Research in Health & Medical Sciences *Original Article*

2023 March; 1(5)

The Relationship between Depression Symptoms, Physical Self-Concept, and Self-Care in Diabetic Patients

Morteza Modares Gharavi [1], Abbasali Ammari [2*], Fatemeh Pourhaji [3]

[1] Department of Psychiatry, School of Medicine, Ebnesina Hospital Mashhad University of Medical Sciences, Mashhad University of Medical Sciences, Mashhad, Iran
[2] Department of psychology, Neyshabur Branch, Islamic Azad University, Neyshabur, Iran
[3] Department of Public Health, School of Health, Torbat Heydariyeh University of Medical Sciences, Torbat Heydariyeh, Iran

*** Corresponding author email: AmmariA1@mums.ac.ir**
Received: 2024/9; Revised: 2025/2; Accepted: 2025/2

Abstract

Diabetes is one of the most common diseases in society and is closely related to living. Physical self-concept and self-care play significant roles in diabetes management. This study aimed to investigate the relationship between depressive symptoms, physical self-concept, and self-care in diabetic patients. This cross-sectional study was conducted in 2014. The sample consisted of 90 patients referred to diabetes clinics in Mashhad health centers, selected through cluster sampling. The research instruments included the Beck Depression Inventory, Diabetes Self-Care questionnaire, and Marsh physical self-description questionnaire. The validity of the instruments was assessed using face and content validity. The reliability of the instruments was calculated using Cronbach's alpha coefficient. Data were analyzed using SPSS software (version 18), Pearson correlation tests and multivariate regression analysis. The mean age was 51.82±11.378. The results showed that the prevalence of depression was 52.2%. There was a significant negative correlation between depression and physical self-concept ($r= -0.420$, $p\leq0.001$), and depression and self-care($r= -0.402$, $p\leq0.001$). Additionally, there was a significant direct relationship between physical self-concept and self-care ($r= 0.365$, $p\leq0.001$). This study demonstrated that both physical self-concept and self-care were related to depression in diabetic patients.

Keywords: Diabetes, Physical self-concept, Self-care, Depression

Introduction

Type 2 diabetes is a disorder of glucose metabolism characterized by reduced insulin production [1] and impaired insulin utilization by tissues, leading to elevated blood sugar levels and making it a significant global health issue [2, 3]. Psychological factors play a crucial role in the development of diabetes. Negative emotions, particularly depression and anxiety, can act as risk factors for diabetes, while diabetes itself can trigger these emotional responses [4].

Living with diabetes presents challenges, increasing the risk for depression. Diabetic patients must continuously monitor their blood sugar levels and may experience complications. Depression can negatively affect a patient's motivation for self-care and adherence to self-care behaviors, particularly glycemic control. Improving depression can result insignificant improvements in blood glucose control [5].

Depression associated with diabetes can negatively affect metabolic control and dietary compliance, as well as increase health care costs, disability, mortality, insulin usage, and diabetes-related complications [6].This disease can also affect a person's self-concept, which encompasses perceptions of appearances, values, and beliefs that shape behavior [7].

In simpler terms, a person's overall perception of their personality is called to as "self-concept" or "self-image." This perception arise from individuals' mental evaluations of their behavioral traits; hence, the self-concept may be positive or negative [8].

Research suggests that daily events can influence changes in self-concept [9]. Additionally, overall health, including psycho-social well-being and emotional distress, can affect self-esteem. Self-concept is a behavioral factors that can independently predict Glycosylated hemoglobin levels [10]. One of the most important issues of diabetes management is self-care, which involves developing awareness to care for the complex nature of the social context [11]. According to the Diabetes Self-Care Education Association, individuals with type 2 diabetes need to develop adequate self-care skills to improve their quality of life and manage their condition more effectively [12].

Depressed moods can lead to negative thoughts and a poor physical self-image, potentially impacting others as well. Addressing both psychiatric and medical issues simultaneously in diabetic patients can help reduce complications and enhance their quality of life. Despite the increasing prevalence of chronic diseases like diabetes and the associated rise in mental health issues, particularly depression, comprehensive research on the psychological aspects of diabetes remains limited. Although global studies have highlighted the link between depression and diabetes, a significant gap remains in understanding how cultural, social, and regional factors influence this relationship. In Iran, where cultural attitudes, healthcare accessibility, and patient behaviors differ from global norms, the specific dynamics of depression among diabetic patients remain unexplored. Studies on depression in diabetic patients, especially in Iran are scarce [13, 14]. Addressing this gap is essential for developing tailored interventions that consider local needs and conditions, ultimately improving outcomes for diabetic patients with depression.

Objectives

This study aimed to investigate the relationship between depressive symptoms, physical self-concept, and self-care in individuals with diabetes.

Methods

This cross-sectional study was conducted on 90 patients referred to diabetes clinics of Mashhad health centers between April 2014 and May 2015. Cluster sampling was used, and the sample was randomly selected from individuals attending diabetes clinics at health centers affiliated with the Health Department. Two clusters were selected from each of the five

health centers in Mashhad and the Cochran formula was used to estimate the sample size.

The research instruments included questionnaires covering demographic information such as age, marital status, duration of illness (in month), education, address, phone number, fasting blood sugar (FBS) in mg/dl, glycosylated hemoglobin percentage, the Beck Depression Inventory, diabetes self-care, and self-concept questionnaire. The Beck Depression Inventory consisted of 21 items rated on a three-point Likert scale. Depression severity was classified based on the total score: 0-13 indicating no or minimal depression, according to the of depression, 20-28 moderate depression, and 29-63 indicating severe depression [15].

The 40-item short form of the Body Self-Concept Questionnaire by Marsh et al. [16] was used to assess body self-concept. It consists of nine specific components: health, coordination, physical activity, body fat, athletic fitness, appearance, authority, flexibility, and endurance. Additionally, it measures two general components and self-esteem. To measure self-care behavior, the Summary of Diabetes Self-care Activities (SDSCA) Questionnaire, developed by Toobert DJ et al. [17], was used. This 15-item scale assesses patients' self-care practices over the past seven days, encompassing various aspects of diabetes treatment. These aspects include diet (5 items), physical activity (2 items), FBS control (2 items), regular medication use (1 item), foot care (4 items), and smoking (1 item). Each question is scored on a scale from 0 to 7 using a Likert rating, resulting in a total score ranging from 0 to 99. A score below 25 indicates poor self-care, a score between 26 and 75 represents moderate self-care, and a score above 75 indicates good self-care. Higher scores suggest better self-care practices in the last seven days [18].

The validity of the instrument was determined through face and content validity. The average content validity ratio (CVR) and content validity index (CVI) scores for the questionnaire as follows: depression (CVI=0.81, CVR=079), body self-concept (CVI=0.80, CVR=0.80), and self-care behavior (CVI=0.78, CVR=0.82). The reliability of the questionnaire was confirmed using Cronbach's alpha coefficient, with the following reliability scores: depression (α=0.78), body self-concept (α=0.88), and self-care behavior (α=0.80).

The inclusion criteria for participation were: (1) a definitive diagnosis of diabetes, characterized by a FBS level of 126 mg/dl or higher after at least 8 hours of fasting and an HbA1c level exceeding 6%. (2) literacy and ability to complete the questionnaire; (3) age over 18 years; (4) Iranian nationality; (5) residing in Mashhad, Razavi Khorasan Province; (6) absence of other diseases; and 7) no severe psychological stress in the past six months. The exclusion criterion was withdrawal from the study after completing the questionnaire. The questionnaire was completed through self-reporting and patient interviews.

The individuals in this study had a documented history of diabetes at the health center's diabetes clinic. The data were analyzed using SPSS software version 20, applying independent t-test, analysis of variance (ANOVA), Pearson correlation, and multiple regression analysis.

This article is part of the master’s thesis of the responsible author at Neyshabur Islamic Azad University with the code 911257182. We would like to thank all those who participated in this research, especially diabetic patients.

Results

The mean age of the subjects was 51.82 ± 11.3 years. The other results are presented in Table 1. The mean FBS level was 154.26 ± 6.61 mg/dL.

The independent t-test revealed no statistically significant difference between gender and self-care, depressive symptoms, and physical self-concept (P-value > 0.05). The t-test showed no statistically significant difference between marital status and self-care, depressive symptoms, and physical self-concept (P-value > 0.05). Similarly, the one-way ANOVA test

showed no statistically significant difference between educational level and self-care, depressive symptoms (P-value > 0.05). However, the one-way ANOVA test showed a statistically significant difference between educational level and physical self-concept (P-value = 0.01) (Table 2).

In this study, the prevalence of depression among diabetic patients was estimated at 52.2% (Table3(.

Table 4 indicates a significant negative correlation between age and physical self-concept (r = -0.230, p=0.030), suggesting that as individuals age, their physical self-concept tends to be decline. No significant relationships were found between other demographic variables and self-care, self-concept, and depression.

Table 5 presents the Pearson's correlation coefficient for the relationship between self-care, physical self-concept, and depression. The findings revealed a positive correlation between physical self-concept and self-care (r= 0.365, p≤0.001). There was a significant and negative correlation between depression and self-care (r= -0.402, p≤0.001), and between depression and physical self-concept (r= -0.420, p≤0.001).

Table 1 - Descriptive characteristics of the participants (n=90)

Variable		N	(%)
Gender	Female	70	77.8
	Male	20	22.2
Marital status	Married	84	93.3
	Single	6	6.7
Educational level	Elementary	48	53.3
	Secondary school	35	38.8
	Graduate	7	7.8
Self-care	Poor	22	24.4
	Moderate	64	71.1
	Strong	4	4.4
Depression	No depression	7	7.7
	Mild	31	34.4
	Moderate	37	41.1
	Severe	15	16.7

Table 2. Comparison of mean self-care scores, depression symptoms, and physical self-concept, and demographic variables

Variable	Mean±SD self-care	Mean±SD depression symptoms	Mean±SD physical self-concept
Gender			
Female	42.29±14.41	22.81±6.87	125.86±4.86
Male	48.50±16.78	21.15±6.92	129.75±2.76
t-test	1.64	0.95	0.450
p-value	0.105	0.34	0.650
Marital status			
Married	44.05±15.03	22.50±6.87	129.49±2.70
Single	47.33±9.709	18.66±4.92	129.75±5.83
t-test	0.525	1.33	1.40
p-value	0.600	0.184	0.164
Educational level			
Elementary	42.77±12.95	22.03±4.68	121.75±4.96
Secondary school	43.57±17.06	30.01±6.73	121.01±3.76
Graduate	44.29±17.65	22.29±7.11	142.71±2.76
One-Way ANOVAs	0.512	2.19	3.174
p-value	0.72	0.07	0.01

Table 3. Descriptive statistics of study variable (n = 90)

Variable	N	Mean±SD
Age	89	51.82±11.3
Fasting blood sugar level (FBS)	90	154.26±61.64
The duration of the disease	87	69.82±73.45
Glycosylated hemoglobin levels(HA1C)	70	7.3±1.9

Table 4 . Correlation between self-care and physical self-concept with other variables

Test	Pearson correlation coefficient		Spearman correlation coefficient	
Variable	**Physical self-concept**		**Self-care**	
	r	p	r	p
Age	-0.23	0.030**	_	_
Duration of diabetes	_	_	0.103	0.342
Fasting blood sugar level	_	_	0.092	0.389
Glycosylated hemoglobin level	-0.023	0.852	_	_

**p≤0.05

Table 5. Correlation matrix between self-care and physical self-concept with other variables

Variable. No	Variable name	Self-care	Physical self-concept	Depression
1	**Self-care**	1	-	
2	**Physical self-concept**	0.365** p≤0.001	1	1
3	**Depression**	-0.402** p≤0.001	-0.420** p≤0.001	1

**Correlation is significant at the 0.05 level (2-tailed).

Discussion

The aim of this study was to investigate the relationship between depressive symptoms, physical self-concept, and self-care behaviors in patients with diabetes. The study sample had a higher participation rate of women compared to men.

This distribution may be attributed to women's greater utilization of health center clinics for their own care, as well as for their children and other services. In contrast, men are more likely to seek care at private clinics [19].

The study found no significant differences in depressive symptoms, physical self-concept, or self-care behaviors among diabetic patients based on gender, education, and duration of illness. However, the results indicated that education level was associated with physical self-concept, which, in turn, was related to depression. A study by Park et al. (2004) showed that in patients with type 2 diabetes higher depression scores were associated with weaker self-care behaviors [20]. This consistency may be attributed to the accurate collection and measurement of each variable.

Mansyur et al. (2015) investigated the effects of social factors and barriers to self-care among Hispanic men and women with diabetes. They concluded that women experienced less social support than men. The study found that a lack of adequate support was a significant barrier to self-care behaviors among women with diabetes [21]. Previous research has shown conducted an association between patients' age and depression [22, 23]. However, the results of the present study indicated no relationship between gender and depression levels, which contradicts the findings of Meshkat et al. [24].

A previous study found a relationship between the severity of depression and factors such as gender, age and duration of diabetes[25]. However, the present study found no statistically significant relationship between depression severity and these variables in diabetic patients. Mahmoudi and Sharifi (2008) [26] that women and individuals under 40 years of age exhibited higher levels of depression in both groups. However, they found no significant association between depression and marital status, household size, residential status, age at onset, income and sources of support. The results of the present study are also inconsistent with the findings of Mahmoudi and Sharifi. This inconsistency highlights the need for more detailed research, particularly regarding sampling methods and research design. Sacco et al. conducted a study investigating the relationship between body mass index (BMI) and depression in adults with type 2 diabetes, focusing on the mediating roles of diabetes symptoms and self-efficacy. They concluded that BMI affects depression through its impact on self-efficacy and diabetes-related medical symptoms [27]. Gemeay et al.[28] found that among patients with diabetes, there was not only a significant relationship between depression and diabetes, but also a strong association between body image and

diabetes. Lee et al. [29] discovered that the likelihood of depression increased with greater pain and long-term complications. Additionally, they found that as the number of traumatic events and stressors increased, so did the risk of depression. Conversely, higher self-esteem was associated with a lower risk of depression.

Limitations

One limitation of this study was that data on depression, physical self-concept, and self-care were obtained through self-reports, which may have led individuals to report behaviors that do not accurately reflect their actual experiences. Furthermore, due to the cross-sectional nature of this study, it is recommended that quasi-experimental studies be designed and conducted to determine the precise effects of the variables under investigation. Additionally, the sampling method used in this study was simple, which may limit the generalizability to broader population of individuals with diabetes.

Conclusion

This study revealed that both physical self-concept and self-care were associated with depression in diabetic patients. It also emphasized the importance of addressing psychosocial factors in diabetes management. Previous research has shown that depression can hinder self-care efforts and blood sugar control, leading to worse health outcomes. Interventions aimed at improving self-concept, self-efficacy, and mental well-being may enhance diabetes management and overall quality of life for these patients. Despite limitations such as reliance on self-reported data, a cross-sectional design, and a simple sampling method, future research should consider longitudinal or quasi-experimental approaches to clarify the causal relationships among these variables. Expanding research to include more diverse populations and addressing social and environmental factors could provide deeper insights into the interplay between how depression, physical self-concept, and self-care in diabetes.

Acknowledgments

This article is part of the master's thesis of the responsible author at Neyshabur Islamic Azad University with the code 911257182. We would like to thank all those who participated in this research, especially diabetic patients.

Conflict of interest

This study has no conflicts of interest.

List of abbreviations

Fasting blood sugar (FBS)

The Diabetes Summary Questionnaire (SDSCA)

Content Validity Ratio (CVR)

Content Validity Index (CVI)

Glycosylated hemoglobin levels (HA1C)

References

1. Tao W, Liu D, Guo Z, Han P, Ma Y, Wu M, Zhang R, He J: Physicochemical properties, structural characterization, and antidiabetic activity of selenylated low molecular weight apple pectin in HFD/STZ-induced type 2 diabetic mice. *Carbohydrate Polymers* 2025, 348:122790.
2. Shahwan M, Alhumaydhi F, Ashraf GM, Hasan PMZ, Shamsi A: Role of polyphenols in combating Type 2 Diabetes and insulin resistance. *International Journal of Biological Macromolecules* 2022, 206:567-579.
3. American Diabetes Association Professional Practice C: 2. Classification and Diagnosis of Diabetes: Standards of Medical Care in Diabetes-2022. *Diabetes Care* 2022, 45(Suppl 1):S17-S38.
4. Mirsaify Fard LS, Moradi K: The role of life skills on mental disorders (anxiety and depression) in type 2 diabetic patients. *Medical Journal of Mashhad university of Medical Sciences* 2018, 61(5):1248-1256.
5. Cohen LB, Taveira TH, Wu W-C, Pirraglia PA: Pharmacist-led telehealth disease management program for patients with diabetes and depression. *Journal of Telemedicine and Telecare* 2019, 26(5):294-302.
6. Salimi HR, Griffiths MD, Alimoradi Z: Prevalence of anxiety and depression among pregnant women with diabetes and their predictors. *Diabetes Epidemiology and Management* 2024, 14:100198.

7. Zhang H: Psychological wellbeing in Chinese university students: insights into the influences of academic self-concept, teacher support, and student engagement. *Frontiers in Psychology* 2024, 14.

8. van der Cruijsen R, Blankenstein NE, Spaans JP, Peters S, Crone EA: Longitudinal self-concept development in adolescence. *Social Cognitive and Affective Neuroscience* 2023, 18(1):nsac062.

9. Varghese D, Scott JG, Bor W, Williams GM, Najman JM, McGrath JJ: The association between adult attachment style and delusional-like experiences in a community sample of women. *The Journal of nervous and mental disease* 2013, 201(6):525-529.

10. Akyirem S, Ekpor E, Abwoye DN, Wang K: Weight-related discrimination, perceived stress and psychological and physical well-being of persons with type 2 diabetes: A mediation analysis. *Diabetic Medicine* 2024, 41(6):e15322.

11. Zimbudzi E, Okada H, Funnell MM, Hamaguchi M: Editorial: Innovation in diabetes self–care management and interventions. *Frontiers in Endocrinology* 2023, 14.

12. Ahmad F, Joshi SH: Self-Care Practices and Their Role in the Control of Diabetes: A Narrative Review. *Cureus* 2023, 15(7):e41409.

13. Hajat C, Stein E: The global burden of multiple chronic conditions: A narrative review. *Preventive Medicine Reports* 2018, 12:284-293.

14. Morowati-Sharifabad MA, Rouhani Tonekaboni N, Baghianimoghadam MH: Predictors of self-care behaviors among diabetic patients referred to Yazd diabetes research Centre based on extended health belief model. *SSU_Journals* 2007, 15(3):85-96.

15. Hubley AM: Beck depression inventory. In: *Encyclopedia of quality of life and well-being research.* edn.: Springer; 2021: 1-11.

16. Babakhanlou A, Babakhanlou Z: The Mediating Role of Body Self-Concept in the Relationship Between Self-Compassion and Emotional Eating in Individuals with Obesity. *International Journal of Education and Cognitive Sciences* 2024, 4(4):52-62.

17. Gaćina S, Mlačak B, Bulum T, Filej B: Application of the Summary of Diabetes Self-Care Activities Questionnaire in Evaluating the Self-Care of People with Diabetes. In: *Diabetology*. vol. 5; 2024: 501-513.

18. Toobert DJ, Hampson SE, Glasgow RE: The summary of diabetes self-care activities measure: results from 7 studies and a revised scale. *Diabetes care* 2000, 23(7):943-950.

19. Höhn A, Gampe J, Lindahl-Jacobsen R, Christensen K, Oksuyzan A: Do men avoid seeking medical advice? A register-based analysis of gender-specific changes in primary healthcare use after first hospitalisation at ages 60+ in Denmark. *Journal of epidemiology and community health* 2020, 74(7):573-579.

20. Park H, Hong Y, Lee H, Ha E, Sung Y: Individuals with type 2 diabetes and depressive symptoms exhibited lower adherence with self-care. *Journal of clinical epidemiology* 2004, 57(9):978-984.

21. Mansyur CL, Rustveld LO, Nash SG, Jibaja-Weiss ML: Social factors and barriers to self-care adherence in Hispanic men and women with diabetes. *Patient education and counseling* 2015, 98(6):805-810.

22. Thompson KN, Hübel C, Cheesman R, Adey BN, Armour C, Davies MR, Hotopf M, Jones IR, Kalsi G, McIntosh AM *et al*: Age and sex-related variability in the presentation of generalized anxiety and depression symptoms. *Depression and anxiety* 2021, 38(10):1054-1065.

23. Grandinetti A, Kaholokula JK, Crabbe KM, Kenui CK, Chen R, Chang HK: Relationship between depressive symptoms and diabetes among native Hawaiians. *Psychoneuroendocrinology* 2000, 25(3):239-246.

24. Meshkat S, Tassone VK, Dunnett S, Pang H, Wu M, Boparai JK, Jung H, Lou W, Bhat V: Gender differences in the relationship between depressive symptoms and diabetes associated with cognitive-affective symptoms. *BJPsych open* 2024, 10(6):e192.

25. Hermanns N, Ehrmann D, Kulzer B, Klinker L, Haak T, Schmitt A: Somatic and mental symptoms associated with dysglycaemia, diabetes-related complications and mental conditions in people with diabetes: Assessments in daily life using continuous glucose monitoring and ecological momentary assessment. *Diabetes, Obesity and Metabolism* 2025, 27(1):61-70.

26. Mahmodi A, Sharifi: COMPARISON FREQUENCY AND FACTORS ASSOCIATED WITH DEPRESSION IN DIABETICS AND NON DIABETICS PATIENTS. Urmia-University-of-Medical-Sciences 2008, 6(2):88-93.

27. Cai J, Zhang S, Wu R, Huang J: Association between depression and diabetes mellitus and the impact of their comorbidity on mortality: Evidence from a nationally representative study. *Journal of Affective Disorders* 2024, 354:11-18.

28. Gemeay EM, Moawed SA, Mansour EA, Ebrahiem NE, Moussa IM, Nadrah WO: The association between diabetes and depression. *Saudi medical journal* 2015, 36(10):1210.

29. Lee J, Brazeal M, Choi H, Rehner TA, McLeod ST, Jacobs CM: Physical and psychosocial factors associated with depression among adults with type 2 diabetes mellitus at a Federally Qualified Healthcare Center. *Social Work in Health Care* 2018, 57(10):834-850.