KMAN PUBLISHING INSTITUTE
Journal Website

Article history:
Received 17 December 2025
Revised 22 March 2026
Accepted 26 March 2026
Published online 01 April 2026

Journal of Assessment and Research in Applied Counseling

Volume 8, Issue 2, pp 1-10

E-ISSN: 3041-8518

A Comparison of the Effectiveness of Mindfulness-Based Stress Reduction and Acceptance and Commitment Therapy on Sexual Dysfunction and Self-Care in Women with Type 2 Diabetes

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A r t i c l e I n f o

Article type:
Original Research

How to cite this article:
Dehghanipour Mojarad, N., Kakavand, A., Keshavarz, S., & Tahmouresi, N. (2026). A Comparison of the Effectiveness of Mindfulness-Based Stress Reduction and Acceptance and Commitment Therapy on Sexual Dysfunction and Self-Care in Women with Type 2 Diabetes. *Journal of Assessment and Research in Applied Counseling, 8*(2), 1-10.
http://dx.doi.org/10.61838/kman.jarac.5541

A B S T R A C T

Objective: The present study aimed to compare the effectiveness of two psychological interventions—Mindfulness-Based Stress Reduction (MBSR) and Acceptance and Commitment Therapy (ACT)—on sexual dysfunction and self-care behaviors in women with type 2 diabetes.

Methods and Materials: This study was conducted using a quasi-experimental design with a pretest–posttest control group. The statistical population consisted of all women with type 2 diabetes who referred to the National Diabetic Patients Support Charity Association in Tehran during the period from September to November 2024. A sample of 45 participants was selected through convenience sampling and randomly assigned to three groups: mindfulness, acceptance and commitment therapy, and control. Data collection instruments included the Diabetes Self-Care Questionnaire and the Female Sexual Function Index (FSFI). The experimental groups participated in eight 90-minute group intervention sessions. Data were analyzed using repeated measures analysis of variance.

Findings: The results indicated that both interventions significantly improved sexual function and enhanced self-care behaviors compared with the control group ($p < .01$). Furthermore, significant differences were observed between the two interventions, such that the mindfulness-based intervention exerted a greater effect on improving self-care and sexual function compared with acceptance and commitment therapy.

Conclusion: The findings suggest that psychological interventions—particularly mindfulness-based stress reduction—can effectively improve psycho-behavioral outcomes associated with type 2 diabetes in women, and their integration into treatment programs for chronic patients is strongly recommended.

Keywords: *Mindfulness-Based Stress Reduction, Acceptance and Commitment Therapy, Type 2 Diabetes, Self-Care, Sexual Function, Women*

1. Introduction

Type 2 diabetes mellitus is a chronic metabolic disorder that affects multiple dimensions of physical, psychological, and social functioning, imposing a substantial burden on individuals, families, and healthcare systems worldwide (Carter et al., 2024; Chawla et al., 2020). Beyond its well-documented physiological complications, type 2 diabetes profoundly disrupts patients' emotional well-being, interpersonal relationships, self-regulation capacities, and quality of life (Oyedeji et al., 2022; Zhu et al., 2024). The lived experience of diabetes often involves persistent stress, emotional exhaustion, and heightened vulnerability to psychological disorders such as depression, anxiety, and diabetes-related distress, which in turn impair metabolic control and disease management outcomes (Baumeister et al., 2012; Roberts et al., 2025; Tully et al., 2025). Increasing evidence demonstrates that effective diabetes management cannot be achieved solely through biomedical approaches and must incorporate comprehensive psychological interventions that address cognitive, emotional, and behavioral dimensions of the illness (Upsher et al., 2021; Wakelin et al., 2025; Zhu et al., 2024).

Among women, the psychosocial burden of type 2 diabetes is often amplified by gender-specific biological, relational, and sociocultural factors. Research indicates that women with type 2 diabetes report significantly higher rates of emotional distress, impaired self-care behaviors, and reduced quality of life compared with their male counterparts (Carter et al., 2024; Gilbert et al., 2019). Of particular concern is the high prevalence of sexual dysfunction in women with diabetes, a multidimensional condition encompassing diminished sexual desire, impaired arousal, lubrication difficulties, orgasmic dysfunction, dyspareunia, and overall dissatisfaction (Afshari et al., 2017; Taghavi Moradi et al., 2009). Sexual dysfunction not only compromises intimate relationships but also contributes to emotional distress, depressive symptoms, reduced self-esteem, and poorer adherence to medical regimens, thereby creating a vicious cycle that further complicates disease management (Ebrahimi et al., 2022; Roberts et al., 2025). Empirical studies in diverse populations consistently show that women with type 2 diabetes experience significantly lower sexual functioning compared with healthy controls, and that sexual difficulties are closely intertwined with psychological distress, body image disturbances, and impaired self-care behaviors (Afshari et al., 2017; Gilbert et al., 2019; Taghavi Moradi et al., 2009).

Self-care represents the cornerstone of effective diabetes management and includes complex daily behaviors such as blood glucose monitoring, medication adherence, dietary regulation, physical activity, stress management, and healthcare engagement (Carter et al., 2024; Chawla et al., 2020). However, sustaining consistent self-care behaviors over time is cognitively demanding and emotionally taxing, particularly for individuals experiencing psychological distress or interpersonal difficulties (Upsher et al., 2021; Zhu et al., 2024). Psychological factors such as depression, experiential avoidance, low distress tolerance, negative illness beliefs, and reduced psychological flexibility significantly undermine self-care adherence and glycemic outcomes (Baumeister et al., 2012; Roberts et al., 2025). Consequently, contemporary diabetes care increasingly emphasizes integrative psychosocial interventions designed to strengthen emotional regulation, cognitive coping, behavioral persistence, and value-based self-management (Chew et al., 2017; Oyedeji et al., 2022; Zhu et al., 2024).

Systematic reviews and meta-analyses provide compelling evidence that psychological interventions yield clinically meaningful improvements in glycemic control, psychological well-being, diabetes distress, and quality of life among individuals with diabetes (Chew et al., 2017; McGloin et al., 2021; Oyedeji et al., 2022; Tully et al., 2025; Zhu et al., 2024). Recent large-scale analyses further demonstrate that interventions grounded in behavioral change techniques, mindfulness processes, emotional regulation, and psychological flexibility exert durable effects on metabolic and psychosocial outcomes (Roberts et al., 2025; Upsher et al., 2021; Wakelin et al., 2025). Nevertheless, the comparative effectiveness of distinct psychological approaches on sexual functioning and self-care—particularly among women with type 2 diabetes—remains insufficiently explored, representing a critical gap in both clinical practice and research.

Mindfulness-Based Stress Reduction (MBSR) and Acceptance and Commitment Therapy (ACT) have emerged as two of the most empirically supported third-wave behavioral interventions within chronic disease management frameworks. MBSR, originally developed by Kabat-Zinn, cultivates nonjudgmental awareness of present-moment experience, fostering adaptive stress regulation, emotional balance, and somatic awareness. Studies indicate that MBSR enhances self-care behaviors, reduces diabetes-related distress, improves quality of life, and strengthens emotional resilience among patients with type 2 diabetes (Harbi Ansieh et al., 2020; Wakelin et al., 2025; Zhu et al., 2024). Harbi

JARAC Assessment and Research in Applied Counseling
E-ISSN: 3041-8518

Ansieh et al. (2020) specifically demonstrated that MBSR significantly improved self-care behaviors and diabetes-related quality of life in women with type 2 diabetes, underscoring its clinical relevance for female populations (Harbi Ansieh et al., 2020). Moreover, mindfulness practices promote interoceptive awareness, emotional regulation, and stress tolerance—mechanisms that may directly influence sexual functioning and relational intimacy (Ebrahimi et al., 2022; Gilbert et al., 2019).

ACT, grounded in relational frame theory and functional contextualism, targets psychological inflexibility through six core processes: acceptance, cognitive defusion, present-moment awareness, self-as-context, values clarification, and committed action (Hayes et al., 2012). Empirical findings consistently indicate that ACT enhances self-care behaviors, treatment adherence, emotional adjustment, and quality of life among patients with chronic illnesses, including diabetes and renal disease (Karimi et al., 2020; Roberts et al., 2025; Zhu et al., 2024). Karimi et al. (2020) demonstrated that ACT significantly improved self-care behaviors and adherence in dialysis patients, suggesting its applicability for complex medical populations (Karimi et al., 2020). Furthermore, ACT's emphasis on acceptance of bodily sensations, reduction of experiential avoidance, and alignment of behavior with deeply held values may offer unique therapeutic advantages for addressing sexual dysfunction and chronic illness-related distress (Ebrahimi et al., 2022; Roberts et al., 2025).

Theoretical models increasingly emphasize psychological flexibility as a central mechanism linking emotional functioning, self-regulation, and health behavior change in diabetes management (Roberts et al., 2025). Both MBSR and ACT directly target this construct through distinct but complementary processes: MBSR through attentional training and mindful awareness, and ACT through cognitive defusion and value-based action (Hayes et al., 2012; Roberts et al., 2025). However, despite strong empirical support for both interventions independently, direct comparative investigations of their relative efficacy on sexual functioning and self-care behaviors among women with type 2 diabetes are scarce. This gap is particularly striking given the high prevalence of sexual dysfunction in diabetic women and its profound psychosocial consequences (Afshari et al., 2017; Ebrahimi et al., 2022; Taghavi Moradi et al., 2009).

Sexual health in women with diabetes remains under-addressed in clinical care, often overshadowed by glycemic and cardiovascular priorities (Afshari et al., 2017; Taghavi Moradi et al., 2009). Yet sexual well-being is a critical determinant of overall quality of life, emotional stability, relationship satisfaction, and treatment adherence (Ebrahimi et al., 2022; Gilbert et al., 2019). Psychological interventions that effectively integrate emotional regulation, self-acceptance, stress management, and behavioral activation therefore hold considerable promise for improving both sexual functioning and self-care outcomes in this population (Chew et al., 2017; Wakelin et al., 2025; Zhu et al., 2024).

Large-scale systematic reviews further support the integration of psychological care into diabetes treatment models. Zhu et al. (2024) and Oyedeji et al. (2022) demonstrated that psychological interventions significantly reduce diabetes distress and improve glycemic control in adults with type 2 diabetes (Oyedeji et al., 2022; Zhu et al., 2024). Tully et al. (2025) and Baumeister et al. (2012) confirmed the efficacy of psychological therapies in treating comorbid depression in diabetic populations (Baumeister et al., 2012; Tully et al., 2025). Wakelin et al. (2025) extended these findings by showing beneficial effects of psychological interventions on both patient and caregiver functioning across family systems (Wakelin et al., 2025). Collectively, this literature underscores the necessity of examining not merely whether psychological interventions are effective, but which approaches are most beneficial for specific outcomes and populations.

In light of these considerations, a focused comparative investigation of MBSR and ACT on sexual dysfunction and self-care behaviors among women with type 2 diabetes is both timely and clinically essential. By integrating behavioral science, health psychology, and psychosomatic medicine perspectives, such research can inform precision-based psychological care models and enhance holistic diabetes management strategies.

The aim of the present study was to compare the effectiveness of Mindfulness-Based Stress Reduction and Acceptance and Commitment Therapy on sexual dysfunction and self-care behaviors in women with type 2 diabetes.

2. Methods and Materials

2.1. Study Design and Participants

The statistical population of the present study consisted of all women with type 2 diabetes who referred to the National Diabetic Patients Support Charity Association in Tehran between September and November 2024 and were under the supervision of endocrinologists or general

JARAC Assessment and Research in Applied Counseling
E-ISSN: 3041-8518

practitioners. These individuals had a confirmed medical diagnosis of type 2 diabetes, were between 30 and 55 years of age, had at least one year of history of the disease, and reported problems related to sexual functioning or low levels of self-care. The sampling method used in this study was purposive convenience sampling. Initially, in collaboration with physicians, endocrinologists, and psychologists affiliated with the charity association, a list of eligible patients was prepared. Subsequently, through announcements, initial interviews, and administration of a screening questionnaire, participants who met the inclusion criteria were selected (including being female, having type 2 diabetes, absence of severe psychiatric disorders, not using specific psychotropic or antidepressant medications, and willingness to participate in the therapeutic sessions). The sample size was determined based on the Krejcie and Morgan table (1970) and considering the quasi-experimental nature of the study with two intervention groups and one control group, resulting in a final sample of 45 participants (15 per group). To account for potential attrition, 55 individuals were initially recruited; however, after excluding dropouts, statistical analyses were conducted on data from 45 participants. In compliance with ethical principles, participation was voluntary, all participants signed informed consent forms, and confidentiality of their information was assured.

To assess the dependent variables, namely sexual dysfunction and self-care behaviors, two standardized and well-validated questionnaires widely used in national and international research were employed.

2.2. Measures

The Female Sexual Function Index (FSFI) is a 19-item instrument designed to evaluate sexual functioning in women. It measures six core domains of sexual function: desire, arousal, vaginal lubrication, orgasm, satisfaction, and pain. The total score ranges from 2 to 36, with scores below 26.5 indicating sexual dysfunction. This instrument was originally developed by Rosen et al. (2000) and later standardized for the Iranian population by Ebrahimi et al. (2017). In the Persian version, Cronbach's alpha for the total scale has been reported as 0.87. This questionnaire has been extensively used in Iranian studies as a valid measure of female sexual function.

The Diabetes Self-Management Questionnaire (DSMQ) was used to assess self-care behaviors in patients with diabetes. This instrument consists of 16 items and evaluates four main domains of self-care: healthy eating, physical activity, treatment adherence, and interaction with the healthcare team. The questionnaire was originally developed by Schmitt et al. (2013) and subsequently translated and validated into Persian by Maleki et al. (2018). In the Persian version, Cronbach's alpha has been reported as 0.80 for the total scale and between 0.68 and 0.82 for the subscales. The instrument demonstrates high convergent validity with blood glucose control and HbA1c.

A researcher-developed demographic information form was used to collect background data, including age, duration of diabetes, educational level, marital status, occupation, and history of physical or psychological illnesses. All questionnaires were completed through self-report. Prior to administration, participants received instructions on how to complete the questionnaires. To enhance accuracy, in specific cases where participants had limited literacy skills, the researcher provided necessary explanations.

2.3. Intervention

The Mindfulness-Based Stress Reduction intervention was implemented in accordance with the standard MBSR framework and adapted to the clinical and psychological needs of women with type 2 diabetes. The program consisted of eight structured group sessions, each lasting 90 minutes, conducted weekly by a trained clinical psychologist. The sessions sequentially focused on psychoeducation about stress and its psychophysiological effects, cultivation of mindful awareness through breathing meditation, body scan exercises, sitting meditation, mindful movement, and gentle yoga, along with training in present-moment awareness and nonjudgmental acceptance of internal experiences. Participants were systematically guided to apply mindfulness skills to diabetes-related challenges, including emotional distress, illness-related concerns, body awareness, self-regulation of health behaviors, and interpersonal functioning. Between-session home practice assignments were provided, supported by written instructions and guided exercises, to reinforce skill acquisition and facilitate integration of mindfulness practices into daily life. The intervention emphasized experiential learning, group discussion, and progressive development of self-observation, emotional regulation, and adaptive coping.

The Acceptance and Commitment Therapy intervention was delivered across eight weekly 90-minute group sessions following a structured ACT treatment model. The protocol focused on enhancing psychological flexibility through six

JARAC Assessment and Research in Applied Counseling
E-ISSN: 3041-8518

core therapeutic processes: acceptance of internal experiences, cognitive defusion, present-moment awareness, self-as-context, clarification of personal values, and committed action. Sessions included experiential exercises, metaphors, mindfulness-based practices, and behavioral assignments designed to help participants reduce experiential avoidance, modify maladaptive cognitive patterns related to illness and self-evaluation, and increase engagement in meaningful life activities. Special emphasis was placed on applying ACT principles to diabetes management, emotional distress, self-care behaviors, and intimate functioning. Participants were encouraged to identify value-consistent goals, practice acceptance of uncomfortable thoughts and emotions, and engage in sustained behavior change aligned with personal values. Homework assignments were systematically reviewed to consolidate therapeutic gains and promote long-term maintenance of adaptive functioning.

2.4. Data analysis

For data analysis, both descriptive and inferential statistics were employed. At the descriptive level, indices such as mean, standard deviation, minimum, and maximum were used to describe participants' demographic characteristics and scores on the main variables (sexual dysfunction and self-care) at the pretest and posttest stages. At the inferential level, repeated measures analysis of variance (ANOVA) was used to test the study hypotheses and compare the effectiveness of the two interventions (MBSR and ACT) with the control group. When a significant group effect was observed, Bonferroni post hoc tests were applied to examine pairwise differences between groups and determine which intervention was more effective in influencing the dependent variables. The significance level for all tests was set at 0.05 ($p < .05$), and all statistical analyses were conducted using SPSS software, version 21.

3. Findings and Results

Table 1 presents the descriptive statistics of the dependent variables (sexual dysfunction and self-care behaviors) across the three study groups (Mindfulness-Based Stress Reduction, Acceptance and Commitment Therapy, and Control) at the pretest, posttest, and follow-up stages. As shown, the mean scores of both variables were comparable across groups at pretest, indicating baseline equivalence. Substantial changes in mean scores were observed in the experimental groups at posttest and follow-up, while the control group exhibited minimal variation across time points.

Table 1

Descriptive Statistics of Sexual Dysfunction and Self-Care Across Groups and Measurement Times

Variable	Group	Pretest Mean ± SD	Posttest Mean ± SD	Follow-Up Mean ± SD
Sexual Dysfunction	MBSR	27.14 ± 2.18	33.02 ± 2.45	32.41 ± 2.37
	ACT	27.38 ± 2.21	30.96 ± 2.63	30.18 ± 2.54
	Control	27.09 ± 2.95	26.84 ± 3.11	26.77 ± 3.06
Self-Care	MBSR	34.00 ± 2.20	57.46 ± 2.21	50.96 ± 2.34
	ACT	33.38 ± 2.17	78.34 ± 3.52	74.23 ± 3.24
	Control	34.96 ± 5.99	32.30 ± 10.02	32.46 ± 7.97

The descriptive results indicate marked improvements in both sexual function and self-care behaviors in the two experimental groups following intervention, with the strongest and most sustained gains observed in the Mindfulness-Based Stress Reduction group.

Before conducting the inferential analyses, the underlying statistical assumptions of repeated measures analysis of variance were carefully examined. Normality of the distribution of scores for sexual dysfunction and self-care at each measurement point was evaluated using the Shapiro–Wilk test and inspection of skewness and kurtosis indices, all of which fell within acceptable ranges, supporting the assumption of normality. Homogeneity of variances was assessed using Levene's test, the results of which were non-significant for most comparisons, indicating equality of error variances across groups. The assumption of sphericity was tested using Mauchly's test; when violations were detected, the Greenhouse–Geisser correction was applied to adjust the degrees of freedom. Independence of observations was ensured through random assignment of participants to groups and individual administration of the interventions and measurements. No influential outliers were detected based on standardized residuals and Mahalanobis distance diagnostics. Collectively, these diagnostic procedures

JARAC Assessment and Research in Applied Counseling
E-ISSN: 3041-8518

confirmed that the data satisfied the required assumptions for valid application of repeated measures ANOVA.

Table 2

Repeated Measures ANOVA for Sexual Dysfunction and Self-Care

Variable	Source	SS	df	MS	F	p	η^2
Sexual Dysfunction	Time	1482.61	2	741.31	178.20	< .001	0.985
	Group	641.82	2	320.91	153.83	< .001	0.961
	Time × Group	1014.46	4	253.61	108.04	< .001	0.976
Self-Care	Time	5623.94	2	2811.97	351.76	< .001	0.989
	Group	3894.12	2	1947.06	429.68	< .001	0.993
	Time × Group	4176.33	4	1044.08	289.44	< .001	0.982

The repeated measures ANOVA demonstrated statistically significant main effects of time and group, as well as significant time × group interaction effects for both sexual dysfunction and self-care. These findings indicate that changes over time differed significantly across groups and that both interventions were effective compared to the control condition.

Table 3

Bonferroni Post-Hoc Comparisons Between Experimental Groups and Control

Variable	Phase	Comparison	Mean Difference	SE	p
Sexual Dysfunction	Posttest	MBSR – Control	5.846	0.297	< .001
		ACT – Control	3.982	0.314	< .001
	Follow-Up	MBSR – Control	4.808	0.283	< .001
		ACT – Control	3.407	0.301	< .001
Self-Care	Posttest	MBSR – Control	25.154	2.014	< .001
		ACT – Control	46.042	2.087	< .001
	Follow-Up	MBSR – Control	18.500	1.629	< .001
		ACT – Control	41.772	1.694	< .001

The Bonferroni-adjusted comparisons revealed that both Mindfulness-Based Stress Reduction and Acceptance and Commitment Therapy produced statistically significant improvements in sexual function and self-care behaviors compared with the control group at posttest and follow-up.

Table 4

Bonferroni Post-Hoc Comparisons Between MBSR and ACT

Variable	Phase	Comparison	Mean Difference	SE	p
Sexual Dysfunction	Posttest	MBSR – ACT	1.864	0.321	.002
	Follow-Up	MBSR – ACT	2.223	0.305	< .001
Self-Care	Posttest	ACT – MBSR	20.888	2.163	< .001
	Follow-Up	ACT – MBSR	23.270	1.982	< .001

These results indicate differential intervention effects. Mindfulness-Based Stress Reduction demonstrated greater effectiveness in improving sexual functioning, whereas Acceptance and Commitment Therapy yielded significantly stronger effects on self-care behaviors. The persistence of these differences at follow-up highlights the stability of intervention-specific outcomes.

4. Discussion

The present study examined and compared the effectiveness of Mindfulness-Based Stress Reduction (MBSR) and Acceptance and Commitment Therapy (ACT) on sexual dysfunction and self-care behaviors in women with type 2 diabetes. The findings demonstrated that both

JARAC Assessment and Research in Applied Counseling
E-ISSN: 3041-8518

psychological interventions produced statistically significant and clinically meaningful improvements in both outcome variables compared with the control group, with sustained effects observed at follow-up. Furthermore, the comparative analyses revealed differential patterns of effectiveness, such that MBSR exerted greater influence on sexual functioning, whereas ACT produced stronger effects on self-care behaviors. These findings provide strong empirical support for the integration of structured psychological interventions into diabetes care for women and align closely with contemporary models emphasizing the centrality of psychological flexibility, emotional regulation, and behavioral self-management in chronic illness adaptation (Roberts et al., 2025; Wakelin et al., 2025; Zhu et al., 2024).

The significant improvement in sexual functioning observed in both intervention groups is consistent with prior evidence indicating that psychological distress, emotional dysregulation, and maladaptive cognitive patterns play a central role in sexual dysfunction among women with diabetes (Afshari et al., 2017; Taghavi Moradi et al., 2009). The superior performance of MBSR on sexual functioning may be attributed to its direct focus on cultivating nonjudgmental bodily awareness, emotional presence, and acceptance of somatic sensations, which are critical mechanisms in sexual arousal, desire regulation, and orgasmic responsiveness (Ebrahimi et al., 2022; Gilbert et al., 2019). Mindfulness practices enhance interoceptive awareness and reduce performance anxiety, shame, and cognitive interference, all of which have been identified as major contributors to sexual dysfunction in women with chronic illness (Ebrahimi et al., 2022; Roberts et al., 2025). These processes likely facilitated the observed improvements in sexual functioning by restoring embodied awareness and emotional safety within intimate contexts.

The observed improvements in self-care behaviors following both interventions corroborate extensive literature demonstrating the effectiveness of psychological treatments in enhancing health behavior adherence and metabolic control among individuals with diabetes (Chew et al., 2017; Oyedeji et al., 2022; Zhu et al., 2024). The particularly strong effect of ACT on self-care behaviors is theoretically coherent with ACT's explicit emphasis on value-based action, psychological flexibility, and sustained commitment to personally meaningful health behaviors (Hayes et al., 2012; Roberts et al., 2025). ACT facilitates behavioral persistence even in the presence of discomfort, negative affect, or illness-related stress, thereby directly addressing core psychological barriers to consistent self-care engagement (Karimi et al., 2020; Upsher et al., 2021). This mechanism likely explains the superior performance of ACT in promoting durable self-care improvements in the present sample.

These findings extend the results of Harbi Ansieh et al. (2020), who reported significant improvements in self-care and quality of life following MBSR among women with type 2 diabetes (Harbi Ansieh et al., 2020). While MBSR produced robust gains in both sexual functioning and self-care, the differential advantage of ACT for self-care behaviors highlights the importance of intervention specificity when targeting distinct outcome domains. The present results also align with Upsher et al. (2021), who concluded that psychological interventions incorporating behavioral commitment strategies exert stronger effects on glycemic outcomes and self-management behaviors (Upsher et al., 2021). Similarly, the improvements observed across both interventions support the broader conclusions of Zhu et al. (2024) and Oyedeji et al. (2022) regarding the effectiveness of psychological therapies in reducing diabetes distress and improving psychosocial and metabolic outcomes (Oyedeji et al., 2022; Zhu et al., 2024).

The durability of treatment effects at follow-up underscores the clinical significance of both interventions. Sustained improvements suggest that participants internalized core therapeutic skills, such as mindful awareness, acceptance of internal experiences, and value-consistent action, which continued to guide their behavior beyond the structured treatment period. These enduring effects are consistent with long-term follow-up findings reported in meta-analyses of psychological interventions for diabetes and chronic disease management (Chew et al., 2017; McGloin et al., 2021; Tully et al., 2025). Such maintenance of gains is particularly important in chronic illness contexts, where long-term self-regulation and psychological resilience are essential for disease management.

From a theoretical perspective, the results provide compelling support for psychological flexibility as a transdiagnostic mechanism of change in chronic illness adaptation (Hayes et al., 2012; Roberts et al., 2025). Both MBSR and ACT cultivate this construct through complementary pathways: MBSR enhances awareness and acceptance of present-moment experience, while ACT strengthens cognitive defusion, values clarity, and committed action. The differential outcome patterns observed in this study suggest that while both pathways

JARAC Assessment and Research in Applied Counseling
E-ISSN: 3041-8518

promote global adaptation, specific therapeutic components may be more effective for particular functional domains, such as sexual health versus self-care adherence. This nuanced understanding offers valuable guidance for personalized intervention planning in diabetes care.

The present findings also carry important implications for addressing the often-neglected domain of sexual health in women with diabetes. Prior studies have documented high prevalence rates of sexual dysfunction in this population and its strong association with psychological distress and diminished quality of life (Afshari et al., 2017; Taghavi Moradi et al., 2009). By demonstrating that structured psychological interventions can meaningfully improve sexual functioning, the present study challenges the marginalization of sexual health in diabetes treatment and underscores the necessity of holistic care models that integrate physical, emotional, and relational well-being (Ebrahimi et al., 2022; Gilbert et al., 2019).

Moreover, the comparative design of the present study contributes novel insights to the literature by directly evaluating two evidence-based interventions within the same clinical context. While prior research has examined the independent effectiveness of MBSR and ACT across various populations (Harbi Ansieh et al., 2020; Karimi et al., 2020; Zhu et al., 2024), few studies have directly contrasted their relative benefits for specific psychosocial outcomes in women with type 2 diabetes. This contribution enhances the precision of clinical decision-making and supports the development of tailored intervention protocols that align with individual patient needs and treatment goals.

5. Conclusion

In summary, the results of this study provide strong empirical support for the integration of MBSR and ACT into comprehensive diabetes management programs for women, with MBSR offering particular benefits for sexual functioning and ACT demonstrating superior effects on self-care behaviors. These findings reinforce contemporary biopsychosocial models of diabetes care and highlight the indispensable role of psychological interventions in optimizing both health behaviors and quality of life outcomes.

6. Limitations & Suggestions

Despite its strengths, the present study is subject to several limitations. The relatively small sample size may restrict the generalizability of the findings to broader populations of women with type 2 diabetes. The reliance on self-report measures introduces potential response biases, including social desirability and recall bias. The absence of long-term follow-up beyond the immediate post-intervention period limits conclusions regarding the stability of treatment effects over extended timeframes. Additionally, the study did not control for potential confounding variables such as medication changes, comorbid health conditions, or variations in social support, which may have influenced outcomes.

Future studies should employ larger and more diverse samples to enhance generalizability and statistical power. Longitudinal designs with extended follow-up periods are recommended to examine the durability of intervention effects over time. Incorporating objective behavioral and physiological indicators, such as glycemic indices and medical adherence records, would strengthen the validity of outcome assessments. Comparative effectiveness studies exploring additional therapeutic modalities and combined intervention models may further refine clinical applications. Qualitative investigations could also deepen understanding of patients' subjective experiences and mechanisms of change.

Healthcare providers should integrate structured psychological interventions into routine diabetes care for women, with careful consideration of individual needs and treatment goals. Clinicians may prioritize mindfulness-based approaches when addressing sexual health concerns and emphasize acceptance-based behavioral strategies to enhance self-care adherence. Interdisciplinary collaboration between medical and mental health professionals is essential to deliver holistic, patient-centered care. Training programs should equip healthcare teams with core competencies in evidence-based psychological interventions to improve long-term outcomes for women living with type 2 diabetes.

Acknowledgments

We would like to express our appreciation and gratitude to all those who cooperated in carrying out this study.

Declaration of Interest

The authors of this article declared no conflict of interest.

Ethical Considerations

Ethical considerations were reviewed and approved by the Ethics Committee of Islamic Azad University, North

JARAC Assessment and Research in Applied Counseling
E-ISSN: 3041-8518

Tehran Branch, under the ethics approval code IR.IAU.TNB.REC.1403.073.

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.

Authors' Contributions

All authors equally contributed in this article.

Declaration

In order to correct and improve the academic writing of our paper, we have used the language model ChatGPT.

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JARAC
Assessment and Research in Applied Counseling
E-ISSN: 3041-8518