

The contribution of self esteem and self-care behaviors to the eating attitudes: A correlational study in type 2 diabetes patients

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Abstract

Context: Type 2 diabetes mellitus (T2DM) is a common metabolic disorder. Self-care plays a crucial role in the management of diabetes. Self esteem can affect diabetes management.

Aim: This study was conducted to determine the contribution of self esteem and diabetes self-care behaviors to the eating attitudes of patients with T2DM.

Setting and Design: This study was conducted in a University Hospital between November 2019 and March 2020.

Materials and Methods: The sample of this cross-sectional and descriptive study was composed of 150 patients with T2DM. Descriptive Characteristics Form, Coopersmith self esteem Inventory, and Eating Attitude Test were used to collect data.

Statistical Analysis: SPSS 25 software was used along with descriptive and inferential statistics in data analysis.

Results: It was found that the self esteem mean score of the patients with T2DM was 63.60 (± 15.92), 26% of them had an impaired eating attitude, and there was no statistically significant correlation between eating attitude and self esteem of patients with T2DM ($P > 0.05$).

Conclusions: It was concluded that high self esteem, and self-esteem of patients with T2DM were not associated with eating attitude.

Keywords: Eating attitude, Self esteem, Type 2 diabetes mellitus

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INTRODUCTION

Diabetes mellitus (DM) is a chronic disease that impairs the quality of life of diabetic individuals due

to its acute and chronic complications, has a high prevalence rate, and has high mortality and morbidity rates.^[1]

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Factors such as self-monitoring of glucose, diet, exercise, weight control, medication adherence, and foot care constitute self-care behaviors in patients with diabetes.^[2] Adopting the self-care behaviors of diabetes is essential to glycemic control in patients with diabetes. In their study, Rahman *et al.* found that 26% of patients with type 2 DMs (T2DM) complied with their diet, and 38.2% conducted glucose self-monitoring.^[3] Çelik *et al.* reported that 41.4% of patients with T2DM maintained dietary adherence.^[4] Baltacı *et al.* determined that patients with T2DM had high but irregular blood glucose self-monitoring levels.^[5] Studies have reported that the compliance of patients with T2DM to diabetes treatment is not at a sufficient level, and they are not adequately adapted to their new lifestyles.^[3-5]

Patients with diabetes must adapt their eating habits and lifestyles to keep their blood glucose levels constant throughout their lives. Factors such as diabetes being a chronic disease, diets to be complied with, and the restriction of certain eating and drinking styles cause anxiety in patients thus leading them to focus more on food and weight control. Considering all of these factors together, it has been observed that the eating attitudes and behaviors of these patients impair a healthy lifestyle.^[6,7] Most patients barely accept that they have a chronic disease and must change their lifestyles. For this reason, these patients may face problems in many areas, such as mental, emotional, social, and sexual.^[8] The physical and mental health of patients with diabetes is closely correlated.^[9] Disease-associated difficulties may cause patients to experience significant mental problems including depression, anxiety, and low self-esteem.^[10] It is known that low self-esteem affects diabetes management negatively.^[11] Self-esteem has a key role in diabetic care.^[12] In a study conducted in the USA on patients with diabetes, it was determined that low self-esteem had negative effects on the self-care of the patients.^[13] In their study, Rustveld *et al.* determined that self-esteem was the main factor in the quality of self-care of patients with diabetes.^[14] Knecht *et al.* reported that patients with high self-esteem had better compliance with diabetes self-care activities.^[15] The caregivers of patients with diabetes should know the effects of psychological processes on diabetes, the emotional and mental situations the patients may experience, and the related measures, and they should also plan the appropriate care.^[16,17] The most important responsibility of the nurses in increasing the self-esteem of patients with diabetes is to establish effective communication with trust, respect, and empathy. Through this, they can enable patients to acquire behaviors that improve their self-care.^[18] This study is unique in that the relationship between self-esteem and the eating attitudes of patients with diabetes has not been examined before. For this reason, it is expected to

contribute to the literature. This study was conducted to determine the impact of self-esteem and diabetes self-care behaviors (blood-glucose measurement and dietary adherence) on the eating attitudes of patients with T2DM.

MATERIALS AND METHODS

Research design and setting

This cross-sectional and descriptive study was conducted with patients who were followed up on after a diagnosis of T2DM at the Diabetes Training Center, the Endocrinology and Metabolism Clinic, or the outpatient clinic of a university hospital between November 2019 and March 2020. The Diabetes Training Center provides diabetes training and consultancy to newly diagnosed patients and patients in the follow-up process. At the Endocrinology and Metabolism Clinic, newly diagnosed patients or patients needing treatment for any health problem related to diabetes (diabetic ketoacidosis, diabetic foot, hyperglycemia, etc.) receive inpatient treatment.

Inclusion criteria

Being diagnosed with T2DM, agreeing to participate in the study, being open to communication, being 18 years old or over.

Exclusion criteria

Having mental illness, having a neurological disease, or intellectual disability.

Sample size and sampling procedure

The sample was composed of 150 patients followed up with after a diagnosis of T2DM at the Diabetes Training Center, the Endocrinology and Metabolism Clinic, or the outpatient clinic of a university hospital.

In this study, G * power software, version 3.1 (Mannheim, Germany), was used to calculate the sample size.^[19] The power of the study was found to be 0.99 when the effect size for the regression analysis was 0.15 ($P = 0.05$); the number of predictor variables was two, and the sample size was 150.

Data collection tools

Descriptive characteristics form

The Descriptive Characteristics Form was a semi-structured form prepared and filled out by the researchers to record information such as the age, gender, marital status, educational status, employment status, and financial status of the participants, the people living with the patients, the duration of diabetes, their perception of their health, use of drugs related to diabetes, chronic complications of diabetes, body mass index (BMI), A1c level, the presence of

a chronic disease other than diabetes, compliance with the diet recommended by a dietitian or physician, the presence of hypoglycemia in the last week, and self-monitoring of blood glucose at the frequency recommended by a nurse or physician.^[4,6,18] Although most of the information on the Descriptive Characteristics Form was obtained by asking the patients, the BMI and A1c levels of the patients were obtained from their medical records.

Coopersmith self-esteem inventory

The Coopersmith Self-Esteem Inventory is an inventory developed by Stanley Coopersmith (1967) for various age groups, particularly adults, and a study of its reliability was conducted by Tufan and Turan (1987). The Cronbach's alpha coefficient of the inventory was found to be $r = 0.62$ by Tufan. Furthermore, in studies conducted by Tufan and Turan in subsequent years, the test-retest reliability of the inventory was determined to be $r = 0.65$ and $r = 0.76$. This inventory measures characteristics of individuals such as being a leader, asserting oneself, self-abuse, one's view of life, and one's attitudes on family relations, social relations, and resilience.^[20,21] The inventory is composed of 25 items, to be rated on a scale from "like me" to "not like me." The inventory is scored as follows: Each correct answer is a "4" and each false answer is a "0." The highest score on the inventory is 100, and the lowest score is "0." Higher scores signify increased self-esteem. A self-esteem level of <50 points is deemed to be low in the inventory, and self-esteem is considered high at 50 points and above.^[20,21] Cronbach's Alpha value was calculated to be 0.74 in this study.

Eating attitude test

The eating attitude test (EAT) is a self-report inventory with 40 items developed by Garner and Garfinkel (1979) to investigate the eating behaviors and attitudes of anorexia nervosa patients and the possible eating attitude disorders of ordinary individuals. The reliability and validity of the study were conducted by Savaşır and Erol (1989) in Turkey. These researchers found that the Cronbach's alpha reliability coefficient and the reliability of the study were 0.70 and 0.65,^[22] respectively. The items 1, 18, 19, 23, 27, and 39 of EAT, a six-point multiple-choice Likert scale, are rated as "sometimes": 1 point, "rarely": 2 points, and "never": 3 points. The other options: 0 points. The other scale items were rated as "always": 3 points, "very often": 2 points, "often": 1 point, and "other options": 0 points. As a result, the scores obtained from each item of the scale were added to obtain the total score of the scale. The cutoff score of the Turkish version of the EAT is 30, and scores higher than 30 are considered an impaired eating attitude (IEB). With EAT, it is possible to determine people at the clinical level and provide information on their

susceptibility to this disorder.^[22,23] The Cronbach's alpha value of this study was 0.75.

Data collection procedure

The data were collected by conducting face-to-face interviews. The data on the clinical characteristics of the patients were obtained from the patient records. The occurrence of diagnosed depression or psychiatric diagnosis among patients with diabetes was examined in their file. In addition, the physician performing the monitoring was also asked the patients about this situation. It took an average of 10–15 min to collect the data.

Data analysis

SPSS 25 (Statistical Package for Social Sciences, SPSS Inc., Chicago, IL, USA). statistical software was used to analyze the data. Descriptive statistics (e.g., number, percentage, average, and standard deviation) were used to obtain populational information about the patients. Furthermore, Chi-square and Spearman's correlation analyses were performed to compare the eating attitudes of the patients with T2DM and their descriptive characteristics. A logistic regression analysis was performed to assess the contribution of the variables, which were found to be significant in the Chi-square analysis regarding the eating attitudes of the patients. The statistical significance level was $\alpha < 0.05$.

Ethical considerations

Before starting the study, approval from the Medical Faculty Noninvasive Clinical Trials Ethical Committee of a university hospital (approval no: 02.10.2019/227) and institutional permission from the related university hospital (05.11.2019/97640934-900) were obtained. The patients were informed about the purpose of the study. The patients were also told that their information would be kept confidential and that they could withdraw from the study at any time. The verbal and written consents of the patients who met the inclusion criteria and agreed to participate in the study were obtained. Their written consents were obtained through the Informed Consent Form.

RESULTS

The age average of the participants was 54.06 ± 13.08 , 58% of them were female, 78.7% were married, 43.3% were illiterate, 83.3% were unemployed, 58% had an income equal to their expenditure, 92% were living with at least one family member, and 51.3% perceived their health status to be "moderate." Regarding the diabetes characteristics of the patients, 44.7% only received insulin therapy, 55.3% did not suffer from any diabetes chronic complications,

76% did not adhere to dietitian-recommended diets, 62.7% performed regular self-monitoring of blood glucose, 62.7% had hypoglycemia, and the BMI mean value of the participants was 28.94 ± 5.48 . The mean A1c of the patients was 10.21 ± 2.95 , and they had Type 2 diabetes for an average of 11.08 ± 8.78 years. The average self-esteem score of the patients was 63.60 ± 15.92 , and 26% had IEB [Table 1].

The eating attitudes of patients with T2DM were examined based on their socio-demographic characteristics. The difference between the eating attitudes was not statistically significant regarding gender, marital status, educational status, employment status, economic condition, the people living in the same residence place, health perception, age, and self-esteem [$P > 0.05$; Table 2].

The eating attitudes of the patients were also examined based on their diabetes-related characteristics. The difference between the eating attitudes and duration of Type 2 diabetes, diabetes treatment type, chronic diabetes complication, hypoglycemia, BMI, and A1c was not statistically significant [$P > 0.05$; Table 2].

Furthermore, 52.8% of the patients with T2DM with IEBs complied with diets prescribed by a dietitian, and 31.9% performed regular blood glucose monitoring, with a statistically significant difference between the two groups [$P < 0.05$; Table 2].

In Table 3, the last model for determining the contributions of the factors affecting the eating attitudes of patients with T2DM, based on a logistic regression analysis, is shown. The possibility of the patients complying with the diet recommended by their dietitians to have irregular eating attitudes was 0.2 times lower ($P < 0.05$). However, the regular blood glucose monitoring of the patients with T2DM did not significantly contribute to the IEB compared to the irregular blood glucose monitoring ($P > 0.05$).

DISCUSSION

In this study, which examined the eating attitudes of patients with T2DM based on their sociodemographic characteristics, there was no statistically significant difference between the eating attitudes of the patients based on their gender, marital status, educational status, employment status, financial condition, living situation (i.e., in the same residence), health perceptions, or age. When eating attitudes based on the characteristics related to diabetes were examined, there was no statistically significant difference between the eating attitudes and the

duration of the Type 2 diagnosis, the type of diabetes treatment, the presence of complications of chronic diabetes, the presence of hypoglycemia, the BMI, or the A1c levels. In the examination of the relevant literature, no statistical difference has been found in eating attitudes based on gender, marital status, employment status, A1c, age, diagnosis duration of diabetes, BMI, diabetes type, or treatment types.^[4,6,24] The results of the present study are compatible with the literature.

In this study, it was found that the patients with T2DM had high self-esteem. In the course of the literature review, it was found in two studies that the patients with diabetes had high self-esteem.^[18,25] The results of the present study are compatible with the literature. The importance of social support in the development of self-esteem is undeniable, and social support affects self-esteem positively. The family is the most important component of social support.^[26-28] The high self-esteem of the diabetes patients in the study may be associated with the fact that most of the patients were married, and they lived with their families (spouse and children), and the social support they obtained from their families was important in the development of self-esteem.

In this study, it was found that the self-esteem of patients with T2DM did not affect their eating attitudes. As there is no study on this subject in the literature, the results of the study cannot be discussed by comparing it with other studies. However, there are studies investigating the correlation between depression and self-esteem and the correlation between depression and eating attitudes in diabetic patients. It is known that individuals have low self-esteem in cases of depression. In the study conducted by Yulianto *et al.* with the diabetic patients, they found that there was a significant correlation between self-esteem and depression, and the individuals experiencing depression had low self-esteem.^[25] Several studies on the patients with T2DM have reported a positive correlation between IEBs and their Beck depression inventory scores.^[4,24] Araujo *et al.* found in their systematic review that there was a positive correlation between depression and eating disorders.^[29] Low self-esteem may cause emotional and behavioral disorders such as suicidal behaviors, eating disorders, and depression.^[30] In other words, it may be asserted that depression is a risk factor that may cause eating disorders in patients with T2DM. Also, the results obtained from the previous studies have indicated that there is a positive correlation between eating attitudes and depression levels in the patients with diabetes; as depression increases, they have IEBs. Individuals suffering from depression have low self-esteem, and self-esteem may indirectly affect eating attitudes. The criterion of not including T2DM patients

Table 1: Distribution of the patients with type 2 diabetes based on their descriptive characteristics (n=150)

Variables	n/Mean±SD	Percentage (%) /minimum-maximum
Age	54.06±13.08	19.00-83.00
Gender		
Female	87	58.0
Male	63	42.0
Marital status		
Single	32	21.3
Married	118	78.7
Education status		
Illiterate	65	43.3
Literate or primary school graduate	39	26.0
Secondary school	17	11.3
High school or university graduate	29	19.3
Employment status		
Employed	25	16.7
Unemployed	125	83.3
Economic condition*		
Income less than expenses	87	58.0
Income equal to the expenses	55	36.7
The income higher than the expenses	8	5.3
People living in the same residence		
Alone	12	8.0
Family member (spouse or child or both)	138	92.0
Status of perceiving own health		
Good	24	16.0
Moderate	77	51.3
Bad	49	32.7
Diabetes treatment type		
Diet + physical activity	7	4.7
OAD	38	25.3
Insulin	67	44.7
OAD and insulin	38	25.3
Status of clinic diabetes complication		
No	83	55.3
Yes	67	44.7
Diet compliance		
No	114	76.0
Yes	36	24.0
Blood glucose monitoring		
No	56	37.3
Yes	94	62.7
Hypoglycemia		
No	56	37.3
Yes	94	62.7
Diagnosis duration of type 2 diabetes	11.08±8.78	0.10-40.00
BMI	28.94±5.48	16.50-46.00
HgA1c	10.21±2.95	6.00-23.00
Self-esteem	63.60±15.92	28.0-92.0
Eating attitude		
<29	111	74.0
≥30	39	26.0

*It expresses the economic income perception of the individuals with type 2 diabetes. ODA: Oral anti diabetic, BMI: Body mass index, HgA1c: Glycosylated hemoglobin

diagnosed with depression or any psychiatric illness in this study supports this interpretation.

In this study, it was found that the patients having dietary adherence were less likely to have an IEB as compared to the patients not having dietary adherence. The studies support this finding.^[6,31,32] In their study, Çobanoğlu *et al.* determined that diet was not aimed at regulating blood glucose levels in the diabetic patients with IEBs and was in fact performed by focusing completely on weight control—a diabetic diet

remained in the background.^[6] Rodin *et al.* determined in their study that dietary nonadherence was a triggering factor for IEBs; thus, flexible diet approaches should be included in diabetes treatment.^[33] Dietary restriction may be the most important indicator for overeating under stress.^[34] It may be considered that patients with diabetes have difficulty in adhering to their diets, thus increasing the possibility of IEBs.

In this study, it was found that regular blood glucose monitoring of the patients with T2DM did not make any

Table 2: Examination the eating attitudes of the patients with type 2 diabetes based on their descriptive characteristics

Variables	Eating attitude		Test (χ^2 , P)
	Normal eating attitude (n (%) ≤29)	Impaired eating attitude (n (%) ≥30)	
Gender			
Female	63 (72.4)	24 (27.6)	0.271, 0.603
Male	48 (76.2)	15 (23.8)	
Marital status			
Single	21 (65.6)	11 (34.4)	1.483, 0.223
Married	90 (76.3)	28 (23.7)	
Education status			
Illiterate	50 (76.9)	15 (23.1)	1.485, 0.686
Literate or primary school	26 (66.7)	13 (33.3)	
Secondary school	13 (76.5)	4 (23.5)	
High school or university	22 (75.9)	7 (24.1)	
Employment status			
Employed	18 (72.0)	7 (28.0)	0.062, 0.803
Unemployed	93 (74.4)	32 (25.6)	
Economic situation			
Income lower than expenses	65 (74.7)	22 (25.3)	0.581, 0.748
Income equal to the expenses	41 (74.5)	14 (25.5)	
Income higher than the expenses	5 (62.5)	3 (37.5)	
People living at home			
Alone	7 (58.3)	5 (41.7)	1.664, 0.197
Family member (spouse or child or both)	104 (75.4)	34 (24.6)	
Perceiving own health			
Good	20 (83.3)	4 (16.7)	2.477, 0.290
Moderate	53 (68.8)	24 (31.2)	
Bad	38 (77.6)	11 (22.4)	
Diabetes treatment type			
Diet + physical activity	6 (85.7)	1 (14.3)	0.803, 0.849
OAD	29 (76.3)	9 (23.7)	
Insulin	49 (73.1)	18 (26.9)	
OAD and insulin	27 (71.1)	11 (28.9)	
Complication of clinical diabetes			
No	66 (79.5)	17 (20.5)	2.941, 0.086
Yes	45 (67.2)	22 (32.8)	
Diet compliance			
No	94 (82.5)	1 (17.5)	17.654, 0.000
Yes	17 (47.2)	19 (52.8)	
Hypoglycemia			
No	77 (77.8)	22 (22.2)	2.160, 0.142
Yes	34 (66.7)	17 (33.3)	
Blood glucose monitoring			
No	47 (83.9)	9 (16.1)	4.578, 0.032
Yes	64 (68.1)	30 (31.9)	
Self-esteem			
Bad (<50)	22 (73.3)	8 (26.7)	0.009, 0.926
Good (≥50)	89 (74.2)	31 (25.8)	
	<i>r</i>		<i>P</i>
Age	-0.033		0.692
Duration of type 2 diabetes	0.007		0.935
BMI	-0.081		0.324
HgA1c	0.077		0.350

Test (χ^2 , P)*, P<0.05 considered as significant. ODA: Oral anti diabetic, BMI: Body mass index, HgA1c: Glycosylated hemoglobin

Table 3: Predictors of the eating attitudes of the patients with type 2 diabetes based on the logistics regression analysis

Variable	B	SE	P	Exp(B)	95.0% CI for EXP(B)
Those complying with the diet versus those not complying with the diet	-1.559	0.421	0.000	0.210	0.092–0.480
Those monitoring blood glucose versus those not monitoring blood glucose	-0.683	0.447	0.127	0.505	0.210–1.214

Eating attitude test, Hosmer and Lemeshow test: χ^2 :1.310, P:.520, Nagelkerke R²: 17%. Predictors of the eating attitudes of the patients with type 2 diabetes based on the logistics regression analysis *The reference value for the eating attitude is "good eating attitude." CI: Confidence interval, SE: Standard error

contribution to the IEBs as compared to irregular blood glucose monitoring. Crow *et al.* found that significant increases or decreases in food consumption may affect glucose control for patients with T2DM.^[35] It may be

asserted that obsessive behavior, which is one of the main characteristics of eating disorders in T2DM patients, controls their lives.^[2]

Patients with diabetes should keep their blood glucose levels within normal limits. The need for excessive control of blood glucose due to the patients' obsession of keeping blood glucose levels regular causes them to perform further measurements.^[36] However, it may be considered that these measurement levels were not significant factors according to the logistic regression analysis, and they may be associated with the sample characteristics of the patients with T2DM participating in this study.

CONCLUSION

Nurses should know that diabetes is not just a physiological disease. Psychological processes and the patients' possible emotional and mental conditions have effects on diabetes. In considering measures to be taken to handle these situations, nurses should plan the appropriate care. It is recommended that diabetes nurses evaluate depression, anxiety, obsessive behaviors, etc., that may affect the eating attitudes of their diabetic patients, and if required, refer the patients to a psychiatric department. Furthermore, when preparing the content of the training to be provided for diabetic patients, it is recommended that nurses should consult the consultation-liaison psychiatric nurse. In addition, the diabetes nurses and consultation-liaison psychiatric nurses should provide for the participation of the families in the diabetes training, which positively improves the self-esteem of the patients. It is recommended that randomized, controlled trials be conducted that apply psycho-educational interventions in the cases of T2DM patients with IEBs.

Conflicts of interest

There are no conflicts of interest.

Authors' contributions

Supervision- H.A.S.; Design- T.Y.U., H.A.S.; Resources- T.Y.U., H.A.S., M.S.; Material/s- T.Y.U., H.A.S.; Data Collection and/or Processing- T.Y.U., M.S.; Data Analysis and Interpretation- T.Y.U., H.A.S.; Literature Search- T.Y.U., M.S.; Writing Manuscript- T.Y.U., H.A.S.; Critical Review- H.A.S.

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