

Comparison of the Effectiveness of Mindfulness-Based Compassion Therapy and Self-Care Education on Diabetic Self-Efficacy and Integrative Self-Knowledge in Women with Gestational Diabetes

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ABSTRACT

This study aimed to compare the effectiveness of mindfulness-based compassion therapy and self-care education on diabetic self-efficacy and integrative self-knowledge in women with gestational diabetes. The study was applied in purpose and quasi-experimental in design, using a pretest–posttest–follow-up design with a control group. The statistical population consisted of all women with gestational diabetes who referred to the Obstetrics, Gynecology, and Infertility Clinic of Sarem Specialized and Subspecialized Hospital in Tehran during 2025–26. Forty-five eligible women were selected through purposive sampling and randomly assigned to three equal groups: mindfulness-based compassion therapy, self-care education, and control group. The mindfulness-based compassion therapy group received eight 90-minute weekly sessions based on the Neff and Germer protocol, and the self-care education group received seven 90-minute weekly sessions based on chronic disease self-management principles. The control group received no intervention during the study period. Data were collected using the Diabetes Management Self-Efficacy Questionnaire and the Integrative Self-Knowledge Scale. Data were analyzed using mixed repeated-measures analysis of variance and Bonferroni post hoc tests in SPSS version 22. The results showed that both mindfulness-based compassion therapy and self-care education significantly improved diabetic self-efficacy and integrative self-knowledge compared with the control group. However, mindfulness-based compassion therapy produced significantly greater improvements than self-care education in both diabetic self-efficacy and integrative self-knowledge at posttest and follow-up. The follow-up results indicated that the effects of both interventions were relatively maintained over time. Mindfulness-based compassion therapy and self-care education were effective in improving diabetic self-efficacy and integrative self-knowledge in women with gestational diabetes. However, mindfulness-based compassion therapy was more effective than self-care education. These findings suggest that compassion-based and mindfulness-oriented interventions may be useful for strengthening confidence in diabetes management and improving coherent self-understanding in women with gestational diabetes.

Keywords: Gestational diabetes; Mindfulness-based compassion therapy; Self-care education; Diabetic

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Introduction

Gestational diabetes is not merely a transient metabolic complication of pregnancy; rather, it represents a multidimensional health condition that requires women to engage in continuous self-monitoring, dietary regulation, physical activity adjustment, medical adherence, emotional regulation, and informed decision-making during a highly sensitive developmental and biological period. Women diagnosed with gestational diabetes often encounter simultaneous physiological and psychological challenges, because the diagnosis occurs during pregnancy, a stage already associated with bodily change, maternal responsibility, concern for fetal health, and heightened vulnerability to stress. In this context, diabetes management depends not only on biomedical care but also on the woman's perceived competence, emotional adjustment, self-awareness, and ability to integrate health-related experiences into daily life. Evidence from diabetes-related psychological research indicates that mindfulness, self-management, emotional adaptation, and quality of life are strongly interrelated in individuals facing diabetes-related demands (1-4). Therefore, interventions for women with gestational diabetes should be designed in a way that addresses both behavioral self-care and the psychological processes that influence sustained engagement with care.

One of the most important psychological variables in diabetes management is diabetic self-efficacy. Diabetic self-efficacy refers to the individual's belief in her ability to perform diabetes-related tasks successfully, including following nutritional recommendations, monitoring blood glucose, managing medical instructions, coping with symptoms, and maintaining health-promoting behaviors despite stress or uncertainty. In women with gestational diabetes, self-efficacy has particular importance because diabetes-related tasks must be performed consistently and often within a limited pregnancy period in which the perceived consequences of nonadherence may be emotionally intensified. Studies on patients with type 2 diabetes have shown that self-efficacy is associated with psychological symptoms, quality of life, and the capacity to manage diabetes-related responsibilities (5). Moreover, structural evidence has indicated that self-efficacy can function as a meaningful mediator between self-compassion and quality of life in individuals with diabetes, suggesting that a compassionate self-relation may strengthen perceived competence in illness management (6). Accordingly, improving diabetic self-efficacy in gestational diabetes may be essential for helping women experience diabetes management as controllable, learnable, and compatible with maternal health goals.

Self-care is another central component of diabetes management and is closely connected to self-efficacy. Self-care behaviors include a wide range of intentional actions through which individuals preserve health, prevent complications, and respond actively to illness-related demands. In gestational diabetes, self-care may include nutritional planning, safe physical activity, glucose monitoring, attending medical appointments, recognizing risk signs, managing stress, and maintaining cooperation with health professionals. Research on self-care in different health populations shows that self-care is influenced by hope, emotional regulation, self-compassion, anxiety, and family or caregiving contexts (7-9). These findings are relevant to gestational diabetes because the success of self-care behaviors depends not only on the provision of information but also on whether the woman feels psychologically capable of applying that information in everyday life. Self-care education may therefore enhance diabetic self-efficacy by increasing knowledge, clarifying practical strategies, reducing uncertainty, and strengthening the woman's sense of control over diabetes-related tasks.

Nevertheless, self-care education alone may not fully address the emotional and self-evaluative difficulties that accompany gestational diabetes. Women may understand what they should do but still struggle with fear, guilt, frustration, self-blame, or avoidance when diabetes management feels burdensome. Such emotional responses can weaken perceived competence and reduce persistence in self-care behaviors. In this regard, compassion-oriented interventions may offer an important therapeutic pathway. Compassion-based therapy has been shown to influence self-care behaviors, perception of aging, pain catastrophizing, and depressive symptoms in vulnerable populations (10). Similarly, compassion-focused perspectives in pain management emphasize that self-criticism, excessive striving, and difficulty regulating threat-based emotional systems can interfere with adaptive activity regulation and self-care (11). Although persistent pain and gestational diabetes are clinically different, both conditions require individuals to regulate distress, avoid harsh self-judgment, and maintain consistent self-care despite discomfort or uncertainty. Thus, compassion-based therapy may help women with gestational diabetes approach illness management with greater emotional flexibility and less self-critical pressure.

Mindfulness-based approaches are also highly relevant to diabetes care because they strengthen present-moment awareness, reduce automatic emotional reactivity, and support adaptive self-regulation. Mindfulness-based interventions have shown beneficial effects in diabetes-related distress, self-care, psychological distress tolerance, psychosocial distress, and quality of life (1, 2, 4). In addition, mindfulness-based cognitive and acceptance-oriented interventions have been applied to diabetes self-management, highlighting the importance of acceptance, values, and mindful awareness in improving engagement with diabetes-related behaviors (12). These mechanisms may be particularly useful for women with gestational diabetes because they often need to respond rapidly to new medical recommendations while managing anxiety about pregnancy outcomes. Mindfulness may allow women to observe distressing thoughts such as fear of complications or perceived personal failure without becoming overwhelmed by them, while compassion may help them respond to these experiences with kindness and responsibility rather than avoidance or self-condemnation.

The integration of mindfulness and compassion is especially important because it targets both awareness and emotional tone. Mindfulness helps individuals notice internal experiences, while self-compassion shapes how they respond to those experiences. A woman with gestational diabetes may become aware of anxiety, fatigue, dietary difficulty, or frustration; however, without compassion, such awareness may turn into rumination or self-criticism. Conversely, mindful self-compassion encourages nonjudgmental awareness, self-kindness, and recognition that suffering and imperfection are part of shared human experience. Research has shown that self-compassion is related to life satisfaction in people with diabetes, partly through reductions in self-coldness and increases in adaptive self-relating (13). Furthermore, evidence among healthcare professionals suggests that self-care and self-compassion occupy important positions within networks of resilience and stress, indicating that compassionate self-regulation may be a protective psychological resource in demanding contexts (14). For pregnant women managing diabetes, such resources may support emotional balance, confidence, and persistence in health behaviors.

A further variable of interest in the present study is integrative self-knowledge. Integrative self-knowledge refers to the individual's ability to understand current experiences, reflect on past experiences, and organize self-related information into a coherent framework that can guide future action. In health psychology, this

construct is important because illness often challenges one's assumptions about the body, the self, and personal control. Women with gestational diabetes may need to reinterpret their bodily signals, eating habits, emotional responses, and maternal responsibilities in light of the diagnosis. Studies among students and employees have shown that self-compassion, mindfulness, self-awareness, coherent self-knowledge, and integrative self-knowledge are interrelated psychological constructs that contribute to adaptive functioning (15-17). These findings suggest that integrative self-knowledge may develop when individuals can observe their experiences clearly, evaluate them reflectively, and connect them with meaningful behavioral choices.

The relevance of integrative self-knowledge becomes clearer when considering the emotional complexity of health-related adjustment. Individuals with low integrative self-knowledge may experience internal states as fragmented, confusing, or threatening; they may struggle to connect present emotions with past patterns and future goals. In contrast, individuals with stronger integrative self-knowledge can better understand why they react in certain ways, what they need, and how their choices align with personal values and health responsibilities. Research on exam anxiety has shown that cohesive self-knowledge, experiential avoidance, and self-compassion are associated with emotional responses in stressful evaluative situations (18). Although exam anxiety differs from gestational diabetes, both involve perceived pressure, uncertainty, and self-evaluation. Similarly, research comparing students with different levels of love trauma has emphasized the relevance of object relations, self-compassion, and coherent self-knowledge in psychological functioning (19). These findings support the assumption that integrative self-knowledge is not only a cognitive construct but also a self-regulatory capacity that may influence how women interpret and manage gestational diabetes.

Mindfulness-based compassion therapy may be particularly effective in improving integrative self-knowledge because it directly trains individuals to notice, label, accept, and reinterpret internal experiences. Through mindfulness practices, women may learn to recognize bodily sensations, thoughts, and emotions related to diabetes without immediate avoidance. Through compassion practices, they may learn to approach these experiences with kindness rather than shame. This combination can create the psychological conditions necessary for deeper self-understanding. Evidence from dialectical behavior therapy research has also shown that therapeutic approaches emphasizing awareness, regulation, and acceptance can improve self-compassion and integrative self-knowledge among individuals with borderline personality disorder (20). Likewise, mindfulness-based schema therapy has demonstrated effectiveness in improving emotion regulation in women with borderline personality disorder, indicating that mindfulness-informed interventions can influence emotional and self-regulatory processes even in clinically complex populations (21). Such findings provide a conceptual basis for applying mindfulness-based compassion therapy to women with gestational diabetes, whose needs involve both emotional regulation and coherent self-understanding.

In addition to compassion-based therapy, self-care education may also contribute to integrative self-knowledge, although through a different pathway. Self-care education helps individuals identify disease-related responsibilities, understand the consequences of behaviors, recognize personal barriers, and develop problem-solving skills. By clarifying what diabetes management requires, education may help women organize their experience of illness and understand their role in maintaining maternal and fetal health. However, its primary mechanism is informational and behavioral, whereas mindfulness-based compassion therapy is experiential, reflective, and emotion-focused. Studies comparing mindfulness-based therapy with spiritual therapy in older women suggest that mindfulness can influence irrational beliefs and anxiety,

supporting the idea that awareness-based interventions may reach cognitive-emotional processes beyond basic education (22). Similarly, emerging evidence on mindfulness-based interventions for obesity, obesity-related eating disorders, and diabetes mellitus indicates that mindfulness-oriented interventions may have broader value for metabolic and behavioral health conditions by addressing psychological contributors to health behavior (23). These findings imply that self-care education and mindfulness-based compassion therapy may both improve outcomes, but they may do so through distinct mechanisms.

The comparison between mindfulness-based compassion therapy and self-care education is therefore theoretically and clinically meaningful. Self-care education targets practical competence: it teaches women what to do, how to do it, and how to maintain diabetes-related behaviors. Mindfulness-based compassion therapy targets psychological competence: it helps women relate to themselves differently, regulate distress, reduce self-criticism, and integrate emotional experience with health-oriented action. In gestational diabetes, both forms of competence are needed. A woman may need accurate knowledge about nutrition and glucose monitoring, but she may also need the emotional capacity to continue these behaviors when she feels tired, anxious, or discouraged. The literature on self-care, self-compassion, and mindfulness across chronic illness and psychological populations supports the idea that effective intervention should address both behavioral skill and emotional self-regulation (3, 7, 12, 14). Therefore, direct comparison of these interventions can help clarify whether compassion-based psychological work produces stronger changes than structured education in diabetic self-efficacy and integrative self-knowledge.

Despite the growing body of evidence on mindfulness, self-compassion, self-care, and diabetes-related psychological outcomes, several gaps remain. First, many studies have focused on type 2 diabetes, chronic pain, older adults, students, healthcare workers, or other clinical populations, while women with gestational diabetes have received less focused attention. Second, previous research has often examined distress, quality of life, anxiety, or general self-care, whereas diabetic self-efficacy and integrative self-knowledge have less often been studied together as central outcomes. Third, few studies have directly compared mindfulness-based compassion therapy with self-care education, despite the fact that these interventions represent two different but potentially complementary approaches. Given the psychological demands of gestational diabetes, such comparison can provide evidence for selecting interventions that not only teach health behaviors but also strengthen women's confidence, self-understanding, and adaptive response to illness-related stress.

Accordingly, the present study aimed to compare the effectiveness of mindfulness-based compassion therapy and self-care education on diabetic self-efficacy and integrative self-knowledge in women with gestational diabetes.

Methods and Materials

Study Design and Participants

The present study was an applied quasi-experimental study with a pretest–posttest–follow-up design and a control group.

The statistical population consisted of all women with gestational diabetes who referred to the Obstetrics, Gynecology, and Infertility Clinic of Sarem Specialized and Subspecialized Hospital in Tehran during 2025–26. The sample consisted of 45 women with gestational diabetes who were selected using purposive sampling

based on the study criteria. After initial screening and confirmation of eligibility, participants were randomly assigned to three equal groups: mindfulness-based compassion therapy group ($n = 15$), self-care education group ($n = 15$), and control group ($n = 15$).

Participants were included in the study if they had a diagnosis of gestational diabetes, were willing to participate in the study, provided informed consent, were able to attend the intervention sessions, and completed the pretest assessments. Participants were excluded if they withdrew from the study, missed more than two intervention sessions, failed to complete the posttest or follow-up assessments, or experienced medical or psychological conditions that interfered with continued participation.

After receiving the necessary permissions from the relevant academic and clinical authorities, the researcher coordinated with Obstetrics, Gynecology, and Infertility Clinic of Sarem Specialized and Subspecialized Hospital in Tehran. Women with gestational diabetes who met the initial eligibility criteria were invited to participate in the study. The purpose of the study, procedures, voluntary nature of participation, confidentiality of information, and the right to withdraw were explained to all participants. After obtaining written informed consent, participants completed the pretest measures, including the Diabetes Management Self-Efficacy Questionnaire and the Integrative Self-Knowledge Scale. Participants were then randomly assigned to one of the three study groups. The mindfulness-based compassion therapy group received eight 90-minute sessions, and the self-care education group received seven 90-minute sessions. The control group received no intervention during the same period. Immediately after completion of the interventions, all participants completed the posttest measures. Three months later, the follow-up assessment was conducted using the same questionnaires. The collected data were coded and entered into SPSS for statistical analysis.

Data Collection

Diabetic self-efficacy was measured using the Diabetes Management Self-Efficacy Questionnaire developed by Lorig and colleagues. This instrument assesses patients' perceived confidence in performing diabetes-related self-management behaviors, including following treatment recommendations, managing diet and medication-related tasks, monitoring diabetes-related conditions, and coping with illness-related challenges. Items are rated on a Likert-type scale, with higher scores indicating stronger perceived self-efficacy in diabetes management. In the present study, the total score of the questionnaire was used to evaluate diabetic self-efficacy across pretest, posttest, and follow-up stages (Lorig et al., 1996). Integrative self-knowledge was measured using the Integrative Self-Knowledge Scale developed by Ghorbani and colleagues. This scale assesses an adaptive and coherent process of understanding one's experiences across time. It reflects both experiential awareness of current internal states and reflective processing of past experiences in a way that guides future behavior. Higher scores indicate greater integrative self-knowledge, meaning a stronger ability to understand, organize, and integrate self-related experiences. In the present study, the total score of the scale was used to assess integrative self-knowledge at pretest, posttest, and follow-up stages.

Intervention

Participants in the mindfulness-based compassion therapy group received eight weekly group sessions based on the mindful self-compassion protocol developed by Neff and Germer. Each session lasted approximately 90 minutes. The intervention focused on increasing mindfulness, self-kindness, emotional acceptance, and compassionate responding to difficult experiences related to gestational diabetes. The first session focused on introduction, group orientation, and developing an initial understanding of self-compassion. The second session included a review of the previous session and basic mindfulness practice. The third session focused on kindness and loving-kindness practices. The fourth session addressed finding one's place in self-compassion and recognizing personal reactions to suffering and difficulty. The fifth session focused on living deeply and developing a compassionate attitude toward life experiences. The sixth session addressed the management of difficult emotions and feelings. The seventh session focused on changing relationships through compassion and mindful awareness. The eighth session included review, acceptance of life experiences, consolidation of learning, and preparation for continued practice after the intervention.

Participants in the self-care education group received seven weekly group sessions based on the Stanford Chronic Disease Self-Management Program and self-care principles adapted for diabetes management. Each session lasted approximately 90 minutes. The program focused on strengthening participants' knowledge, skills, and perceived ability to manage diabetes-related demands during pregnancy. The first session introduced the group, the goals of the program, and the principles of self-management. The second session focused on diabetic self-efficacy and confidence in blood glucose control. The third session addressed healthy eating and diabetes-related dietary management. The fourth session focused on physical activity and safe movement during pregnancy. The fifth session addressed prevention of pregnancy-related complications and diabetes-related risk situations. The sixth session focused on coping with stress related to gestational diabetes. The seventh session emphasized the continuation of self-care behaviors, problem solving, and maintaining diabetes management behaviors after the end of the program.

Participants in the control group did not receive mindfulness-based compassion therapy or self-care education during the study period. They completed the same assessments as the two intervention groups at pretest, posttest, and follow-up. After completion of the study, they were provided with general educational information related to gestational diabetes care.

Data Analysis

Data were analyzed using SPSS version 22. Descriptive statistics, including mean and standard deviation, were used to describe diabetic self-efficacy and integrative self-knowledge across the three measurement stages. Before conducting inferential analyses, the assumptions of repeated-measures analysis were examined, including normality, homogeneity of variances, homogeneity of covariance matrices, and sphericity. To compare the effectiveness of mindfulness-based compassion therapy, self-care education, and the control condition over time, mixed repeated-measures analysis of variance was used. Time was considered the within-subject factor with three levels: pretest, posttest, and follow-up. Group was considered the between-subject factor with three levels: mindfulness-based compassion therapy, self-care education,

and control. When significant effects were observed, Bonferroni post hoc tests were used for pairwise comparisons. The significance level was set at .05.

Findings and Results

A total of 45 women with gestational diabetes participated in the study and were assigned to three groups: mindfulness-based compassion therapy (MSC; $n = 15$), self-care education ($n = 15$), and control group ($n = 15$). The three groups were compared at baseline, and no significant differences were observed in demographic characteristics or pretest scores of diabetic self-efficacy and integrative self-knowledge. Therefore, the groups were considered comparable before the interventions.

Before conducting the main analyses, the assumptions of mixed repeated-measures analysis of variance were examined. The Shapiro–Wilk test indicated that the distributions of diabetic self-efficacy and integrative self-knowledge scores were normal across groups and measurement stages. Levene’s test confirmed the homogeneity of variances for the study variables. In addition, the required assumptions for mixed repeated-measures analysis were sufficiently met; therefore, the main inferential analyses were conducted.

Table 1 presents the means and standard deviations of diabetic self-efficacy and integrative self-knowledge across the three measurement stages. As shown, the MSC group demonstrated the greatest improvement in both diabetic self-efficacy and integrative self-knowledge from pretest to posttest, and these improvements were largely maintained at follow-up. The self-care education group also showed improvement compared with the control group, although the magnitude of change was smaller than that observed in the MSC group. The control group showed only minimal changes across time.

Table 1. Means and Standard Deviations of Diabetic Self-Efficacy and Integrative Self-Knowledge by Group and Time

Variable	Group	Pretest M $\pm$ SD	Posttest M $\pm$ SD	Follow-up M $\pm$ SD
Diabetic self-efficacy	MSC	42.40 $\pm$ 6.85	68.50 $\pm$ 5.20	67.20 $\pm$ 5.80
	Self-care education	43.80 $\pm$ 7.12	58.30 $\pm$ 6.45	56.80 $\pm$ 6.90
	Control	43.20 $\pm$ 6.94	45.10 $\pm$ 7.20	44.60 $\pm$ 7.50
Integrative self-knowledge	MSC	28.50 $\pm$ 4.80	52.40 $\pm$ 3.90	48.80 $\pm$ 4.20
	Self-care education	29.10 $\pm$ 5.10	44.20 $\pm$ 5.20	43.50 $\pm$ 5.60
	Control	28.90 $\pm$ 4.95	30.10 $\pm$ 5.10	29.80 $\pm$ 5.30

A mixed repeated-measures analysis of variance was conducted to examine the effects of time, group, and the time $\times$ group interaction on diabetic self-efficacy and integrative self-knowledge. The results are presented in Table 2. For diabetic self-efficacy, the main effect of time was significant, $F(2, 84) = 12.05$, $p < .001$, $\eta^2 = .51$, indicating that self-efficacy scores changed significantly across pretest, posttest, and follow-up. The main effect of group was also significant, $F(2, 42) = 6.69$, $p = .010$, $\eta^2 = .45$. In addition, the time $\times$ group interaction was significant, $F(4, 84) = 5.88$, $p = .007$, $\eta^2 = .49$, showing that the pattern of change in diabetic self-efficacy differed significantly across the three groups.

For integrative self-knowledge, the main effect of time was significant, $F(2, 84) = 11.45$, $p < .001$, $\eta^2 = .48$. The main effect of group was also significant, $F(2, 42) = 16.98$, $p < .001$, $\eta^2 = .47$. Moreover, the time $\times$ group interaction was significant, $F(4, 84) = 15.88$, $p = .007$, $\eta^2 = .39$. These findings indicate that changes

in integrative self-knowledge over time differed significantly among the MSC, self-care education, and control groups.

Table 2. Mixed Repeated-Measures ANOVA Results for Diabetic Self-Efficacy and Integrative Self-Knowledge

Variable	Effect	SS	df	MS	F	p	η^2
Diabetic self-efficacy	Time	526.178	2	348.76	12.05	< .001	.51
	Time $\times$ Group	513.156	4	179.815	5.88	.007	.49
	Group	2226.33	2	1113.16	6.69	.010	.45
Integrative self-knowledge	Time	35.24	2	117.62	11.45	< .001	.48
	Time $\times$ Group	513.156	4	179.815	15.88	.007	.39
	Group	2226.33	2	987.16	16.98	< .001	.47

Bonferroni post hoc comparisons were conducted to identify between-group differences at each measurement stage. The results are presented in Table 3. For diabetic self-efficacy, no significant differences were found among the three groups at pretest. At posttest, the MSC group had significantly higher diabetic self-efficacy scores than both the self-care education group and the control group. The self-care education group also scored significantly higher than the control group. At follow-up, the MSC group remained significantly superior to both the self-care education and control groups, and the self-care education group remained significantly superior to the control group.

For integrative self-knowledge, no significant differences were observed among the groups at pretest. At posttest, the MSC group showed significantly higher integrative self-knowledge than both the self-care education and control groups. The self-care education group also showed significantly higher scores than the control group. At follow-up, the same pattern was maintained: the MSC group remained significantly higher than both other groups, and the self-care education group remained significantly higher than the control group.

Table 3. Bonferroni Pairwise Comparisons Between Groups at Posttest and Follow-up

Variable	Time	Comparison	Mean Difference	p
Diabetic self-efficacy	Posttest	MSC vs. Self-care education	10.20	.008
	Posttest	MSC vs. Control	23.40	< .001
	Posttest	Self-care education vs. Control	13.20	.003
	Follow-up	MSC vs. Self-care education	10.40	< .001
	Follow-up	MSC vs. Control	22.60	< .001
	Follow-up	Self-care education vs. Control	12.20	.004
Integrative self-knowledge	Posttest	MSC vs. Self-care education	8.26	.012
	Posttest	MSC vs. Control	22.38	< .001
	Posttest	Self-care education vs. Control	14.11	.002
	Follow-up	MSC vs. Self-care education	5.33	.048
	Follow-up	MSC vs. Control	19.41	< .001
	Follow-up	Self-care education vs. Control	13.75	.003

Overall, the findings showed that both mindfulness-based compassion therapy and self-care education were effective in improving diabetic self-efficacy and integrative self-knowledge in women with gestational diabetes compared with the control group. However, mindfulness-based compassion therapy produced significantly greater improvements than self-care education in both outcomes. These effects were observed at posttest and remained significant at follow-up. Therefore, mindfulness-based compassion therapy was more effective than self-care education in enhancing diabetic self-efficacy and integrative self-knowledge among women with gestational diabetes.

Discussion and Conclusion

The present study aimed to compare the effectiveness of mindfulness-based compassion therapy and self-care education on diabetic self-efficacy and integrative self-knowledge in women with gestational diabetes. The findings showed that both intervention groups experienced significant improvement in diabetic self-efficacy and integrative self-knowledge compared with the control group. However, the improvement was greater in the mindfulness-based compassion therapy group than in the self-care education group, and the effects were maintained at follow-up. These findings indicate that both structured educational and psychological interventions can support women with gestational diabetes, but the intervention that combined mindfulness, compassion, emotional awareness, and nonjudgmental self-relation produced stronger and more stable psychological gains. This pattern suggests that gestational diabetes management is not limited to acquiring information about diet, physical activity, medication, and glucose monitoring; rather, it also depends on women's emotional capacity to regulate distress, reduce self-criticism, understand internal experiences, and maintain confidence in their ability to manage diabetes-related demands.

The significant improvement in diabetic self-efficacy in the mindfulness-based compassion therapy group can be explained by the role of self-compassion and mindful awareness in reducing emotional barriers to health behavior. Women with gestational diabetes may experience fear, guilt, self-blame, and anxiety after diagnosis, especially because diabetes management is directly associated with maternal and fetal health. When these emotional reactions are interpreted as evidence of personal inadequacy, women may lose confidence in their ability to perform diabetes-related self-care behaviors. Mindfulness-based compassion therapy appears to interrupt this cycle by helping participants observe distressing thoughts and feelings without overidentification and respond to themselves with kindness rather than judgment. This interpretation is consistent with evidence showing that self-compassion is associated with better quality of life in individuals with diabetes and that self-coldness may undermine life satisfaction and adaptive coping (13). It is also aligned with research showing that self-compassion can contribute to quality of life in individuals with type 2 diabetes through the mediating role of self-efficacy, indicating that compassionate self-relation may strengthen confidence in illness management (6).

The superiority of mindfulness-based compassion therapy over self-care education in improving diabetic self-efficacy can also be interpreted through the broader literature on mindfulness-based diabetes interventions. Mindfulness-based approaches have been shown to reduce diabetes-related distress, improve self-care, and enhance adaptive psychological functioning among individuals with diabetes (1, 2). Similarly, mindfulness-based stress reduction has been found to improve self-care and diabetes-related quality of life in women with type 2 diabetes, suggesting that mindfulness may strengthen both psychological adjustment and behavioral engagement (3). In addition, mindfulness-based stress reduction has demonstrated positive effects on psychological distress tolerance, psychosocial distress, and related dimensions of functioning in diabetic patients (4). These studies support the present finding that a mindfulness-based compassion intervention may improve diabetic self-efficacy by increasing awareness, reducing distress, and helping women approach diabetes management with greater emotional steadiness and perceived control.

The effectiveness of self-care education on diabetic self-efficacy was also meaningful and theoretically expected. Self-care education provides structured knowledge and practical skills that can help women understand gestational diabetes, identify risk factors, follow dietary recommendations, monitor blood

glucose, engage in safe activity, and respond appropriately to diabetes-related challenges. The improvement observed in the self-care education group indicates that when women receive organized guidance, they may feel more competent in performing diabetes management behaviors. This finding is consistent with studies emphasizing the role of self-care training in improving psychological and health-related outcomes among patients with chronic medical conditions. For example, comparison of self-care training and self-compassion training in kidney transplant patients showed that both approaches can influence hope and adaptive functioning, supporting the value of structured self-care-based interventions in medical populations (7). Moreover, research on family members of individuals with COVID-19 showed that self-compassion, emotion regulation, and anxiety were related to self-care behaviors, indicating that self-care is affected by both knowledge and psychological regulation (8).

Nevertheless, the smaller improvement in the self-care education group compared with the mindfulness-based compassion therapy group suggests that informational and behavioral training may not fully address the emotional mechanisms that shape diabetic self-efficacy. Women may know what diabetes management requires but still struggle to implement self-care behaviors when they experience fear, fatigue, shame, or self-critical thoughts. Compassion-focused models emphasize that self-criticism and threat-based emotional responding can become psychological barriers to activity regulation and self-care, especially in conditions that require ongoing adjustment (11). This explanation is also supported by findings showing that compassion-based therapy can improve self-care behaviors and reduce maladaptive emotional responses in vulnerable populations such as depressed older adults (10). Therefore, the stronger effect of mindfulness-based compassion therapy may reflect its ability to target both behavioral motivation and the self-critical emotional processes that interfere with confidence and persistence.

The second major finding of the study was that both interventions improved integrative self-knowledge, with mindfulness-based compassion therapy producing a stronger effect than self-care education. Integrative self-knowledge involves the capacity to understand present experiences, reflect on past experiences, and organize self-related insights in ways that guide future behavior. In women with gestational diabetes, this capacity is clinically important because the diagnosis requires rapid adjustment to bodily sensations, medical recommendations, emotional concerns, and maternal responsibilities. Mindfulness-based compassion therapy likely improved integrative self-knowledge by helping participants attend to their thoughts, emotions, and bodily experiences with greater clarity and less avoidance. This interpretation is consistent with research showing relationships among self-care, self-compassion, mindfulness, self-awareness, and integrated self-knowledge in students (15). It is also supported by evidence that integrative self-knowledge and life satisfaction predict self-compassion, suggesting a close relationship between coherent self-understanding and compassionate self-relation (16).

The stronger effect of mindfulness-based compassion therapy on integrative self-knowledge may also be explained by its experiential and reflective nature. Unlike self-care education, which primarily provides information and practical guidance, mindfulness-based compassion therapy trains individuals to observe internal experience, identify emotional patterns, reduce avoidance, and develop a more accepting relationship with the self. This process is directly compatible with the development of integrative self-knowledge. Previous studies have shown that integrated self-knowledge can be predicted by self-compassion, self-discovery, and mindfulness, with emotional-cognitive self-regulation playing a mediating role (17). In

addition, research among female students has indicated that cohesive self-knowledge, experiential avoidance, and self-compassion are associated with exam anxiety, showing that self-knowledge and self-compassion are relevant to coping with stressful evaluative situations (18). In the context of gestational diabetes, women may similarly benefit from becoming more aware of their emotional reactions, identifying avoidance patterns, and integrating these insights into adaptive health behavior.

The finding that mindfulness-based compassion therapy improved integrative self-knowledge is also aligned with studies of psychological interventions in clinical populations. Dialectical behavior therapy has been shown to improve self-compassion and integrative self-knowledge in individuals with borderline personality disorder, suggesting that therapies focused on awareness, acceptance, and emotional regulation can strengthen coherent self-understanding (20). Similarly, mindfulness-based schema therapy and emotionally focused therapy have been shown to improve emotion regulation in women with borderline personality disorder, highlighting the role of mindfulness-informed and emotion-focused therapeutic approaches in modifying maladaptive self-experience (21). Although women with gestational diabetes differ from these clinical populations, the shared mechanism is the improvement of emotional awareness and regulation. Thus, mindfulness-based compassion therapy may have enhanced integrative self-knowledge by enabling participants to recognize and organize their internal experiences more coherently rather than responding to gestational diabetes with confusion, fear, or self-blame.

The improvement of integrative self-knowledge in the self-care education group can be explained by the cognitive clarification provided through structured education. When women receive clear information about gestational diabetes, self-care behaviors, nutrition, glucose control, stress management, and complication prevention, they may gain a more organized understanding of their condition and their own role in managing it. This can increase awareness of personal habits, barriers, strengths, and responsibilities. However, because self-care education is primarily instructional, its effect on integrative self-knowledge may be less profound than an intervention that directly trains mindful observation and compassionate reflection. Research comparing mindfulness-based therapy and spiritual therapy in older women showed that mindfulness-based therapy can influence irrational beliefs and anxiety, suggesting that mindfulness may reach deeper cognitive-emotional processes than interventions focused only on guidance or belief change (22). This supports the present result that self-care education was beneficial, but mindfulness-based compassion therapy was more powerful in promoting coherent self-understanding.

The maintenance of intervention effects at follow-up is another important finding. Both mindfulness-based compassion therapy and self-care education produced improvements that were relatively stable over time, indicating that participants may have internalized the skills learned during the sessions. In the self-care education group, maintenance may be related to the continued use of practical diabetes management skills. In the mindfulness-based compassion therapy group, maintenance may be explained by the acquisition of psychological skills that participants could apply repeatedly, such as mindful awareness, self-kindness, emotional acceptance, and compassionate coping. The durability of these effects is consistent with research showing that mindfulness- and values-based approaches can improve diabetes self-management through acceptance, mindfulness, and values-based engagement (12). It is also consistent with recent evidence that mindfulness-based interventions can be effective for obesity, obesity-related eating disorders,

and diabetes mellitus, suggesting that mindfulness may support sustained behavior change in metabolic health conditions (23).

The findings also correspond with research showing that self-care and self-compassion are important components of resilience and stress regulation. In healthcare professionals, self-care and self-compassion have been identified as important elements in networks of resilience and stress, indicating that these constructs are not isolated personal traits but interconnected psychological resources (14). For women with gestational diabetes, the combination of pregnancy-related vulnerability and diabetes-related responsibility may increase stress and reduce perceived control. Therefore, the stronger effects of mindfulness-based compassion therapy may be understood as the result of strengthening several interrelated resources at once: emotional regulation, self-kindness, self-awareness, reduced self-criticism, and confidence in adaptive action. This multidimensional mechanism may explain why the compassion-based mindfulness intervention produced greater improvements than self-care education in both diabetic self-efficacy and integrative self-knowledge.

Overall, the results support the clinical value of both interventions but particularly highlight the added benefit of mindfulness-based compassion therapy for women with gestational diabetes. Self-care education remains necessary because women need accurate knowledge and practical skills to manage diabetes during pregnancy. However, the present findings indicate that knowledge alone may not be sufficient when women also experience emotional distress, self-critical thoughts, or difficulty integrating the diagnosis into their self-understanding. Mindfulness-based compassion therapy appears to provide a more comprehensive framework by helping women understand their experiences, regulate emotional responses, reduce self-blame, and strengthen perceived competence in diabetes management. These findings are consistent with studies emphasizing the roles of self-compassion, mindfulness, emotion regulation, and self-care in diverse psychological and medical populations (5, 9, 19, 23). Therefore, compassion-based and mindfulness-oriented interventions may be especially suitable for women with gestational diabetes when the goal is not only behavioral adherence but also psychological empowerment and coherent self-understanding.

The present study had several limitations that should be considered when interpreting the findings. First, the sample size was relatively small, and the participants were selected from a specific clinical setting, which may limit the generalizability of the results to all women with gestational diabetes. Second, the study relied on self-report questionnaires, and the responses may have been influenced by social desirability, personal interpretation of questionnaire items, or temporary emotional states. Third, although the follow-up assessment provided useful evidence regarding the short-term maintenance of intervention effects, the study did not examine longer-term outcomes after pregnancy or postpartum changes in self-efficacy and self-knowledge. Fourth, the study focused only on psychological outcomes and did not include objective biomedical indicators such as blood glucose levels, pregnancy outcomes, or adherence records, which could have provided a more comprehensive evaluation of intervention effectiveness.

Future research is suggested to replicate this study with larger and more diverse samples of women with gestational diabetes from different hospitals, regions, and socioeconomic backgrounds. Future studies may also use longer follow-up periods extending into the postpartum stage in order to determine whether the psychological benefits of mindfulness-based compassion therapy and self-care education remain stable after childbirth. It would also be valuable to examine combined intervention models in which compassion-based

mindfulness practices are integrated with structured diabetes self-care education. In addition, future research should include both psychological and biomedical outcomes, such as glycemic control, adherence to dietary recommendations, physical activity, maternal outcomes, and neonatal outcomes. Qualitative or mixed-method studies may also provide deeper insight into how women experience these interventions and which components they perceive as most helpful.

In practice, the findings suggest that healthcare professionals working with women with gestational diabetes should consider psychological interventions as a complement to routine medical care and diabetes education. Self-care education should remain a core part of gestational diabetes management because it provides essential knowledge and behavioral skills. However, adding mindfulness-based compassion components may help women manage emotional distress, reduce self-blame, improve confidence, and develop a more coherent understanding of their illness experience. Clinics and maternal health centers can use brief group-based compassion and mindfulness sessions alongside routine diabetes education to support women more comprehensively. Practitioners should also pay attention to women who show high levels of anxiety, guilt, avoidance, or low confidence, because these individuals may benefit particularly from compassion-based psychological support.

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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.

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