

# Acceptance and Commitment Therapy for Diabetes: Enhancing Self-Care and Coping Strategies

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Received January 7, 2025; Accepted February 22, 2025; Online Published March 30, 2025

## Abstract

**Background:** Diabetes is a chronic disease requiring ongoing self-care, which can be emotionally challenging and lead to difficulties with coping and adherence, ultimately impacting health outcomes.

**Objectives:** This study investigated the impact of Acceptance and Commitment Therapy (ACT) on self-care behaviors and coping strategies in individuals with diabetes.

**Methods:** The present study used a quasi-experimental design incorporating pre-test, post-test, and follow-up assessments with a control group. The study population consisted of female patients aged between 30 and 50 years with a diagnosis of type 2 diabetes who were registered with the Ahvaz Diabetes Association between January and April 2023. Thirty participants with type 2 diabetes were recruited using convenience sampling and subsequently randomly assigned to either the intervention group (n = 15) or the control group (n = 15). The intervention group participated in eight weekly 90-minute sessions of ACT, whereas the control group received treatment as usual. Data were collected at three time points (pre-intervention, post-intervention, and follow-up) using the Summary of Diabetes Self-Care Activities (SDSCA) questionnaire and the Coping Inventory for Stressful Situations (CISS). Repeated measures analysis of variance (ANOVA) was performed using SPSS version 26 for data analysis.

**Results:** Findings indicated a significant effect of ACT, leading to decreased utilization of avoidance strategies and increased engagement in problem-focused coping and self-care behaviors among individuals with diabetes ( $P < 0.001$ ). Conversely, ACT did not demonstrate a significant impact on emotion-focused coping strategies in this population.

**Conclusion:** This study supports the potential benefits of ACT for improving diabetes self-care. Significant reductions in avoidance and increases in problem-focused coping and self-care following ACT suggest its potential to empower individuals to actively manage their condition. While ACT did not demonstrate a statistically significant impact on emotion-focused coping, its positive effects on other coping mechanisms and self-care highlight its potential to improve patient outcomes.

**Keywords:** Diabetes Mellitus, Acceptance and Commitment Therapy, Emotions, Self-care

## 1. Background

Type 2 diabetes is a prevalent global health issue, characterized by insulin resistance and insufficient insulin secretion.<sup>1,2</sup> This complex metabolic disorder arises from the interplay of lifestyle and genetic factors, impacting insulin function in peripheral tissues and pancreatic beta cells.<sup>3,4</sup> As Mohamed et al.<sup>5</sup> describe, it's a multifactorial syndrome involving abnormal metabolism of carbohydrates, fats, and proteins, leading to hyperglycemia and hyperlipidemia. The International Diabetes Federation projects a significant increase in diabetes prevalence, estimating 642 million adults affected by 2040, primarily in low- and middle-income countries.<sup>6</sup> While these statistics highlight the growing burden of diabetes, effective management requires addressing not only the physiological aspects but also the psychological challenges patients face.

Several factors contribute to the onset and progression of type 2 diabetes, some modifiable and others not. A key

modifiable factor is individual lifestyle, including self-care practices, which can significantly mitigate diabetes-related problems, signs, and symptoms.<sup>7</sup> Self-care education, now recognized as a crucial component of diabetes management, is provided to individuals with diabetes by clinical specialists. Diabetic self-care encompasses education in five key areas: medication adherence, dietary recommendations, increased physical activity, self-monitoring of blood glucose, and proper foot care. Research supports the effectiveness of improving self-care behaviors in controlling diabetes and its complications.<sup>8</sup> For example, dietary adherence significantly impacts the control and improvement of diabetes symptoms.<sup>9</sup> However, the success of self-care practices can be influenced by various psychological factors, including coping styles.

Coping styles are among the influential psychological variables that help explain individual differences in patients' vulnerability to physical and psychological

problems, and their subsequent quality of life.<sup>10</sup> Studies indicate that individuals lacking effective coping styles and with limited emotional understanding often exhibit less resilience to life's pressures and crises, experiencing more psychological problems such as stress, anxiety, mood, and adjustment disorders.<sup>11,12</sup>

Acceptance and Commitment Therapy (ACT) is a third-wave cognitive behavioral therapy that prioritizes the development of psychological flexibility as the key mechanism of change.<sup>13</sup> Distinct from traditional CBT, which often focuses on modifying the content of thoughts, ACT targets their function, encouraging acceptance of unwanted internal experiences rather than struggling against them.<sup>14</sup> This is accomplished through six core interrelated processes: acceptance (allowing thoughts and feelings to arise and pass without struggle), cognitive defusion (creating distance from thoughts, recognizing them as mental events rather than literal truths), present moment awareness (cultivating a non-judgmental connection with the present moment), self-as-context (experiencing the self as a stable observer of experiences), values clarification (identifying personally meaningful values), and committed action (engaging in actions consistent with those values).<sup>15</sup> These processes synergistically enhance psychological flexibility—the capacity to be present, open to experience, and act in accordance with one's values—empowering individuals to lead fulfilling lives even in the presence of difficult thoughts and feelings. This approach has demonstrated efficacy in addressing a range of psychological and physical health challenges.<sup>16</sup>

ACT's focus on acceptance and values-driven action is particularly pertinent for individuals managing chronic health conditions such as type 2 diabetes, where persistent symptoms and necessary lifestyle modifications can engender significant emotional distress.<sup>17</sup> For instance, the ongoing demands of diabetes management, including blood glucose monitoring and dietary restrictions, can evoke feelings of frustration, anxiety, or resentment. ACT assists individuals in accepting these challenging emotions rather than struggling against them. Defusion techniques can be employed to create space from negative thoughts, such as "I can't handle this," while present moment awareness can be cultivated to manage immediate challenges. Moreover, by clarifying personal values related to health and well-being, ACT can motivate committed action toward self-care behaviors despite these emotional hurdles. Rather than aiming to eliminate symptoms or directly alter negative thoughts, ACT promotes engagement in valued activities even amidst ongoing challenges. This emphasis on psychological flexibility can improve coping skills, reduce experiential avoidance (the tendency to avoid unwanted internal experiences), and enhance adherence to treatment protocols.<sup>18</sup> Research has established the

effectiveness of ACT in improving outcomes for individuals experiencing chronic pain,<sup>19</sup> anxiety disorders, and depression,<sup>20</sup> highlighting its broad applicability in promoting well-being across diverse contexts.

Diabetes mellitus is a pervasive chronic disease associated with significant physical and psychological sequelae, placing a substantial burden on individuals and global healthcare systems. Effective self-care, encompassing consistent self-management practices and adaptive coping strategies, is essential for mitigating these burdens and enhancing quality of life. However, many individuals with diabetes experience challenges in these aspects of disease management, underscoring the need for effective psychological interventions. The global prevalence of diabetes continues to escalate, posing a major public health challenge. Beyond the physiological complications, diabetes frequently leads to emotional distress and difficulties with self-care and coping, which can negatively impact treatment adherence and overall well-being. While prior research has explored various interventions aimed at improving diabetes management, further investigation is needed to specifically examine the impact of ACT on both self-care behaviors and coping strategies within this population. Few studies have investigated the simultaneous effects of ACT on these critical dimensions of diabetes management, creating a gap in the literature regarding its potential benefits.

## 2. Objectives

This study aimed to investigate the impact of ACT on self-care behaviors and coping strategies in individuals with type 2 diabetes.

## 3. Methods

This study employed a quasi-experimental design with pre-test, post-test, and two-month follow-up assessments, utilizing a control group. The target population comprised female patients aged 30–50 years diagnosed with type 2 diabetes and registered with the Ahvaz Diabetes Association in 2023, who had received a specialist diagnosis for at least three years. Thirty participants with type 2 diabetes were recruited via convenience sampling and subsequently randomized to either the intervention group (n = 15) or the control group (n = 15). A priori power analysis, conducted using G\*Power with an alpha level of 0.05 and a desired power of 0.95, determined a minimum sample size of 30 participants to detect a statistically significant effect. Inclusion criteria were: age between 30 and 50 years, a diabetes diagnosis for at least three years, a minimum of high school education (to ensure comprehension of questionnaire items), the absence of any diagnosed psychological disorders, non-participation in concurrent therapy, and the absence of significant social problems such as substance abuse. Exclusion

criteria included missing more than two therapy sessions or withdrawing from the study. All participants provided informed consent prior to study participation. Following group allocation, the intervention group received an eight-week, 90-minute weekly ACT program delivered by the first author, a trained ACT therapist. Adherence to the ACT protocol was monitored through session

recordings and supervision. The control group received treatment as usual. A summary of the ACT intervention sessions is provided in Table 1. Data were collected using the Summary of Diabetes Self-Care Activities (SDSCA) questionnaire and the Coping Inventory for Stressful Situations (CISS) at pre-intervention, post-intervention, and the two-month follow-up.

**Table 1.** A Summary of the ACT Sessions

Session	Objectives	Content
1	Group introduction, pre-test, and foundational concepts	Established group rapport, obtained informed consent, outlined therapeutic goals, introduced ACT principles (e.g., creative hopelessness, acceptance, mindfulness), explored diabetes management, assessed eating patterns, and examined past coping strategies.
2	Therapeutic contract and core ACT principles	Introduced the concept of psychological inflexibility, emphasizing the counter-productiveness of avoidance and control. Focused on cultivating present-moment awareness and full acceptance of internal experiences.
3	Review of self-control strategies	Reviewed and discussed assigned tasks related to self-control strategies, highlighting the limitations of controlling internal experiences.
4	Review and performance evaluation	Reviewed individual experiences since the previous session and conducted a performance evaluation.
5	Distinguishing between conceptualized self and observing self	Conducted performance evaluation and explored the distinction between the conceptualized self (self-concept) and the observing self (awareness of present experience).
6	Values clarification and mindfulness training	Introduced mindfulness and meditation practices, focusing on emotional awareness, wise mind awareness, and the cultivation of non-judgmental observation of internal experiences.
7	Aligning self-efficacy with values	Emphasized the importance of values in guiding behavior change, introduced the concept of "willingness," and explored the relationship between values and self-efficacy.
8	Goal setting and relapse prevention	Focused on achieving behavioral goals through values-guided action planning. Prepared clients for potential setbacks by identifying coping strategies, obstacles, and developing a relapse prevention plan based on the ACT algorithm.

### 3.1. Measure

#### 3.1.1. The Summary of Diabetes Self-Care Activities (SDSCA) Questionnaire

The SDSCA Questionnaire: Developed by Toobert and Glasgow,<sup>21</sup> the SDSCA consists of 15 items assessing self-care behaviors related to diet, physical activity, blood glucose monitoring, foot care, and medication adherence. Respondents rate each item on a 7-point Likert scale (0-7) indicating the number of days in the past week they engaged in the specific behavior. The total score ranges from 0 to 105, with higher scores reflecting greater adherence to self-care behaviors. Based on the total score, adherence levels are categorized into three groups: optimal (65-105), suboptimal (35-65), and poor (0-35). Mirzaei et al.<sup>22</sup> reported a Cronbach's alpha coefficient of 0.79 for the SDSCA, indicating good internal consistency reliability.

#### 3.1.2. Coping Inventory for Stressful Situations (CISS)

The CISS is a self-report instrument adapted from Calsbeek's original scale.<sup>23</sup> This 48-item measure assesses three primary coping styles: problem-focused, emotion-focused, and avoidance, each further subdivided into seven subcategories. Participants rate their agreement with each item on a 5-point Likert scale (1 = very little to 5 = very much). The CISS yields scores for each coping style, ranging from 16 to 80. The Persian version of the CISS demonstrated acceptable reliability with a Cronbach's alpha coefficient of 0.82.<sup>24</sup>

### 3.2. Statistical Analysis

Data were analyzed using the SPSS software version 26. Descriptive statistics (means and standard deviations (SD)) were computed to summarize the data. Prior to conducting repeated-measures ANOVA, assumptions of normality and homogeneity of variance were assessed. Normality was examined using the Shapiro-Wilk test, and homogeneity of variance was assessed using Levene's test. Mauchly's test was used to assess the sphericity assumption for the repeated measures. The intervention's efficacy on outcome variables across the three time points (pre-intervention, post-intervention, and follow-up) was then assessed through repeated-measures ANOVA.

### 4. Results

The study cohort comprised 30 female participants with type 2 diabetes. The intervention group (n = 15) had a mean age of 39.66 years (SD = 3.47), compared to a mean age of 40.21 years (SD = 6.61) for the control group (n = 15). Within the intervention group, marital status was distributed as follows: 40.0% single (n = 6) and 60.0% married (n = 9). The control group consisted of 33.33% single (n = 5) and 66.67% married (n = 10) participants.

Table 2 presents the means and SDs for self-care, problem-focused coping, emotion-focused coping, and avoidance coping at pre-intervention, post-intervention, and follow-up for both groups. Baseline scores were similar between groups across all variables. In the post-

**Table 2.** Means and SD of Research Variables

Variables	Groups	Pre-intervention	Post-intervention	Follow-up
		Mean $\pm$ SD	Mean $\pm$ SD	Mean $\pm$ SD
Self-care	Control group	34.26 $\pm$ 6.19	34.06 $\pm$ 5.32	33.93 $\pm$ 5.28
	ACT group	32.33 $\pm$ 4.45	42.53 $\pm$ 6.62	39.73 $\pm$ 5.59
Problem-focused strategies	Control group	36.25 $\pm$ 6.47	35.06 $\pm$ 6.12	33.40 $\pm$ 5.28
	ACT group	34.40 $\pm$ 8.60	45.40 $\pm$ 8.69	43.13 $\pm$ 8.89
Emotion-focused strategies	Control group	39.66 $\pm$ 6.78	40.20 $\pm$ 9.14	40.66 $\pm$ 8.14
	ACT group	41.21 $\pm$ 6.34	42.80 $\pm$ 5.65	41.20 $\pm$ 4.64
Avoidance strategies	Control group	47.73 $\pm$ 11.29	50.60 $\pm$ 10.43	50.86 $\pm$ 10.60
	ACT group	44.53 $\pm$ 7.92	33.53 $\pm$ 6.51	36.93 $\pm$ 5.52

intervention stage, the ACT group showed significant increases in self-care and problem-focused coping, and a significant decrease in avoidance coping, indicating a positive effect of ACT. This is while no statistically significant effect was observed for emotion-focused coping. In the follow-up stage, the ACT group largely maintained these improvements. The control group exhibited no statistically significant changes across the three time points. This pattern suggests the changes in the ACT group for self-care, problem-focused coping, and avoidance coping were attributable to the intervention.

Prior to conducting the repeated measures ANOVA, the normality of each research variable's distribution within each group was examined using the Shapiro-Wilk test. Results indicated that scores for self-care, problem-focused strategies, emotion-focused strategies, and avoidance strategies were normally distributed at all three assessment points (pre-intervention, post-intervention, and follow-up). Additionally, Levene's test confirmed homogeneity of variance. However, Mauchly's test indicated a violation of the sphericity assumption. Therefore, the Greenhouse-Geisser correction was applied to all analyses to address this violation.

Table 3 presents the results of repeated-measures ANOVAs examining the effects of time (pre-intervention, post-intervention, and follow-up) and group (intervention and control) on four outcome variables: self-care, problem-focused strategies, emotion-focused strategies,

and avoidance strategies. For self-care, significant main effects were observed for both time ( $F = 26.39, P < 0.001, \eta^2 = 0.99$ ) and group ( $F = 4.77, P = 0.038, \eta^2 = 0.56$ ). A significant time  $\times$  group interaction was also found ( $F = 29.14, P < 0.001, \eta^2 = 0.99$ ), indicating that changes in self-care scores across time differed significantly between the intervention and control groups.

For problem-focused strategies, significant main effects of both time ( $F = 35.75, P < 0.001, \eta^2 = 0.86$ ) and group ( $F = 5.25, P = 0.030, \eta^2 = 0.60$ ) were observed. A significant time  $\times$  group interaction was also found ( $F = 69.51, P < 0.001, \eta^2 = 0.89$ ), demonstrating that changes in problem-focused strategy scores over time varied significantly between the two groups. In contrast, for emotion-focused strategies, neither the main effect of time ( $F = 0.57, P = 0.576, \eta^2 = 0.14$ ) nor the main effect of group ( $F = 0.53, P = 0.474, \eta^2 = 0.11$ ) reached statistical significance. The time  $\times$  group interaction was also non-significant ( $F = 0.87, P = 0.425, \eta^2 = 0.19$ ), indicating no significant differences between the groups in the change of emotion-focused strategy scores over time. Finally, for avoidance strategies, significant main effects of both time ( $F = 11.15, P < 0.001, \eta^2 = 0.71$ ) and group ( $F = 12.93, P = 0.001, \eta^2 = 0.73$ ) were found. A significant time  $\times$  group interaction was also present ( $F = 35.53, P < 0.001, \eta^2 = 0.85$ ), demonstrating that the pattern of change in avoidance strategy scores over time differed significantly between the intervention and control groups.

**Table 3.** Repeated-measures ANOVA Results

Variables	Source	SS	df	MS	F	P	$\eta^2$
Self-care	Time	396.36	1.25	317.25	26.39	0.001	0.79
	Group	380.28	1	380.28	4.77	0.038	0.56
	Group $\times$ time	437.69	1.25	350.33	29.14	0.001	0.83
Problem-focused strategies	Time	364.87	1.32	276.01	35.75	0.001	0.86
	Group	828.10	1	828.10	5.25	0.030	0.60
	Group $\times$ time	709.40	1.32	536.70	69.51	0.001	0.89
Emotion-focused strategies	Time	10.87	1.34	8.11	0.57	0.576	0.14
	Group	65.88	1	65.88	0.53	0.474	0.11
	Group $\times$ time	16.96	1.34	12.67	0.87	0.425	0.19
Avoidance strategies	Time	248.87	1.53	248.87	11.15	0.001	0.71
	Group	2924.10	1	2424.10	12.93	0.001	0.73
	Group $\times$ time	793.27	1.53	517.98	35.53	0.001	0.85

## 5. Discussion

This study examined the effects of ACT on self-care behaviors and coping strategies among individuals with diabetes. Post-intervention, the ACT group demonstrated significant increases in mean scores for self-care among individuals with diabetes. This increase in self-care aligns

with the findings of Sakamoto et al.,<sup>25</sup> who, in their meta-analysis, also reported improvements in diabetes self-management following ACT interventions. Similarly, Alho et al.<sup>26</sup> observed positive trends in self-care behaviors among adolescents with type 1 diabetes participating in an ACT group intervention, although their study focused

on a different age group and diabetes type. This finding suggests that ACT may be an effective intervention for promoting self-care behaviors in this population. Self-care, encompassing a range of activities such as medication adherence, healthy eating, regular exercise, and blood glucose monitoring, is crucial for managing diabetes and preventing long-term complications.<sup>27</sup> The observed improvement in self-care within the ACT group indicates that the therapy may be associated with individuals' ability to engage in these essential health practices. This could be attributed to ACT's focus on psychological flexibility, which involves acceptance of difficult thoughts and feelings, present moment awareness, and commitment to values-driven action.<sup>13</sup> By fostering psychological flexibility, ACT may help individuals overcome barriers to self-care, such as emotional distress, avoidance, and lack of motivation, thereby facilitating greater adherence to recommended health behaviors.

The observed increase in self-care behaviors following the ACT intervention is consistent with prior research demonstrating ACT's efficacy in promoting health-related behaviors across diverse populations.<sup>25</sup> By emphasizing acceptance of internal experiences rather than struggling against them, ACT interventions can reduce experiential avoidance, a factor associated with poorer health outcomes, including difficulties with self-care in chronic conditions.<sup>17</sup> In the context of diabetes, this may manifest as an increased willingness to engage in potentially uncomfortable self-care tasks, such as blood glucose monitoring or dietary modifications. Moreover, ACT's focus on values clarification and committed action can motivate individuals to align their behaviors with their health goals, thereby enhancing their engagement in self-care practices.<sup>26</sup>

The finding that ACT enhances problem-focused coping while simultaneously reducing avoidant coping, without significantly impacting emotion-focused strategies, provides valuable insights into the mechanisms of ACT. Problem-focused coping involves actively addressing the source of stress by identifying solutions and taking action.<sup>28</sup> ACT's emphasis on acceptance and cognitive defusion may facilitate this process by reducing the tendency to avoid or ruminate on problems, thereby enabling individuals to engage more effectively in problem-solving. Concurrently, ACT directly targets experiential avoidance, the tendency to avoid unwanted thoughts, feelings, and sensations.<sup>29</sup> By promoting the acceptance of these experiences, ACT reduces reliance on avoidant coping strategies, such as denial or withdrawal, which are often maladaptive in the long term.

The lack of a significant impact on emotion-focused coping, which involves regulating emotional responses to stress, warrants consideration. While some studies have suggested ACT's influence on emotional regulation,<sup>30</sup> the present findings indicate that ACT's primary effect on

coping may be mediated through enhancing problem-focused approaches and reducing avoidance, rather than directly altering emotion-focused strategies. This aligns with ACT's core principle of values-driven action, which encourages individuals to engage in behaviors consistent with their values, irrespective of their emotional state. It is plausible that changes in emotion-focused coping occur indirectly as a consequence of more effective problem-solving and reduced experiential avoidance.

Several limitations should be considered when interpreting the findings of this study. First, the use of a convenience sampling method restricts the generalizability of the results beyond the specific population of women aged 30–50 with type 2 diabetes registered with the Ahvaz Diabetes Association. Future research employing random sampling methods with larger, more diverse samples could enhance generalizability. Second, the relatively small sample size may have reduced the statistical power to detect smaller effects, particularly regarding emotion-focused coping. Future studies with larger samples are needed to confirm these findings and explore potential effects on emotion-focused coping. Finally, the reliance on self-reported data introduces the potential for response bias. Future research could incorporate objective measures of self-care behaviors, such as blood glucose levels or medication adherence, to complement self-report data and provide a more comprehensive assessment.

## 6. Conclusion

The present study offers valuable insights into the effects of ACT on coping and self-care in individuals with diabetes. The observed pattern of results, characterized by significant reductions in avoidance strategies and a concurrent increase in problem-focused coping and self-care behaviors, suggests that ACT promotes a shift towards more adaptive coping mechanisms. These findings have practical implications for diabetes care. By targeting psychological flexibility, ACT can empower individuals to better manage the emotional challenges associated with diabetes, leading to improved self-care and coping. For example, ACT techniques can help individuals accept the discomfort of blood glucose monitoring and motivate them to engage in consistent self-care behaviors aligned with their values, even when experiencing negative emotions. The absence of a significant effect on emotion-focused coping may reflect the distinct focus of ACT on acceptance and values-based action, rather than direct modification of emotional experience. This distinction highlights the need for further research to clarify the interplay between different coping strategies and the specific mechanisms of ACT in the context of diabetes. In conclusion, this study demonstrates the potential benefits of ACT for improving self-care and promoting adaptive coping strategies in individuals with type 2 diabetes, suggesting its value as a

therapeutic approach for enhancing diabetes management and overall well-being.

### Research Highlights

#### What Is Already Known?

Diabetes mellitus requires consistent self-management, which can be emotionally demanding. It also notes that difficulties with coping and self-care adherence are common among individuals with diabetes and are associated with poorer health outcomes. This establishes the existing understanding of the challenges faced by individuals with diabetes in managing their condition and the negative consequences of inadequate coping and self-care.

#### What Does This Study Add?

This study provides evidence for ACT's effectiveness in improving diabetes self-management by decreasing avoidance strategies and increasing problem-focused coping and self-care behaviors. Although ACT did not significantly impact emotion-focused coping, its positive effects on other coping mechanisms and self-care suggest its potential to improve patient outcomes.

### Author Contributions

Authors contributed equally to this work.

### Conflict of Interest Disclosures

All authors declared that they have no conflict of interest.

### Ethical Approval

The study was approved by the Ethical Committee of Islamic Azad University- Ahvaz Branch (code: IR.IAU.AHVAZ.REC.1403.166).

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