

Comparing the Effectiveness of Acceptance and Commitment Therapy (ACT) and Dialectical Behavior Therapy Skills Training (DBT-ST) on Self-Care and Psychological Well-being in Patients with Type 2 Diabetes

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ABSTRACT

Objective: Diabetes is a chronic, multifaceted, threatening disease with significant psychological consequences. The present study aimed to compare the effectiveness of Acceptance and Commitment Therapy (ACT) and Dialectical Behavior Therapy Skills Training (DBT-ST) on self-care and psychological well-being in patients with Type 2 diabetes.

Methods and Materials: The present study was a quasi-experimental, pre-test-post-test with a control group design. The population included all patients with Type 2 diabetes visiting a medical clinic in the city of Sari, among whom 45 were conveniently selected and randomly assigned into two experimental groups (Acceptance and Commitment Therapy and Dialectical Behavior Therapy Skills Training) and one control group. Data were collected using the Self-Care Questionnaire (Toobert et al., 2000), and the Psychological Well-being Scale (Ryff & Keyes, 1995) at three stages: pre-test, post-test, and follow-up, and were analyzed using analysis of variance with repeated measures.

Findings: The results showed that both Dialectical Behavior Therapy Skills Training and Acceptance and Commitment Therapy were effective on the scores of self-care and psychological well-being. However, the effect of Acceptance and Commitment Therapy was greater than that of Dialectical Behavior Therapy Skills Training on the scores of self-care and psychological well-being.

Conclusion: Based on the results of this study, it can be stated that Acceptance and Commitment Therapy and Dialectical Behavior Therapy Skills Training, through cognitive coping strategies, can lead to the improvement of psychological indicators and enhance the mental and physical health of patients with Type 2 diabetes.

Keywords: Acceptance and Commitment Therapy, Dialectical Behavior Therapy Skills Training, Self-Care and Psychological Well-being, Type 2 Diabetes.

1. Introduction

Diabetes mellitus is a metabolic disorder with various causes, characterized by chronic hyperglycemia and disturbances in carbohydrate, protein, and fat metabolism. Diabetes results from defects in insulin secretion, insulin action, or usually a combination of both. Long-term complications of these metabolic disorders are a major cause of morbidity and mortality. The global prevalence of diabetes is increasing, and the economic burden associated with it is significant (Martino et al., 2020). There are two main types of diabetes: type 1 diabetes (insulin-dependent) and type 2 diabetes (non-insulin dependent). The global prevalence of diabetes is on the rise. While about 422 million people worldwide were affected by diabetes in 2014, it is estimated that 645 million people will have diabetes by 2040 (Al Hayek & Al Dawish, 2019).

According to the Centers for Disease Control and Prevention (2014), 34.2 million people of all ages, or 10.5% of the U.S. population, have diabetes. The prevalence of diabetes in Iran was about 7.7% in 2005, and it is projected to reach about 5.2 million cases by 2025 if the current trend continues (Hosseini et al., 2021). This disease is the most common cause of amputation, blindness, chronic kidney failure, and a risk factor for heart disease (Chang, 2010). The Global Burden of Disease, Injuries, and Risk Factors Study (GBD) in 2017 indicates that 1.37 million people die from diabetes worldwide annually. In Iran, from 2007 to 2017, over ten years, diabetes, with a 63% increase, is among the top 10 causes of premature deaths and is one of the major health and disability problems (Mojahed et al., 2019).

Diabetes is often accompanied by mental health problems, reducing the patient's ability to self-manage their disease (Hendrieckx et al., 2019). For example, longitudinal studies have shown that the rate of depression in people with diabetes is between 15 to 24% higher compared to people without diabetes. On the other hand, the prevalence of type 2 diabetes is also seen between 15 to 37% among those with depression, indicating a bidirectional relationship between these conditions (Bonora & DeFronzo, 2020). Sturt et al. (2015) believe that diabetes-related distress symptoms, such as worries about the future and the possibility of serious complications, guilt or anxiety when managing diabetes, and feeling discouraged from the diabetes diet, are seen in 60% of people with type 1 or type 2 diabetes being treated with insulin (Sturt et al., 2015). Furthermore, the reduced ability of patients to control diabetes exacerbates their mental

problems, trapping them in a vicious cycle (Al-Qahtani, 2020; İlhan et al., 2021).

One of the most important reasons for the exacerbation of diabetes and the occurrence of its complications is the lack of self-care (Guo et al., 2021). Self-care requires individuals to take care of themselves and be determined in following the prescriptions provided by the doctor for self-care (İlhan et al., 2021). Self-care is an active and practical process led by the patient, including specific activities to achieve disease management goals. In the self-care process, patients and their families understand behaviors affecting a medical condition (such as food consumption, carbohydrates, fats), and behaviors that prevent complications of a medical condition (such as foot care in diabetes, or regular ophthalmological examinations to control diabetic eye complications) and strategically employ these health behaviors over time (Al-Qahtani, 2020).

Patients with type 2 diabetes often do not have appropriate emotional responses due to the problems imposed by diabetes, such as diet, activity restrictions, invasive blood sugar monitoring, daily insulin injections, chronic physical complications, and hospitalization, and usually experience poor psychological well-being (Hosseini et al., 2021). Psychological well-being is one of the components of quality of life, referring to how individuals evaluate their lives and consists of cognitive and emotional components. The cognitive dimension refers to individuals' cognitive evaluation of their life satisfaction, and the emotional dimension means having maximum positive affect and minimum negative affect (Boehm, 2021; Randall et al., 2021). Researchers today believe that creating psychological well-being leads humans toward greater success in life, better health, more supportive social relationships, and ultimately higher mental and physical health (Randall et al., 2021).

Given the numerous problems faced by patients with type 2 diabetes, the presence of effective therapeutic methods to improve the psychological characteristics of these patients is essential. In the last two decades, psychologists have applied various psychological interventions for a wide range of psychological problems in people with diabetes. However, not all therapeutic methods have been highly effective. Among the new and structured approaches, Acceptance and Commitment Therapy (ACT) and Dialectical Behavior Therapy (DBT) can be mentioned (George & Joseph, 2014).

Acceptance and Commitment Therapy (ACT) is a psychological intervention based on modern behavioral and evolutionary principles, including Relational Frame Theory

(RFT), which applies mindfulness processes, acceptance, commitment, and behavioral change processes to create psychological flexibility (Luoma et al., 2007). Acceptance and Commitment Therapy differs from cognitive-behavioral therapy. Its underlying principles include 1) acceptance or willingness to experience pain or other disturbing events without trying to suppress them, and 2) value-based action or commitment coupled with the willingness to act as meaningful personal goals before eliminating unknown experiences. It's the verbal methods and cognitive processes that, in interaction with other verbal dependencies, lead to healthy functioning. This method includes exposure-based exercises, linguistic metaphors, and techniques such as mindfulness (Ahmadi & Valizadeh, 2021). The ultimate goal of this model is to increase the prevalence of valued living. Acceptance, contact with the present moment, defusion, self as context, values articulation, and commitment are the six core processes of this therapy (Hayes, 2002; Hayes et al., 2011). The main assumption of Acceptance and Commitment Therapy is that a significant portion of psychological distress is a normal part of human experience (Pears & Sutton, 2021). Acceptance and Commitment Therapy helps individuals experience problematic thoughts and emotions differently, not attempting to change or reduce their frequency systematically (Wagner et al., 2007).

On the other hand, Dialectical Behavior Therapy (DBT) is a cognitive-behavioral approach that Linehan identified as a treatment for individuals engaging in self-destructive behaviors. This approach blends interventions related to cognitive-behavioral therapy based on the principle of change with Eastern teachings and techniques based on the principle of acceptance, thereby proposing four intervention components: 1) fundamental and pervasive mindfulness and 2) distress tolerance (as acceptance components); 3) emotional regulation and 4) interpersonal effectiveness (as change components). Dialectical Behavior Therapy is a combination of methods related to supportive, cognitive, and behavioral therapies (Miller et al., 2006). Miller, Rathus, and Linehan state that the goal of Dialectical Behavior Therapy is to increase self-esteem, achieve individual goals, and resolve feelings of defectiveness (Sheets, 2009). According to Sheets, Dialectical Behavior Therapy teaches skills for managing stress and difficult emotional states and focuses on current problems and concerns here and now that lead to troublesome behaviors and emotions.

In general, regarding the importance and necessity of this research, it can be said that type 2 diabetes is one of the chronic medical diseases that affects all aspects of the

patient's life and incapacitates the person against problems. In this context, attention to psychological aspects in the prevention and treatment of diabetes has been of interest to health professionals in recent decades, and the perspective on chronic medical diseases based on the biopsychosocial approach necessitates paying more attention to the psychological aspects of these diseases. Therefore, given the existence of various psychological problems in patients with diabetes and the recent increase in its prevalence in Iranian society, conducting new research on new and effective psychological treatments to reduce the psychological and physical problems of patients with diabetes seems necessary. In this regard, reviewing available previous research showed that they mostly referred to the existence of physical and psychological problems such as stress, anxiety, anger, depression, low self-care, and psychological well-being in diabetic patients, and so far, no research has directly examined the effectiveness of Acceptance and Commitment Therapy and Dialectical Behavior Therapy skills training on self-care and psychological well-being in patients with type 2 diabetes. Therefore, the novelty of this research is the use of Acceptance and Commitment Therapy and Dialectical Behavior Therapy skills training to improve the psychological symptoms of diabetic patients, and accordingly, the goal of the present research was to compare the effectiveness of Acceptance and Commitment Therapy and Dialectical Behavior Therapy skills training on self-care and psychological well-being in patients with type 2 diabetes.

2. Methods and Materials

2.1. Study Design and Participants

The present study utilized a quasi-experimental design, specifically a pre-test-post-test with a control group. The study population consisted of all patients with type 2 diabetes attending the Baghban (Tuba) Medical Clinic in the city of Sari. The sampling method in this study was purposive. To determine the sample size, the PASS software version 2021 was used. The standard deviation of one of the variables (psychological well-being) from previous similar studies served as the criterion parameter for sample size determination. Based on the calculated standard deviation (13.99) for psychological well-being in the study by Hosseini, Ahadi, Hatami, and Khalatbari (2021), the sample size for each group was estimated to be 15 individuals at a 0.05 error level and 80% power. From among the visitors to the Tuba Medical Clinic, 45 individuals were purposively

selected based on the research's inclusion criteria (diagnosis of type 2 diabetes by an endocrinology specialist, age between 25 to 45, minimum education of fifth grade, no severe mental disorder or incurable disease, and not undergoing other psychological interventions during the study) and were randomly assigned to two experimental groups undergoing Acceptance and Commitment Therapy and Dialectical Behavior Therapy Skills Training, and one control group. Exclusion criteria included absence from more than two therapy sessions. The first group received Acceptance and Commitment Therapy in eight 2-hour sessions, twice a week over four weeks. For the second experimental group, Dialectical Behavior Therapy Skills Training focusing on self-care and psychological well-being was conducted in twelve 2-hour sessions over six weeks according to a therapeutic guide. Initially, each group consisted of 15 participants, but one participant from each of the two experimental groups was excluded due to absence from more than two sessions. Consequently, one individual was randomly removed from the control group to equalize the groups, resulting in a final sample of 42 participants. For the first experimental group, Acceptance and Commitment Therapy was held in eight 2-hour sessions, twice a week over four weeks. In the second experimental group, Dialectical Behavior Therapy Skills Training was conducted in a group format focusing on self-care and psychological well-being in twelve 2-hour sessions over six weeks according to a therapeutic guide. The control group was placed on a waiting list without receiving any intervention. At the end of the sessions, participants from all three groups were separately invited for post-testing. After 45 days, all individuals participated in a third round of testing (follow-up) for the self-care and psychological well-being questionnaires.

In this study, to test the hypotheses and confirm or refute them, an analysis of variance with repeated measures was used. It is worth mentioning that the SPSS-21 software was utilized for data analysis. Ethical considerations in this research included obtaining informed consent from patients for their participation and ensuring the confidentiality of all obtained information. Participants were assured that their individual scores would be shared with them upon request. Thus, all participants joined the study with informed consent. The control group was assured that they would receive the intervention if they wished after the research concluded. Additionally, patients were free to withdraw from the study at any time. This research was conducted with the ethical approval code IR.IAU.SARI.REC.1399.060 from

the Ethics Committee of Islamic Azad University, Sari Branch.

2.2. Measures

2.2.1. Psychological Well-Being

The Psychological Well-Being Questionnaire by Ryff and Keyes (1995) consists of 84 items based on the model of psychological well-being. The construct of psychological well-being is composed of six factors: purpose in life, positive relations with others, personal growth, self-acceptance, autonomy, and environmental mastery (Ryff & Keyes, 1995). The questionnaire uses a 5-point scale (strongly disagree to strongly agree) with scoring from 0 to 4. Also, the reliability of this questionnaire has been obtained with a Cronbach's alpha test as 0.93. In the study by Bayani et al. (2008), the internal reliability of this test was reported as 0.82 (Bayani et al., 2008).

2.2.2. Diabetes Self-Care

A 15-item self-report questionnaire that examines patients' self-care criteria over the past seven days, covering various aspects of the diabetes treatment regimen including general diet and specific diabetes diet (5 questions), exercise (2 questions), blood sugar testing (2 questions), insulin injection or diabetes pill (1 question), foot care (4 questions), and smoking (1 question) (Toobert et al., 2000). In the study by Hamdzadeh et al. (2011), the content validity of the questionnaire was confirmed by 8 experts with an average of 0.84, and its reliability was obtained using Cronbach's alpha method as 0.78 (Hamadzadeh et al., 2013).

2.3. Interventions

2.3.1. Acceptance and Commitment Therapy

This protocol, developed by Hayes, Strosahl, & Wilson (2011) (Hayes et al., 2011), has been studied in various researches, indicating its effectiveness in treating chronic pain (Scott & McCracken, 2015), cancer (Hahn et al., 2018), and MS (Nordin & Rorsman, 2011). The stages of Acceptance and Commitment Therapy are briefly presented in Table 1. It's a novel behavioral treatment that employs acceptance and mindfulness interventions alongside change and commitment strategies to assist clients in building a meaningful, purposeful, and satisfying life. Unlike more traditional cognitive-behavioral approaches, Acceptance and Commitment Therapy does not aim to alter the form or

frequency of unwanted thoughts and emotions but rather focuses on enhancing psychological flexibility, i.e., the ability to connect with the present moment and act according to situational demands for changing or persisting behavior in

line with personal values. In other words, Acceptance and Commitment Therapy focuses on helping individuals live satisfactorily even in the presence of unpleasant thoughts, emotions, and sensations (Flaxman et al., 2011).

Table 1

Brief Description of Acceptance and Commitment Therapy Sessions

Session	Description
1	Pre-test and Introduction, Assessment of current problems and their development, problem-solving methods used so far, identification of problematic thoughts and feelings, values assessment, current life situation of the client, Agreement on treatment goals and therapy principles
2	Education about ACT and formulation, Differentiating pain from suffering, Goal-setting exercise: What are your life values? How many hours per week do you spend and what do you do for these values?, Defining creative hopelessness
3	Defusion techniques: Awareness of negative judgments, Function of negative judgments, Observing thoughts, Speaking thoughts out loud
4	Present moment contact techniques: Focus on body, breathing, attention, Attention control training: Mindful attention to breathing, eating, and engaging in enjoyable activities
5	Values clarification techniques: Logic (difference between goals and values), Categorizing values (parenting, social, relationships, career, health), Planning efforts towards these goals
6	Behavioral activation techniques (from CBT): For example, use of activity logs and mastery and pleasure schedules (self-monitoring plans)
7	Self-as-context: Self-concept and self-observation, Self-observation exercises: Balcony exercise, Time machine exercise, Chessboard exercise
8	Summary of sessions and post-test execution

2.3.2. Dialectical Behavior Therapy Skills Training

The treatment plan implemented in the current study is delivered in twelve 2-hour class sessions. Each session includes the introduction of objectives and topics relevant to

that session, discussion and in-session exercises, as well as homework assignments. The treatment package and program were prepared using the Dialectical Behavior Therapy Skills Workbook (McKay et al., 2019).

Table 2

Brief Description of Dialectical Behavior Therapy Skills Training Sessions

Session	Description
1	Pre-test and Introduction, Mindfulness: Definitions of dialectics, principles and methods of dialectical thinking and acting, teaching the existence of more than one perspective on issues. Training on three states of mind (logical, emotional, wise), mindfulness concept; practice through breathing, feedback, and assignments.
2	Fundamental Mindfulness: "What" skills including "Observing," "Describing," "Participating"; aiming for attention control. Full focus on the present moment; recognizing thoughts, emotions, feelings; releasing judgmental thinking and merging with the current experience; practice focusing on an object, feedback, and assignments.
3	Fundamental Mindfulness: Training and practice of "What" skills; concept of fundamental acceptance; practice of non-judgment; mindfulness meditation, feedback, and assignments.
4	Fundamental Mindfulness: Effective action; daily mindfulness-based schedule; mindfulness meditation, feedback, and assignments.
5	Fundamental Interpersonal Effectiveness Skills: Mindful attention to interpersonal relationships; identifying one's communication style; consequences of "should" thinking; barriers to using interpersonal skills, feedback, and assignments.
6	Fundamental Interpersonal Effectiveness Skills: Key interpersonal skills; identifying interpersonal values; recognizing one's needs; expressing needs; difficulty in identifying needs, feedback, and assignments.
7	Advanced Interpersonal Effectiveness Skills: Drafting assertiveness; listening skills; assertive behavior; analyzing problematic interactions, feedback, and assignments.
8	Emotion Regulation: Recognizing emotions and their functioning; importance of identifying and naming emotions; practice identifying and naming emotions; emotion logging, feedback, and assignments.
9	Emotion Regulation: Relationship between emotions and behavior; reducing vulnerability to mood-disrupting emotions; practice identifying self-harmful behaviors; observing oneself without judgment, feedback, and assignments.
10	Emotion Regulation: Reducing cognitive vulnerability (counteractive thoughts, evidence checking); practice of thought-emotion non-attachment; acting against intense emotional desires, feedback, and assignments.
11	Distress Tolerance: Survival strategies in a crisis; defining and characteristics of a crisis; recognizing a crisis situation; distraction skills, feedback, and assignments.
12	Distress Tolerance and Summary: Developing a distraction plan; committed action practice; use of self-encouraging coping thoughts; teaching how to generalize skills outside therapy sessions, summarizing and reviewing sessions; post-test execution.

2.4. Data analysis

The research data were collected using questionnaires, medical records, and interviews, and analyzed using descriptive (mean and standard deviation) and inferential statistics (analysis of variance with repeated measures) with the help of SPSS V22 statistical analysis software.

3. Findings and Results

The highest frequency in both experimental and control groups was observed in individuals aged 41-45 years, and

the lowest frequency was among those aged 30-40 years. The highest frequency in both experimental groups and the waiting list was among individuals with diabetes duration of 6-10 years, and the lowest frequency was in those with a duration of 10-15 years. This section presents the descriptive findings of mean and standard deviation scores for pre-test, post-test, and follow-up, self-care, and psychological well-being, separately for the two experimental groups (DBT-ST and ACT) and the waiting list.

Table 3

Mean and Standard Deviation of Pre-test, Post-test, and Follow-up Scores for Self-care and Psychological Well-being in the Experimental and Waiting List Groups

Variable	Group	Pre-test Mean	Pre-test SD	Post-test Mean	Post-test SD	Follow-up Mean	Follow-up SD
Self-care	ACT	38.64	5.286	54.14	4.672	51.93	4.731
	DBT-ST	41.43	4.415	48.86	2.538	47.86	2.770
	Waiting List	41.14	5.947	43.29	6.366	41.93	6.439
Psychological Well-being	ACT	274.43	16.533	299.71	4.393	297.79	2.754
	DBT-ST	271.86	11.608	286.36	4.814	282.71	6.753
	Waiting List	270.29	8.991	268.57	14.596	268.29	14.710

As observed in Table 3, the mean scores for pre-test self-care and psychological well-being were nearly equal across the two experimental groups (DBT-ST and ACT) and the waiting list. However, in the post-test, the mean self-care scores for the experimental groups (DBT-ST and ACT) were significantly lower than those of the waiting list group. This trend is also visible in the follow-up values for both experimental groups (DBT-ST and ACT) and the waiting list.

To examine the effect of Acceptance and Commitment Therapy and Dialectical Behavior Therapy Skills Training on self-care and psychological well-being in patients with type 2 diabetes across pre-test, post-test, and follow-up stages, an analysis of variance with repeated measures (one

within-subject factor and one between-subject factor) was utilized. The three stages of pre-test, post-test, and follow-up were considered as a within-subject factor, and the grouping of subjects into three groups was considered as a between-subject factor. It's notable that for reporting the analysis, either multivariate tests or univariate statistics can be used. This report employed the former, necessitating the assumption of sphericity and the presentation of multivariate tests. To examine the significant difference between the means of self-care and psychological well-being across the three groups in the three stages of treatment, the assumptions of homogeneity of variances and sphericity were checked first.

Table 4

Results of Repeated Measures ANOVA with Within-Group and Between-Group Factors for Subscales

Factors	Source Variation	of	Subset	Sum of Squares	Degrees of Freedom	Mean Square	F	Significance	Effect Size
Within-Group Factor	Stages of treatment on scales		Self-care	260487.220	1	260487.220	4022.054	0.000	0.990
			Psychological Well-being	987840.005	1	987840.005	42864.244	0.000	0.999
Between-Group Factor	Group		Self-care	807.850	2	403.425	6.369	0.000	0.822
			Psychological Well-being	9799.406	2	4899.203	21.205	0.000	0.922

Given the non-significance of the F-scores in Levene's test, the assumption of homogeneity of variances is met ($p > 0.05$). The results from the test of homogeneity of variances (Mauchly's sphericity) which yielded a value of 0.766 and was not significant ($p = 0.289$), confirm the homogeneity of variances across the three study points. Table 4 summarizes the results of the analysis of variance with repeated measures for within-group and between-group factors. Table 4 results indicate that the calculated F-value for the within-group factor, representing the effect of the

stages (pre-test, post-test, and follow-up), is significant at the 0.05 level. Thus, it demonstrates the impact of Acceptance and Commitment Therapy and Dialectical Behavior Therapy Skills Training on self-care and psychological well-being in patients with type 2 diabetes, with a significant difference between the mean scores of pre-test, post-test, and follow-up stages in self-care and psychological well-being. Post hoc Tukey tests were conducted to examine the differences between means at different treatment stages.

Table 5

Summary of Tukey's Post Hoc Test to Determine Differences in Pre-test, Post-test, and Follow-up among the Experimental Group

Phase Comparison	Means Difference	Standard Error	Significance
Self-care			
Post-test - Pre-test	8.357	0.542	<0.001
Follow-up - Pre-test	8.833	0.570	<0.001
Follow-up - Post-test	1.524	0.261	0.630
Psychological Well-being			
Post-test - Pre-test	12.690	2.030	<0.001
Follow-up - Pre-test	10.738	1.993	<0.001
Follow-up - Post-test	0.552	0.441	0.149

Table 5 results show a significant difference between the pre-test and post-test scores, and between pre-test and follow-up scores. No significant difference between post-test and follow-up scores indicates the stability of treatment

effects. The comparison of means demonstrates that the scores for self-care and psychological well-being significantly increased in the post-test and follow-up stages compared to the pre-test stage.

Table 6

Summary of Tukey's Post Hoc Test for Three Groups

Variable	Group Comparison	Difference in Means	Standard Error	Significance
Self-care	DBT-ST - ACT Group	2.190	0.756	0.020
	ACT Group - Waiting List	6.119	0.756	0.001
	DBT-ST - Waiting List	3.929	0.756	0.031
Psychological Well-being	DBT-ST - ACT Group	10.333	0.867	<0.001
	ACT Group - Control Group	21.595	0.867	<0.001
	DBT-ST - Waiting List	11.262	0.867	<0.001

Table 6 results reveal significant differences between the scores of the DBT-ST experimental group and the ACT experimental group, as well as between the DBT-ST

experimental group and the waiting list group, and between the ACT experimental group and the waiting list group.

Table 7

Summary of Repeated Measures ANOVA for Between-Group Comparisons

Comparison	Source of Variation	Sum of Squares	Degrees of Freedom	Mean Square	F	Significance	Effect Size
ACT Group - Waiting List	Group	311.255	2	155.627	7.619	<0.001	0.905
	Error	796.586	39	20.425			
DBT-ST - Waiting List	Group	229.785	2	114.892	6.027	<0.001	0.866
	Error	763.968	40	19.062			

Considering the effectiveness of DBT-ST and ACT treatments on self-care and psychological well-being scores, the effectiveness of the two therapeutic methods compared to the waiting list group was calculated separately.

Table 7 results showed that both methods (DBT-ST and ACT) significantly outperformed the waiting list group, with the effect size for the impact of Acceptance and Commitment Therapy on the waiting list group ($\eta^2 = 0.905$) being slightly higher than that of DBT compared to the waiting list group ($\eta^2 = 0.866$). According to Cohen, with an eta-squared of 0.01 indicating a small effect size, 0.06 indicating a medium effect size, and 0.14 indicating a large effect size, both DBT-ST and Acceptance and Commitment Therapy (ACT) methods were effective on self-care and psychological well-being scores, but the effect of ACT was greater than that of DBT-ST on self-care and psychological well-being scores.

4. Discussion and Conclusion

This study aimed to compare the effectiveness of Acceptance and Commitment Therapy (ACT) and Dialectical Behavior Therapy Skills Training (DBT-ST) on self-care and psychological well-being in patients with type 2 diabetes. The results showed that both DBT-ST and ACT methods were effective in improving self-care and psychological well-being scores; however, the effect of ACT was greater than DBT-ST on these scores which is in line with previous studies (Baigan et al., 2016; Hasanzadeh et al., 2019; Marino et al., 2021). Yet, no study has been observed comparing the effectiveness of these two therapeutic methods on the three mentioned variables.

To explain these findings, it can be said that Acceptance and Commitment Therapy encourages clients to treat their self-assessments as mere thoughts and teaches individuals to correct their negative evaluations. This therapy also aims to weaken experiential avoidance and encourages clients to fully accept their thoughts, feelings, emotions, and impulses and define valuable goals for themselves (Hasanzadeh et al., 2019). Additionally, cognitive fusion in individuals with type 2 diabetes is weakened through the process of cognitive defusion and acceptance, reducing cognitive dysfunctions and rationalizations in them and leading to the pursuit of valuable life goals and committed action towards achieving these goals, which results in improved functioning and reduced psychological distress. It can also be said that the goal of Acceptance and Commitment Therapy, reducing experiential avoidance and increasing psychological

flexibility through the acceptance of unavoidable and disturbing unpleasant emotions like anxiety, fostering mindfulness to neutralize excessive engagement with cognitions, and identifying specific values related to behavioral goals, encourages the patient to fully and non-resistively engage with their experiences as they emerge without judgment about their correctness or incorrectness. This increases motivation for change despite unavoidable obstacles and encourages the person to strive towards realizing valuable life goals, leading to improved quality of life, enhanced psychological well-being, self-care, and adoption of adaptive strategies (Marino et al., 2021). Therefore, psychological flexibility and acceptance can enhance mental and physical health in diabetic patients, improve their psychological well-being across various domains, assist them in enhancing meaningful aspects of life, and increase valuable activities to improve quality of life.

On the other hand, Dialectical Behavior Therapy is a structured treatment that uses behavioral techniques. The emphasis on validation leads to the acceptance of emotional problems, which ultimately facilitates changes. A characteristic of diabetic patients is that they do not perform well in distancing themselves from their negative emotions and moods. Throughout the Dialectical Behavior Therapy Skills Training process, patients engage in behavioral exercises and self-observation in a non-judgmental state, observing their depressed mood and its physiological, mental, behavioral, and emotional consequences, and learning mechanisms to transition from this state through exercises (Baigan et al., 2016). Mindfulness, a component of Dialectical Behavior Therapy interventions, elucidates that mindfulness is a tool that helps us manage our thoughts and feelings, become aware of what is happening in a situation, immerse ourselves in the current moment as it presents itself, and ultimately provides a coherent description of the nature of the mind, emotions, suffering, and liberation from it, leading to a healthy and balanced mind for a good and optimal life. In the process of teaching Dialectical Behavior Therapy, we ask individuals to create a different relationship with their unpleasant experiences and, through acceptance and validation of unpleasant emotions, be aware of how to respond to emotions (McKay et al., 2019). It seems this relationship leads to a reduction in anxiety, depression, and change in maladaptive emotional strategies, ultimately enhancing an individual's psychological well-being.

5. Limitations & Suggestions

Among the limitations of this study, it was conducted on patients with type 2 diabetes in the city of Sari, so generalizing the results to other cities, regions, and even type 1 diabetes should be avoided. The sampling method was non-random. Only questionnaires were used as the measurement tool for variables, and interviews, observations, and other measurement methods were not utilized. It is suggested that the effectiveness of Acceptance and Commitment Therapy and Dialectical Behavior Therapy Skills Training be compared with other types of psychotherapy such as Cognitive-Behavioral Therapy, Schema Therapy, Compassion-Focused Therapy, and the like, on patients with type 2 diabetes and other mental disorders and physical illnesses. Finally, it is recommended that the treatment duration of Acceptance and Commitment Therapy and Dialectical Behavior Therapy Skills Training, as two structured short-term therapeutic methods, be integrated into diabetes management training courses at health and medical centers, and medical and psychological interventions provided to these patients be unified.

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Declaration of Interest

The authors of this article declared no conflict of interest.

Ethics Considerations

The study protocol adhered to the principles outlined in the Helsinki Declaration, which provides guidelines for ethical research involving human participants. This research was conducted with the ethical approval code IR.IAU.SARI.REC.1399.060 from the Ethics Committee of Islamic Azad University, Sari Branch.

Transparency of Data

In accordance with the principles of transparency and open research, we declare that all data and materials used in this study are available upon request.

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Authors' Contributions

All authors contributed equally.

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