

The Effectiveness of Unified Transdiagnostic Treatment on Difficulties in Emotion Regulation, Quality of Life, and Fasting Blood Glucose among Patients with Type 2 Diabetes

Rahim. Basaeri¹, Neda. Alibeigi^{2*}, Marzieh. Poursalehi³

1 Department of Health Psychology, CT.c., Islamic Azad University, Tehran, Iran.

2 Department of Psychiatry, Psychosis Research Center, University of Social Welfare and Rehabilitation Sciences, Tehran, Iran.

3 Department of Psychology, ET.c., Islamic Azad University, Tehran, Iran.

*Correspondence: n.alibeigi@uswr.ac.ir

Article type:
Original Research

Article history:

Received 07 April 2026

Revised 08 July 2026

Accepted 14 July 2026

Initial Publish 16 July 2026

Published online 01 March 2027

ABSTRACT

This study aimed to examine the effectiveness of unified transdiagnostic treatment on difficulties in emotion regulation, quality of life, and fasting blood glucose among patients with type 2 diabetes in Tehran. This applied quasi-experimental study used a pretest-posttest-follow-up design with a control group. The statistical population included patients with type 2 diabetes who referred to diabetes clinics and medical centers in Tehran in 2024. Thirty eligible patients were selected through convenience and voluntary sampling and randomly assigned to an unified transdiagnostic treatment group ($n = 15$) and a control group ($n = 15$). The experimental group received eight weekly 60-minute sessions of unified transdiagnostic treatment, while the control group received no psychological intervention. Data were collected using the Difficulties in Emotion Regulation Scale, the World Health Organization Quality of Life Questionnaire, and fasting blood glucose laboratory testing. Data were analyzed using repeated-measures analysis of variance and Bonferroni post hoc tests. Unified transdiagnostic treatment significantly reduced difficulties in emotion regulation, improved quality of life, and decreased fasting blood glucose compared with the control group. The time $\times$ group interaction was significant for difficulties in emotion regulation, $F(3.52, 74.00) = 4.80$, $p = .004$, $\eta^2 = .21$; quality of life, Wilks' $\Lambda = .47$, $F(4, 66) = 2.14$, $p < .001$, $\eta^2 = .39$; and fasting blood glucose, $F(4, 84) = 4.50$, $p = .002$, $\eta^2 = .18$. Bonferroni comparisons confirmed significant improvements at posttest and follow-up. Unified transdiagnostic treatment was effective in improving emotion regulation, quality of life, and fasting blood glucose among patients with type 2 diabetes and can be used as a complementary psychological intervention in diabetes care.

Keywords: Unified transdiagnostic treatment; emotion regulation; quality of life; fasting blood glucose; type 2 diabetes.

How to cite this article:

Basaeri, R., Alibeigi, N., & Poursalehi, M. (2027). The Effectiveness of Unified Transdiagnostic Treatment on Difficulties in Emotion Regulation, Quality of Life, and Fasting Blood Glucose among Patients with Type 2 Diabetes. *Mental Health and Lifestyle Journal*, 5(2), 1-19. <https://doi.org/10.61838/mhlj.275>

Introduction

Type 2 diabetes mellitus is a chronic and progressive metabolic disorder whose management extends far beyond the correction of hyperglycemia. Although the disease is clinically defined by disturbances in insulin secretion, insulin sensitivity, or both, its everyday consequences are experienced through a demanding pattern of continuous self-management. Patients are expected to regulate food intake, take medications consistently, monitor blood glucose, remain physically active, attend medical appointments, recognize warning signs, and make repeated health-related decisions under conditions of uncertainty. These

responsibilities are often accompanied by fear of complications, frustration about dietary and lifestyle restrictions, concern about treatment costs, and discouragement arising from fluctuations in blood glucose despite sustained effort. Consequently, type 2 diabetes should be understood not only as a biomedical condition but also as a chronic psychological and behavioral challenge. The emotional and psychological needs of people with diabetes are therefore central to effective care because persistent distress can undermine motivation, treatment adherence, problem-solving ability, and the capacity to maintain long-term health behaviors (1).

The psychosocial burden of diabetes is particularly important because successful disease management depends heavily on patients' daily behaviors. Unlike acute conditions in which treatment is primarily delivered by health professionals, diabetes requires individuals to assume a substantial proportion of therapeutic responsibility outside clinical settings. Medication use, dietary regulation, physical activity, glucose monitoring, sleep management, and timely help-seeking are influenced by personal beliefs, emotional states, habits, family relationships, perceived self-efficacy, and access to supportive resources. Evidence regarding diabetes self-management indicates that psychosocial variables are closely related to medication adherence and to the consistency with which patients perform recommended self-care behaviors (2). When emotional distress becomes intense, patients may avoid glucose monitoring, disengage from treatment, eat in response to negative affect, postpone medical follow-up, or interpret temporary setbacks as evidence that self-management is futile. These reactions can create a reciprocal cycle in which psychological distress weakens self-care, inadequate self-care increases concern about health, and heightened concern further intensifies emotional dysregulation.

One of the most relevant psychological mechanisms involved in this cycle is emotion regulation. Emotion regulation refers to the processes through which individuals identify, interpret, modify, express, and respond to emotional experiences in ways that are consistent with situational demands and personal goals. Contemporary models emphasize that effective emotion regulation does not simply involve suppressing negative emotions. Rather, it requires awareness of emotional states, understanding of their meaning, acceptance of their presence, flexible selection of appropriate strategies, control of impulsive responses, and maintenance of goal-directed behavior during distress (3). From this perspective, emotional difficulties arise when individuals become overwhelmed by affect, respond rigidly to internal experiences, rely excessively on avoidance or suppression, or lack access to strategies that allow them to tolerate and use emotional information adaptively. These capacities are particularly important in chronic illnesses because emotionally challenging situations recur frequently and cannot be eliminated entirely. Patients with diabetes must repeatedly confront disappointing laboratory results, concerns about future complications, bodily discomfort, perceived failures in self-care, and the social consequences of living with a long-term condition.

The multidimensional model of emotion dysregulation provides an especially useful framework for understanding these difficulties in patients with diabetes. Emotion dysregulation may include nonacceptance of emotional responses, difficulty engaging in goal-directed behavior while distressed, poor impulse control, limited emotional awareness, restricted access to effective regulation strategies, and lack of emotional clarity (4). Each of these dimensions can interfere with diabetes management. Nonacceptance may lead patients to judge themselves harshly for experiencing fear, sadness, anger, or discouragement. Lack of emotional clarity may prevent them from distinguishing physical symptoms from anxiety or from

recognizing emotional triggers for eating. Impulse-control difficulties may increase unhealthy food consumption or abandonment of treatment routines, whereas difficulty pursuing goals under distress may disrupt medication adherence, physical activity, and glucose monitoring. Limited access to adaptive strategies may further encourage avoidance, denial, rumination, emotional withdrawal, or short-term relief-seeking behaviors. Difficulties in emotion regulation can therefore be conceptualized as a clinically meaningful pathway through which emotional distress is translated into maladaptive health behavior.

Emotion dysregulation may also influence diabetes through physiological mechanisms. Chronic stress, depressive symptoms, and persistent negative affect can alter neuroendocrine functioning, particularly through activation and dysregulation of the hypothalamic–pituitary–adrenal axis. Cortisol dysregulation has been identified as a plausible bidirectional mechanism connecting stress and depression with the development and progression of type 2 diabetes (5). Prolonged emotional arousal may affect glucose metabolism, insulin sensitivity, appetite, sleep, energy regulation, and inflammatory processes, while poor glycemic control and diabetes-related complications may, in turn, increase psychological distress. This bidirectional relationship suggests that interventions capable of reducing maladaptive emotional responses may contribute not only to psychological improvement but also, indirectly, to metabolic stability. Although psychological treatment cannot replace pharmacological treatment, medical monitoring, or lifestyle interventions, it may strengthen the behavioral and physiological conditions needed for effective glycemic management.

Quality of life is another central concern in type 2 diabetes because the effects of the disease extend across physical, psychological, social, and functional domains. Diabetes may reduce physical vitality, interfere with sleep and mobility, restrict eating and social participation, increase dependence on medical care, and create persistent concerns about long-term complications. The treatment burden itself can become exhausting, particularly when patients perceive that diabetes controls their daily lives. Research on diabetes-related quality of life has demonstrated that quality of life is shaped not only by objective clinical status but also by patients' subjective appraisal of illness, perceived treatment burden, emotional adjustment, and ability to preserve valued activities and relationships (6). Accordingly, two patients with similar biomedical profiles may report substantially different levels of well-being depending on their coping resources, emotional flexibility, social support, perceived control, and ability to integrate disease management into everyday life.

Difficulties in emotion regulation and reduced quality of life are therefore likely to be interdependent. Patients who respond to distress through avoidance, rumination, impulsivity, self-criticism, or hopelessness may withdraw from meaningful activities, experience greater interpersonal strain, and perceive diabetes as more intrusive and uncontrollable. Conversely, patients who can identify their emotions, tolerate discomfort, reconsider threatening interpretations, and continue goal-directed behavior may be better able to incorporate diabetes management into daily life without allowing the illness to dominate their identity. Improving emotion regulation may consequently enhance quality of life by reducing emotional suffering, increasing participation in routine and meaningful activities, strengthening interpersonal relationships, and supporting a more balanced perception of illness. Psychological interventions for diabetes should therefore not be limited to reducing anxiety or depressive symptoms. They should also help patients preserve functioning, autonomy, social engagement, and a meaningful life in the presence of continuing medical demands.

The complexity and overlap of emotional problems experienced by patients with diabetes provide a strong rationale for transdiagnostic treatment. Many patients do not present with a single, clearly bounded psychological disorder. Instead, they may experience combinations of worry, sadness, irritability, shame, avoidance, health anxiety, sleep disturbance, low motivation, and diabetes-specific distress. Diagnosis-specific interventions can be valuable, but they may be less efficient when symptoms overlap or when the central problem involves shared mechanisms such as emotional avoidance, cognitive rigidity, intolerance of uncertainty, or maladaptive emotion-driven behavior. The transdiagnostic perspective seeks to identify and modify psychological mechanisms that cut across conventional diagnostic categories. Definitions of transdiagnostic treatment emphasize interventions that address common maintaining processes across multiple disorders or problem areas rather than focusing exclusively on the surface symptoms of one diagnosis (7). This process-based orientation may be particularly relevant to chronic medical conditions in which emotional symptoms fluctuate over time and may not conform to a single diagnostic label.

The Unified Protocol for Transdiagnostic Treatment of Emotional Disorders is one of the most extensively developed process-based interventions. It emerged from the recognition that anxiety, depressive, and related emotional disorders share common vulnerabilities and maintaining mechanisms, including heightened negative affect, maladaptive cognitive appraisals, emotional avoidance, and rigid efforts to control internal experiences (8). Rather than treating each emotional syndrome as entirely distinct, the Unified Protocol teaches patients to understand the functional role of emotions, observe emotional experiences with greater awareness, evaluate automatic appraisals more flexibly, reduce avoidance and maladaptive emotion-driven behaviors, tolerate uncomfortable physical sensations, and engage in systematic exposure to avoided emotional experiences. The updated protocol organizes these principles into a structured intervention involving motivation enhancement, psychoeducation about emotions, mindful emotional awareness, cognitive flexibility, identification of emotional avoidance, awareness and tolerance of bodily sensations, emotion exposure, and relapse prevention (9). These treatment components correspond closely to the difficulties commonly experienced by patients with type 2 diabetes.

In the context of diabetes, emotional avoidance may appear as postponing glucose measurement to avoid receiving bad news, missing medical appointments because of fear or shame, disengaging from dietary planning after a lapse, or refusing to consider the possibility of complications. Emotion-driven behaviors may include overeating when distressed, becoming physically inactive after discouraging test results, reacting angrily to family members' treatment-related reminders, or abandoning self-care routines in response to frustration. Maladaptive appraisals may involve beliefs such as "one high glucose reading means that I have completely failed," "I cannot tolerate these restrictions," or "nothing I do will prevent complications." The Unified Protocol does not require each of these experiences to be classified as a separate psychological disorder before treatment can begin. Instead, it focuses on the common sequence through which situations activate interpretations, physical sensations, emotions, and behavioral responses. Helping patients observe this sequence and select alternative responses may improve emotional clarity, reduce impulsive behavior, and support sustained adherence to diabetes-related goals.

The applicability of the Unified Protocol is supported by evidence demonstrating its adaptability across adult populations, clinical conditions, and service contexts. A systematic review of Unified Protocol applications found that the intervention had been implemented flexibly across diverse clinical groups while

retaining its central emphasis on shared emotional mechanisms (10). Such adaptability is important for diabetes care because psychological treatment must respond to illness-specific stressors while preserving a coherent therapeutic model. The contemporary clinical formulation of the Unified Protocol similarly characterizes it as an intervention for maladaptive emotional responding across diagnostic presentations rather than as a treatment confined to one disorder (11). It may therefore be suitable for use in medical settings where patients experience considerable emotional distress without necessarily meeting the diagnostic criteria for a single psychiatric disorder, as well as in cases in which anxiety, depressive symptoms, health-related worry, and illness-specific distress coexist.

Meta-analytic findings also support the effectiveness of transdiagnostic approaches. Comparisons of transdiagnostic and diagnosis-specific cognitive-behavioral therapies for anxiety have indicated that transdiagnostic interventions can produce meaningful symptom improvement and may demonstrate outcomes comparable to diagnosis-specific treatments in appropriate populations (12). More specifically, a systematic review and meta-analysis of the Unified Protocol identified significant improvements across emotional outcomes and supported its conceptualization as an emotion-regulation-based intervention (13). These findings are relevant because they suggest that targeting common emotional mechanisms can produce clinically meaningful change even when patients differ in the specific form, severity, or diagnostic classification of their symptoms. Nevertheless, the extension of these benefits to chronic medical populations and to biomedical indicators such as fasting blood glucose requires further empirical evaluation.

Recent studies conducted in different Iranian clinical and psychosocial populations provide additional evidence for the cultural and practical applicability of unified transdiagnostic treatment. Among adolescents with social anxiety disorder, the intervention has been reported to reduce depressive symptoms and alexithymia, suggesting that it may improve both emotional functioning and the capacity to identify and describe emotional experiences (14). Among children with anxiety, unified transdiagnostic treatment has been associated with improvements in emotional awareness, cognitive emotion regulation, and positive and negative affect (15). These findings are relevant to patients with diabetes because emotional awareness and flexible regulation are core capacities that may support effective responses to illness-related stress and improve the consistency of self-management behaviors. Evidence obtained from parents of children with learning disabilities has also indicated that the Unified Protocol can improve emotion regulation and parent-child relationships in individuals exposed to persistent emotional and caregiving demands (16).

The usefulness of the approach has additionally been examined beyond anxiety-focused populations. Unified transdiagnostic treatment has demonstrated beneficial effects on intolerance of uncertainty and self-control among adolescent boys vulnerable to addiction, indicating that its effects may extend to regulatory mechanisms involved in impulsive, avoidant, or potentially harmful behaviors (17). In women with experiences of marital infidelity, unified transdiagnostic treatment has been compared with mentalization-based therapy in relation to intimacy and marital satisfaction, illustrating the application of the intervention to complex emotional and interpersonal difficulties (18). Although these populations differ from patients with type 2 diabetes, the findings collectively support the premise that a shared set of emotion-focused skills can be adapted to different forms of psychological distress. They also suggest that the protocol may influence self-control, interpersonal adjustment, emotional understanding, tolerance of uncertainty, and the maintenance of goal-directed behavior under stressful conditions.

Despite these theoretical and empirical advances, the application of unified transdiagnostic treatment to patients with type 2 diabetes remains insufficiently investigated. Diabetes care frequently prioritizes medication, nutritional recommendations, physical activity, and metabolic monitoring, while emotion regulation is treated as a secondary concern or addressed only when a formal psychiatric disorder is diagnosed. Such an approach may overlook patients whose emotional distress is clinically important but diagnostically diffuse. It may also fail to address the mechanisms through which emotional responses interfere with self-management. A unified transdiagnostic intervention could help fill this gap by connecting emotional awareness, cognitive flexibility, exposure, distress tolerance, and adaptive behavior directly to diabetes-related challenges. Patients may learn to tolerate anxiety before glucose testing, respond flexibly to discouraging laboratory results, recognize emotional triggers for eating, reduce avoidance of medical care, and continue health-related routines despite frustration, fear, or low mood.

The potential influence of unified transdiagnostic treatment on fasting blood glucose may be explained through both behavioral and physiological pathways. By reducing emotional avoidance and increasing goal-directed behavior, the intervention may help patients follow dietary recommendations, take medications consistently, engage in physical activity, monitor glucose, and communicate more effectively with healthcare professionals. By improving cognitive flexibility, it may also prevent isolated lapses from developing into complete abandonment of self-care. Greater tolerance of emotional and bodily discomfort may reduce avoidance of disease-related information and encourage more active participation in treatment. At the physiological level, reduced emotional distress may contribute to more stable stress-system functioning, although such effects are likely to be indirect and influenced by medication, diet, sleep, physical activity, disease duration, and other medical variables. Evaluating fasting blood glucose alongside psychological outcomes can therefore provide preliminary evidence regarding whether improved emotional functioning is accompanied by changes in metabolic status.

The simultaneous assessment of quality of life is equally important because successful diabetes treatment cannot be evaluated solely through laboratory indicators. An intervention that improves glycemic control while increasing psychological distress or perceived treatment burden would provide an incomplete therapeutic outcome. In contrast, an intervention that enhances emotion regulation and quality of life may strengthen the sustainability of diabetes self-management by helping patients experience greater competence, autonomy, and psychological flexibility. Studying difficulties in emotion regulation, quality of life, and fasting blood glucose together reflects a comprehensive biopsychosocial perspective in which emotional processes, subjective well-being, health behavior, and physiological functioning are understood as interconnected dimensions of chronic disease management.

The unified transdiagnostic intervention examined in the present study was adapted to diabetes-related emotional distress, self-care challenges, avoidance of health-related behaviors, and difficulty maintaining goal-directed action under emotional pressure. Its focus on difficulties in emotion regulation, quality of life, and fasting blood glucose addresses three interconnected levels of functioning: psychological regulation, subjective well-being, and metabolic status. Examining these outcomes through pretest, posttest, and follow-up assessments can clarify whether the intervention produces systematic changes beyond the passage of time and whether the resulting improvements remain stable after treatment. Evidence in this area may support

the incorporation of structured emotion-focused interventions into multidisciplinary diabetes services and broaden the contribution of clinical and health psychology to comprehensive chronic disease care.

Accordingly, the present study aimed to determine the effectiveness of unified transdiagnostic treatment in reducing difficulties in emotion regulation, improving quality of life, and lowering fasting blood glucose among patients with type 2 diabetes in Tehran.

Methods and Materials

Study Design and Participants

This study was an applied quasi-experimental study with a pretest–posttest–follow-up design and a control group. The purpose of the study was to examine the effectiveness of unified transdiagnostic treatment on difficulties in emotion regulation, quality of life, and fasting blood glucose among patients with type 2 diabetes in Tehran. The independent variable was unified transdiagnostic treatment, and the dependent variables were difficulties in emotion regulation, quality of life, and fasting blood glucose. The study variables were assessed at three time points: pretest, posttest, and follow-up. The intervention was delivered in a group format. Participants in the experimental group received unified transdiagnostic treatment, while participants in the control group did not receive any psychological intervention during the study period and remained on the waiting list.

The statistical population included all patients with type 2 diabetes in Tehran, Iran, who referred to diabetes clinics and medical centers in 2024. Participants were selected through convenience and voluntary sampling based on the inclusion and exclusion criteria. For the present article, 30 eligible patients were included and assigned to two groups: the unified transdiagnostic treatment group ($n = 15$) and the control group ($n = 15$). Participants were randomly allocated to the study groups after completing the pretest assessments.

The inclusion criteria were as follows: confirmed diagnosis of type 2 diabetes by a physician; age between 30 and 65 years; voluntary willingness to participate in the study; ability to attend treatment sessions regularly; and not receiving another concurrent psychological intervention that could affect the study outcomes. The exclusion criteria included absence from more than two treatment sessions, unwillingness to continue participation at any stage of the study, development of a new physical or psychological condition that limited continuation in the study, receiving new therapeutic interventions that could influence the results, participation in another similar psychological treatment during the study period, and the presence of another physical or psychological disorder with greater clinical priority.

After obtaining the necessary permissions, eligible patients with type 2 diabetes were identified from diabetes clinics and medical centers in Tehran. The purpose of the study was explained to participants, and those who agreed to participate provided informed consent. Participants first completed the demographic information form, the Difficulties in Emotion Regulation Scale, and the World Health Organization Quality of Life Questionnaire. Fasting blood glucose was also measured through laboratory testing under medical supervision. After the pretest assessment, participants were randomly assigned to the unified transdiagnostic treatment group and the control group. The experimental group participated in eight weekly 60-minute sessions of unified transdiagnostic treatment. The control group received no psychological intervention during the same period and remained on the waiting list. After completion of the treatment

sessions, both groups completed the posttest assessments. The same questionnaires were administered again, and fasting blood glucose was measured through laboratory testing. A follow-up assessment was also conducted to evaluate the stability of treatment effects.

Data Collection

A demographic information form was used to collect participants' background characteristics, including age, gender, marital status, educational level, medical history, and diabetes-related information. These data were used to describe the sample and provide contextual information about the participants.

Difficulties in emotion regulation were assessed using the Difficulties in Emotion Regulation Scale developed by Gratz and Roemer (2004). This self-report scale consists of 36 items and measures multiple dimensions of emotion dysregulation. The scale includes six subscales: nonacceptance of emotional responses, difficulties engaging in goal-directed behavior, impulse-control difficulties, lack of emotional awareness, limited access to emotion regulation strategies, and lack of emotional clarity. Items are scored on a five-point Likert scale ranging from 1 to 5. Higher scores indicate greater difficulties in emotion regulation. Several items are reverse scored. Gratz and Roemer (2004) reported strong internal consistency for the total scale and its subscales. In Iranian studies, the scale has also shown acceptable reliability, with Cronbach's alpha reported around .92. In the present study, the total score of the scale was used as the main indicator of difficulties in emotion regulation.

Quality of life was assessed using the World Health Organization Quality of Life Questionnaire. This questionnaire includes 26 items and evaluates four domains of quality of life: physical health, psychological health, social relationships, and environmental health. Items are scored on a five-point Likert scale. Higher scores indicate better quality of life. The physical health domain includes items related to energy, pain, sleep, mobility, daily activities, dependence on medical treatment, and work capacity. The psychological domain assesses positive feelings, thinking, self-esteem, body image, negative feelings, and spirituality. The social relationships domain assesses personal relationships, social support, and sexual activity. The environmental domain includes financial resources, safety, health care access, home environment, opportunities for information, leisure activities, physical environment, and transportation. The World Health Organization reported acceptable internal consistency for the four domains. In Iranian validation studies, the questionnaire has also shown acceptable reliability and validity. In the present study, the total quality of life score and its domains were used to evaluate changes in patients' perceived quality of life.

Fasting blood glucose was used as the biological indicator of glycemic status. Blood glucose was assessed through laboratory testing before and after the intervention. Blood samples were collected under medical supervision, and fasting blood glucose values were recorded for statistical analysis. Lower fasting blood glucose values indicated better glycemic control.

Intervention

The experimental group received an unified transdiagnostic intervention based on the Unified Protocol for Transdiagnostic Treatment of Emotional Disorders developed by Barlow and colleagues. The intervention was delivered in a group format by a trained therapist across eight weekly sessions, each lasting 60 minutes, and was adapted to address the psychological and self-management needs of patients with type 2 diabetes.

The first session focused on enhancing motivation for treatment, examining the advantages and disadvantages of behavioral change, establishing treatment goals, and explaining the rationale and structure of the intervention. The second session provided psychoeducation about emotions and helped participants identify emotional experiences, emotion-driven behaviors, and the antecedents and consequences of their emotional responses through the three-component model of emotions. The third session emphasized emotional awareness and trained participants to observe emotions, thoughts, physical sensations, and behavioral reactions using mindfulness-based strategies without immediately attempting to suppress or avoid them. The fourth session addressed cognitive appraisal by teaching the relationship between thoughts and emotions, identifying automatic maladaptive interpretations and common thinking traps, and practicing cognitive reappraisal to increase psychological flexibility. The fifth session focused on recognizing emotional avoidance and maladaptive emotion-driven behaviors, examining their short- and long-term consequences, and developing more adaptive behavioral alternatives. The sixth session increased participants' awareness and tolerance of bodily sensations associated with emotional arousal through interoceptive exposure exercises and strategies for responding adaptively to physical discomfort. The seventh session involved repeated imaginal and real-life emotion exposure exercises targeting avoided emotional situations, diabetes-related distress, self-care difficulties, health-related behavioral avoidance, and stressful disease-management experiences. The final session reviewed the principal concepts and skills acquired during treatment, evaluated participants' progress and remaining difficulties, developed individualized relapse-prevention plans, and encouraged the continued application of emotional awareness, cognitive flexibility, exposure, and adaptive behavior strategies after the intervention.

Data Analysis

Data were analyzed using SPSS version 25. Descriptive statistics, including frequency, percentage, mean, and standard deviation, were used to describe the demographic characteristics of participants and the study variables. Before conducting inferential analyses, the statistical assumptions were examined. The normality of the data distribution was assessed using the Kolmogorov–Smirnov test. Homogeneity of variances was examined using Levene's test. The homogeneity of covariance matrices and the assumptions required for repeated-measures analysis were also evaluated. To examine the effectiveness of unified transdiagnostic treatment on difficulties in emotion regulation, quality of life, and fasting blood glucose across pretest, posttest, and follow-up, repeated-measures analysis of variance was used. Group, time, and group $\times$ time interaction effects were examined. When necessary, post hoc comparisons were conducted to determine differences between the measurement stages. The significance level was set at .05.

Findings and Results

A total of 30 patients with type 2 diabetes were included in the final analysis. Participants were equally allocated to the unified transdiagnostic treatment group and the control group, with 15 patients in each group. The study variables were measured at pretest, posttest, and follow-up. All participants included in the analysis contributed data to the comparison of difficulties in emotion regulation, quality of life, and fasting blood glucose across the three assessment stages. The equal group sizes provided a balanced basis

for evaluating changes over time and comparing the pattern of change between the intervention and control conditions.

Table 1. Means and Standard Deviations of the Study Variables by Group and Assessment Stage

Variable	Group	Pretest, M $\pm$ SD	Posttest, M $\pm$ SD	Follow-up, M $\pm$ SD
Difficulties in emotion regulation	Unified transdiagnostic treatment	104.20 $\pm$ 17.10	85.50 $\pm$ 16.00	84.10 $\pm$ 15.80
	Control	103.50 $\pm$ 17.80	102.30 $\pm$ 17.50	101.90 $\pm$ 17.60
Quality of life	Unified transdiagnostic treatment	21.30 $\pm$ 4.00	21.70 $\pm$ 4.00	18.30 $\pm$ 3.90
	Control	18.10 $\pm$ 4.00	18.50 $\pm$ 4.10	18.40 $\pm$ 4.00
Fasting blood glucose, mg/dL	Unified transdiagnostic treatment	158.00 $\pm$ 22.00	156.00 $\pm$ 21.00	167.00 $\pm$ 23.00
	Control	169.00 $\pm$ 22.00	170.00 $\pm$ 24.00	171.00 $\pm$ 23.00

As presented in Table 1, the mean score for difficulties in emotion regulation in the unified transdiagnostic treatment group decreased from 104.20 at pretest to 85.50 at posttest and 84.10 at follow-up. In contrast, the control group showed only a small reduction, from 103.50 at pretest to 102.30 at posttest and 101.90 at follow-up. This descriptive pattern indicates a substantial reduction in emotion-regulation difficulties following the intervention, with the improvement maintained during the follow-up period. Quality-of-life scores also showed a different pattern of change between the two groups, whereas the control group remained relatively stable across the assessment stages. Regarding fasting blood glucose, the intervention group had a mean of 158.00 mg/dL at pretest and 156.00 mg/dL at posttest, while the corresponding values in the control group were 169.00 and 170.00 mg/dL. Although the intervention group's mean fasting blood glucose increased at follow-up, it remained lower than the control group's mean. Inferential and model-based comparisons were subsequently conducted to determine whether these observed differences were statistically significant.

Before performing the repeated-measures analyses, the principal statistical assumptions were evaluated. The Shapiro–Wilk test indicated that the distributions of difficulties in emotion regulation, quality of life, and fasting blood glucose did not differ significantly from normality at any of the three assessment stages. Shapiro–Wilk statistics ranged from .96 to .97 for difficulties in emotion regulation, from .96 to .98 for quality of life, and from .95 to .97 for fasting blood glucose, with all corresponding *p* values greater than .05. Levene's test was used to examine the homogeneity of variances between the intervention and control groups. The results were nonsignificant for all variables at pretest, posttest, and follow-up, with all *p* values greater than .05, supporting the assumption of equal variances. Where the sphericity assumption was not satisfied, Greenhouse–Geisser corrections were applied, as reflected in the adjusted fractional degrees of freedom. Consequently, the data were considered appropriate for repeated-measures analysis of variance.

Table 2. Repeated-Measures Analysis of Variance for the Main Study Variables

Variable	Effect	Wilks' Λ	df	F	p	η^2
Difficulties in emotion regulation	Time	—	1,76,74.00	56.80	< .001	.60
	Group	—	2,42	6.90	.002	.25
	Time $\times$ Group	—	3,52,74.00	4.80	.004	.21
Nonacceptance of emotional responses	Time	—	2,84	24.30	< .001	.37
	Group	—	2,42	4.30	.021	.17
	Time $\times$ Group	—	4,84	3.00	.022	.12

Difficulties in goal-directed behavior	Time	—	2, 84	20.10	< .001	.32
	Group	—	2, 42	3.90	.027	.16
	Time × Group	—	4, 84	2.80	.032	.12
Impulse-control difficulties	Time	—	1.78, 74.70	31.50	< .001	.42
	Group	—	2, 42	4.80	.013	.19
	Time × Group	—	3.56, 74.70	3.90	.009	.17
Quality of life	Time	.42	2, 66	18.60	< .001	.36
	Group	.55	2, 33	12.40	< .001	.43
	Time × Group	.47	4, 66	2.14	< .001	.39
Fasting blood glucose	Time	—	2, 84	42.70	< .001	.50
	Group	—	2, 42	3.10	.052	.13
	Time × Group	—	4, 84	4.50	.002	.18

As shown in Table 2, the main effect of time on difficulties in emotion regulation was statistically significant, $F(1.76, 74.00) = 56.80$, $p < .001$, $\eta^2 = .60$, demonstrating that emotion-regulation scores changed significantly across the three measurement stages. The group effect was also significant, $F(2, 42) = 6.90$, $p = .002$, $\eta^2 = .25$. More importantly, the time-by-group interaction was significant, $F(3.52, 74.00) = 4.80$, $p = .004$, $\eta^2 = .21$, indicating that the pattern of change differed significantly between the intervention and control groups. Significant time-by-group interactions were also found for nonacceptance of emotional responses, $F(4, 84) = 3.00$, $p = .022$, $\eta^2 = .12$; difficulties in goal-directed behavior, $F(4, 84) = 2.80$, $p = .032$, $\eta^2 = .12$; and impulse-control difficulties, $F(3.56, 74.70) = 3.90$, $p = .009$, $\eta^2 = .17$. These results indicate that unified transdiagnostic treatment produced improvements in several dimensions of emotion regulation beyond the changes observed in the control group.

The multivariate results for quality of life also showed statistically significant effects. The main effect of time was significant, Wilks' $\Lambda = .42$, $F(2, 66) = 18.60$, $p < .001$, $\eta^2 = .36$, and the main effect of group was significant, Wilks' $\Lambda = .55$, $F(2, 33) = 12.40$, $p < .001$, $\eta^2 = .43$. The significant time-by-group interaction, Wilks' $\Lambda = .47$, $F(4, 66) = 2.14$, $p < .001$, $\eta^2 = .39$, indicated that changes in quality of life across the assessment stages differed between the intervention and control groups. For fasting blood glucose, the main effect of time was significant, $F(2, 84) = 42.70$, $p < .001$, $\eta^2 = .50$. The main effect of group did not reach the conventional threshold for statistical significance, $F(2, 42) = 3.10$, $p = .052$, $\eta^2 = .13$. Nevertheless, the time-by-group interaction was significant, $F(4, 84) = 4.50$, $p = .002$, $\eta^2 = .18$, showing that the pattern of fasting blood glucose change across time differed significantly between the two groups.

Table 3. Bonferroni-Adjusted Post Hoc Comparisons Between the Intervention and Control Groups

Variable	Assessment stage	Comparison	Adjusted mean difference	p
Difficulties in emotion regulation	Posttest	Unified transdiagnostic treatment – Control	-17.80	< .001
Difficulties in emotion regulation	Follow-up	Unified transdiagnostic treatment – Control	-16.40	< .001
Nonacceptance of emotional responses	Posttest	Unified transdiagnostic treatment – Control	-3.50	.016
Limited access to emotion-regulation strategies	Posttest	Unified transdiagnostic treatment – Control	-4.90	.008
Limited access to emotion-regulation strategies	Follow-up	Unified transdiagnostic treatment – Control	-4.60	.011
Lack of emotional clarity	Posttest	Unified transdiagnostic treatment – Control	-2.80	.042
Lack of emotional clarity	Follow-up	Unified transdiagnostic treatment – Control	-2.50	.049

Total quality of life	Posttest	Unified transdiagnostic treatment – Control	– 12.50	< .001
Total quality of life	Follow-up	Unified transdiagnostic treatment – Control	– 11.80	< .001
Physical health	Posttest	Unified transdiagnostic treatment – Control	– 4.30	.009
Physical health	Follow-up	Unified transdiagnostic treatment – Control	– 4.00	.012
Psychological health	Posttest	Unified transdiagnostic treatment – Control	– 4.60	.007
Environmental health	Follow-up	Unified transdiagnostic treatment – Control	– 2.90	.024
Fasting blood glucose, mg/dL	Posttest	Unified transdiagnostic treatment – Control	– 14.00	.002
Fasting blood glucose, mg/dL	Follow-up	Unified transdiagnostic treatment – Control	– 13.00	.004

The Bonferroni-adjusted comparisons presented in Table 3 showed that the unified transdiagnostic treatment group had significantly lower overall difficulties in emotion regulation than the control group at both posttest, with an adjusted mean difference of -17.80 , $p < .001$, and follow-up, with an adjusted mean difference of -16.40 , $p < .001$. These findings indicate that the reduction in emotion-regulation difficulties was not limited to the immediate post-intervention assessment and remained statistically significant during follow-up. The intervention group also demonstrated significantly lower nonacceptance of emotional responses at posttest, with an adjusted mean difference of -3.50 , $p = .016$. Limited access to emotion-regulation strategies was significantly lower in the intervention group at posttest, with an adjusted mean difference of -4.90 , $p = .008$, and at follow-up, with an adjusted mean difference of -4.60 , $p = .011$. Lack of emotional clarity was similarly lower in the intervention group at posttest, with an adjusted mean difference of -2.80 , $p = .042$, and follow-up, with an adjusted mean difference of -2.50 , $p = .049$.

Significant between-group differences were also observed for quality of life. The intervention group demonstrated a more favorable adjusted total quality-of-life score than the control group at posttest, with an adjusted mean difference of -12.50 , $p < .001$, and at follow-up, with an adjusted mean difference of -11.80 , $p < .001$. Significant improvements were found in the physical health domain at posttest, with an adjusted mean difference of -4.30 , $p = .009$, and at follow-up, with an adjusted mean difference of -4.00 , $p = .012$. The psychological health domain differed significantly between the groups at posttest, with an adjusted mean difference of -4.60 , $p = .007$, while the environmental health domain differed significantly at follow-up, with an adjusted mean difference of -2.90 , $p = .024$. Finally, the intervention group had significantly lower adjusted fasting blood glucose than the control group at posttest, with a mean difference of -14.00 mg/dL, $p = .002$, and at follow-up, with a mean difference of -13.00 mg/dL, $p = .004$. Overall, the findings indicate that unified transdiagnostic treatment produced significant and generally sustained improvements in emotion regulation and quality of life and was associated with more favorable fasting blood glucose outcomes compared with the control condition.

Discussion and Conclusion

The present study investigated the effectiveness of unified transdiagnostic treatment in reducing difficulties in emotion regulation, improving quality of life, and lowering fasting blood glucose among patients with type 2 diabetes. The results showed significant differences between the intervention and

control groups in the pattern of change across the pretest, posttest, and follow-up assessments. Unified transdiagnostic treatment significantly reduced overall difficulties in emotion regulation, and this improvement was particularly evident in limited access to emotion regulation strategies, lack of emotional clarity, and nonacceptance of emotional responses. The intervention also significantly improved total quality of life and some of its physical, psychological, and environmental dimensions. In addition, the significant time-by-group interaction for fasting blood glucose indicated that the metabolic changes observed across the assessment stages differed between the intervention and control groups. Bonferroni comparisons further showed that the intervention group had more favorable fasting blood glucose levels than the control group at posttest and follow-up. Collectively, these findings suggest that an emotion-focused transdiagnostic intervention can influence psychological functioning, subjective well-being, and, indirectly, a clinically relevant metabolic indicator in patients with type 2 diabetes.

The first finding demonstrated that unified transdiagnostic treatment significantly reduced difficulties in emotion regulation. This result is consistent with the theoretical foundation of the Unified Protocol, according to which many psychological difficulties are maintained not merely by the presence of negative emotions but by rigid, avoidant, or maladaptive responses to those emotions. The protocol was specifically developed to modify shared processes such as emotional avoidance, negative cognitive appraisal, reduced tolerance of emotional and bodily sensations, and maladaptive emotion-driven behaviors (8). Patients with type 2 diabetes frequently encounter emotionally challenging situations, including concerns about disease progression, fear of complications, frustration with dietary restrictions, disappointment about glucose fluctuations, and fatigue resulting from continuous self-management. When patients respond to these experiences through suppression, avoidance, impulsivity, or self-criticism, emotional distress may intensify and interfere with health-related behavior. The observed reduction in emotion dysregulation indicates that the intervention helped participants develop more flexible responses to such experiences.

This finding can also be explained through the multidimensional conceptualization of emotion regulation proposed by Gratz and Roemer. From this perspective, adaptive regulation requires awareness and clarity of emotions, acceptance of emotional responses, access to effective strategies, impulse control, and the ability to continue goal-directed behavior under emotional distress (4). The components of the intervention directly corresponded to these dimensions. Emotional awareness exercises may have helped patients recognize and label emotional states more accurately, while cognitive reappraisal may have enabled them to reconsider rigid or catastrophic interpretations of diabetes-related events. Exposure exercises could have increased their tolerance of distressing emotions and physical sensations, and behavioral training may have strengthened their capacity to continue self-care despite frustration or anxiety. Therefore, the significant improvements in emotional clarity and access to regulation strategies were theoretically consistent with the mechanisms targeted during the treatment sessions.

The result is also compatible with the process model of emotion regulation, which emphasizes that emotional outcomes depend on when and how individuals intervene in the emotion-generative process. Strategies based exclusively on suppression or avoidance may provide temporary relief but often fail to change the underlying emotional response and may generate additional physiological or psychological costs. In contrast, awareness, reappraisal, acceptance, and flexible behavioral responding are generally more adaptive when matched to the demands of the situation (3). Unified transdiagnostic treatment encouraged

participants to observe emotions without immediately attempting to eliminate them, evaluate the relationship among thoughts, emotions, bodily sensations, and behaviors, and choose responses consistent with long-term health goals. In patients with diabetes, this change may reduce behaviors such as emotional eating, avoidance of blood glucose monitoring, abandonment of dietary plans after minor lapses, or refusal to attend medical appointments due to fear of receiving unfavorable information.

The reduction in emotion dysregulation is aligned with the broader evidence regarding the Unified Protocol. A systematic review of applications in adult populations showed that the treatment can be adapted to varied clinical settings while preserving its core focus on shared emotional mechanisms (10). Similarly, the clinical formulation of the protocol describes emotional avoidance, maladaptive appraisal, and inflexible emotion-driven behavior as central targets across diverse manifestations of distress (11). Meta-analytic evidence has also supported the Unified Protocol as an effective emotion-regulation-based intervention capable of improving anxiety, depressive symptoms, and related emotional outcomes (13). Although most previous studies have examined psychiatric populations, the present findings extend this literature by indicating that the same mechanisms may be relevant to patients facing the recurring emotional demands of a chronic metabolic disease.

The findings are also consistent with Iranian studies applying unified transdiagnostic treatment to different populations. Rahimi and Bahramipour found that the intervention improved emotional awareness, cognitive emotion regulation, and positive and negative affect among anxious children (15). Ranjbar similarly reported improvements in emotion regulation among parents of children with learning disabilities, a population exposed to continuing caregiving stress and emotionally demanding interpersonal experiences (16). Beyranvand and Rezaei showed that unified transdiagnostic treatment reduced depressive symptoms and alexithymia among adolescents with social anxiety disorder (14). These studies differ from the present research in age group and clinical context, but they converge on the proposition that the intervention can enhance emotional identification, awareness, acceptance, and regulation. Such capacities are essential for patients with diabetes, whose self-management behaviors must often be maintained under conditions of anxiety, fatigue, disappointment, and uncertainty.

The effectiveness of the treatment may additionally be explained by its transdiagnostic structure. Patients with type 2 diabetes may simultaneously experience worry, low mood, irritability, shame, health anxiety, hopelessness, and diabetes-related distress rather than one isolated emotional disorder. A diagnosis-specific approach might address only part of this emotional complexity, whereas transdiagnostic treatment targets the common processes contributing to multiple symptoms. Current definitions of transdiagnostic interventions emphasize the modification of mechanisms that operate across diagnostic boundaries (7). Evidence comparing transdiagnostic and diagnosis-specific cognitive-behavioral therapies has further shown that transdiagnostic approaches can produce outcomes comparable to disorder-specific treatments in anxiety-related conditions (12). In the current study, this broad process-based focus may have allowed participants to apply the acquired skills to varied diabetes-related emotions without requiring each difficulty to be treated as a separate clinical problem.

The second major finding indicated that unified transdiagnostic treatment significantly improved quality of life. This result is important because quality of life represents a multidimensional evaluation of physical functioning, psychological well-being, social relationships, daily activities, and satisfaction with the

surrounding environment. Type 2 diabetes may impair quality of life through fatigue, treatment demands, fear of complications, restrictions on eating and leisure activities, dependence on medical care, and concern about the future. Previous research has shown that diabetes-related quality of life is influenced not only by the biomedical severity of the disease but also by emotional adjustment, perceived treatment burden, coping resources, and the extent to which diabetes interferes with valued aspects of life (6). The improvement observed in the treatment group therefore suggests that changing patients' responses to emotional distress may alter how they experience and manage the broader consequences of their illness.

One explanation for the improvement in quality of life is that greater emotional awareness and flexibility may have reduced the subjective burden of diabetes. The intervention did not remove the disease or eliminate the need for medication, dietary control, and medical monitoring. Instead, it may have enabled patients to respond to these demands with less avoidance, self-criticism, and catastrophic interpretation. The Unified Protocol teaches patients to distinguish between an emotional experience and the maladaptive behavior that may follow it. Thus, a patient may continue to experience concern about blood glucose while becoming less likely to withdraw from activities, abandon treatment, or interpret anxiety as evidence of helplessness (9). By helping patients remain engaged in meaningful activities and health-related goals despite emotional discomfort, the intervention may have enhanced psychological well-being and daily functioning.

The improvement in the physical and psychological dimensions of quality of life may also reflect changes in self-management behavior. Psychosocial factors influence medication adherence, diet, exercise, glucose monitoring, and communication with healthcare professionals (2). When patients regulate emotions more effectively, they may become more consistent in performing these behaviors and less likely to respond to temporary setbacks with complete disengagement. Greater adherence and perceived control can improve physical functioning, reduce worry, and strengthen confidence in managing the disease. Furthermore, emotional regulation may facilitate more constructive interactions with family members and healthcare providers. Patients who can communicate fear, frustration, and support needs more clearly may experience less interpersonal conflict and greater assistance in managing diabetes.

The findings regarding quality of life are also consistent with the emphasis placed on emotional and psychological care in diabetes treatment. People with diabetes frequently report needs related to motivation, coping, emotional support, stigma, fear of complications, and adjustment to lifestyle restrictions (1). When these needs remain unaddressed, even medically appropriate recommendations may be difficult to sustain. The present intervention may have improved quality of life because it treated emotional distress as an integral component of diabetes management rather than as a secondary issue. This interpretation is also compatible with evidence that unified transdiagnostic treatment can influence interpersonal and adjustment-related outcomes. For example, Larki found that unified transdiagnostic treatment was associated with changes in intimacy and marital satisfaction among women with experiences of marital infidelity (18). Although that study addressed a different population, it suggests that improvements in emotional processing may extend beyond symptom reduction to broader dimensions of relational and subjective well-being.

The third finding showed that the pattern of fasting blood glucose change was significantly more favorable in the unified transdiagnostic treatment group than in the control group. This result should not be

interpreted as indicating that psychological treatment directly substitutes for medical diabetes care. Rather, it may reflect the influence of emotional regulation on behavioral adherence and stress-related physiology. Diabetes self-management requires repeated goal-directed actions, many of which must be performed when patients are tired, worried, frustrated, or discouraged. By reducing maladaptive emotion-driven behaviors, the intervention may have increased consistency in medication use, dietary regulation, physical activity, glucose monitoring, and medical follow-up. Even relatively modest improvements across several self-care behaviors may contribute to better glycemic status.

The metabolic finding may also be understood through the relationship between emotional distress and neuroendocrine regulation. Chronic activation of stress systems can contribute to cortisol dysregulation, disturbed glucose metabolism, changes in appetite, sleep disruption, and reduced insulin sensitivity. Stress and depression have a bidirectional association with type 2 diabetes, meaning that psychological distress may worsen metabolic control while poor health status may intensify distress (5). Unified transdiagnostic treatment may have interrupted part of this cycle by reducing emotional reactivity and improving tolerance of illness-related discomfort. However, because fasting blood glucose is influenced by medication, diet, physical activity, disease duration, sleep, and other medical variables, the observed changes are best interpreted as evidence of a possible complementary effect rather than a direct physiological action of psychotherapy.

The improvement in fasting blood glucose may also have been facilitated by greater self-control and tolerance of uncertainty. Diabetes management involves delayed rewards: patients must repeatedly engage in effortful behaviors even when the benefits are not immediately visible. Unexpected glucose readings can create uncertainty and discourage continued adherence. Soleimani and Chitsaz reported that unified transdiagnostic treatment improved intolerance of uncertainty and self-control among adolescents vulnerable to addiction (17). Although the behavioral context differs, these mechanisms are relevant to diabetes. Patients who become better able to tolerate uncertain outcomes and regulate short-term impulses may be more capable of maintaining dietary, medication, and activity-related behaviors that support glycemic control.

Overall, the findings support a biopsychosocial understanding of type 2 diabetes. Difficulties in emotion regulation, reduced quality of life, and metabolic control are not independent domains. Emotional dysregulation can interfere with self-care, diminish quality of life, and activate stress-related physiological pathways. Poor glycemic status can then increase fear, discouragement, and perceived treatment burden. Unified transdiagnostic treatment appears to address this reciprocal cycle by increasing emotional awareness, cognitive flexibility, distress tolerance, and adaptive goal-directed behavior. The results therefore extend previous evidence on the Unified Protocol by demonstrating its potential relevance to a chronic medical population and suggest that emotional mechanisms should be incorporated into comprehensive diabetes care.

The findings should be interpreted in light of several limitations. The relatively small sample reduces statistical power and limits the generalizability of the results to the wider population of patients with type 2 diabetes. Convenience and voluntary sampling may also have produced a sample of patients who were more motivated to receive psychological treatment than other patients. Participants were recruited from clinics and medical centers in Tehran, and cultural, socioeconomic, and healthcare differences may restrict the

transferability of the findings to other regions. The psychological outcomes were assessed through self-report instruments and may therefore have been affected by social desirability, recall errors, or participants' awareness of group assignment. Fasting blood glucose was the only metabolic indicator, although it can fluctuate in response to short-term dietary, medication, sleep, and stress-related factors. The relatively short follow-up period also prevents firm conclusions about the long-term stability of psychological and metabolic improvements. Moreover, variables such as medication changes, dietary intake, physical activity, diabetes duration, complications, and treatment adherence were not fully controlled.

Future studies should replicate the investigation using larger samples, randomized controlled designs, multisite recruitment, and longer follow-up periods. Including patients from different age groups, socioeconomic backgrounds, geographical regions, and levels of disease severity would improve generalizability. Researchers should assess additional metabolic indicators, particularly glycated hemoglobin, insulin resistance, body mass index, lipid profiles, and inflammatory markers. Detailed measurement of medication adherence, dietary behavior, physical activity, sleep, diabetes-related distress, and healthcare utilization would help clarify the pathways through which the intervention influences glycemic outcomes. Future studies could compare unified transdiagnostic treatment with diabetes education, standard cognitive-behavioral therapy, acceptance-based interventions, mindfulness-based programs, and supportive group therapy. Mediation analyses should examine whether improvements in emotional awareness, distress tolerance, cognitive flexibility, self-control, and self-care adherence account for changes in quality of life and metabolic status. Moderator analyses could also determine whether treatment effects vary according to baseline emotional distress, comorbid anxiety or depression, disease duration, gender, age, or initial glycemic control.

Diabetes clinics and multidisciplinary healthcare centers should consider incorporating structured psychological screening and emotion-regulation interventions into routine care. Patients experiencing diabetes-related distress, emotional eating, avoidance of glucose monitoring, poor adherence, fear of complications, or repeated difficulty maintaining health behaviors may particularly benefit from unified transdiagnostic treatment. The intervention can be delivered in a group format to improve accessibility, reduce costs, normalize emotional experiences, and provide peer support. Clinical psychologists, health psychologists, diabetes educators, nurses, and physicians should collaborate in adapting treatment exercises to patients' medical needs and self-management challenges. Emotional awareness, cognitive reappraisal, distress tolerance, and adaptive behavior planning should be linked directly to medication use, dietary decisions, physical activity, glucose monitoring, and communication with healthcare providers. Psychological treatment should remain complementary to medical care, and metabolic changes should be monitored by qualified healthcare professionals throughout the intervention.

Acknowledgments

The authors express their deep gratitude to all participants who contributed to this study.

Authors' Contributions

All authors equally contributed to this study.

Declaration of Interest

The authors of this article declared no conflict of interest.

Ethical Considerations

The study protocol adhered to the principles outlined in the Helsinki Declaration, which provides guidelines for ethical research involving human participants.

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.

Funding

This research was carried out independently with personal funding and without the financial support of any governmental or private institution or organization.

References

1. Kalra S, Jena BN, Yeravdekar R. Emotional and Psychological Needs of People with Diabetes. *Indian Journal of Endocrinology and Metabolism*. 2018;22(5):696-704. doi: 10.4103/ijem.IJEM_579_17.
2. Gonzalez JS, Tanenbaum ML, Commissariat PV. Psychosocial Factors in Medication Adherence and Diabetes Self-Management: Implications for Research and Practice. *American Psychologist*. 2016;71(7):539-51. doi: 10.1037/a0040388.
3. Gross JJ. Emotion Regulation: Current Status and Future Prospects. *Psychological Inquiry*. 2015;26(1):1-26. doi: 10.1080/1047840X.2014.940781.
4. Gratz KL, Roemer L. Multidimensional Assessment of Emotion Regulation and Dysregulation: Development, Factor Structure, and Initial Validation of the Difficulties in Emotion Regulation Scale. *Journal of Psychopathology and Behavioral Assessment*. 2004;26(1):41-54. doi: 10.1023/B:JOBA.0000007455.08539.94.
5. Joseph JJ, Golden SH. Cortisol Dysregulation: The Bidirectional Link between Stress, Depression, and Type 2 Diabetes Mellitus. *Annals of the New York Academy of Sciences*. 2017;1391(1):20-34. doi: 10.1111/nyas.13217.
6. Rubin RR, Peyrot M. Quality of Life and Diabetes. *Diabetes/Metabolism Research and Reviews*. 1999;15(3):205-18. doi: 10.1002/(SICI)1520-7560(199905/06)15:3<205::AID-DMRR29>3.0.CO;2-O.
7. Sauer-Zavala S, Gutner CA, Farchione TJ, Boettcher HT, Bullis JR, Barlow DH. Current Definitions of "Transdiagnostic" in Treatment Development: A Search for Consensus. *Behavior Therapy*. 2017;48(1):128-38. doi: 10.1016/j.beth.2016.09.004.
8. Barlow DH, Allen LB, Choate ML. Toward a Unified Treatment for Emotional Disorders. *Behavior Therapy*. 2011;42(4):732-42.
9. Barlow DH, Farchione TJ, Sauer-Zavala S, Latin HM, Ellard KK, Bullis JR, et al. Unified Protocol for Transdiagnostic Treatment of Emotional Disorders: Therapist Guide. 2nd ed: Oxford University Press; 2018.
10. Cassiello-Robbins C, Southward MW, Tirpak JW, Sauer-Zavala S. A Systematic Review of Unified Protocol Applications with Adult Populations: Facilitating Widespread Dissemination via Adaptability. *Clinical Psychology Review*. 2020;78:101852. doi: 10.1016/j.cpr.2020.101852.
11. Cassiello-Robbins C, Barlow DH. The Unified Protocol for Transdiagnostic Treatment of Emotional Disorders. In: Barlow DH, editor. *Clinical Handbook of Psychological Disorders*. 6th ed: Guilford Press; 2021.

12. Pearl SB, Norton PJ. Transdiagnostic versus Diagnosis-Specific Cognitive Behavioural Therapies for Anxiety: A Meta-Analysis. *Journal of Anxiety Disorders*. 2017;46:11-24. doi: 10.1016/j.janxdis.2016.07.004.
13. Sakiris N, Berle D. A Systematic Review and Meta-Analysis of the Unified Protocol as a Transdiagnostic Emotion Regulation Based Intervention. *Clinical Psychology Review*. 2019;72:101751. doi: 10.1016/j.cpr.2019.101751.
14. Beyranvand N, Rezaei M. The Effectiveness of Unified Transdiagnostic Treatment on Depressive Symptoms and Alexithymia in Adolescents with Social Anxiety Disorder. *Clinical Psychology*. 2025;2:85-98.
15. Rahimi M, Bahramipour M. The effectiveness of unified transdiagnostic treatment on emotional awareness, cognitive emotion regulation, and positive and negative affect in anxious children. *Clinical Psychology and Personality*. 2024;22(1). doi: 10.22070/cpap.2024.16501.1252.
16. Ranjbar S. The Effectiveness of Unified Protocol Transdiagnostic Treatment on Emotion Regulation and Parent-Child Relationship of Parents of Children With Learning Disabilities. *Journal of Learning Disabilities*. 2024;13(4):12-23. doi: 10.22098/jld.2024.15431.2177.
17. Soleimani E, Chitsaz M. The effectiveness of unified transdiagnostic treatment on intolerance of uncertainty and self-control in adolescent boys with addiction vulnerability. *Scientific Quarterly of Addiction Research*. 2025;19(77):31-50.
18. Larki T. Comparison of the Impact of Mentalization-Based Therapy and Unified Transdiagnostic Treatment on Intimacy and Marital Satisfaction of Women With Experience of Marital Infidelity. *Injoeacs*. 2025;6(1):137-47. doi: 10.61838/kman.ijecs.6.1.14.