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ARAŞTIRMA / RESEARCH

Relationship between adherence to treatment and acceptance of illness in patients with type 2 diabetes

Tip 2 diyabetli hastalarda tedaviye uyum ve hastalık kabulü arasındaki ilişki

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Abstract

Purpose: This study aimed at examining the relationship between patient acceptance of illness and adherence to treatment with type 2 diabetes mellitus.

Materials and Methods: This cross-sectional, descriptive study was conducted in a state hospital in Sinop with 200 patients diagnosed with type 2 diabetes. The Patient Identification Form, Illness Acceptance Scale, and Adherence Scale to Type 2 Diabetes Mellitus Treatment were applied to collect the study data.

Results: In our study, the mean score of the patients' acceptance scale was 24.12 ± 9.30 and 61.5% of the patients scored below this average. This indicates that patients' acceptance levels are low. When the scores of Type 2 Diabetes Mellitus Acceptance Scale were evaluated, their compliance with the treatment was found to be moderate (107.39 ± 13.55). There was a significant and negative relationship between the patients' illness acceptance scale scores and treatment adherence scale scores (-0.78).

Conclusion: Majority of patients had low level of admission and moderate compliance to treatment.

Keywords: Acceptance of illness, adherence to treatment, type 2 diabetes

Öz

Amaç: Bu çalışmada tip 2 diyabetes mellitus hastalarında hastalık kabulü ile tedaviye uyum arasındaki ilişkinin incelenmesi amaçlanmıştır.

Gereç ve Yöntem: Bu kesitsel tanımlayıcı çalışma, Sinop'da bir devlet hastanesinde tip 2 diyabet tanısı ile takip edilen 200 hasta ile gerçekleştirilmiştir. Çalışma verilerini toplamak için, Hasta Kimlik Formu, Hastalık Kabul Ölçeği ve Tip 2 Diabetes Mellitus Tedavisine Uyum Ölçeği kullanıldı.

Bulgular: Çalışmamızda hastaların hastalığı kabul ölçeği puan ortalaması 24.12±9.30'dür ve hastaların %61.5'i bu ortalamanın altında puan almıştır. Bu da hastaların hastalığı Kabul düzeylerinin düşük seviyede olduğunu göstermektedir. Hastaların Tip 2 Diyabetes Mellitus Tedavisine Uyum Ölçeği puanları değerlendirildiğinde tedaviye uyumlarının orta düzeyde olduğu (107.39±13.55) belirlenmiştir. Hastaların hastalığı kabul ölçeği puanları ile tedaviye uyum ölçeği puanları arasında (-0.78) anlamlı ve negatif yönde bir ilişki olduğu belirlenmiştir.

Sonuç: Hastaların çoğunluğunun hastalığı kabul düzeyinin düşük ve hastaların tedaviye uyumun orta düzeyde olduğu belirlenmiştir.

Anahtar kelimeler: Hastalığı kabul, tedaviye uyum, tip 2 diyabet

INTRODUCTION

Diabetes mellitus (DM) is a chronic disease that is becoming increasingly prevalent worldwide, because of its frequency and its associated complications[1,2]. According to 2015 International Diabetes Federation Diabetes Atlas, Turkey has the highest age-adjusted comparative prevalence (12.8% comparative prevalence, 12.5% raw prevalence) and the third-highest number of people with diabetes in the Europe Region, after Germany and the Russian Federation[2]. However, diabetes is not only an epidemic in Turkey but also in the world. Therefore, it is so crucial for a patient and his/her family to maintain a well-planned, life-long treatment program for the management of the disease and prevention of

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its complications[3-6].

Adherence to treatment is one of the significant factors affecting the success of treatment in chronic diseases such as diabetes and is defined as a state of showing attitudes that are consistent with health proposals[7]. Individuals should change their routines to cater treatment rules, thus they experience adherence and acceptance matters[8]. Adherence to diabetes treatment and maintaining metabolic control are closely related[9,10] and it is stated that there is a relationship between the blood glucose levels of people with the the acceptance of illnes compliance. Such individuals can enhance the quality of life and live without suffering from disease complications[8,11]. People with a chronic disease should accept the disease to control their health actively[12]. Ericson[13] revealed that people recently diagnosed with diabetes and with acceptance of disease had lower HbA1c levels. In other words, these individuals can better manage their illness in a better way. In a study of Lewko et al[14] that the quality of life of patients with and without diabetic neuropathy were evaluated, the level of illness acceptance was found to be higher in those without diabetic neuropathy. Lewko et al[15] also found that individuals who had lower levels of illness acceptance had higher levels of anxiety and depression and reduced quality of life. Schmitt et al[16] determined that a low level of illness acceptance was related to insufficient self-care and poor glycemic control.

That the level of the adherence to treatment of patients will go up with the acceptance of diabetes is considered. As the illness acceptance and adherence level increase, life quality of patients will increase providing management of illness and prevention of complications with the autonomy of the individual. The aim of this study is to examine the relationship between illness acceptance and adherence to treatment status of individuals with diabetes. The results of our study will be a data source for the next studies to increase levels of diabetes acceptance and adherence to treatment.

The aim of this study is to reply these questions?

1. What is the illness acceptance level of patients with diabetes?
2. What is the treatment adherence level of patients with diabetes?
3. Do illness acceptance and treatment adherence levels affect illness outcomes?
4. Is there any relationship between illness acceptance and treatment adherence in patients with diabetes?

MATERIALS AND METHODS

This study is cross-sectional, descriptive type. This study included patients with type 2 diabetes under care of diabetes nurse mentor in Sinop Atatürk State Hospital, Turkey, between November 2014 and February 2015. Totally 200 participants were enrolled and the study power [P (Statistical Power)] was calculated as 90%. 65 years of age and older having a type 2 diabetes for at least two years without a diagnosis of dementia, being literate, not having severely hearing or visual impairment, being able to verbally communicate, agreeing to participate.

The aim of the study was explained to the participants and both their written and oral consents were obtained. This study was approved by the Institutional Review Board of the University (IRB approval no: OMU KAEK 2015/12). Additionaly, written permissions were obtained from General Secretariat of the Public Hospitals Association.

Procedure

The study data was gathered with face-to-face interviews by researcher using the The Patient Identification Form, Acceptance of Illness Scale (AIS), and Scale of Adherence to Type 2 Diabetes Mellitus Treatment. Inpatients and outpatients completed forms with face-to-face interview technique under care of diabetes nurse mentor. This step took approximately 20 minutes. The disease data and metabolic values of the participants were obtained by using reports which were kept by a diabetes nurse.

Measures

The following data collection tools were used; The Patient Identification Form, Acceptance of Illness Scale (AIS), Scale of Adherence to Type 2 Diabetes Mellitus Treatment.

Patient Identification Form

This form was prepared in accordance with the literature[4,7,8,12]. It was composed of 22 questions that the participants were asked to determine their socio-demographic features also with 10 questions that

related to the laboratory values and diabetes complications of the participants.

Acceptance of Illness Scale (AIS)

The AIS, used to measure the illness acceptance level of the participants was developed by Felton and Revenson in the USA in 1984.[17] Buyukkaya Besen and Esen (2011) determined that this scale was valid and reliable with validity and reliability analyses for patients with diabetes in Turkish society. (Cronbach Alfa=0,79; test-re-test r=0,71)[12]. This scale composed of eight items and each item is scored five points. The maximum score is 40 while the minimum is 8. The state of agreement to expressions (1 point) is defined as a low score and indicates poor treatment adherence and severe physical discomfort, while a five-point score for an item is a high score, and indicates a high level of illness acceptance[12].

Adherence Scale to Type 2 Diabetes Mellitus Treatment

This scale was developed by Demirtas (2014), and validity and reliability analyses were pointed out[18]. The scale is applied to participants diagnosed with diabetes for at least 1 year and consists of 30 items. A Likert-type scale with five choices is used in scoring and participants select the most applicable statement (1=totally agree, 2= agree, 3=partially agree, 4=disagree, 5=totally disagree). There are 13 positive and 17 negative statements in the scale. Positive statements are scored from 1 to 5 (1, 3, 5, 8, 13, 15, 16, 17, 19, 23, 25, 26, and 29). Negative statements are scored from 5 to 1 (2, 4, 6, 7, 9, 10, 11, 12, 14, 18, 20, 21, 22, 24, 27, 28, and 30). The maximum score is 150 and lower scores reveal high/good adherence to treatment. Total scale scores are used for interpretation of the scores acquired; Scores are interpreted as follows: between 0-20% (30-45 points) "the adherence to treatment is good", between 20-80% (55-125 points) "the adherence to treatment is moderate" and between 80–100% (126-150 points) "the adherence to treatment is poor" [18].

The scale composed of seven sub-dimensions such as follows: 1. Attitude and emotional factors 2. Knowledge and personal factors 3. Lifestyle change 4. Anger 5. Feelings and behaviors appropriate to adherence 6. Talks on diet and 7. Denial. Lower sub-dimension scores indicate that the participant reveals positive and expected behaviors during diabetes treatment while high scores reveal that the participant does not adhere to treatment and show expected feelings and behaviors[18].

Statistical analysis

Dependent variables were patient's acceptance of Illness and adherence to treatment and independent variables were socio-demographic features. Microsoft Excel and Statistical Package for Social Sciences Release 21.0 programs were used to evaluate the data and $p<0.05$ was accepted as statisticaly significant. All descriptive statistics were represented as mean±standard deviation, number, and percentage (%). A chi-square test was used to compare categorical data (gender, level of education, etc.). The normal distribution of data was determined by using the Shapiro-Wilk test and parametric test in normal distribution and nonparametric test in abnormal distribution were applied. The direction and power of the variables were determined using correlation analysis.

RESULTS

Of the participants, 37.5% were male, 62.5% were female and their average age was 53.87 ± 11.3 years (Table 1). The average disease duration was 9.3 ± 5.5 years, 84% of the participants were using a combination of oral antidiabetics and insulin therapy, and 93.5% stated that they regularly used their medication (Table 2).

According to the metabolic values and disease complications of the participants, 86% had fasting blood glucose values of between 141 and 200 mg/dl and 51.5% had postprandial blood glucose values of between 201 and 250 mg/dl. The average HbA1c level was %10.2±1.8 with 58% of the patients having HbA1c levels of 10.1% or more. That a total of 59% of the participants had burning and tingling senses in their feet, 21% had diabetic neuropathy, 6.5% had diabetic retinopathy, 2% had diabetic nephropathy and 1% had an amputation were identified.

The adherence scale to type 2 diabetes mellitus treatment scores showed that the participants had moderate levels of treatment adherence (107.39±13.55) (Table 3). The average illness acceptance score was 24.12±9.3 (Table 3) and 61.5% of the participants had scores below average. Thus, it was determined that these participants had a low illness acceptance level.

Table 1. Demographic features of the participants

Demographic features		**n**	**%**
Age	29–49	73	36.5
	50–69	109	54.5
Mean±SS (53.8 ± 11.32 years)	70 and over	18	9.0
Gender	Female	125	62.5
	Male	75	37.5
Marital status	Married	198	99.0
	Single	2	1.0
Educational status	Illiterate	11	5.5
	Primary school	150	75.0
	Secondary school	10	5.0
	High school	15	7.5
	University	14	7.0
Working status	Government official	21	10.5
	Employee	19	9.5
	Self-employed	19	9.5
	Retired	40	20.0
	Housewife	101	50.5
Income level	Poor	2	1.0
	Moderate	130	65.0
	Good	68	34.0
Smoking	Yes	53	26.5
	No	147	73.5
Alcohol use	Yes	12	6.0
	No	188	94.0

S: Standard Deviation

Table 2. Features of the disease and treatment process

Features of the disease and treatment process		**n**	**%**
Duration of diabetes	1–5 years	56	28.0
	69 years	49	24.5
	10 years and over	95	47.5
Treatment	Oral antidiabetic	32	16.0
	Oral antidiabetic and insulin	168	84.0
Adherence to diet	Obey the rules of the diet	4	2.0
	Partially obey the rules of the diet	178	89.0
	Do not obey the rules of the diet	18	9.0
Exercise	Yes	3	1.5
	No	197	98.5
Receiving diabetes education	Yes	200	100
Diabetes educational resource	Nurse	200	100
Hypoglycemia status in the last month	Yes	25	12.5
	No	175	87.5
Regular use of medication	Regularly use	12	6.0
	Sometimes regularly use	187	93.5
	Do not use regularly	1	0.5
Average disease duration	**Mean±SS**		
	9.3 ± 5.55 years		

SS: Standard Deviation

Table 3. Average scores of scale of the Adherence to Type II Diabetes Mellitus Treatment and AIS

	Mean±SS	Min	Max
Score of Scale of Adherence to Type II Diabetes Mellitus Treatment	107.39±13.55	79	146
Attitude and emotional factors	35.52±6.09	18	45
Knowledge and personal factors	28.84±4.30	17	36
Changes in lifestyle	9.82±2.65	4	15
Anger feelings	7.97±2.14	3	14
Feelings and behaviors that are in accordance with adherence	11.88±3.73	5	20
Diet bargaining	7.28±1.84	2	12
Denial	6.09±1.56	2	10
Score of AIS	24.12±9.30	8	40

SS: Standard Deviation

When the AIS scores and the Adherence to Type 2 Diabetes Mellitus Treatment Scale scores were compared with the participants' socio-demographic features, a significant relationship between educational status, illness acceptance level, and adherence to treatment status was pointed out. As the educational status increased, the illness acceptance and adherence to treatment levels also increased. It was found that the participants who were taking insulin and oral antidiabetics in combination had lower levels of illness acceptance and adherence to treatment compared to the participants taking oral antidiabetics merely ($p<0.05$) (Table 4). There was no significant difference between gender, marital status, income status, and duration of diabetes and the illness acceptance and adherence to treatment (Table 4).

Table 4. Comparison of AIS Scores and Scale of Adherence to Type II Diabetes Mellitus Treatment Scores of the participants according to their socio-demographic features

			Average scores of the AIS	Average scores of the Scale of Adherence to Type II Diabetes Mellitus Treatment
		n	Mean±SS	Mean ±SS
Gender	Female	125	25.71±9.27	108.69±1.25
	Male	75	23.17±9.22	105.21±1.45
			t: 1.88 p: .061	t: -1.76 p:.079
Marital status	Married	198	24.07±9.27	107.55± 13.47
	Single	2	29.50±14.84	91.00±15.55
			t:-0.82 p:.412	t: 1.72 p:.086
Educational status	Illiterate	11	22.64±11.13	113.64±13.17
	Primary school	150	22.99±8.62	108.71±13.03
	Secondary school	10	28.20±9.34	97.10±7.20
	High school	15	27.20±10.91	103.80±14.05
	University	14	31.14±9.67	99.43±16.27
			KW: 12.90 p:.012*	F: 4.09 p: .003*
Income level	Poor	2	40.00±0.00	81.00±2.82
	Moderate	130	23.92±8.83	107.97±12.35
	Good	68	24.03±9.94	107.04±15.16
			KW: 5.21 p:.074	F: 4.05 p: .059
Duration of diabetes	1–5 years	56	25.59±10.22	106.18±14.81
	6–9 years	49	24.00±8.46	108.73±12.18
	10 years or over	95	23.32±9.13	107.40±13.51
			F: 1.05 p: .349	F: 0.46p: .630
Treatment	Oral Antidiabetic	32	27.91±9.48	99.06±12.37
	Oral Antidiabetic and Insulin	168	23.40±9.11	108.97±13.21
			t: 2.54 p: .012*	t: -3.92 p: .000**

*p < .05. **p < .001; SS: Standard Deviation

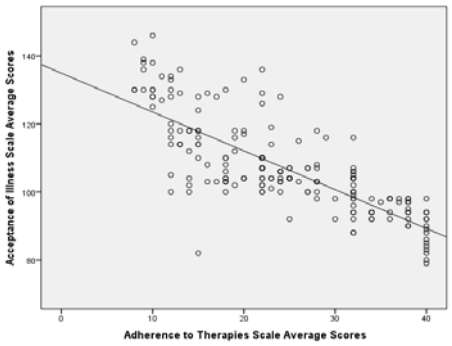
The correlation analysis showed a significant and negative relationship between acceptance of illness scores and the age (-0.17), HbA1c (-0.41), fasting blood glucose level (-0.36), postprandial blood glucose level (-0.37), and body mass index (-0.19) ($p<0.05$). Furthe more there was a significant and positive relationship between adherence to treatment scores and the age (0.18), HbA1c (0.52), fasting blood glucose level (0.41), postprandial blood glucose level (0.43), and body mass index (0.27) of the participants ($p<0.05$), as shown in Table 5.

Table 5. Relationship between the acceptance of illness levels and adherence to the treatment levels of the participants according to their socio-demographic features and metabolic parameters

	Acceptance of Illness Scale		Scale of Adherence to Type II Diabetes Mellitus Treatment	
	r	p	r	p
Age	-.17	.012*	.18	.010*
HbA1c value (%)	-.41	.000**	.52	.000**
Fasting blood glucose (mg/dl)	-.36	.000**	.41	.000**
Postprandial blood glucose (mg/dl)	-.37	.000**	.43	.000**
Body mass index	-.19	.007*	.27	.000**

*p < .05. **p < .001.

Furthermore, there was a significant and negative relationship (-0.78) between the AIS scores and the adherence to treatment scale scores (Graph 1). Graph 1 shows that as the AIS score increased, the adherence to treatment scale score decreased, meaning that participants with high levels of adherence to treatment also had high illness acceptance levels.



Graph 1. Relationship between the acceptance of illness levels and adherence to treatment levels

DISCUSSION

Type II diabetes mellitus is a chronic disease that is primarily observed after the age of 40 and mostly among women[1-3,6]. The average age and gender of the participants in the present study are in accordance with this finding (Table 1).

As the average duration of the disease was long (9.3 years), most of the patients used oral antidiabetics and insulin together. Furthermore, the majority of our patients stated that they partially complied with their diet, did not exercise, and only sometimes regularly took their medicines (Table 2). The HbA1c and fasting and postprandial blood glucose levels of our participants were above normal levels. The adherence to the treatment status of the participants was moderate (107.39±13.55) (Table 3), and over half of the participants had low illness acceptance levels showing problems in illness acceptance and adherence to treatment. Furthermore, there were negative disease outcomes.

Training is very important in the management of diabetes[5]. In our study, although all of our participants stated that they had received education regarding nutrition, exercise, and the correct use of their treatment from nurses, they had poor glycemic values. This finding led us to believe that there is a relationship between education levels and illness acceptance and adherence to treatment (Table 4). It is known that adherence to diet and exercise is generally insufficient[19-21]. A significant relationship between educational status and illness acceptance and adherence to treatment was found ($p<0.05$) as shown in Table 4. Education level is an important factor in the transformation of education and recommendations regarding diabetes into behavior[5,6]. Individuals with high illness acceptance and adherence to treatment levels can easily ensure satisfactory blood glucose management with the help of diet, exercise and the use of antidiabetic

agents[6,12,17]. Our study showed that the participants who were taking insulin and oral antidiabetics in combination had lower levels of illness acceptance and adherence to treatment compared to those who were taking oral antidiabetics only. This finding supports the results of previous studies[8,12,14,15-20].

A significant and negative relationship between age, HbA1c, fasting and postprandial blood glucose levels, and body mass index of participants with low illness acceptance levels was found (Table 5), meaning that the illness acceptance of older and overweight individuals is lower. Low illness acceptance leads to a deterioration in blood glucose management. There is a strong relationship between low illness acceptance and insufficient self-care and poor glycemic control[16]. Bertolin et al [22] found a negative relationship between illness acceptance and HbA1c levels, while Büyükkaya Besen and Esen[12] showed that as the illness acceptance levels of individuals increases, Hb1Ac, fasting and postprandial blood glucose levels, and body mass index decrease. People who accept the disease show behaviors that are in accordance with diabetes education requirements, such as nutrition, exercise, and regular use of their medications. In this manner, they can maintain their blood glucose levels without experiencing complications[11].

In our study, there was a significant and positive relationship between adherence to treatment levels and the age, HbA1c, fasting and postprandial blood glucose levels, and body mass index of the participants (Table 5). The high adherence to treatment score means that adherence to the treatment is not sufficient. It can be claimed that the adherence of old and overweight individuals to treatment was poor in terms of ensuring satisfactory blood glucose management. Reasons for the incompatibility with diabetes treatment can be advanced age, lack of information, polytherapy, and complications in medication dosage calculations. This incompatibility leads to a deterioration in both weight and blood glucose management. Less than 50% of people with diabetes can reach the recommended glycemia levels because of low levels of adherence to treatment[23].

A significant and negative relationship between illness acceptance scores and adherence to treatment scores (Graph 1) was observed, meaning that as the illness acceptance level increases, the adherence to treatment level also increases. According to the World Health Organization, the adherence to the treatment average is 50% in terms of long-term therapies for chronic diseases[23]. The treatment incompatibility in diabetes is an important factor in the deterioration of HbA1c levels, blood pressure values, lipid-level control, hospitalization status, and increased mortality and complications risks[24]. It is difficult to comply with treatment because of the lifestyle changes and complicated treatment regimens that are associated with diabetes. Accepting the illness increases the belief in the efficacy of treatment modalities. In this manner, the adherence to treatment also increases.

Majority of our participants had low illness acceptance levels and their adherence to treatment levels was moderate. Illness acceptance and adherence to treatment are effective in weight and blood glucose management and an increase in illness acceptance levels also increases the adherence to treatment levels. Therefore, training programs that can increase illness acceptance levels and facilitate disease management should be planned in order to motivate and support people with diabetes.

It was determined that the patients had low illness acceptance levels and their adherence to treatment levels was moderate. In the management of diabetes successfully, training programs that can increase illness acceptance levels and facilitate disease management should be planned in order to motivate and support patients.

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