	15.00	1	15.00	7.87	0.007
	Group	110.60	58	1.91		
	Error	125.60	59			
Anhedonia	Intercept	10.42	1	10.42	5.71	0.020
	Group	105.77	58	1.82		
	Error	116.18	59			
Negative self esteem	Intercept	26.67	1	26.67	8.99	0.004
	Group	172.07	58	2.97		
	Error	198.73	59			

Table 8 Showing the effect sizes on depression and its different subscales

Variables	groups	Cohen's *d*	Effect size	Interpretation
Depression	Experimental	2.06	0.78	Medium
	Control	0.10	0.05	Weak
	Between groups	1.43	-0.58	Medium
Negative mood	Experimental	0.94	0.42	Small
	Control	0.11	0.05	Weak
	Between groups	0.85	0.40	Small
Interpersonal Problems	Experimental	0.81	0.37	Small
	Control	0.01	0.008	Weak
	Between groups	0.52	0.25	Small
Ineffectiveness performance	Experimental	1.18	0.51	Medium
	Control	0.02	0.009	Weak
	Between groups	0.72	0.34	Small
Anhedonia	Experimental	0.39	0.19	Weak
	Control	-0.16	-0.08	Weak
	Between groups	-0.47	-0.23	Small
Negative Self-esteem	Experimental	1.10	0.48	Small
	Control	0.10	0.05	Weak
	Between groups	-0.77	-0.36	Small

As shown in the table 7, Chohen's d shows magnitude of change for experimental group (0.78) which indicates that 78 percent of changes in depression are explained with the efficacy of CBT interventions and for between the groups magnitude of effect size was (0.58). On the other hand, the magnitude of change for depression subscales in experimental, control and between two groups expect of ineffectiveness with a medium effect size (0.58), were totally small and weak.

Grades effects on depression

Table 9 Results of repeated measure ANOVA for grade-wise comparison on depression

Source of variation	Sum of squares	df	Mean squares	F	Sig
Within subject effects					
Time	17563.99	5	3512.80	872.80	0.000
Time*grades	27.96	10	2.80	0.695	0.729
Error	1147.05	285	4.03		
Between subject effects					
Intercept	22027.38	1	22027.38	164.0	0.000
Grades	8.07	1	4.04	0.301	0.742
Error	765.55	57	13.43		

As table 9 shows, a significant difference was observed from pre to post assessment in relation to depression irrespective of grades, F (5,285) = 872.80, p<0.001. When grades-wise comparison was made (time*grades), the F value (10,285) = 0.695, p>0.05; didn't show a significant differential decrease between 1st, 2nd and 3rd grades on depression in post assessment. Further, table 4-16 shows a non significant difference in between subject effects F (1.57) =0.301, p> 0.05.

Contrast interactions (within-between subject effects)

Table 10 Within and between subjects interaction effects of group, gender, grade on depression

Source of variation	Sum of squares	d.f	Mean squares	F	Sig
Within subject effects					
Time		5			
Time*group*gender	10.00	5	2.00	.558	.732
Time*group*grades	18.16	10	1.82	.507	.884
Time*gender*grades	27.66	10	2.76	.772	.645
Time*group*gender*grades	34.15	10	3.41	.953	.485
Error	859.93	240	3.58		
Between subject effects					
Intercept	22027.38	1	22027.38	243.4	.000
Group*Gender	12.10	1	12.10	1.34	.253
Group*Grades	1.07	2	.536	.059	.943
Gender*Grades	19.57	2	9.79	1.08	.347
Group* Gender * Grades	6.95	2	3.47	.384	.683
Error	434.47	48	9.05		

Table 10 shows that the within subject effects of interaction of group, gender, grade in relation the efficacy of CBT on depression was not statistically significant. Further, results indicate that the interaction of group*gender*grades in respect to the efficacy of CBT on depression was not statistically significant.

DISCUSSION

This study has carried out in order to investigate of the effectiveness of cognitive behavior therapy (CBT) on depression among high school students. In the present study the following hypothesis was verified with appropriate statistical methods: CBT is effective in decreasing depression.
The results of this study are discussed as follow:

The effects of group on dependent variable:

In this part research hypothesis is discussed according to dependents variables. As observed in the findings part, the obtained F ratio for determining of the effectiveness of CBT according to group on dependent variable was statistically significant. That is, significant differences observed between two groups in relation to depression and its subscales. Further, the estimated means show that the new combined variable (group) has significant effect on the dependent variable. In other words, comparison of means of groups in post-test revealed that subjects in experimental group gained scores less than control group in respect to depression and its subtests.

Before puberty the rates of depression in boys and girls are equal. After puberty twice as many girls as boys become depressed. About 5 adolescents in 100 become depressed. Depressive illness in adolescents can be difficult to recognize. Anger, irritability, withdrawing from friends and alienating from parents, academic underachieving, low self-esteem and sadness may all indicate depression – or be a reflection of the challenges and turmoil of normal adolescence. The changes brought about by depressive illness in adults are also seen in adolescents, but sleep disturbance is less common (adolescents are famously good at sleeping!). Delusions (abnormal beliefs) and hallucinations (abnormal perceptions) are less common than in adults.

Teenagers and younger children can certainly become seriously depressed. Adolescents need careful treatment because they are going through all the stresses of adolescence, and because they are growing rapidly and facing with all sorts of new challenges in their lives, and not least because it's not easy to know what they're thinking. Also, children might go to the doctor with physical symptoms, so that depression is visually very hard to recognize (Cembrowicz, 2002). In this study the effectiveness of CBT has been investigated in treatment of adolescent's depression.

As shown in the finding part, the effect of CBT in decreasing depression was statistically significant. This finding is concordant with the previous studies such as (Jasmine, 2010; Hamdan, Puskar & Bandak, 2009; Strachowski et al, 2008;Chen et al, 2006; , Carrico, Antoni & Weaver, 2005; Webb,

Brigman & Campbell, 2005; Hyun, Chung & Lee, 2005; Peden, Hall, Rayans & Beebe, 2001,etc.) and supports the efficacy of CBT in reducing depression.

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. 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, Freeman, & Christner, 2006).

A probability explanation for this finding is that most of surveyed 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 the inner problems and receiving some effective strategies to change.

On the other hand, since the researcher was not a member of schools, and there was no previous familiarity between him and students, their confident to researcher regarding keeping their secrets increased and for this reason, they divulge problems that were basis of their all affective, interpersonal and motivational disturbances. Therefore, given appropriate techniques could have marked effects on decreasing of academic stress symptoms.

Lack of knowledge about how to face with the problems and worries was one of the most common factors of depression among the majority of students. In such case, problem solving technique (PST) had an important role in decreasing their problems, because most of participants reported positive feedback after receiving this strategy. For example, students who had interpersonal and affective problems with their parents and teachers, after receiving PST reported that they really learned how to behave and how to control their emotions.

Lack of knowledge about how to manage the time was another major factor of depression. Therefore, given a suitable frame to help the student how to manage their time and to allocate enough time to each subject, could be another way to decrease their academic stress, because allocating enough time to subjects in respect to their priority and importance reduce time pressures and provides opportunities to pleasure and other social activities. As a result, the person can show improved performance and this case was revealed in the student's performance in post-test.

Having no knowledge about how to study well, lack of concentration and loss of motive to continue the study were related to depression. PQ4R training was a way for saving time and concentrating on the important contents of subjects. This method could decrease the pressure of time and the negative effects of difficult subjects (e.g. giving up the subject, etc.).

One of the reasons of academic concerns among the students was their inability (especially girls) to face with their parent's request and force to get marry to whom that they didn't interest them. 4 of the girls and 1 of the boys had to get married under their parent's pressures. In such case, the anxiety resulted in thinking about ambiguous future disturbs their concentration and decreases their motivation to study hard. PST technique and also assertive skills training were two suitable methods for reducing academic concerns and thought rumination about the future by becoming assertive to reject some unpleasant applications and how to face with the parents in a proper manner.

One probable explanation of this finding is that the studied students showed interestingly reduction in academic stress. Since depression is correlated to stress, any change in stress can lead to change in depression. Findings revealed that while the academic stress of the students of experimental group significantly has decreased, the depressive symptoms have shown a significant reduce in the scores in the experimental group. Thus the findings prove that the intervention plan proposed in the present study has been proven successfully. In other words, some symptoms of stress and depression are similar (such as, cognitive, interpersonal/social, affective and motivational symptoms) and changing in stress can be along with change in depression.

One effective component of CBT in this study was problem solving training (PST). Consistent with this finding is a study by Lynch, Tamburrino, and Negal (1997) that applied the PST model to treat minor depression and found it to be more efficacious than control group. According to (Nezu, Wilkins & Nezu, cited in sited in Sprry, 2003) identifying why a situation is a problem, generating possible solutions, making effective decisions and delineating realistic personal goals will help both clinical (e.g. adults diagnosed with major depressive disorder and cancer), and nonclinical (e.g. high school students, college students, community residents) group to effectively overcome their depressive symptoms.

With CBT, subjects were taught to monitor and record their negative thoughts. Special emphasis was put on automatic thoughts, recurring thoughts that came into their mind as if by habit rather than as a specific response to what was currently going on. With CBT interventions, subjects were able to identify these automatic thoughts when they occurred.

According to (Nemade, Reiss & Dombeck, 2007) though every client's automatic thoughts are unique, there are also clear patterns of depressive automatic thoughts that are formed are common across many depressed people's minds. Some common patterns of negative and irrational automatic thoughts include:

Catastrophizing - always anticipating the worst possible outcome to occur (e.g., expecting to be criticized or fired when the teacher asks a question in the class).

Filtering - exaggerating the negative and minimizing the positive aspects of an experience (e.g., focusing on all the extra homework that went into a good mark rather than on how nice it is to have a good mark).

Personalizing - automatically accepting blame when something bad occurs even when you had nothing to do with the cause of the negative event (e.g., He didn't answer my greeting in the morning because I am a terrible friend or a boring person; I caused him not to answer.).

(Over)Generalizing - viewing isolated troubling events as evidence that all following events will become troubled (e.g., having one bad day in the school means that the entire week is ruined).

Polarizing - viewing situations in black or white (all bad or all good) terms rather than looking for the shades of gray (e.g., "I missed two questions on my exam, therefore I am stupid", instead of "I need to study harder next time, but hey - I did pretty well anyway!").

Emotionalizing - allowing feelings about an event to override logical evaluation of the events that occurred during the event. (e.g., I'm a stupid student that it's obvious that I'm a stupid person).

The therapy focused on linking the past experiences with present emotions by probing into their childhood, and identifying events that were linked to the beginning of difficulties with depression. Students were encouraged to understand that their problems are not exclusive to them and everybody can experience them once, but the ways that they process the events, situations and experiences are so different from the others. By the help of researcher, the students could overcome their cognitive distortions.

In cognitive behavior therapy, clients were taught to identify debate, and then correct their irrational ideas. The disputing process involved teaching clients to systematically ask and answer a set of questions designed to draw out whether particular ideas have any basis. Examples of disputing questions include:

1. Is there any evidence for this belief?
2. What is the evidence against this belief?
3. What is the worst that can happen if you give up this belief?
4. What is the best that can happen?

After this session of CBT training, subjects learn to monitor their own thoughts and perform the disputing process on their own outside of therapy sessions.

On the other words, CBT works in three ways:

1. CBT helps the person to identify and change negative thinking associated with depressed feelings.

When the person is depressed, he/she feels weak, tired, hopeless and anxious. These feelings make it difficult for him/her to think positively about themselves and about the people in their life. Therapist helps them to look into the events in their life and talk about the possible interpretations of those events.

Through this therapy the negative thoughts are identified and therapist will give them a helpful interpretation of a situation. Through this process they learn how to replace negative thinking patters with more positive ones and this helps them feel better about themselves and their life in general.

2. CBT helps person to focus on positive things

It is possible that if persons are feeling depressed, they will not enjoy the things that they used to enjoy. This can turn into a cycle where doing less fun things results in sadness and in turn make them feel too sad to do any fun things. In this situation, it is important for someone to support and motivate them. A therapist can work with them to gradually increase the fun activities in their life through using cognitive behavior therapy techniques.

3. CBT helps to manage person's problems

It is very hard for depressed people to manage everyday problems which seem to be getting on top of them. CBT helps them to manage these problems through different techniques. CBT teaches people to control their thoughts, feelings, and behaviors. CBT combines two therapies "Cognitive Therapy" and "Behavior Therapy" to change unhealthy and unhelpful thoughts and behaviors. Cognitive Therapy acknowledges that distorted thoughts cause self-destructive feelings and behaviors. For example, someone who thinks they are unworthy of love and respect may behave shyly in social situations and isolate themselves and refuse to attend social functions (Kirk, Hawton, Salkovskis & Clark, 1989).

Cognitive Therapy restructures the thoughts of a person by showing them that what they believe or perceive is not the right thoughts or feelings. This is done through asking certain questions and making the person realize that they are worth of love and respect. While Behavior Therapy teaches the person techniques to change their behaviors and reactions to certain issues, CBT has a good success rate (Dobson & Dozois, 2001) because it combines the techniques of these two very effective therapies.

Cognitive behavioral techniques aim at reducing the physical as well as psychological effects of stress and making the individual subject comfortable with increased sense of control, self efficacy and self-esteem. This ultimately leads to a reduction in anxiety, depression and social isolation and improvement in the quality of life, and sense of well being. Interest and performance in academic area get improved, and efforts toward satisfaction of achievement needs get accelerated, student start functioning to full potential and zeal. Cognitive techniques concern with the rational of scientific empiricism and collaborative atmosphere which states that thinking can be evaluated, analyzed, understood, explained, and carried forward on truly based scientific paradigms (Beck, Rush, Straw & Emmery, 1979; cited in Sharma, 2010).

As a conclusion, Cognitive behavioral therapy is a good fit for verbal, goal-oriented people who want short-term, symptom-focused strategies. CBT requires that people commit to monitoring and practicing skills outside the therapy session. CBT is less of a good fit for people who have trouble with meta-cognition (e.g., people who have difficulty thinking about their own thinking process), who are put off by Socratic-style questioning (logical debate and argument used to examine the appropriateness and validity of thoughts), who are interested in a less directive therapist, or who are unwilling to monitor their thinking, behavior, and feelings outside the therapy sessions. The present study supports the effectiveness of CBT in improving or reducing the symptoms of some variable such as academic stress, depression, anxiety, self-efficacy, academic performance and, etc. with respect of their nature.

Limitations

Despite all attempts to doing study, the researcher was exposed with some limitations that inevitably influenced the internal validity of the study.

In this study a small sample was allocated to each grade. Therefore, generalizing the results to all high school students should be cautiously.

Some student could not attend quietly in defined therapeutic sessions because their teachers didn't permit them to leave the class. Thus, some of them had to leave the session after half an hour.

The last sessions was exposed to the student's exam times. Hence, 14 days before exams student could not attend at school. For this reason, researcher had to avoid of using some CBT techniques (e.g. relaxation training) and carry out some session in group (such as time management and study skills training).

Since the intervention was implemented within the school, factors such as loudness noise, taking label of mad or sanity from their classmates was disrupted the student's concentration and prevented them to active collaboration in sessions.

Another limitation was comparing the researcher with school's counselor; because they posed that counselor divulge their secrets. Therefore, some of them behaved very cautiously in the first sessions of intervention.

Recommendations

According to research findings and limitations, it is suggested that:

In the next studies, students with their parents joint together in intervention programs because some of the students have some interpersonal problems with their parents.

Training programs should be applied for parents to know how to have an appropriate relationship and behavior with their children.

Schools try to make use of expert and confidant counselors, so that students can easily disclose themselves without fear of labeling.

Researchers study more samples in each grade in the future, because of increasing the external validity of findings.

Establishing comprehensive counseling trainings for students about how interpersonal relations with parents, teachers and classmates, how to percept their potentials, and how to make a positive impression toward themselves.

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