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Research Article

Effectiveness of Self-Compassion Training on Self-Esteem, Psychological Well-Being, Psychological Flexibility, and Resilience in Individuals with Type 2 Diabetes

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Abstract

Objective: Type 2 diabetes, in addition to its physical consequences, exerts significant psychological effects on patients' quality of life and mental health. Psychological interventions that strengthen individuals' internal resources can therefore contribute to improved mental health and resilience. The present study aimed to examine the effectiveness of self-compassion training on self-esteem, psychological well-being, psychological flexibility, and psychological resilience in individuals with type 2 diabetes.

Method: A quasi-experimental design with pre-test and post-test measures and a control group was employed. The statistical population comprised all individuals with type 2 diabetes who visited specialized diabetes treatment centers in Tabriz, Iran, during the first quarter of 2023. Of these, 30 participants were selected through convenience sampling and were then randomly assigned to experimental and control groups. Data were collected using the Rosenberg Self-Esteem Scale (1989), Ryff's Psychological Well-Being Scale (2002), the Dennis and Vander Wal Psychological Flexibility Questionnaire (2010), and a Persian Psychological Resilience Scale (Kiamarsi, Najarian, & Mehrabizadeh-Honarmand, 1998). The self-compassion training program consisted of eight one-hour sessions based on Gilbert's therapeutic protocol (2009).

Results: Data analysis indicated that self-compassion training significantly improved self-esteem, psychological well-being, and psychological flexibility in individuals with type 2 diabetes ($p < 0.05$). However, the intervention did not produce a significant effect on psychological resilience in this population.

Conclusion: These findings suggest that enhancing self-compassion skills can constitute an effective component of psychological interventions for patients with type 2 diabetes.

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Keywords: Self-compassion; Self-esteem; Psychological well-being; Psychological flexibility; Psychological resilience; Type 2 diabetes.

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Extended Abstract

Background and Objectives

Type 2 diabetes mellitus is a chronic metabolic disorder that is associated not only with physical complications but also with substantial psychological burden. Individuals with type 2 diabetes often experience elevated levels of stress, reduced self-esteem, impaired psychological well-being, and difficulties in adapting to disease-related demands. These psychological challenges can negatively influence treatment adherence, self-care behaviors, and overall quality of life. Therefore, the identification and implementation of effective psychological interventions are essential alongside medical management.

In recent years, self-compassion training has emerged as a promising therapeutic approach aimed at improving emotional regulation, reducing self-criticism, and enhancing adaptive psychological functioning. Self-compassion involves treating oneself with kindness, recognizing shared human experiences, and maintaining a mindful and balanced awareness of negative emotions. Although previous studies have demonstrated beneficial effects of self-compassion on various psychological outcomes, limited research has simultaneously examined its impact on multiple psychological constructs in individuals with type 2 diabetes.

Accordingly, the present study aimed to investigate the effectiveness of self-compassion training on self-esteem, psychological well-being, psychological flexibility, and psychological resilience in individuals with type 2 diabetes.

Materials and Methods

This study employed a quasi-experimental design with pretest–posttest and a control group. The study population consisted of individuals diagnosed with type 2 diabetes who referred to specialized diabetes clinics in Tabriz, Iran, during the first quarter of 2023. A total of 30 eligible participants were selected through convenience sampling and were randomly assigned to either an experimental group (n = 15) or a control group (n = 15). No attrition occurred, and all participants completed the study.

Inclusion criteria included confirmed diagnosis of type 2 diabetes, age between 20 and 60 years, minimum educational level of high school diploma, and willingness to participate. Exclusion criteria included severe psychiatric disorders, use of psychotropic medications, and prior participation in similar psychological interventions.

The experimental group received an eight-session self-compassion training program based on Compassion-Focused Therapy (CFT) developed by Gilbert. Each session lasted approximately 60 minutes and included psychoeducation, mindfulness exercises, compassionate imagery, self-soothing techniques, and strategies for reducing self-criticism. The control group did not receive any intervention during the study period.

Data were collected using standardized self-report questionnaires, including the Rosenberg Self-Esteem Scale, Ryff's Psychological Well-Being Scale, the Cognitive Flexibility Inventory, and a Psychological Resilience Scale. Data were analyzed using descriptive statistics and multivariate analysis of covariance (MANCOVA), controlling for pretest scores. Statistical significance was set at $p < .05$.

Results

The results of ANCOVA indicated that self-compassion training had a statistically significant effect on self-esteem ($F = 8.94$, $p = .006$, $\eta^2 = .249$), psychological well-being ($F = 7.57$, $p = .010$, $\eta^2 = .219$), and psychological flexibility ($F = 7.05$, $p = .013$, $\eta^2 = .207$). These findings suggest that the intervention was effective in improving key psychological outcomes among individuals with type 2 diabetes.

However, the effect of self-compassion training on psychological resilience was not statistically significant ($F = 3.50$,

$p = .072$, $\eta^2 = .115$), indicating that the intervention did not produce a reliable improvement in this variable within the study period.

Effect size analysis showed that the intervention had moderate to large practical effects on self-esteem, psychological well-being, and psychological flexibility. In contrast, the effect on psychological resilience was small to moderate but not statistically significant.

Discussion and Conclusion

The findings of this study provide evidence that self-compassion training can significantly enhance self-esteem, psychological well-being, and psychological flexibility in individuals with type 2 diabetes. These results are consistent with previous research indicating that self-compassion-based interventions contribute to improved emotional adjustment and psychological functioning in clinical and non-clinical populations.

From a theoretical perspective, self-compassion may help individuals reduce harsh self-judgment and develop a more accepting and supportive attitude toward themselves when facing chronic illness-related challenges. This process may facilitate more adaptive cognitive and emotional responses to stressors associated with diabetes management. However, it is important to note that potential mediating variables such as emotion regulation, cognitive appraisal, and self-criticism were not directly measured in this study. Therefore, the proposed mechanisms remain theoretical and should be interpreted with caution.

In contrast, the absence of a significant effect on psychological resilience suggests that resilience may represent a more stable psychological construct that is less sensitive to short-term interventions. It may also be influenced by broader contextual and personal factors such as life experiences, social support, and socioeconomic conditions. Consequently, longer and more comprehensive interventions may be required to produce measurable changes in resilience.

The present study demonstrates that self-compassion training is an effective psychological intervention for improving self-esteem, psychological well-being, and psychological flexibility in individuals with type 2 diabetes. However, it does not significantly affect psychological resilience within the timeframe of the intervention.

These findings highlight the importance of incorporating self-compassion-based approaches into psychological care programs for patients with chronic illnesses. Such interventions can support better psychological adjustment and enhance coping with the daily challenges of diabetes management. Future research should examine long-term effects, include follow-up assessments, and investigate potential mediating mechanisms to better understand how self-compassion training influences psychological outcomes.

Introduction

Diabetes is among the most prevalent chronic diseases worldwide, and the considerable costs of its treatment impose a heavy economic burden on health systems. The number of people living with diabetes rose from an estimated 135 million in 1995 to a projected 643 million by 2040 (Rezaei & Parsa, 2023). Over the past decade, this upward trajectory has been driven by an aging population, genetic predisposition, unhealthy dietary habits, sedentary lifestyles, rising obesity rates, and urbanization. Diabetes currently ranks as the fourth leading cause of death globally, and approximately 90% of cases are type 2 diabetes, in which the body either fails to use insulin effectively or exhibits a diminished cellular response to it (Soleimani et al., 2022; Soheili et al., 2021). Type 2 diabetes is closely associated with obesity, which heightens insulin resistance; indeed,

insulin resistance is present in roughly 90% of affected individuals, about 80% of whom are overweight (Falah et al., 2022). Although the condition can be partially managed through exercise, dietary regulation, medication, and insulin therapy, the pancreas's impaired insulin production results in chronic hyperglycemia that, if left unmanaged, can damage the nerves and blood vessels and lead to serious complications such as stroke and cardiovascular disease (Sain et al., 2020).

The situation in Iran is similarly concerning. The prevalence of diabetes in adults aged 25 to 70 reached 11.9% in 2011—a 35% increase relative to 2005—and an estimated 9.2 million Iranians may be affected by 2030, with Iran's annual growth rate among the highest in the Middle East (Ne'matollahi et al., 2023). Other estimates indicate that over 11.5% of the Iranian population, or more than 3 million individuals, currently live with diabetes, a figure that the World Health Organization warns could climb to roughly 7 million without effective intervention (Bagheri, 2020; Soheili et al., 2021).

Beyond its physical consequences, the chronic and incurable nature of diabetes places patients under continuous psychological strain. Diabetic patients face persistent stressors associated with disease management and its daily demands, predisposing them to psychological disturbances such as depression and anxiety and ultimately diminishing their quality of life (Mohammadi Moghaddam et al., 2022). Traumatic experiences associated with the illness can erode a sense of security, confront patients with mortality, and, over time, disrupt both psychological well-being and self-esteem (Ozdin & Bayrak, 2020). Because pharmacological interventions for these psychological symptoms—such as sedatives—carry numerous side effects, healthcare providers have increasingly turned to non-pharmacological approaches that prevent and treat psychological problems, reduce diabetes-related complications, and promote mental well-being (Pourmanti et al., 2022). Such interventions are believed to act by strengthening patients' internal psychological resources, of which self-esteem, psychological well-being, and psychological flexibility are among the most consequential.

Self-esteem refers to an individual's overall evaluation of their personal value and reflects the extent to which a person values and appreciates themselves (Orth et al., 2018). Frequently conceptualized as a personality trait that remains relatively stable over time, self-esteem encompasses various self-beliefs, including judgments about appearance, abilities, emotions, and behaviors, and plays a critical role in motivation and life success. Maslow's hierarchy of needs likewise accords self-esteem a central place, distinguishing between the need for esteem from others—conveyed through recognition, achievement, and admiration—and the need for self-respect, manifested as self-love, confidence, and competence; both forms must be fulfilled for individuals to progress toward self-actualization (Bolton & McClain, 2022). Although self-esteem shapes various psychological characteristics, research indicates that it remains susceptible to environmental and personal conditions, particularly among chronically ill populations (Mahdion et al., 2022).

Psychological well-being is a further factor affected by diabetes (Wu et al., 2020). At its core, psychological well-being refers to living well, feeling good, and functioning effectively, and it is closely allied with related constructs such as happiness and life satisfaction; it does not, however, imply the continuous experience of positive emotions, nor does it preclude the ordinary management of negative states such as despair or sadness (Adams et al., 2022). More broadly, it encompasses interest, engagement, confidence, affection, effective functioning, a sense of control over one's life, purpose, and positive relationships. According to the influential model of Ryff and Keyes (1995), psychological well-being comprises six components: positive relations with others, self-acceptance, autonomy, purpose in life, personal growth, and environmental mastery

(Trudel-Fitzgerald et al., 2021). Because each of these dimensions represents a developable internal resource, psychological well-being can be enhanced in diabetic patients through appropriately targeted interventions.

Psychological flexibility likewise merits attention in this population. Defined as the capacity to adapt one's cognitive strategies in response to novel and unexpected situations, psychological flexibility allows individuals to consider multiple perspectives, modify their cognitive frameworks, and avoid habitual reactions when the environment changes (Landry et al., 2021; Cherry et al., 2021). As an aspect of executive functioning closely tied to healthy mental performance, it enables individuals to cope with daily challenges and sustain mental balance. Notably, research suggests that flexibility promotes well-being more effectively than any static psychological trait, precisely because it equips individuals to respond adaptively to shifting circumstances such as those imposed by a chronic illness (Hall & Dimonck, 2021).

Taken together, the foregoing evidence indicates that self-esteem, psychological well-being, and psychological flexibility are both compromised by type 2 diabetes and amenable to strengthening through psychological intervention. However, despite growing interest in such approaches, few studies have examined the effect of self-compassion—an inner resource centered on treating oneself with kindness and acceptance—on these variables in diabetic populations. The present study therefore sought to address this gap by investigating whether self-compassion training enhances psychological well-being, psychological flexibility, self-esteem, and psychological resilience in individuals with type 2 diabetes.

Beyond psychological flexibility, psychological resilience constitutes another essential inner resource for patients coping with chronic conditions such as diabetes. Resilience refers to a mindset that transforms potential threats in stressful situations into opportunities for growth, encouraging engagement with new experiences and the constructive use of past ones (Ndlovu & Ferreira, 2019). As a buffer against stressful life events, resilience has been conceptualized as comprising three related components: *commitment*—finding meaning in stressors—*control*—perceiving stressors as manageable—and *challenge*—regarding stress as a normal and expectable aspect of life (Onat & Eroz, 2018). Individuals high in this trait do not interpret stress primarily as a threat; instead, they respond with confidence, adaptive coping strategies, and the mobilization of social support (Malakin et al., 2019).

Research on chronic diseases has increasingly highlighted the value of self-compassion training in improving psychological outcomes (Sundsen et al., 2016). Self-compassion training teaches individuals to relate to their own suffering with care rather than avoidance, cultivating a genuine desire to alleviate their pain and to treat themselves with kindness. It further addresses self-critical judgments concerning perceived inadequacy, pain, and failure, while helping individuals recognize that their struggles form part of the broader shared human experience (Buts & Stalberg, 2020). The approach also promotes mindful, balanced responses to distress, encourages the preservation of dignity and fair judgment in the face of adversity, and fosters present-moment optimism (Lander, 2019). In essence, self-compassion interventions guide patients to adopt an attitude of self-kindness during negative thought processes and equip them with skills to manage challenges and respond appropriately to life's demands (Finlay-Jones et al., 2020). Importantly, self-compassion training is grounded in the three interrelated components set out by Neff (2003): self-kindness, common humanity, and mindfulness.

Despite growing recognition of the psychological burden borne by individuals with chronic illnesses such as diabetes, few studies have simultaneously examined the relevant psychological factors and the interventions designed to improve them. For instance, Wong, Lau, and Leung (2021) explored the relationship between

self-compassion and psychological well-being, whereas Edwards et al. (2019) investigated the influence of self-compassion on psychological performance among individuals with chronic pain. Nevertheless, according to the researcher's review of the literature, no study to date has simultaneously examined the effectiveness of self-compassion training on self-esteem, psychological well-being, psychological flexibility, and psychological resilience in individuals with type 2 diabetes. Given this evident gap, the present study seeks to answer the following research question: Does self-compassion training influence self-esteem, psychological well-being, psychological flexibility, and psychological resilience in individuals with type 2 diabetes?

Method

Participants and Procedure

This study employed a quasi-experimental pretest–posttest design with a control group. The research design included one experimental group and one control group, both of which were assessed at pretest and posttest stages. The experimental group received the intervention, while the control group did not receive any training during the study. The statistical population consisted of all individuals diagnosed with type 2 diabetes who were referred to specialized diabetes treatment centers in Tabriz City during the first quarter of 2023. A total of 30 participants were initially enrolled in the study and assessed at baseline. All participants completed the pretest and were randomly assigned to the experimental (n = 15) and control (n = 15) groups. No participant dropped out during the intervention period, and all 30 participants completed the posttest assessment. Therefore, no attrition was observed throughout the study.

The inclusion criteria were: (a) diagnosis of type 2 diabetes confirmed by a physician, (b) age between 20 and 60 years, (c) minimum educational level of high school diploma, (d) no history of psychiatric hospitalization or diagnosed severe psychiatric disorder, (e) no current use of psychotropic medications, and (f) willingness to participate and provision of informed consent. The exclusion criteria included: (a) presence of a disabling physical illness other than diabetes, (b) withdrawal from the study at any stage, (c) incomplete completion of questionnaires at pretest or posttest, (d) prior participation in self-compassion-based interventions, and (e) absence from more than two intervention sessions.

The experimental intervention consisted of self-compassion training based on the Compassion-Focused Therapy (CFT) model developed by Paul Gilbert (2009). The protocol was adapted from established CFT guidelines and delivered in eight weekly group sessions, each lasting approximately 60 minutes. The sessions included psychoeducation about self-compassion, recognition of self-criticism, development of compassionate mind training, soothing rhythm breathing, compassionate imagery, and exercises aimed at enhancing emotional regulation and reducing self-judgment. A summary of the intervention content is presented in Table 1. The control group did not receive any intervention during this period and only completed the assessment measures at pretest and posttest.

A priori power analysis was not conducted; however, the sample size was determined based on accessibility and the quasi-experimental nature of the study. Therefore, the relatively small sample size should be considered when interpreting the results. Data were analyzed using descriptive statistics (mean and standard deviation) and inferential statistics. Multivariate analysis of covariance (MANCOVA) was used to examine the effect of the intervention on the dependent variables, including self-esteem, psychological well-being,

psychological flexibility, and Psychological Resilience, while controlling for pretest scores. Assumptions of normality, homogeneity of variance-covariance matrices, and homogeneity of regression slopes were tested prior to conducting the analysis. Statistical significance was set at $p < 0.05$.

Ethical Statements

The study was conducted in accordance with ethical principles of the Declaration of Helsinki. Participation was voluntary, and all participants were fully informed about the purpose and procedures of the study prior to participation. Written informed consent was obtained from all participants. Confidentiality of information was ensured, and participants were informed of their right to withdraw from the study at any time without any consequences.

Measures

***Rosenberg Self-Esteem Scale*:** The Rosenberg Self-Esteem Scale (RSES), originally developed by Morris Rosenberg, consists of 10 items, including five positively worded items and five negatively worded items. The scale has been widely used in psychological research and has demonstrated satisfactory reliability and validity across different populations (e.g., Schmitt & Allik, 2005; Sinclair et al., 2010) Responses are scored on a four-point Likert scale (strongly agree, agree, disagree, strongly disagree), with total scores ranging from 10 to 40. Shisbei, Barlow, Cullen, and Wright (2000) reported acceptable diagnostic validity for this scale in populations with physical disabilities and general populations. In Iran, Rakhordari, Jalalmanesh, and Mahmoudi (2009) confirmed the reliability and validity of the Persian version. Cronbach's alpha for the scale has been reported as 0.74. Rajabi and Behlol (2007) reported reliability using Cronbach's alpha as 0.84 in a student sample. In a study by Pournaghash Tehrani, Fadavi Ardakani, and Nasri Taj Abadi (2017), concurrent validity with the Coopersmith Self-Esteem Inventory and subscales of anxiety and depression was assessed, yielding a positive correlation of 0.61 with Coopersmith self-esteem, and negative correlations of -0.43 and -0.54 with anxiety and depression, respectively.

***Psychological Well-Being*:** The Psychological Well-Being Questionnaire was developed by Ryff (2002) and the version used in this study included 18 items. It is a self-report measure with a five-point Likert scale, ranging from 1 (strongly disagree) to 5 (strongly agree), where higher scores indicate greater psychological well-being. Items 1, 3, 4, 5, 9, 10, 13, and 17 are reverse-scored. The correlation of Ryff's scale with the original scale has ranged from 0.70 to 0.89 (Ryff & Singer, 2006). In Iran, the validity and reliability of this scale were confirmed by Khanjani, Shahidi, Fathabadi, Mazaheri, and Shokri (2014), reporting reliability coefficients for subscales ranging from 0.71 to 0.76, and overall reliability of 0.71.

Psychological Flexibility: The Dennis and Vanderwal Psychological Flexibility Questionnaire (2010) is a 20-item self-report instrument assessing cognitive flexibility necessary for adapting to challenges and replacing maladaptive thoughts with more effective alternatives. Responses are rated on a five-point Likert scale from 1 (strongly disagree) to 5 (strongly agree), with reverse scoring for items 2, 4, 7, 9, 11, and 17. Scores range from 20 to 140, with higher scores indicating greater cognitive flexibility. Dennis and Vanderwal (2010) reported a concurrent validity of -0.39 with Beck Depression Inventory and convergent validity of 0.75 with Martin and Rubin's Psychological Flexibility Scale. Cronbach's alpha for overall scale, perceived controllability, and perception of options were 0.91, 0.84, and 0.91, respectively. In Iran, Shareh, Farmani, and Soltani (2012, cited in Soltani, Shareh, Bahrinian, & Farmani, 2013) reported test-retest reliability of 0.71 and Cronbach's

alpha for the overall scale as 0.81.

Psychological Resilience: The Psychological Resilience Questionnaire, developed by Kiamarsi et al. (1998) at Shahid Chamran University of Ahvaz, consists of 27 items with four response options: "never," "rarely," "sometimes," and "often," scored 0 to 3. Items 6, 21, 17, 13, 10, and 7 are reverse-scored due to negative factor loadings. Total scores range from 0 to 81, with higher scores indicating greater Psychological Resilience. Kiamarsi et al. (1998) reported reliability via test-retest and Cronbach's alpha as 0.84 and 0.76, respectively. Ghafouri Varnosfaderani, Kamali, and Nouri (2008) assessed concurrent validity with general anxiety, depression, and Maslow's self-actualization scale, obtaining correlations of 0.65, 0.67, and 0.62, all significant at $p < 0.001$. Construct validity was also satisfactory.

***Self-Compassion Training*:** Self-compassion training was conducted according to the Compassion-Focused Therapy (CFT) protocol developed by Paul Gilbert (2009). The intervention consisted of eight weekly 60-minute group sessions for participants in the experimental group. The training included psychoeducation about self-compassion, compassionate imagery, self-kindness exercises, mindfulness practices, and techniques for reducing self-criticism. A summary of the intervention protocol is presented in Table 1.

Table 1. Self-Compassion Training Program

Session	Content
1	Orientation session: overview of session structure and main group rules, number and duration of sessions, explanation of expectations, introductory activities for group members to get acquainted, discussion about coronary artery disease with group collaboration, review of participants' issues, and administration of pretest.
2	Exploration of participants' positive and negative thoughts and feelings regarding coronary artery disease and associated psychological issues, body scan and breathing exercises, introduction to compassion-focused brain systems, empathy training, explanation of self-compassion, and assignment of homework.
3	Introduction to characteristics of compassionate individuals, compassion toward others, cultivation of warmth and kindness toward self, understanding that others also have flaws and difficulties in response to self-critical feelings, and assignment of homework.
4	Review of previous homework, encouraging self-reflection and assessment of one's personality as compassionate or unkind based on prior sessions, identification and application of mindfulness-based compassion exercises (empathy and self-compassion toward self and others), training on forgiveness, and homework assignment.
5	Review of prior exercises, practice of compassion-focused techniques (forgiveness, non-judgmental acceptance, patience), and homework assignment.
6	Review of prior exercises, practical exercises creating compassionate imagery, training in modes of expressing compassion (verbal, behavioral, situational, continuous), application of these strategies in daily life with friends, acquaintances, etc., and homework assignment.
7	Review of previous session, training in writing compassion-based letters to self and others, instruction in recording and journaling real-life situations based on compassion, and evaluation of individual responses in those situations.
8	Summary and review of all sessions, Q&A to address participants' questions, guidance on maintaining and applying the intervention in daily life, and administration of the posttest.

Data Analysis

Data were analyzed at descriptive and inferential levels. Descriptive statistics included frequency, percentage, mean, and standard deviation. At the inferential level, the Kolmogorov–Smirnov test was used to examine the normality of the research variables. Hypotheses were tested using multivariate analysis of covariance

(MANCOVA) and univariate analysis of covariance (ANCOVA) within the multivariate framework. All analyses were conducted using SPSS version 23.

Result

Table 2 presents the descriptive statistics of the study variables for the experimental and control groups in the pretest and posttest.

Table 2. Descriptive Statistics of Study Variables by Group and Test Phase.

Variable	Phase	Experimental Mean	SD	Control Mean	SD
Self-esteem	Pretest	30.88	5.66	31.06	4.21
	Posttest	34.20	4.87	30.20	3.36
Psychological well-being	Pretest	52.40	5.38	51.33	3.97
	Posttest	56.26	6.17	51.40	5.27
Cognitive flexibility	Pretest	51.93	4.99	52.33	6.12
	Posttest	58.66	7.08	53.33	5.03
Psychological resilience	Pretest	61.66	15.44	60.73	12.84
	Posttest	70.26	12.42	61.46	13.05

As shown in Table 2, the mean scores of self-esteem, psychological well-being, cognitive flexibility, andPsychological Resilience increased in the posttest for the experimental group compared to the pretest.

Prior to performing the Multivariate Analysis of Covariance (MANCOVA), a series of statistical assumptions were rigorously evaluated. First, the univariate normality of the research variables was assessed via Kolmogorov–Smirnov and Shapiro–Wilk tests. The results demonstrated that the distributions for self-esteem, psychological well-being, psychological flexibility, and psychological resilience—at both pretest and posttest stages across experimental and control groups—did not significantly deviate from normality ($p>.05$), thereby fulfilling the univariate normality assumption. Although multivariate normality was not explicitly tested, it was deemed sufficiently satisfied given the univariate results and the balanced group sizes.

Second, the homogeneity of regression slopes was examined to validate the suitability of the MANCOVA model. No significant interactions were observed between group membership and the covariates for any of the dependent variables ($p > .05$), confirming the adherence to this assumption. Third, Box's M test was employed to assess the homogeneity of covariance matrices. The test yielded non-significant results ($p >.001$), indicating that the covariance matrices were equal across groups; consequently, Wilks' Lambda was selected for the multivariate analysis.

Additionally, Levene's test was utilized to evaluate the homogeneity of variances, which was satisfied for the majority of the variables ($p > .05$). Given the equal sample sizes between groups, the robustness of the MANCOVA against minor potential violations was also considered. Notably, Bartlett's test was omitted as it was deemed redundant for the current research design. In conclusion, the preliminary analyses confirmed that all requisite statistical assumptions for conducting the MANCOVA were adequately met.

Table 3. Results of ANCOVA for Examining Differences in Self-Esteem, Psychological Well-Being, Psychological Flexibility, and Psychological Resilience

Dependent Variable	Source	SS	df	MS	F	Sig.	η^2
Self-Esteem	Group	124.842	1	124.842	8.94	.006	.249
	Error	376.816	27	13.956	–	–	–
	Adjusted Total	610.800	29	–	–	–	–
Psychological Well-Being	Group	112.127	1	112.127	7.57	.010	.219
	Error	399.923	27	14.812	–	–	–
	Adjusted Total	1100.167	29	–	–	–	–
Psychological Flexibility	Group	228.026	1	228.026	7.05	.013	.207
	Error	872.901	27	32.330	–	–	–
	Adjusted Total	1272.000	29	–	–	–	–
Psychological Resilience	Group	553.369	1	553.369	3.50	.072	.115
	Error	4269.132	27	158.116	–	–	–
	Adjusted Total	5123.467	29	–	–	–	–

The results presented in Table 3 indicate that the F-values for group differences were 8.94 for self-esteem, 7.57 for psychological well-being, 7.05 for psychological flexibility, and 3.50 for Psychological Resilience. The results showed that self-compassion training had a significant effect on self-esteem, psychological well-being, and psychological flexibility at the posttest stage after controlling for pretest scores. However, the effect on Psychological Resilience was not statistically significant.

In addition, it should be noted that the present study did not include a follow-up assessment; therefore, the long-term stability of the intervention effects could not be determined. Future research is recommended to include follow-up evaluations to examine the durability of the observed changes over time. In addition to statistical significance, the effect sizes indicated meaningful practical and clinical implications of the intervention. The effect of self-compassion training on self-esteem ($\eta^2 = .249$) can be interpreted as a large effect, suggesting that approximately one-quarter of the variance in self-esteem was attributable to the intervention. From a clinical perspective, this improvement may reflect a noticeable enhancement in patients' self-evaluation and coping with diabetes-related challenges. Similarly, the effects on psychological well-being ($\eta^2 = .219$) and psychological flexibility ($\eta^2 = .207$) represent moderate-to-large effects, indicating that the intervention had a substantial impact on participants' emotional adjustment and adaptive functioning in daily life. In practical terms, these changes may translate into improved emotional regulation, better acceptance of illness-related limitations, and more adaptive responses to stressors associated with type 2 diabetes management. Although the effect on psychological hardiness was not statistically significant, the observed small-to-moderate effect size ($\eta^2 = .115$) may suggest a weak practical trend that could become more evident in longer or more intensive interventions. Overall, the magnitude of the effect sizes supports the practical relevance of self-compassion training in improving key psychological outcomes in individuals with type 2 diabetes.

Discussion and Conclusion

The present study aimed to investigate the effectiveness of self-compassion training on self-esteem, psychological well-being, psychological flexibility, and psychological resilience in individuals with type 2 diabetes. the findings indicated that self-compassion training was effective in improving self-esteem among individuals with type 2 diabetes. This result is consistent with previous studies (e.g., Nobakht & Khoshnevisan, 2022; Tahmasbi et al., 2022; Asadollahi & Shojaei, 2021), which have reported positive effects of compassion-based interventions on self-esteem in different populations.

The observed improvement in self-esteem may be tentatively interpreted within the framework of self-compassion theory, which suggests that adopting a kind and nonjudgmental attitude toward oneself may reduce harsh self-criticism and promote more adaptive self-evaluation. However, as constructs such as self-criticism, emotional regulation, and self-awareness were not directly measured in the present study, these explanations should be considered theoretical and interpreted with caution.

Regarding psychological well-being, the results showed a significant improvement following self-compassion training ($\Delta = 0.22$, $p < .05$). This finding is consistent with previous research (e.g., Minayi & Kianfar, 2022; Akbarpour et al., 2021; Edwards et al., 2019), which has demonstrated the beneficial effects of compassion-based interventions on psychological well-being. The improvement in well-being may be conceptually associated with greater acceptance of personal experiences and reduced psychological distress; however, these mechanisms remain speculative, as they were not directly assessed in the present study.

The results also indicated a significant effect of self-compassion training on psychological flexibility ($\Delta = 0.20$, $p < .05$). This finding is in line with prior studies (e.g., Ghaffari Jahed et al., 2021; Mansouri Karyani et al., 2019), which have highlighted the relationship between compassion-based approaches and cognitive flexibility. From a theoretical standpoint, self-compassion may be associated with more adaptive ways of relating to internal experiences; nevertheless, since specific cognitive and emotional processes (e.g., cognitive reappraisal and acceptance) were not measured, such interpretations should be regarded as preliminary and hypothesis-generating.

In contrast, self-compassion training did not have a statistically significant effect onPsychological Resilience. This finding is inconsistent with some previous research (e.g., Imani Abbasi et al., 2018). The discrepancy may be attributed to differences in sample characteristics, intervention context, and methodological factors. Additionally,Psychological Resilience is often conceptualized as a relatively stable construct that may require longer and more intensive interventions to demonstrate measurable change. Therefore, the non-significant result should be interpreted cautiously, and no definitive conclusions should be drawn regarding the effect of self-compassion training on resilience in the present study.

From a clinical perspective, the observed improvements in self-esteem, psychological well-being, and psychological flexibility suggest that self-compassion training may be a useful psychological intervention for individuals with type 2 diabetes. Given the ongoing demands of diabetes management, including dietary regulation, medication adherence, and continuous monitoring, patients are often exposed to psychological distress and self-critical thinking patterns. Self-compassion-based interventions may help individuals adopt a more accepting and less judgmental stance toward themselves when facing disease-related challenges, thereby facilitating psychological adjustment.

However, it is important to emphasize that the explanatory mechanisms discussed in this study remain theo retical, as potential mediating variables were not directly assessed. Future research is recommended to incor porate mediators such as emotion regulation, self-criticism, and cognitive flexibility to better elucidate the pathways through which self-compassion training exerts its effects. Furthermore, future studies should exam inePsychological Resilience using longer intervention periods, larger samples, and more comprehensive lon gitudinal designs to clarify its responsiveness to such interventions.The findings indicate that self-compassion training significantly improves self-esteem, psychological well-being, and psychological flexibility but does not significantly affect psychological resilience. These results highlight the effectiveness of self-compassion interventions in enhancing mental health among individuals with chronic illnesses, including type 2 diabetes. Self-compassion promotes acceptance, kindness, and empathetic understanding toward oneself, reducing self-criticism, guilt, and helplessness, thereby fostering a more positive and accepting self-perception. This process increases self-esteem, enhances life satisfaction, and improves psychological well-being. It also strengthens psychological flexibility, enabling individuals to adapt to complex and stressful conditions effectively. The lack of impact on resilience may be attributed to its relatively stable and deeply rooted nature, which is influ enced more by long-term personality traits and life experiences. Interventions targeting resilience may require longer or combined therapeutic approaches, including cognitive-behavioral and meaning-based strategies. Overall, self-compassion training can serve as an effective psychotherapeutic approach alongside medical treatment to enhance the mental health and quality of life of individuals with type 2 diabetes.

Limitations

Despite the valuable findings, several limitations should be considered. The relatively small sample size may limit statistical power and generalizability. The study did not include a follow-up assessment;therefore, the long-term sustainability of the intervention effects remains unknown. In addition, potential confounding variables such as socioeconomic status and family support were not controlled. Clinical characteristics of participants (e.g., duration of diabetes, HbA1c, treatment type, and complications) were also not assessed, which may have influenced the results. Finally, the exclusive reliance on self report questionnaires may have introduced response biases, including social desirability and common method variance. Future studies should employ larger samples, multi-method assessments,and longitudinal designs.

Suggestions

Based on the findings, it is recommended to combine self-compassion training with other psychological approaches, such as cognitive-behavioral therapy and acceptance and commitment therapy. Future studies should examine larger and more diverse samples, including individuals with other chronic conditions. Extending the training duration and conducting long-term follow-ups may clarify the sustainability of effects. Incorporating self-compassion training into diabetes rehabilitation programs and educating families to provide psychological support is also advised. Furthermore, future research could investigate the roles of self-efficacy, resilience, and social support in mediating the effects of self-compassion on mental health.

Conflict of Interest

The authors declare that there is no conflict of interest regarding the publication of this article. The authors confirm that they have no financial, personal, or professional relationships that could have influenced the work reported in this study.

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