

## The Effectiveness of Acceptance and Commitment Therapy on Depression among Patients with Type II Diabetes

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### Abstract

**Objective:** Depression is a common co-morbid condition in patients with type II diabetes. This study was aimed to investigate the impact of acceptance and commitment therapy (ACT) on depression among patients with type II diabetes.

**Materials and Methods:** Using a pre-test post-test experimental design with control group. With conventional sampling method 40 subjects were selected from Alborz Diabetes Association, being evaluated according to DSM-IV-TR. They were randomly divided into an experimental and a control groups. For gathering data we used demographic questionnaire and Beck depression inventory (BDI) .Experimental group under acceptance and commitment therapy sessions. Groups (Experimental and control) were studied for 3 months .These questionnaire (BDI) were given to the patients before and after treatment and at 3 month follow up period .The data were analyzed by analysis of variance with repeated measures.

**Results:** Acceptance and commitment therapy in post -test and follow up decrease in depression scores ( $P$ -value <0.001).

**Conclusion:** The Conclusions of this study indicated that acceptance and commitment therapy can be effective as a psychological intervention on depression in patients with type II diabetes.

**Keywords:** Type II diabetes, Acceptance and commitment therapy, Depression.

## Introduction

Diabetes is one of the most common chronic metabolic diseases (1). The number of diabetic patients will become double in 2030 in compare of 2000. So about 366 million diabetic patients will be in 2030 worldwide (2). Depression is common among type II diabetic patients .The depression is two times more prevalent in

diabetic population than non-diabetics (3). Depression is one of the factors determines the prognosis of the disease (4,5). Diabetes has various effects on the body, mind and social functioning. (6), although the relationship between diabetes and depression is unclear (i.e., whether depression is a consequence or a risk factor for diabetes), about 30% diabetics

are depressed. Long time depression has a negative effect on improving type II diabetics (7,8). Conducted studies reported the risk of depression (3), anxiety (4) and low quality of life (5) is obvious in these patients. There is a significant relationship between diabetes and quality of life (8). Diabetes has negative effects on patients' general health, well-being and quality of life (9). The quality of life is unpleasant in 60% of patients with diabetes (9). The risk factors of depression are: Female, low level of education, low socio-economic condition, rural residence and family history of psychiatric illness. Depression increases the risk of mortality in diabetics (10,11).

The quality of life dimensions are physical, psychological and emotional health, feeling of mental health and the ability to work (12). Treatment of depression can improve diabetics' disability. Depression and diabetes is associated with poor diet and metabolic control, increasing disability and cost of health care, risk of death and decreasing medication adherence and quality of life (9-16). Depression treatment can help improving chronic illnesses, like diabetics. It can help them by increasing coping behaviors (diet and exercise), decreasing high-risk health behaviors (smoking, high fat intake) and improving life style. Psychological diabetic problems like depression and anxiety will reduce by psychological treatment and psychoactive medication if needed (17,18). Acceptance and commitment therapy (ACT) is more effective than cognitive behavior therapy (CBT) in depression of chronic illnesses, (19). ACT model has shown success in improvement of quality of life, stress symptoms and quality of sleep in patients with breast and prostate cancer (13-14). It also showed a significant effect on increasing mental clarity, mental health and decreasing physical stress (15). ACT is a psychological therapy that teaches mindfulness (like 'attention on purpose, being in the present time and no judgmentally') and acceptance (like 'openness, willingness to encounter with problem'). This psychotherapy will increase the

skills of responding to uncontrolled experiences and enactment of personal values. In ACT model, we should accept automatic thoughts, consider sensations and urges, defuse thought (observe thoughts without believing them or following their directions) (20). ACT is more effective than other psychotherapy in depression and chronic pain (21). ACT therapists search to identify the patterns which patient is trying to control or avoid problems. Then ACT therapists teaches patients to accept them instead of encounter them. ACT is successful in various treatments such as: self-management of blood glucose in diabetic patients (22), ACT plus diabetes education (23), chronic pain (24), improving quality of life, stress disorder and post-traumatic (25), improving problem (26), self-management of type II diabetes (27) setting of obsessive-compulsive disorder (OCD), psychosis, smoking, tinnitus, epilepsy and emotionally disordered eating and nonclinical settings (worksite stress, mental health stigma and weight loss) (28). This study aimed to investigate the impact of ACT on depression among patients with type II diabetes.

## Materials and Methods

This study was a quasi-experimental with three months follow-up. The studied sample consisted of all patients who were referred to Alborz Diabetes Association in Karaj during spring 2015. After interviewing them by Structured Clinical Interview (SCID-I) according to DSM-IV criteria, Beck Depression Inventory (BDI) was distributed among patients. Ultimately the patients diagnosed with high levels of depression (with scores between 29 and 63 based on the scale and the interview) were selected for the study. Totally 50 patients of 300 patients were major depressed and 10 patients were excluded (4 patients under psychological treatment, 2 patients change living location and 4 patients with chronic renal disease). About 40 depressed diabetic patients were selected and were randomly divided in to two groups. Experimental group participated in eight

sessions and each session took 90 minute therapy and control group did not receive any therapy. Experimental and control groups were studied for 3 months. The BDI questionnaires were given to the patients before and after treatment and then after 3 months follow up period again. The inclusion criteria was, age between 30 to 60 years, at least a high school education, living in Karaj and diabetes diagnosis for at least five years, willing and informed consent during the execution of the intervention research program. The exclusion criteria were gestational diabetes, past history of psychiatric disorders and chronic diseases, psychotherapy, hospitalization during the intervention research period, change living location, absence for more than three days in intervention research program and patients with diabetic complications. The data were analyzed using analysis of covariance; LSD post hoc test was used through SPSS-21.

### Data collection

Data was collected as part of a brief background inventory, for the purposes of the present study; we used the Four Factor Index of Social Status Hollingshead (29) (marital status, retired/employed status, educational attainment, and occupational prestige) as a measure.

BDI is a 21 items scale, (0 to 13 minimal depressions, 14 to 19 mild, 20 to 28 moderate and severe depression, 29 to 63 major depressions). Internal consistency, test-retest reliability of 0.73 and 0.87 have been reported for Iranian students (30). The BDI was found to be appropriate for measuring severity of depressive symptoms in type 2 diabetics.

Session outlines for acceptance and commitment therapy (ACT) intervention was conducted in 8 sessions: the first session, education, information and the limits of control (short and long-term costs and benefits), focus on experience. The second session, Values (what you care about, how do you want to live); Third to fifth session, Cognitive diffusion (observing thoughts without trying to evaluate or change them),

Mindfulness (being at the moment). Sixth to eighth session; Committed action (“road map” connecting values, goals, actions, obstacles, and strategies), Review and continued action in support of values (31). Patients (20 patients in experimental group and 20 patients in control group) completed a standard set of measures at the beginning and end of treatment, as well as at the 3-month follow-up visit. The ACT protocol can be downloaded at:

[www.contextualpsychology.org](http://www.contextualpsychology.org)  
and [www.ACT-Forum.se](http://www.ACT-Forum.se).

### Results

The mean ( $\pm$ standard deviation) age of participants in experimental group was  $44.07 \pm 6.77$  years and control group was  $43 \pm 4.05$  years. The demographic characteristics of the studied patients were listed in Table 1.

All patients had medium income and were married. There was no significant difference between the control and experimental groups in demographic characteristics ( $P > 0.05$ ).

The mean and SD of depression scores in the experimental and control groups in three stages of pre-test, post-test, and follow-up were reported in Table 2. The mean scores of these variables in the control group in the pre-test and follow-up showed no significant ( $P$ -Value 0.003) changes compared to the pre-test. The description data of depression (BDI) in the experimental and control groups the pre-test, post-test and Follow-up can be seen. As can be seen, there is no much difference in the mean scores of pre-test in BDI in experimental and control groups ( $P$ -Value=0.505), but the ACT intervention impact significant difference between depression in post-test and Follow-up in the experimental group ( $P$ -Value=0.001). Mean depression scores in the experimental group after the intervention, compared to the baseline had changed, while the control group was not significantly changed in three stages (Table 3).

### Treatment Process Analysis

**Table 1. Comparison of demographic variables between the two groups under study**

Variable	Group	Variables	Frequency	p-value
<b>gender</b>	Experimental	women	13 (65%)	0.218
		men	7 (35%)	
	Control	women	14 (70%)	
		men	6 (30%)	
<b>Level of education</b>	Experimental	guidance school	9(45%)	0.628
		high school	5 (25%)	
		College graduate	6 (30%)	
	Control	guidance school	11 (55%)	
		high school	6 (35%)	
		College graduate	3 (20%)	
<b>Career</b>	Experimental	housewives	9 (45%)	0.358
		employed	6 (30%)	
		self –employed	5 (25%)	
	Control	housewives	10 (50%)	
		employed	5 (25%)	
		self -employed	5 (25%)	

**Table 2. Means and SD of Measures by Treatment Condition**

Measure	Time	experimental		control		P-Value
		Mean	SD	Mean	SD	
		<b>Beck depression inventory</b>	<b>Pre treatment</b>	30.70	5.00	
	<b>Post treatment</b>	24.90	3.85	30.95	5.38	0.003
	<b>Follow-up</b>	21.84	4.06	30.95	6.74	0.001

Data were analyzed by analysis of variance with repeated measures and with internal factors (depression index) and the difference between groups was verified in 3 stages. The results showed that repeated measurements of depression severity score at 3 stages the difference is significant. Observed power is equal to one, so statistically significant indicator is impact (Table 3). So, between time (pre-intervention, post-intervention and follow-up), there is significant difference in depression severity. These results demonstrate that ACT program has to improve depression. Pretest, posttest and 3month follow up scores of the two groups (experimental and control groups) were analyzed by repeated measures (check the assumptions of repeated measures in Table4) ANOVAs indicated (Table 5). A repeated measure ANOVA showed a significant improvement across (BDI) measure of Outcome at Treatment Conclusion and 3-Month Follow-Up periods, in experimental group. The result of analysis showed that the final score of treatment depression in experimental group, in post-test and 3month Follow-up significantly decreased ( $P<0.05$ ).

Data analyses showed that ACT group therapy is effective in the treatment of depression of diabetic Patients.

The result of analysis showed that the final score of treatment depression in experimental group, in post-test and 3month Follow-up significantly ( $P=0.001$ ) that ACT group therapy is effective in the treatment of depression of diabetic Patients.

Interaction between and within-subjects depression was significant. Multi-variable analysis showed that ACT intervention in follow up and post treatment is just as relevant to treating severe depression index. Observed power is equal one, so statistically significant indicator is impact. Interaction between group and variable was significant. Multi-variable analysis showed that ACT intervention in groups (experimental and control) is just as relevant to treating severe depression index. Observed power in depression and group is 0.940 and observed power in quality of life and group is 1.000, so statistically significant indicator is impact.

**Table 3. Interaction of time (Pretreatment, Post treatment and Follow-up) on depression between the two groups under study (experimental and control)**

Measure	Group		Mean Difference	Std. Error	P-value
Depression	Experimental	Pre treatment Follow-up	8.86	0.94	0.001
		Post treatment Follow-up	3.06	0.79	0.505
	Control	Pre treatment Follow-up	0.52	-1.36	0.750
		Post treatment Follow-up	0.04	1.04	0.150

\*LSD

**Table 4. Assumptions of repeated measures**

Within Subjects Effect	Mauchly's W	Approx. Chi-Square	Df	Sig.	Epsilon		
					Greenhouse-Geisser	Huynh-Feldt	Lower-bound
Depression	0.952	2.739	2	0.254	0.954	1.000	0.500
Quality of life	0.832	1.959	2	0.301	0.845	1.000	0.485

**Table 5. Analysis of variance between subjects and Within-Subjects Effects, repeated measurements**

Source	Sum of Squares	Df	Mean Square	F	P-value	Effect size	Observed power
Group	142467.200	1	142467.200	19.789	0.001	0.992	1.000
Error	840.700	38	420.350				
Depression	1171.870	2	871.870	37.890	0.001	0.399	1.000
Depression group	495.950	2	247.970	8.0180	0.001	0.219	0.940
Error	1762.670	76	30.920				

## Discussion

The prevalence of diabetes with depression is so high. Depression has negative effect on diabetic health. Some problem like level of distress related to diabetes, neuropathy, retinopathy and nephropathy can predict depression in diabetics, so it is important to identify and treat these two diseases together. Early treatment can reduce the disease burden in physical illnesses. In ACT the individuals confidently let the thoughts, feelings, emotions, habits and reactions show themselves. Meanwhile, they do not stick themselves to their thoughts, feelings, ideas and imaginations and do not consider them the same as themselves. It means they do not crave their identity of them. For an individual with ACT, thought is one thing and reality is another thing and thought is not necessarily the fact of life. ACT helps individuals manage their negative emotions better, gain more adaptive coping skills and be able to reassess stresses (for example, consider fighting with the problem as an opportunity to grow, not a threat). In explaining this hypothesis, it can be said that what ACT does is that individuals are one step away of all the thoughts, both positive and negative. Thoughts are just thoughts and are not facts. Individuals cannot completely

control their thoughts. All that can do is that they look at the thoughts, take away from them and stop their spontaneous reaction to them. The more they are able to do that, the more they feel in control of it. Therapeutic effects of group ACT reduction program increases by group-related factors. This program increases the ability of adaptive coping, creating hope and greater responsiveness to treatment. So, more therapeutic consequences are affected. Also it has been observed in the present study was generally consistent with the studies of Dickens et al (2012), Markowitz et al (2011), Pan et al. (2010), Waitzfelder et al (2010) (32), Egede and Ellis (2010), Munshi et al (2007) (33), Srydhr (2007) (34) and Nauet al (2007) (35). The current study examined the effectiveness of acceptance and commitment therapy on depression among patients with type II diabetes. In post-test and follow-up Acceptance and commitment therapy can reduce depression index. The result has been observed in the present study be consistent with the studies of Hayes et al (2004), Gregg (2004), Gregg et al (2007), McCracken et al (2005), Hayes et al (2005), Forman et al (2007), Pull et al (2009) and Makvand et al (2014). Meta-analyses have shown medium to large effect sizes of ACT interventions on



different symptoms of psychological distress. Egede and Ellis (2010) have evaluated the cost and burden of depression in patients with diabetes by meta-analysis trials, from 1966 to 2009 showed that the involvement of both diabetes and depression, reduced Adherence, poor metabolic control, increasing higher complication rates and health care costs and risk of disability and death. So, the treatment of depression in patients with diabetes should be in the same time, in order to improve clinical outcomes and reduce the burden of disease is too necessary. Wang et al (2010) (36) suggested that psychotherapy for depression, reduce depression symptoms in patients with diabetes. Mann et al (2009) (37); confirm that people with diabetes frequently experience emotional disorders, specially depression which significantly impacts quality of life and poor adherence. Poor adherence, low self-esteem and conflicting beliefs about treatment and medication refers to the depression, so this problem is modifiable by educational interventions to improve diabetes self-management. Waitzfelder et al (2010) (32) suggest that, mental health intervention in diabetes management is often significant impact, but the pharmacotherapy impact lonely is moderate. Treatment of depression in people with diabetes is an essential step. The best therapy for glycemic control and reducing depression is psychotherapy and pharmacotherapy. Beside the pharmacotherapy, the role of psychotherapy has effective value to treat depression in diabetes management. Our study have several limitations such as: this intervention is not a special program for patients with diabetes; although it was used as a public education program to reduce depression. In our study the required sample size was not calculated and it is other limitation for this research. Reducing

external validity and generalizability of the results should be considered because of no calculation of required sample size, controlled conditions and the number of females participants more prevalent than males. According to experimental researches we also selected 40 patients (29), previous studies like Makvand et al., 2014, McCracken et al., 2005 and Forman et al., 2008, used same number of selected patients, too (40 patients) .We suggest to repeat this research by larger samples with long-term follow-up. Also ,we suggest authorities and institutions that are active in this field to design a special program acceptance and commitment therapy, for diabetics and integrate in formal training diabetes care programs.

### Conclusions

Our study showed ACT intervention reduces depression, in post treatment and follow up. ACT can help diabetics to encounter with discomfort of disease burden, because ACT aim to reduce experiential avoidance. We should pay more attention to management of depressive disorder in diabetics. According to the results, group ACT reduction program is an effective method in improving quality of life in type 2 diabetes patients. The role of psychotherapy is so much important for proper diagnosis and management of depressive disorder in physical illnesses such as diabetes. Psychotherapy such as ACT can reduce depression and the disease burden in physical illnesses and increases the quality of life in patients with diabetes.

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