→ **Research Article**

Effectiveness of Acceptance and Commitment Therapy Intervention on Healthy Lifestyle and Self-Care Indicators in Type 2 Diabetic Patients

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Abstract

Background: It is necessary to help type 2 diabetic patients solve diabetes problems by identifying factors affecting healthy lifestyle and self-care indicators that can be improved using different psychological approaches. This research aimed at determining the effectiveness of the acceptance and commitment therapy (ACT) intervention on healthy lifestyle and self-care indicators in type 2 diabetic patients.

Methods: This was a quasi-experimental study with a pre-test, post-test, and follow-up with a control group. The statistical population of the study consisted of patients with type 2 diabetes in the age range of 30-60 years at the Diabetes Clinic of Zahedan University of Medical Sciences in 2019. The sample included 40 patients with type 2 diabetes selected by a convenient sampling method and assigned to ACT (n = 20) and control (n = 20) groups using a simple randomization method. ACT training was performed in 9 sessions for 90 minutes. Data were collected through the lifestyle questionnaire and self-care behavior questionnaire and analyzed by the multivariate analysis of covariance using SPSS 22.

Results: The findings indicated that ACT was effective in increasing healthy lifestyle ($P = 0.022$) and self-care indices ($P < 0.001$) in type 2 diabetic patients.

Conclusion: Overall, ACT could affect healthy lifestyle and self-care indicators in type 2 diabetic patients. Thus, it can be used for decreasing type 2 diabetic patients' psychological problems.

Keywords: Diabetes mellitus, Self-care, Health lifestyle, Acceptance, Commitment therapy

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Background

Diabetes is a chronic disease that, like other chronic diseases, encounters the patient with many challenges; these problems include pressures caused by disease control, observance of treatment plans, complicated and costly care, a need to repeatedly visit the doctor and perform various tests, concerns about the future of the disease, the likelihood of children, disruption of family and community relations, sexual problems, and disruption of work (1). Diabetes is a common metabolic disorder in the world that is associated with increased blood sugar, insufficient secretion, or insulin dysfunction (2). A group of common metabolic disorders that are common in the phenotype of hyperglycemia involves diabetes. The global prevalence of diabetes mellitus dramatically increased from about 30 million in 1985 to 285 million in 2010 (3).

Self-care behaviors are among the variables that improve patients with type 2 diabetes (4). Appropriate self-care behaviors promote capabilities, helping patients better perform their daily activities and achieve independence. Thus, the patient becomes more capable of performing social functions and more hopeful for life, and ultimately, enjoys a more desirable life quality. Patient education aims at empowering him by giving him the necessary information about diabetes and self-care skills. The patient will be able to make important decisions about his health. This type of education is one of the nursing group's duties and an essential factor for improving the quality of life and reducing patient treatment (5).

Available evidence suggests that the main goal of treatment in diabetes, as a disease based on metabolic problems, should be to relieve the disease's physical signs and symptoms and improve patient's lifestyle. A healthy lifestyle is a multidimensional model of perceptions and actions initiated by the individual's motivation that helps sustain and strengthen the health and self-concept of the person and expresses the human tendency to excellence that leads to optimal well-being, individual development, and creative life. In addition, it can have dimensions of responsibility for health, spiritual growth, interpersonal relationships and self-cooperation, physical activity, nutrition, and stress management (6). Based on research, the World Health Organization has estimated that up to 90% of type 2 diabetes can be avoided by changing lifestyles. The prevalence of diabetes is strongly associated

with changing people's lifestyles (6).

Some researchers believe that the use of acceptance and commitment therapy (ACT) has a latent mechanism such as acceptance, observation without judgment, confrontation, presence at the moment, and release in combination, along with traditional cognitive behavior therapy techniques can increase the effectiveness while reducing the symptoms of the disease (7). Paying attention to the interaction of physical and psychological factors in the etiology, control, and treatment of diseases and evaluating the effect of different treatments on the psychological indicators of patients with diabetes is one of the priorities of health policymakers, especially the Ministry of Health Medical Education. ACT is one of the third-wave treatments, which has recently been used in physical and psychological health problems (8). In this treatment, it is essential to establish a working relationship because it provides conditions for treatment (9). When the therapeutic relationship is correctly established and its principles are followed, it indirectly strengthens acceptance and motivation and continues treatment, and moves toward one's values. During this period, a tissue is created in which both good and useful behaviors are called, during which the authorities find the necessary skills to identify and apply appropriate behaviors. One of the main goals of the ACT is to increase psychological flexibility. In other words, it helps the person to get himself out of the cycle of avoidance and cognitive fusion (10).

Gillanders et al suggested that cognitive fusion is the strongest predictor of anxiety symptoms in people with cancer (11). In their research, Levin et al concluded that ACT impacted people's mental health (12). In a study focusing on improving diabetes self-learning and mental health through acceptance and commitment to treatment, A-Tjak et al found that useful interventions are useful for improving the self-care and mental health of diabetic patients (13).

Objectives

This research aimed to determine the effectiveness of the ACT intervention on healthy lifestyle and self-care indicators in type 2 diabetic patients.

Methods

The statistical population of this quasi-experimental research with a pre-test, post-test, and follow-up design with a control group included 30-60 years old patients with type 2 diabetes referred to diabetes clinics at Zahedan University of Medical Sciences in 2019. The sample consisted of 40 patients with type 2 diabetes selected by the convenient sampling method and assigned to ACT (n = 20) and control (n = 20) groups using a simple randomization method. It should be noted that the number of research samples was selected to be 40 people based on the effect size of 0.25, alpha 0.05, and power of 0.80. Considering the number of lost samples

according to previous studies, the probability of sample loss in this study was 5 people in each group. The follow-up period was performed two months after the end of the sessions. The inclusion criteria included type 2 diabetes with physician's approval for at least one year, hemoglobin A1c level above 7%, a minimum age of 30, lack of psychological treatment from diagnosis time, acute or chronic medical failure in patients' medical records such as epilepsy, skeletal diseases, and heart and respiratory failures that cause problems in blood sampling and long session tolerance. The other inclusion criteria were no severe mental illnesses such as psychotic disorders and non-use of psychotropic drugs or substance abuse approved by a psychologist. On the other hand, severe complications of diabetes leading to a hospital stay, absence of more than two sessions in treatment sessions, and major stresses due to unpredicted accidents were considered as the exclusion criteria. After the end of the sessions and in the final session, the subjects of all three groups completed the research questionnaires again, and the research questionnaires were performed one month after the end of the training course. The present study's ethical considerations were as follows:

All individuals received written information about the research and participated in the research if they wished to. The assurance was given to individuals that all information is confidential and used for research. In addition, the participants' names and surnames were not registered to respect their privacy.

Lifestyle Questionnaire

This questionnaire was constructed to evaluate and measure lifestyle. The final version of the Lifestyle Questionnaire has 70 questions in the Likert spectrum that are scored as always (3), usually (2), sometimes (1), and never (0). In a study, Melby et al obtained Cronbach's alpha in a range between 0.78 and 0.89 (14). Mohammadi et al (15) study showed that Cronbach's alpha coefficients ranged between 0.77 and 0.88. Further, the re-analysis coefficients ranged from 0.84 to 0.94 (15).

Self-care Behaviors Questionnaire

This three-part standard questionnaire was collected by the interview method. This scale has 12 questions. On this scale, each behavior is given a score from zero to seven based on the number of days a week so that if a person has performed the desired behavior in the last seven days of the week, the full score is 7, and if it is not performed on any days of the week, the score is zero. Furthermore, a total adherence score is obtained by collecting the scores of each question. The total score of the scale was -0.77. Cronbach's alpha coefficient for the construct of self-care behaviors was 0.66 in the pilot study and 0.68 in all samples (16). Moreover, to determine the instrument's scientific trust, the self-care scale was available to 30 diabetic patients who were eligible for the research.

The Cronbach's alpha coefficient of the whole scale (12 questions) was 0.76 in Iran (17).

Therapy sessions were conducted for 60 minutes every week for 10 weeks. Topics included in each session were establishing therapeutic relationships, familiarizing people with the subject of research, responding to questionnaires, and closing treatment contracts, as well as discovering and evaluating treatment methods and evaluating their effects, discussing temporary and ineffective treatments using metaphors, receiving feedback, and providing tasks. Additionally, the other topics were helping authorities to identify inefficient control strategies and to recognize their futility, accepting painful personal events without conflicting with them using allegory, receiving feedback, and providing tasks. In addition, other investigated topics included explaining about avoiding painful experiences and awareness of its consequences, teaching acceptance steps, changing language concepts using allegory, teaching relaxation, receiving feedback, and providing assignments. Further, introducing a 3D behavioral model in order to express the common relationship between behavior/emotions, psychological functions, and visible behavior and discuss efforts to change behavior based on it, receiving feedback, and providing assignments were among the other topics that underwent investigation. In other sessions, the concepts of the role and context were explained, followed by observing oneself as a context and establishing self-contact using metaphors, awareness of different sensory perceptions, and separation from feelings that are part of subjective content. Further, the concept of values was explained and patients were motivated to change and empower references for a better life and practiced concentration, resulting in receiving feedback, and providing assignments. Finally, training commitment to action, identifying behavioral plans in accordance with values, and making commitments to act on them, as well as summing up meetings and performing post-test and relapse prevention were the remaining discussed topics (18).

Frequency tables and charts, as well as central indices and distribution indices such as mean and standard deviation, were calculated in the descriptive statistics section. In addition, the multiple covariance analysis was used in the inferential statistics section. The above-mentioned statistical analyzes were performed using SPSS software, version 22.

Results

Participants in this study were between 31 and 55 years of age, and 69.76% and 30.24% of them were males and females, respectively. The mean (standard deviations, SD) age for the experimental and control groups was 43.26 (10.11) and 43.50 (9.73), respectively ($P > 0.05$). Table 1 presents the mean (SD) of the variables of a healthy lifestyle and self-care measures in the experimental and control groups.

The homogeneity of the variance-covariance matrices has been well observed since the Box's M test was not significant for any of the research variables. Moreover, the lack of significance of any of the variables in Levene's test showed that the equality of intergroup variances was observed, and the level of variance of the dependent variable error in all groups was equal. Finally, examining the results of Mauchly's test of sphericity revealed that this test was significant for the quality of life, indicating that the assumption of the equality of intra-subject variances (sphericity assumption) has not been observed (Mauchly's W = 0.39; $P = 0.31$). The Wilks' lambda test with a value of 0.12 and the F = 95.32 test demonstrated a significant difference between the effectiveness scores of ACT on improving healthy lifestyle and self-care indicators in the experimental and control groups at a significance level of 0.0001.

Based on the results of multiple analyses of covariance in Table 2, ACT was effective in healthy lifestyle (F = 5.87, $P = 0.022$) and self-care indicators (F = 10.12, $P < 0.001$) in type 2 diabetic patients.

Discussion

This research attempted to evaluate the effectiveness of ACT on healthy lifestyle and self-care indicators in type 2 diabetic patients. The results represented that ACT could affect healthy lifestyle and self-care indices in type 2 diabetic patients, which is in line with the results of Gillanders et al (11) and Levin et al (12).

In explaining that acceptance and commitment intervention affects the healthy lifestyle of type 2 diabetic patients, it can be indicated that the approach based on the commitment and acceptance of psychological inflexibility and avoidance of acceptance of disturbing emotions and thoughts can lead to the strengthening of these feelings and their thoughts and annoyances. In this

Table 1. The Mean and Standard Deviation of Research Variables in Experimental and Control Groups

Variables	Experimental Group		Control Group	
	Pre-test	Post-test	Pre-test	Post-test
Healthy lifestyle	29.16 ± 4.05	39.42 ± 8.57	30.60 ± 4.43	31.09 ± 4.15
Self-care indicators	25.59 ± 5.31	34.34 ± 8.36	26.42 ± 6.19	27.71 ± 6.43

Table 2. Results of Covariance on Healthy Lifestyle and Self-care Indicators in Control and Experimental Groups

Dependent Variable	SS	df	MS	F	P Value
Healthy lifestyle					
Group	263.51	1	263.51	5.87	<0.022
Error	1256.97	28	44.89		
Self-care indicators					
Group	356.11	1	356.11	10.12	<0.001
Error	64.083	28	78.002		

Note. SS: Sum of squares; df: Degree of freedom; MS: Mean squares.

approach, the individual is helped to focus on the present and to identify his/her values and even act following his/her values and objectives even with negative thoughts and feelings. One learns to accept them instead of trying to control their internal events and take steps to achieve their goals and values, thus improving the individual's overall performance at the individual and family level. Patients treated with this approach learn to identify goals consistent with their values instead of drowning in problems related to their illness and the hardships they may face in the future. Even despite the exhausting thoughts and feelings that cause a person's depression and reduce their healthy lifestyle, they are committed to their goals so that they can better and more efficiently manage their lives and conditions. In addition to mental and physical peace and social relationships, they enjoy a healthier and happier life (9).

On the other hand, the treatment of ACT challenges and humiliates the reality of one's thoughts. As a result of the disease, patients usually have many negative thoughts about themselves in their minds, consider those thoughts real, and judge themselves negatively. In the acceptance and commitment treatment, the negative aspects of mind and language are taken into consideration, helping the patient not to react and follow them despite the negative thoughts in his mind (10); for example, a person may think (I am a weak person) to try not to withdraw and avoid social activities but to be able to do his favorite activities. Serious and real assumptions of thoughts (cognitive faults) cause negative thoughts related to the disease to impact the individual, activities, and style of a healthy life.

Additionally, regarding the effect of acceptance and commitment-based intervention on the self-care indicators of type 2 diabetic patients, it can be explained that during the treatment of ACT, people learn to accept emotions without avoidance and get rid of the disturbing content of their thoughts with a more conscious focus on their thinking process and link it to goal-based practice. Increased acceptance in diabetic patients makes them more important to themselves and their health and to behave better and have more self-care behaviors; in other words, it helps them try to take prescribed medications and insulin on time, follow the recommended diet better, do more physical activity, and measure their daily blood sugar, which improves metabolism (9). Improving metabolism increases the permeability of muscle cell membranes to glucose due to increased glucose carriers in plasma membranes. Overall, the reason for teaching acceptance and commitment skills is that it is a more realistic alternative compared to other psychological stress reactions to diabetes, thus acceptance is especially necessary when a person's unpleasant experience cannot be changed, including experiencing lifelong diabetes. In addition, recognizing the cause of the disease and awareness of the disease's concepts leads to understanding the nature of the disease and adapting to diabetes (12).

Among the limitations of this research is the use of self-report tools. People's feedback or opinions and self-reports about themselves coming from these tests may be different from what we can observe in one's actions and behavior. Further, environmental and familial factors such as family conditions, parental status, and economic and social status were not controlled in this study. Another limitation of this research was the therapist's help. It is recommended that this analysis be performed on another study group and the findings be analyzed and compared to the results of this research. In future research, the researcher can use an expert as a therapist and treatment training, along with the experimental method to reduce the likelihood of bias. Furthermore, this research can be conducted in other cities. After group training, this study should be followed up as individual counseling. It is suggested that a wider community of type 2 diabetic patients be used to increase generalization to improve healthy lifestyles and self-care indicators of type 2 diabetic patients.

Conclusion
It can be concluded that ACT was effective on healthy lifestyle and self-care indicators in type 2 diabetic patients. Accordingly, it can be applied for decreasing type 2 diabetic patients' psychological problems.

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