Evaluation of the Presence of Orthorexia Nervosa in Individuals With Type 2 Diabetes and Its Relationship With Diabetes Self-management

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Abstract

Purpose

This study was conducted to investigate the relationship between the presence of orthorexia nervosa and diabetes self-management in individuals with type 2 diabetes.

Methods

The study included 373 individuals with type 2 diabetes between the ages of 18–65 who applied to Akdeniz University Hospital Endocrinology and Metabolic Diseases Polyclinic between January 2022 and May 2022. In the study, a questionnaire including sociodemographic data, information about diabetes, nutritional habits, ORTO-R and "Type 2 Diabetes Self-Management Scale" was used as a data collection tool. In addition, height and weight measurements were taken and body mass index (BMI) were calculated. Biochemical parameters were evaluated by accessing from the hospital system.

Results

46.1% of the participants were men, 53.9% were women and mean age was 57.5 ± 9.6 years. Low diabetes self-management is associated with an increase in fasting glucose ($p < 0,05$), HbA1c ($p < 0,05$), BMI ($p < 0,01$). ORTO-R scores were significantly higher in the group with low diabetes self-management ($p < 0,001$). Education level, presence of non-diabetic disease and diabetes-related complication, treatment method are the factors affecting diabetes self-management and ON. While medical nutrition therapy provides better diabetes self-management, it increases the susceptibility to ON.

Conclusion

ON is common in people with type 2 diabetes. Although medical nutrition therapy provides better self-management, it may increase susceptibility to ON.

Level of evidence:

Level V, cross-sectional study

1. Introduction

Diabetes mellitus prevalence is one of the important public health problems that is constantly increasing and causes serious health expenditures [1]. Obesity due to Western-style diet and physical inactivity, and

diabetes, cardiovascular diseases, hypertension, cancer and many other diseases caused by obesity have led to an increased interest in healthy nutrition and healthy living, especially in developed societies [2, 3].

Nutrition, on the other hand, plays a fundamental role in the prevention, treatment and healthy life of these diseases. Continuous dieting for the treatment of many diseases or just to be thin can cause eating behavior disorders in some individuals. The incidence of Orthorexia Nervosa (ON), which is one of the unclassifiable eating behavior disorders and defined as a healthy eating obsession, has started to increase in recent years [4–6]. First described by Steven Bratman, orthorexia is explained as a pathological obsession with consuming healthy foods that are biologically pure and do not contain herbicides, pesticides or artificial substances[5, 7].

Obsessive behaviors related to orthorexia are related to the content of the food consumed rather than the amount [8]. Healthy eating habits are not pathological. However, it has been reported that it can be considered as a disorder when it turns into an overwork, when it is long-term, and when it causes negativities in daily life. Although not yet accepted as a formal medical condition, "orthorexia nervosa" is a growing and important health problem according to many health professionals [5, 9]. The obsessive situation seen in orthorexia pushes individuals to adopt strict diets or to remove essential nutrients from their diets, and therefore, inadequate and unbalanced nutrition can be seen in individuals with these characteristics [5, 10, 11].

In recent years, studies have been started to determine whether orthorexic behaviors are observed in patients with Diabetes Mellitus, who have always had to diet throughout their lives, especially from the moment they were diagnosed [12–15]. In a study conducted in Turkiye, the incidence of orthorexia in diabetic individuals was 13.4% [16], while in another study it was found to be 41.1% in men and 24.4% in women with with type 2 diabetes (T2DM) [15]. In the USA, the prevalence of orthorexia was 67.4% in Type 1 diabetics and 62.3% in type 2 diabetics [17]. The tendency to increase the frequency of orthorexia nervosa among diabetic individuals will begin to affect factors closely related to diabetes self-management, such as blood glucose regulation and complication control in diabetic patients in the future. The concept of self-management refers to the level of the patient's ability to adapt to the psychosocial effects, symptoms, treatment processes, lifestyle changes required by the disease, and to actively participate in the treatment process, especially in chronic diseases. It is necessary for diabetic patients to have the awareness of recognizing the effects and symptoms of the disease and to have self-management skills for effective management of the disease [18]. There are seven basic self-care behaviors for patients with diabetes, including healthy eating, being physically active, blood glucose monitoring, medication adherence, problem-solving skills, coping skills, and risk reduction behaviors [19, 20]. This increase in the level of disease knowledge in type 2 diabetics has a healing effect in terms of stress management, glycemic control, reduction of complications, nutritional status and health responsibility.

As far as we know, there is no study conducted in Turkiye examining the relationship between disease self-management and orthorexia nervosa in diabetic individuals. This study was carried out to investigate

the relationship between orthorexia nervosa and diabetes self-management in individuals with T2DM aged 18–65 years who applied to Akdeniz University Hospital Endocrinology and Metabolic Diseases Polyclinic.

2. Methods

Study Population and Design

The sample population of this cross-sectional study was determined as 373 individuals at the 95% confidence interval using a certain sample size calculation. The data were collected between January 2022 and May 2022. There were 392 patients with T2DM who applied to Akdeniz University Hospital Endocrinology and Metabolism Diseases Polyclinic, between the ages of 18–65, with a body mass index (BMI) above 18.5 kg/m^2, and who had not been diagnosed with eating behavior disorder before. Those who have undergone bariatric surgery, pregnant and lactating women, those with digestive system diseases that may affect nutrition, those who use psychiatric drugs that may affect appetite, individuals with neurological diseases that prevent them from communicating with, and 19 individuals who have deficiencies in the questionnaire form were excluded from the study and the remaining 373 people constituted the study sample. This study was conducted according to the guidelines set forth in the Declaration of Helsinki, and informed consent was obtained from all participants before starting the study. Ethics committee approval of the study was received from Akdeniz University Faculty of Medicine Clinical Research Ethics Committee (dated 22/12/2021 and KAEK-950 decision number).

Data Collection

The questionnaire was prepared by the researchers and presented to the participants by face-to-face interview technique. A questionnaire including socio-demographic characteristics, health status and diabetes information, nutritional habits, ORTO-R and Type 2 Diabetes Self-Management Scale. The fasting blood glucose, glycosylated hemoglobin (HbA1c) and low-density lipoprotein (LDL) cholesterol values of the individuals analyzed within the last 15 days were obtained from the hospital system. Blood findings were evaluated according to the hospital's laboratory reference values. In addition, the body mass index (BMI) of all participants was calculated and evaluated using the body weight (kg)/height^2 (m^2) formula by taking the height and body weight measurements of the individuals [21].

Intruments

ORTO-R Scale

ORTO-R is the revised version of ORTO-15 [22] used to assess the presence of ON. The new scale includes 6 items of ORTO-15 and is scored on a 4-point Likert scale (never, sometimes, often and always) [23]. Reverse scoring is used for scoring, with lower scores indicating an increased trend towards ON.

Type 2 Diabetes Self-Management Scale

It is a five-point Likert style (always, often, sometimes, rarely, never) scale developed by Koç to evaluate the self-management of diabetic patients. The scale consists of 3 sub-dimensions, namely "Healthy Lifestyle Behaviors" (11 questions), "Health Services Use" (4 questions) and "Blood Glucose Management" (4 questions) and a total of 19 questions. While evaluating the scale, the “Never” response was scored as 1 point, “Rarely” as 2 points, “Sometimes” as 3 points, “Often” as 4 points, and “Always” as 5 points. An increase in the score obtained from the scale indicates that individuals with T2DM have higher self-management. In this study, the median cut-off value of 68 was used to evaluate the diet self-management of individuals [18]. Those with a score of 67.99 were classified as low diabetes self-management, and those with a score of 68 and above were classified as high self-management.

Data Analysis

The data obtained from the study were evaluated in the SPSS 23.0 Statistics package program. Qualitative variables were given as numbers (n) and percentage (%), and the chi-square test was used to evaluate categorical variables. The mean and standard deviation values of the quantitative data were calculated. The conformity of quantitative variables to normal distribution was evaluated with the “Kolmogorov-Smirnov” test. Since the variables did not show normal distribution, Mann Withney U Test was used for two groups and Kruskal Wallis was used for 3 groups or more. The significance level was accepted as $p < 0.05$ in all statistical analyzes. Bonferroni correction was applied in Kruskal wallis analysis.

3. Results

This study was performed on 373 people aged between 18 and 65 who were diagnosed with T2DM. 46.1% of the subjects were men, and 53.9% were women. A significant part of the individuals (41.3%) were primary school graduates (33.7% of men and 47.8% of women) (Table 1). Most of the subjects were married (85.8%) and non-smokers (57.1%) (Table 1).

Table 1
General Characteristic of Participants by Sex

General characteristics	Men (n = 172)		Women (n = 201)		p
	n	%	n	%	
Education status					
Literate	4	2.3	28	13.9	0.001*
Primary school	58	33.7	96	47.8	
Secondary school	36	20.9	29	14.4	
High school	47	27.3	25	12.4	
Bachelor	24	14.0	22	10.9	
Postgraduate education	3	1.7	1	0.5	
Marital status					
Married	154	89.5	166	82.6	> 0.05
Single	18	10.5	35	17.4	
Smoking					
Yes	41	23.8	16	8.0	< 0.001*
No	61	35.5	152	75.6	
Former smokers	70	40.7	33	16.4	
Age (year)	57,5 ± 10,0		57,4 ± 9,2		> 0,05
Blood Parameters					
Fasting blood glucose (mg/dl)	162.5 ± 53.3		159.6 ± 58.8		> 0.05
HbA1c (%)	7.1 ± 2.1		7.3 ± 1.6		0.040*
LDL-C (mg/dl)	128.1 ± 32.8		110.7 ± 32.0		< 0.001*

HbA1c: Glycosylated hemoglobin LDL–C; Low density lipoprotein cholesterol,

* Chi–square test was used for categorical variables.

The mean duration of diabetes in patients was 12.7 years (Table 2). 72.4% of the subjects had a family history of diabetes (Table 2). Diabetes-related diseases/complications were present in 41.3% of the individuals (Table 2). Diabetic foot (13.7%) and retinopathy (13.4%) were the most common diabetes-related complications (data not presented). 78.6% had a diagnosis other than diabetes (men 73.8%; women %82.6) (Table 2). The most common diseases in patients with diabetes were hypertension

(48.0%) and cardiovascular diseases (42.4%) (data not presented). Most of the patients received oral antidiabetic drugs (42%) and insulin treatment (29.8%) (Table 2).

Table 2
Diabetes-Related Descriptive Information of The Participants

	Men (n = 172)		Women (n = 201)		p
	n	%	n	%	
Diabetes year (SD ± SS)	12.6 ± 8.5		12.7 ± 9.5		> 0.05
Presence of disease except diabetes					
Yes	127	73.8	166	82.6	0.044*
No	45	26.2	35	17.4	
Family history of diabetes					
Yes	130	75.6	140	69.7	> 0.05
No	42	24.4	61	30.3	
Presence of diabetes complications					
Yes	85	49.4	69	34.3	0.004*
No	87	50.6	132	65.7	
Diabetes treatment method					
Oral antidiabetic	64	37.2	93	46.3	0.002*
Insulin	60	34.9	51	25.4	
Diet only	7	4.1	5	2.5	
Diet and physical activity only	26	15.1	16	8.0	
Combined medical therapy	15	8.7	36	17.8	

*Chi−square analysis, p<0.05

44.8% of the participants were slightly overweight, and 32.4% were obese. The rates of being overweight and obese were 57% and 19.2% in men, and 34.3% and 43% in women, respectively (Table 3).

Table 3
Distribution of The Participants by Body Mass Index

BMI Classification	Men (n = 172)			Women (n = 201)			p
	SD ± SS	n	%	SD ± SS	n	%	
Thin	-	-	-	16.7 ± 0.4	3	1.5	-
Normal	23.1 ± 1.3	41	23.8	22.8 ± 1.6	41	20.4	> 0.05
Overweight	26.9 ± 1.3	98	57.0	27.2 ± 1.4	69	34.3	> 0.05
Obese	33.8 ± 3.9	33	19.2	35.4 ± 4.5	88	43.8	0.035*

BMI; Body mass index, *Chi–square analysis, p<0.05

The mean and standard deviations of the subjects' diabetes self-management scale and ORTO-R scores are given in Table 4. The diabetes self-management scale score of the men was 65.8 ± 17.5, and the mean value of the women was 65.5 ± 15.44. The mean ORTO-R score was 16.8 ± 3.5 in men and 15.5 ± 3.5 in women. Men's ORTO-R scores are significantly higher than women. (p < 0.01) (Table 4).

Table 4
Distribution of Diabetes Self-Management Scale and ORTO-R Scores

	Men (n = 172)		Women (n = 201)		p
	Score SD ± SS	n	Score SD ± SS	n	
Diabetes self-management scale	65.8 ± 17.5	172	65.4 ± 15.4	201	> 0.05
ORTO-R	16.8 ± 3.5	172	15.5 ± 3.5	201	0.002

Increasing education level in both sex is associated with a decrease in ORTO-R scores. Diabetes self-management scores in men suggested a significant difference depending on the educational level (p < 0.001). Diabetes self-management of undergraduates and high school and secondary school graduates was significantly higher than that of primary school graduates (p = 0.008). It increased with the educational level in men. In women patients, however, it did not show any difference in terms of education (p > 0.05).

The presence of non-diabetic disease negatively affects diabetes self-management in both -sex. In addition, ORTO-R scores are statistically higher in men with non-diabetic disease (Table 5) ORTO-R scores were higher in patients with diabetic complications in the study population. In addition, men with diabetic complications have higher ORTO-R scores than women (Table 5).

Table 5
Distribution of Scale Scores by Some Descriptive Information

Descriptive information	Men (n = 172)		Women (n = 201)		Total (n = 373)	
	Diabetes self-management	ORTO-R	Diabetes self-management	ORTO-R	Diabetes self-management	ORTO-R
Education Status						
Literate	76.7 ± 7.2	15.7 ± 1.2	62.5 ± 17.7	17.3 ± 2.7 [f,g]	64.3 ± 17.3	17.1 ± 2.6
Primary school	58.4 ± 16.2[a,b,c]	18.1 ± 3.3 [d,e]	63.2 ± 14.8	15.6 ± 3.7	61.4 ± 5.5	16.6 ± 3.8
Secondary school	68.8 ± 18.4[a]	16.3 ± 2.7[d]	67.7 ± 17.2	16.1 ± 3.0[h]	68.3 ± 17.7	16.2 ± 2.8
High school	65.7 ± 17.7[b]	16.6 ± 3.6	69.6 ± 14.6	13.6 ± 3.0 [f,h]	67.0 ± 6.7	15.5 ± 3.7
Bachelor	75.5 ± 12.7[c]	15.0 ± 3,7[e]	70.7 ± 11.0	14.8 ± 2.9[g]	73.3 ± 12.0	14.9 ± 3.3
Postgraduate education	79.0 ± 17.3	13.3 ± 1.5	79	-	79.0 ± 14.1	12.7 ± 1.7
Presence of Disease Except Diabetes						
Yes	63.8 ± 17.8[i]	16.9 ± 3.4[j]	64.3 ± 14.6[k]	15.5 ± 3.3[j]	64.1 ± 16.0	16.1 ± 3.4
No	71.4 ± 15.8[i]	16.3 ± 3.5	71.0 ± 18.0[k]	15.7 ± 4.1	71.2 ± 16.7	16.0 ± 3.8
Presence of Diabetes Complications						
Yes	61.8 ± 18.4	17.5 ± 3.5[l,m]	63.2 ± 15.6	15.8 ± 3.7[m]	62.4 ± 17.1	16.8 ± 3.6[n]
No	69.7 ± 15.8	16.0 ± 3.3[l]	66.6 ± 15.2	15.4 ± 3.4	67.8 ± 15.5	15.6 ± 3.3[n]
Diabetes Treatment Method						
Oral antidiabetic	69.5 ± 16.7[o]	15.8 ± 3.5[r]	63.7 ± 14.4[s,t]	15.2 ± 3.8	66.0 ± 15.6	15.4 ± 3.7[z]
Insulin	56.8 ± 15.7 [o,p]	17.9 ± 3.8[r]	59.9 ± 16.2[p,u]	16.9 ± 3.6[v]	58.2 ± 16.0	17,4 ± 3,7 [z,ab]

Descriptive information	Men (n = 172)		Women (n = 201)		Total (n = 373)	
	Diabetes self-management	ORTO-R	Diabetes self-management	ORTO-R	Diabetes self-management	ORTO-R
Diet only	68.5 ± 23.6	17.7 ± 2.9	63.4 ± 18.7[s]	15.4 ± 2.6	66.4 ± 20.9	16.7 ± 2.9
Diet and physical activity only	77.3 ± 10.8[p]	16.6 ± 1.8	79.9 ± 13.4[p]	16.1 ± 2.0[y]	78.3 ± 11.7	16,4 ± 1.9 [ac]
Combined medical therapy	64.8 ± 18.7	16.2 ± 3.0	71.6 ± 11.2 [t,u]	14.5 ± 2.4 [v,y]	69.6 ± 14.0	15 ± 2.7 [ab,ac]
BMI Classification						
Thin	-	-	49.0 ± 8.6	19.0 ± 1.0	49.0 ± 8.6	19.0 ± 1.0
Normal	68.2 ± 17.8	15.9 ± 4.1	67.2 ± 19.2	15.6 ± 3.8	67.7 ± 18.4	15.7 ± 3.9
Overweight	67.5 ± 16.7	17.1 ± 3.1	67.9 ± 15.2	16.3 ± 2.9 [ae]	67.6 ± 16.1	16.8 ± 3.0 [af]
Obese	57.7 ± 17.7[ad]	17.0 ± 3.6	63.3 ± 13.1[ad]	14.8 ± 3.6 [ae]	61.8 ± 14.6	15.4 ± 3.7 [af]

** Those who were underweight in the BMI class, those who received only diet therapy in the treatment group, those who were literate or postgraduate in men and those who received postgraduate education in women were excluded from the analysis due to the low frequency in the group.*

There is a statistically significant difference between groups with the same letter. Mann Whitney U analysis was used for two group comparisons and Kruskal Wallis analysis was applied for multiple groups. Bonferroni correction was made.

Diabetes self-management differed in both sexes depending on the treatment method ($p < 0.001$). In men, those on insulin therapy had lower diabetes self-management than those on oral antidiabetic and diet + exercise therapy. In women, diabetes self-management is lower in those who receive insulin therapy than those who receive diet + exercise therapy and those who receive combined medical therapy (Table 5).

Diabetes self-management scores are higher in women with obesity than men with obesity (Table 5).

Table 6
Correlation of ORTO-R with Diabetes Self-Management Scale

ORTO-R	n	Diabetes self-management scale score SD ± SS		p
ORTO-R		$R^2 = 0.16$	r=-0.41	< 0.001

While fasting blood glucose, HbA1c, and BMI values were statistically lower in the group with high diabetes self-management, no significant difference was found for LDL-cholesterol and diabetes year (p > 0.05) (Table 7).

Table 7
Comparison of Various Parameters According to Diabetes Self-Management Scale

Parameters	Low Diabetes Self-Management (< 68) SD ± SS	High Diabetes Self-Management (≥ 68) SD ± SS	p
Fasting Blood Glucose (mg/dl)	166.7 ± 58.1	155.7 ± 54.0	0.049
HbA1c (%)	7.6 ± 2.1	7.0 ± 1.8	0.021
LDL-Cholesterol (mg/dl)	115.3 ± 37.1	120.1 ± 32.0	> 0.05
BMI (kg/m^2)	29.3 ± 5.6	28.0 ± 5.3	0.002
Diabetes year (year)	12.7 ± 9.3	12.6 ± 8.8	> 0.05
ORTO-R	17.2 ± 3.6	15.0 ± 3.0	< 0.001

HbA1c: Glycosylated hemoglobin, LDL–C; Low density lipoprotein, BMI: Body mass index; Mann Whitney U

While diabetes self-management scores were higher in the medical nutrition therapy (MNT) group (p < 0.001), ORTO-R scores were lower (p = 0.002) (Table 8).

Table 8
Relationship Between Medical Nutrition Therapy Status and Scale Scores

Scale Scores	Medical Nutrition Therapy		
	Yes	No	p
	n = 151(%40,5)	n = 222 (%59,5)	
Diabetes self-management scale score	75.6 ± 12.5	58.9 ± 15.2	< 0.001
ORTO-R sore	15.4 ± 2.8	16.6 ± 3.9	0.002
Mann Whitney U			

4. Discussion

It is estimated that approximately 531 million people in the world have T2DM and this number will reach 743 million in 2045 [24]. The increasing prevalence of T2DM not only causes worsening of health status in many patients, but also places a significant burden on healthcare services and complicates patients' self-management of diabetes [25, 26]. In addition, these patients need to comply with a series of self-care behaviors such as eating healthy, exercising, using medication, monitoring blood glucose and doing foot care in their daily lives in order to control the disease and prevent related complications [27]. This approach, called self-management, is accepted as the basic approach to improve metabolic control and quality of life, reduce the risk of complications and health expenditures, together with pharmacological treatment [25, 28, 29]. However, it is thought that self-management behaviors such as strict blood sugar controls, regulation of eating behaviors and focusing on body weight control required for the management of the disease may be associated with an increased risk of ON in patients with T2DM. In addition, obesity, one of the most important modifiable risk factors for T2DM [30], is also associated with an increased risk of eating disorders [31, 32]. As confirmed in studies, the risk of eating disorders increases in patients with T2DM, and this increase worsens both metabolic and psychological outcomes [33, 34].

Orthorexia Nervosa, although not yet recognized as a disease, includes obsessive eating behaviors associated with healthy eating [35]. However, adherence to a healthy diet is an important part of both effective self-management for patients with prediabetes, type 1 diabetes (T1DM), T2DM, and first-line preventive treatment for various noncommunicable diseases. The difference between ON, an atypical eating disorder, and healthy eating is that ON has severe restrictive dietary behaviors and severe diet-related self-discipline, adhering to evidence-based or non-evidence-based information to be healthy [36].

Studies investigating the frequency of ON in patients with T2DM report quite different results. Anil et al. (2015) found that the prevalence of ON in patients with T2DM was 15.5% in men and 11.1% in women [16]. Kamanlı B. (2017) reported this rate as 32.8% (men: 41.1%; women: 24.2%) [15]. In children with type 1 diabetes in Türkiye, this rate rises to 86.1% [13]. Such a wide prevalence range warrants further research on the subject. It is thought that one of the reasons for the high frequency of ON in this study may be due

to the high number of patients (59.2%) who do not MNT. Studies have shown that dietary intervention is critical for the treatment of eating disorders [37], and dietary intervention has reduced food obsession in people with diabetes and increased awareness of food choices on the market and at meals [38]. Nevertheless, another study proposes that nutritional counseling may increase the risk of ON in patients with T2DM who have no eating behavior disorders and no ON tendency [12]. In our study, ORTO-R scores were statistically lower in the group receiving MNT, suggesting that MNT may increase the tendency towards ON. In addition, ORTO-R scores were statistically higher in the group with low diabetes self-management. In this respect, further research is needed on providing appropriate nutritional counseling to patients with T2DM and evaluating the effects of such process. In addition, the tendency for ON in men with comorbidity to T2DM or with diabetes-related complications is statistically increased compared to women with the same condition.

In patients with T2DM, inadequate self-management is quite common and is associated with worsening glycemic parameters [39]. As seen in our study, fasting blood glucose and HbA1c and BMI levels are statistically higher in patients with low diabetes self-management. Self-management is higher in people who do not have an additional disease to T2DM. This was not the case for diabetes-related complications. Although diabetes self-management does not differ according to BMI classification, diabetes self-management is significantly higher in women with obesity compared to men with obesity. One of the vital components of diabetes management is medical nutrition therapy and body weight control. Consistently, our study found that diabetes self-management was significantly higher in the MNT group.

Our findings also suggest that the method chosen for the treatment of T2DM also affects diabetes self-management and ON tendency. Diabetes self-management was lowest in the insulin-treated group, and highest in the diet + exercise group. Similarly, insulin therapy may increase the tendency to ON. Considering all the factors affecting diabetes self-management, it is thought that these patients may benefit more from a personalized treatment plan related to diabetes self-management subcategories rather than a treatment plan that is applicable to everyone [40].

Conclusions

The number of studies investigating the frequency, prevalence and factors associated with ON in patients with T2DM is quite limited. In the treatment and effective self-management of T2DM, there is a need to increase awareness of ON and to conduct more research on the subject.

Strength and Limitations

The number of studies investigating the frequency, prevalence and factors associated with ON in patients with T2DM is limited. To the best of our knowledge, this study is the largest sampled study investigating orthorexia nervosa in adult diabetics in Turkiye. The cross-sectional design of the study is a limitation. Also, our study does not evaluate the effect of other independent variables that may cause ON tendency on the development of ON.

What is already known on this subject?

T2DM affects hundreds of millions of people. The fact that these patients have some self-management skills, such as following a strict diet and treatment plan, facilitates the management of the disease. In recent years, studies have begun to investigate the frequency of orthorexia nervosa in diabetic individuals, with the thought that strict dieting with the aim of ensuring blood glucose regulation and preventing complications may lead individuals to obsession with healthy nutrition. Although the prevalence of ON was found to be high in diabetic individuals, it is not yet known how this affects the self-management of the disease.

What this study adds?

Low self-management is associated with impaired glycemic parameters. In addition, although MNT improves diabetes self-management, it may increase susceptibility to ON. In the treatment and effective self-management of T2DM, ON awareness should be raised, and more studies investigating the relationship of ON, MNT and T2DM should be conducted.

Conclusion

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Declarations

Conflict of Interest

The authors declare no conflict of interest.

Ethical Approval

Akdeniz University Faculty of Medicine Clinical Research Ethics Committee approved the study (dated 22/12/2021 and with decision number KAEK-950).

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