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Family and health Quarterly, vol12, Issu4, Winter 2022, ISSN: 2322-3065

http://journals.iau-astara.ac.ir, D.O.R. 20.1001.1.23223065.1401.12.4.3.9

Family and Health

The effectiveness of treatment based on acceptance and commitment to anxiety tolerance and cognitive flexibility of patients with type 2 diabetes

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Abstract

Introduction: People with diabetes face psychological challenges. Attention to acceptance and commitment therapy is important in this regard. The aim of this study was to evaluate the effectiveness of acceptance and commitment-based therapy on distress tolerance and cognitive flexibility.

Methods: The quasi-experimental research design was pretest-posttest with a control group. The statistical population included all type 2 diabetic patients referred to the Maternal Diabetes Center, Touba specialized and sub-specialized clinic and Mostafavian clinic in Sari in 2009-2010. Thirty people were selected as the sample by available sampling method and randomly assigned to an experimental group (15 people) and a control group (15 people). The intervention group underwent 90 minutes of treatment based on acceptance and commitment in 8 sessions once a week. However, no intervention was performed on the control group during this period. The Simons and Gaher Emotional Anxiety Tolerance Questionnaire and the Dennis and Vander Wal Cognitive Flexibility Questionnaire were administered. Data were analyzed using mean, standard deviation and analysis of covariance using SPSS-23 software. P value less than 0.05 was considered significant.

Results: The results showed that the treatment was based on acceptance and commitment on distress tolerance (F = 807.6, P <0.001) and cognitive flexibility (F= 814.89, P< =0 /001) had a significant effect.

Conclusion: Cognitive therapy based on acceptance and commitment based on distress tolerance and cognitive flexibility was effective. Therefore, this intervention can be used to reduce the psychological problems of patients with type 2 diabetes.

Keywords: Cognitive flexibility, Anxiety tolerance, Type 2 diabetes, Acceptance and commitment based cognitive therapy.

Received: 30/April/2022 **Accepted: 20/July/ 2022**

Citation: Dakani M., Fakhri M.K., Hassanzadeh R.. The effectiveness of treatment based on acceptance and commitment to anxiety tolerance and cognitive flexibility of patients with type 2 diabetes, Family and health, 2023; 12(4):

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Introduction:

Diabetes is one of the most common chronic diseases caused by abnormalities in carbohydrates, proteins, and fats metabolism. According to the World Health Organization, the number of people involved with this disease will increase from 200 million in 2000 to 592 million in 2035, with the highest prevalence in developing countries, including the Middle East [1]. Diabetes is one of the greatest epidemics in human history. Type 2 diabetes is a chronic condition in which the body cannot produce or use insulin, this situation includes 90% of the disease. Type 2 diabetes has a high mortality rate and people with diabetes have 50% higher mortality than people without diabetes.[2]

The prevalence of diabetes and its related risk factors in Iran is reported to be 9.6% in men, 11.1% in women, and 10.3% in all individuals, [3]. The spread of type 2 diabetes has made this disease known as an epidemic and one of the main causes of mortality, especially in developing countries [4].

Psychological flexibility is defined as the ability to change cognitive motives to adapt to changing environmental stimuli and refers to an individual's ability to experience external and internal experiences [5]. This factor requires the ability to communicate with the present time and it has the power to separate inner thoughts from the experiences of a person [6]. People with flexible thinking positively adjust and change their mental structure to the environment and they overcome stressful situations with acceptance and tolerance [7]. Cognitive flexibility is a process in which a person's ability to cope with emotional, social, and physical challenges increases and gives the person more power to face life's adversities [8].

Another psychological consequence of type 2 diabetes is anxiety [9]. Anxiety tolerance is a person's ability to experience and tolerate a negative emotional state that affects a person's evaluation and judgment and has been identified as an important factor in the onset and continuation of psychological trauma as well as prevention and treatment of patients [10]. In life, people have to deal with physical pain and emotional turmoil. Pain is inevitable and unpredictable. Some people who experience these pains show unhealthy reactions because they can do nothing else; Because when there is emotional pain, wise thinking is not working and person will experience anxiety. These fruitless strategies deepen emotional pain [11].

People with low anxiety tolerance know that they cannot tolerate the feeling of discomfort and feel that others have better tools to deal with negative emotions, so they often feel ashamed [12]. These people also work hard to avoid negative emotional experiences. If it is not possible to avoid them, they go ahead with unhealthy methods in an attempt to release themselves from the annoying emotional state; These unhealthy strategies are likely to reduce their energy and ultimately disrupt their physical, mental, and social functions [13].

One of the therapies used to treat type 2 diabetes is acceptance and commitment therapy. its based principles include acceptance or willingness to experience pain or other disturbing events without restraining them, and action based on value or commitment together that the tendency to act as meaningful personal goals before eliminating unwanted experiences [14].This type of therapy is a

Family and health Quarterly, vol12, Issu4, Winter 2022, ISSN: 2322-3065
http://journals.iau-astara.ac.ir, D.O.R. 20.1001.1.23223065.1401.12.4.3.9

cognitive and behavioral intervention that uses the processes of acceptance and mindfulness and the processes of commitment and behavior change for psychological flexibility.it has six basic principles: cognitive defusion, acceptance, contact with the moment, myself as a context, Values , and committed practice. [15]. These principles are taught to patients through mindfulness skills, metaphors, and experiential practices. [16]

Bending et al. Showed in their research that acceptance and commitment therapy has led to the control of type 2 diabetes [17]. In a study, Sakamoto et al. Found that acceptance and commitment therapy can control blood sugar in patients with diabetes [18]. Amirian et al. Showed that acceptance and commitment therapy increases anxiety tolerance. [19] Hosseini et al. [20], as well as Anbigi et al. [21], showed that acceptance and commitment therapy increases cognitive flexibility.

Diabetes treatment is often long and challenging, and because people do not consider the short-term and long-term effects of the disease, they may experience depression, anxiety, and other similar psychological problems. As with other chronic diseases, a person's attitude and approach to diabetes and its treatment is effective on prognosis. Acceptance of treatment in diabetes leads to increased control of blood sugar [17]. The high frequency of negative psychological symptoms and the difficulties of the drug treatment process increase the need for psychotherapy interventions. Considering the favorable effect of acceptance and commitment therapy on psychological problems and also increasing the number of diabetics. this study aimed to evaluate the effectiveness of acceptance and commitment therapy on cognitive tolerance and cognitive flexibility in patients with type 2 diabetes.

Methods:

The research method was quasi-experimental with a pretest-posttest design with a control group. The statistical population of the present study was 218 type 2 diabetic patients referred to the specialized and sub-specialized clinic of mother diabetes center name Touba and Mostafavian clinic in Sari in winter 1398 and spring 1399.Thirty patients were selected as the sample by purposive sampling and randomly assigned to experimental (n = 15) and control (n = 15) groups. The required number of samples was considered with 95% reliance level and 10% drop rate for each group of 15 people. entrance criteria included the followings: receiving a diagnosis of type 2 diabetes, age between 40 and 65 years, at least middle School degree education, being married, not receiving other psychological treatment during the research, not experiencing a stressful event such as divorce, death of loved ones, job loss or Accident, non-use of psychiatric medication during the past 3-month, completion of an informed consent agreement to participate in the research project. Exclusion criteria included the followings: absence of more than two sessions in treatment, having one of the diagnoses of disorders based on a 5 DSM-structured clinical interview by a psychologist or psychiatrist, diagnosis of psychiatric drug use or substance during the 3-month period It was over. Ethical considerations of this study included the followings: a) All participants

in the study participated voluntarily and willingly. B) Regarding the principles of confidentiality of the participants' identities, they were assured that all information will remain confidential. C) At the end of the training, the participants in the research were praised and thanked. D) Participants are free to leave the group whenever they wish to quit. Research tools:

Emotional Anxiety Tolerance Scale: This scale was designed by Simons and Gaher in 2005. Which has 15 items and is answered on a five-point scale (1 = strongly agree, 2 = slightly agree, 3 = neither agree nor disagree, 4 = slightly disagree and 5 = strongly disagree). The scale has an overall score of emotional anxiety tolerance and four subscales. In the original version, the alpha coefficients for this scale were reported to be 0.72, 0.82, and 0.70, respectively, and for the entire scale to be 0.82. It has also been reported that this questionnaire has good standard validity and initial convergence [22]. Alevi, in his research showed that the whole scale has high internal consistency reliability ($\alpha = 0.71$) and subscales have moderate reliability (for tolerance 0.54, absorption 0.42, evaluation 0.56, adjustment 0.58) Are [23]. In this study, Cronbach's alpha was 0.79 for the whole scale and 0.86 for tolerance, 0.62 for absorption, 0.58 for evaluation and 0.74 for adjustment.

Cognitive flexibility questionnaire: flexibility questionnaire was made by Dennis and Wal in 2010. This questionnaire consists of 20 items and used to evaluate the progress of the individual in clinical and non-clinical work and to create flexible thinking in the cognitive-rheumatoid depression therapy and other mental illnesses. For each questionnaire phrase, there is a seven-point Likert rating scale with a value of 1 to 7. A higher score indicates greater cognitive flexibility and a lower score close to 20 indicates lower cognitive flexibility. In the original version, the simultaneous validity of this questionnaire was obtained with Beck Depression Inventory equal to -0.39 and its convergence validity was obtained with Martin and Robin Cognitive Flexibility Scale of 0.75 [24]. In Iran, Fazeli et al. Reported a Cronbach's alpha coefficient of 0.75 [25]. In the present study, the calculated Cronbach's alpha is 0.91.

The intervention was performed on the experimental group. After completing the informed consent form by the patients, 8 sessions of acceptance and commitment therapy (one session per week, for 90 minutes) were performed for the intervention group. But no intervention was performed in the control group. At the end of 8 sessions, both groups were re-examined. Research tools were used to collect information before and after the intervention. A summary of the content of acceptance and commitment therapy training is presented in Table 1 [26].

Table 1- Summary of the content of acceptance and commitment therapy training

Session	Subject Session and Assignments
1	greetings, getting to know and introducing the group members to the therapist and to each other; Expressing people's feelings before coming to the meeting; The reason for coming to this meeting and the expectations they have from the treatment sessions; Expressing

	similar previous experiences; Expressing the rules that must be observed in the group, such as: not arriving on time (punctuality), doing homework, etc.; expressing the principle of confidentiality and mutual respect of group members to each other.
2	Explain and express the principle why the need for psychological interventions? Creating hope and expectation of treatment in reducing these pressures; Expressing the principle of accepting and recognizing feelings and thoughts about problems, raising awareness in the field that thoughts as thoughts and; Accept emotions as emotions and memories only as memories; Provide homework on self-acceptance and feelings of illness.
3	Review of previous session assignments; Talk about the feelings and thoughts of the band members; Teaching members to accept their thoughts and feelings without judging whether they are good or bad; Teaching and recognizing emotions and their differences with thoughts and feelings; Assigning how much we accept ourselves and our feelings and how much we accept others and others' feelings?
4	Homework review; Introduce mindfulness technique and focus on breathing; Introducing the technique of being present in the moment and stopping thinking; Re-emphasis on the principle of acceptance in recognizing feelings and thoughts; Emphasis on recognizing feelings and thoughts with a different perspective; Assignments: Look at life events (annoying) in a different way and do not see addiction as the end of the work and think of it only as a disease and nothing more.
5	Homework review; Educate and build on the difference between acceptance and submission and be aware of what we cannot change; Recognize the subject of judgment and encourage members not to judge their own feelings; Presenting this technique of being aware of the existence of their emotions by being aware of the mind at every moment, only witnessing them but not judging; Provide mindfulness homework with non-judgmental acceptance.
6	Provide feedback and short surveys of the training process; Asking group members to express their feelings and emotions about the tasks of the previous session; Teaching and presenting the principle of commitment and its necessity in the process of education and treatment, presenting the technique of selective attention for more calm about the influx of negative spontaneous thoughts; re-training the mindfulness along with scanning the body.
7	Provide feedback and search for unresolved issues in group members; Identify behavioral plans for accepted matters and make a commitment to act on them; Creating the ability to choose between different options, so that it is more convenient, not more practical.
۸	Homework review; Conclusion; Obtaining commitment from members to do homework after the end of the course; Presenting feedback to group members, appreciating and thanking them for attending the meetings; Post-test run.

In order to describe the data, central indices of mean and standard deviation and multivariate analysis of covariance were used using SPSS software version 23. P value less than significant 0.05 was considered.

Results:

In this study, 30 patients with type 2 diabetes (19 females and 11 males) were divided into two groups of 15 (experimental and control). There was no shedding in any of the experimental and control groups during the intervention and until the end of the study. The age range was 65-40 years. Also, in terms of education, 7 (23.3%) had a diploma and lower, 14 (46.7%) had a post-diploma and 9 (30%) had a bachelor's degree or higher. Table 1 shows the mean and standard deviation of the experimental and control groups in the pre-test-post-test conditions in the variables of stress tolerance and cognitive flexibility.

Table 2 - Descriptive indicators of research variables in experimental and control groups

Variable	stage	Control	Test acceptance and commitment therapy
		Mean±SD	Mean±SD
Tolerance	pre-exam	2.57±6.78	2.87±6.88
	Post-test	2.31±6.36	3.30±9.31
Absorption	pre-exam	3.24±6.994	3.03±7.12
	Post-test	3.55±7.74	3.28±10.28
Assessment	pre-exam	4.24±12.29	4.12±12.37
	Post-test	3.47±11.89	4.04±16.88
adjustment	pre-exam	2.74±6.58	3.12±6.36
	Post-test	2.27±5.78	2.87±8.21
Tolerance of anxiety	pre-exam	7.63±29.33	7.88±31.33
	Post-test	6.94±28.20	7.62±43.93
Cognitive flexibility	pre-exam	8.85±60.13	8.78±61.00
	Post-test	7.51±59.27	7.50±87.60

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According to the results of Table 2, in the experimental group compared to the control group, the post-test scores of variable anxiety tolerance and cognitive flexibility increased compared to the pre-test, indicating the effect of acceptance and commitment therapy on increasing anxiety tolerance and cognitive flexibility. To determine the significance of this difference, due to the need to inhibit the effect of the pretest, the analysis of covariance was used, the results of which are presented in Table 3. Before using the analysis of covariance, its hypotheses were tested. Shapiro-Wilk test was used to evaluate the normal distribution of pre-test and post-test scores .Accordingly, a significance level for all greater than 0.05 was considered and the assumption of normality of variables, the distribution of scores was accepted. Another assumption of multivariate analysis of covariance was the homogeneity of variance of dependent variables between groups, which was evaluated by Levin test. Levin test results were not significant in any of the variables. Therefore, the hypothesis of homogeneity of variance of variables was confirmed. Box test was used to examine the homogeneity of the covariance matrix and its significance level was 0.314. Since this value was greater than the significance level (0.001) required to reject the null hypothesis, the covariance matrix homogeneity was confirmed.

Table 3 - Results of multivariate analysis of covariance to compare anxiety tolerance and its components and cognitive flexibility in experimental and control groups

result	Test	Amounts	F	Degree of freedom	Degree of error freedom
group	Pilay trace	0.775	**13.57	2	27
	Wilks Lambda	0.841	**31.27	2	27
	hotelling's trace	0.378	**16.57	2	27
	The largest root on	0.548	**31.38	2	27

The results of Table 3 showed that the significance level of all four relevant multivariate statistics, namely Pilay trace, Wilkes lambda, hoteling effect and largest zinc root, was less than 0.001. Thus, it was found that there was a significant difference between the experimental and control groups in scores related to blood sugar, anxiety tolerance and cognitive flexibility in the post-test. The results of analysis of covariance showed that the mean tolerance of cognition and cognitive flexibility also increased in the experimental group, in the post-test compared to the pre-test and in comparison, with the control group and did not show much change in the control group. The results of univariate analysis of covariance analysis of anxiety tolerance and cognitive flexibility in the post-test of the experimental and control groups are presented in Table 4.

Table 4- Results of univariate analysis of covariance analysis of anxiety tolerance and cognitive flexibility in post-test of experimental and control groups

Variable	Source	total roots	Degrees of freedom	Average squares	F	Significance level	Eta coefficient
Tolerance of anxiety	pre-exam	346.22	1	346.22			
	group	1628.64	1	1628.64	34.62	0.001	0.46
Cognitive flexibility	pre-exam	984.38	1	984.38			
	Group	1357.76	1	1357.76	71.89	0.001	0.53

Based on the results of Table 4, the observed significant level for the difference between the mean anxiety tolerance of the treatment group based on acceptance, commitment and control (P = 0.001 = 34.62) is less than 0.05. Therefore, acceptance and commitment treatment had an effect on increasing the anxiety tolerance scores of the experimental group compared to the control group. The value of ETA squared (0.46) shows that about 46% of the changes in the post-test scores of the dependent variable are explained by the treatment method based on acceptance and commitment. Also, the observed significance level for the difference between the mean of cognitive flexibility of the treatment group based on acceptance, commitment and control (P = 0.001 = 71.89, P = 0.001) is less than 0.05. Therefore, acceptance and commitment therapy had an effect on increasing the cognitive flexibility scores of the experimental group compared to the control group. The ETA squared value (0.53) indicates that about 53% of the changes in the post-test scores of the dependent variable are explained by acceptance and commitment therapy.

Discussion and Conclusion:

The aim of this study was to evaluate the effectiveness of acceptance and commitment therapy on anxiety tolerance and cognitive flexibility in patients with type 2 diabetes. The results showed that acceptance and commitment therapy was effective on anxiety tolerance. This finding was consistent with the results of other studies. Amirian et al. Showed that acceptance and commitment therapy increases anxiety tolerance. [19]. Explaining this finding, we can say that in commitment and acceptance therapy, by emphasizing people's desire for inner experiences, they can help them to experience their disturbing thoughts only as a thought and the ineffective nature of their current program. Be aware and instead of responding to it, do what is important to them in life and in line with their values. This treatment also reduces the psychological anxiety of these patients by focusing on different metaphors and focusing on pain and suffering and liberating the mind and avoiding avoiding internal experiences by using metaphors and trainings provided in the treatment session. In acceptance and commitment therapy, people are taught to improve their living

conditions, achieve personal values and problems instead of intellectually and practically avoiding thoughts and social situations by increasing psychological acceptance of inner experiences. Less likely to avoid it, thereby increasing their tolerance for anxiety and their mental health and well-being.

In fact, active and effective confrontation with emotions, avoidance of avoidance, change of self-attitude and challenges, review of values and goals of life and finally commitment to a social goal can be considered as the main factors of this method. Encouraging patients with diabetes to recognize their values and set goals, actions, barriers, and ultimately a commitment to achieve them in order to achieve goals and move in the direction of values despite the problems, while achieving goals and happiness caused by That life satisfaction will increase and these people will be freed from being caught in the circle of negative thoughts and emotions such as anxiety, stress, despair, hopelessness and depression that increase the severity of problems, which will eventually increase the threshold of tolerance for anxiety .

Commitment-based therapy can greatly reduce negative emotions such as stress and anxiety by changing the way we think and changing the way we think and perceive the suffering and harm that human life requires. Stress is one of the causes of hyperglycemia in diabetic patients (19).

Another finding of this study showed that acceptance and commitment therapy was effective on cognitive flexibility. This finding was consistent with the results of other studies. Hosseini et al. [19] as well as Enberg et al. [21] showed that acceptance and commitment therapy increases cognitive flexibility. Explaining this result, it can be said that the acceptance and commitment therapy training program has helped the subjects to accept their thoughts and feelings and to be committed to the changes that have taken place.

This treatment helps people to experience their annoying thoughts as just a thought, to become aware of the dysfunctional nature of their current plan, and instead of responding to it, to do what is important to them in life and in line with their values. They are walking. This training program also helps people to realize that having a healthy life is not necessarily accompanied by feeling very good, but the goal is to have both a good feeling and a good life [20]. If people are psychologically healthy when they experience emotions as they are, when circumstances cause them to feel bad and experience bad emotions.

When people's interpretations of messages prevail, they will not be able to defend themselves against those feelings, and vice versa, when emotions can only have their true meaning, or in other words, a little emotion from the past. They bring them to the present. In fact, centralized processes of commitment-based acceptance teach individuals how to let go of the thought of deterrence, get rid of annoying thoughts instead of being conceptualized, strengthen the observer, and accept events instead of controlling them.[21]

Research Limitations:

One of the limitations of this study is that the reviews and interviews were in accordance with several sessions of psychotherapy and there was no time for follow-up courses. Treatment training sessions were also associated with many problems such as justifying timely attendance at meetings, not absent from treatment sessions and other cases. Also, since the study in the city of Sari means that it has been done only in one place and city, care should be taken in generalizing the results to the whole country or to all patients with type 2 diabetes. According to the results of this study, it is recommended to therapists to conduct different researches in different populations (age, education, etc.). Also use other therapeutic interventions.

Gratitude

This article is taken from the doctoral dissertation of the first author and has the code of ethics IR.IAU.SARI. REC.1399.096 is from Islamic Azad University, Sari Branch. The authors would like to thank all the participants in this study and all those who contributed effectively to this research.

References:

1. Zimmet PZ. Diabetes and its drivers: the largest epidemic in human history?. Clinical diabetes and endocrinology, 2017; 3(1):1-8.

2. Karadere ME, Yavuz KF, Asafov EY, Küçükler FK. Reliability and validity of a Turkish version of the acceptance and action diabetes questionnaire. Psychiatry investigation, 2019;16(6):418.

3. Care D. Economic Costs of Diabetes in the US in 2017. Diabetes care, 2018; 41(5): 917-928.

4. Yazdi M, Saffarinia M, Zare H. Comparison the efficacy of life-based treatment and emotional regulation therapy on HbA1C biological markers and blood glucose in patients with type 2 diabetes. Quarterly Journal of Health Psychology, 2020; 9(33): 61-78. [In Persian]

5. faal M, atef vahid T, MadadiTaeme Z, shaaban N, amani O. The Effectiveness of Accepted and Commitment Group Therapy on Psychological Flexibility and Family Communication Patterns in Women with Type 2 Diabetes. Iranian Journal of Psychiatric Nursing, 2019; 7 (4):41-49. [In Persian]

6. Ramaci T, Bellini D, Presti G, Santisi G. Psychological Flexibility and Mindfulness as predictors of individual outcomes in hospital health workers. Frontiers in Psychology, 2019;10:1302.

7. Moradzadeh F, Pirkhaefi AR. The effectiveness of acceptance and commitment therapy on marital satisfaction and cognitive flexibility among married employees of the welfare office. Iranian Journal of Psychiatric Nursing, 2018; 5(6): 1-6. [In Persian]

8. Buttelmann F, Karbach J. Development and plasticity of cognitive flexibility in early and middle childhood. Frontiers in psychology, 2017;8:1040-44.

9. Jaser SS, Datye K, Morrow T, Sinisterra M, LeStourgeon L, Abadula F, Bell GE, Streisand R. Positive psychology intervention to treat diabetes distress in teens with type 1 diabetes: Rationale and trial design. Contemporary Clinical Trials, 2020;96:106086.

10. Potter CM, Vujanovic AA, Marshall-Berenz EC, Bernstein A, Bonn-Miller MO. Posttraumatic stress and marijuana use coping motives: The mediating role of distress tolerance. Journal of anxiety disorders, 2011; 25(3): 437-43.Link

11. Hosein Esfand Zad A, Shams G, Pasha Meysami A, Erfan A. The Role of Mindfulness, Emotion Regulation, Distress Tolerance and Interpersonal Effectiveness in Predicting Obsessive-Compulsive Symptoms. Iranian Journal of Psychiatry and Clinical Psychology, 2017; 22 (4) :270-283. [In Persian]

12. Roohi R, Soltani A A, Zinedine Meimand Z, Razavi Nematollahi V. The Effect of Acceptance and Commitment Therapy (ACT) on Increasing the Self-Compassion, Distress Tolerance, and Emotion Regulation in Students with Social Anxiety Disorder. Journal of Children Mental Health, 2019; 6 (3) :173-187.[In Persian]

13. Kozak AT, Fought A. Beyond alcohol and drug addiction. Does the negative trait of low distress tolerance have an association with overeating? Appetite, 2011;57(3):578-81.

14. Nasiri F, Omidi A, Mozaffari M, Mousavi SGA, Joekar S. Effectiveness of group acceptance and commitment therapy (ACT) on Self-care and HbA1C in type II diabetic patients. FEYZ, 2020; 24(2): 209-218.[In Persian]

17. Duff H, Larsson A, McHugh L. Evaluations of self-referential thoughts and their association with components of Acceptance and Commitment Therapy. J Contex Behav Sci, 2016; 5(1): 39-47.

16. Bardeen JR, Fergus T. The interactive effect of cognitive fusion and experiential avoidance on anxiety, depression, stress and posttraumatic stress symptoms. J Con Behav Sci, 2016; 5(1): 1-6.

17. Bendig E, Bauereiss N, Schmitt A, Albus P, Baumeister H. Act on Diabetes—a guided psychological internet intervention based on Acceptance and Commitment Therapy (ACT) for adults living with type 1 or 2 diabetes: results of a randomized controlled feasibility trial. BMJ open, 2021;11(7):e049238.

18. Sakamoto R, Ohtake Y, Kataoka Y, Matsuda Y, Hata T, Otonari J, Yamane A, Matsuoka H, Yoshiuchi K. Efficacy of acceptance and commitment therapy for people with type 2 diabetes: Systematic review and meta-analysis. J Diabetes Investigation, 2021; 4(6): 21-36.

19. Amirian K., Mami S., Ahmadi V., Mohamadzadeh J.. Effectiveness of Group Psychotherapy Based on Acceptance and Commitment Therapy on Difficulties Emotion Regulation and Distress Tolerance in Substance Abusers. Journal of Education and Community Health, 2022; 5(2): 53-61. [In Persian]

20. Einbeigi A, Soleimanian AA, Jajarmi M. Comparing the Effectiveness of Acceptance and Commitment Therapy and Existentialism Therapy on Increasing Improving Cognitive Flexibility in the Elderly. J North Khorasan University of Medical Sciences, 2021;13(1):85-92.

21. Hosseini SF, Karimi J, Ghadampour E. The Effectiveness of Acceptance and Commitment Therapy on Cognitive Emotion Regulation Strategies and Cognitive Flexibility in Gastrointestinal Patients. Yafteh, 2021;23(2).[In Persian]

22. Simons JS, Gaher RM. The Distress Tolerance Scale: Development and validation of a self-report measure. Motivation and emotion, 2005;29(2):83-102.

23. Alavi Kh, Modarres Gharavi M, Amin-Yazdi SA, Salehi Fadardi J. Effectiveness of group dialectical behavior therapy (based on core mindfulness, distress tolerance and emotion regulation components) on depressive symptoms in university students. Journal of Fundamentals of Mental Health, 2011; 13(2): 124-35. [In Persian]

24. Dennis JP, Vander Wal JS. The cognitive flexibility inventory: Instrument development and estimates of reliability and validit. Cognition Therapy Research, 2010; 34, 241-253

25. Fazeli, M., Ehteshamzadeh, P., Hashemi, S. The effectiveness of cognitive behavior therapy on cognitive flexibility of depressed people. Thoughts and Behavior in Clinical Psychology, 2015; 9(34): 27-36.[In Persian]

26. Ayes SC. A Practical Guide to Acceptance and Commitment Therapy. New York. Springer Science and Business, Media Inc. 2008; 168.

27. Ngan HY, Chong YY, Chien WT. Effects of mindfulness-and acceptance-based interventions on diabetes distress and glycemic level in people with type 2 diabetes: Systematic review and meta-analysis, 2021; 38(4): 14525.