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Diabetes Attitude and Self-Efficiency Levels of Patients with Type 2 Diabetes Mellitus Taking Insulin*

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Abstract: This study was conducted with descriptive design to determine the disease attitudes and self-efficacy levels of patients with type 2 diabetes mellitus taking insulin. The study was conducted with 120 patients diagnosed with type 2 diabetes mellitus, who applied to the internal medicine outpatient clinics of Balıklıgöl State Hospital between January and April 2021. Personal information form, Diabetes Attitude Scale, and Self-Efficacy in Type 2 Diabetes scale were used to collect data. The data were analyzed in the Statistical Package of Social Sciences 25.0 software. The total mean score of the patients was found to be 57.25±19.07 for the self-efficacy in type 2 diabetes scale. In the study, it was determined that there was a strong positive correlation between diabetes attitude scale and diabetes self-efficacy scale ($p<0.05$). While there was a moderate positive correlation between the diet + foot control subscale of the self-efficacy in type 2 diabetes scale and the need for special training to provide diabetes care, impact of diabetes on the patient's life, patient compliance and team care subscales of the diabetes attitude scale, there was a positive and high level correlation between seriousness of type 2 diabetes, the relationship between blood glucose levels and complications, and patient autonomy subscales ($p<0.05$). In the subscale of medical treatment and physical exercise, a significant relationship was found between the subscales of the diabetes attitude scale. ($p<0.05$). Consequently, it was determined that individuals with type 2 diabetes who were taking insulin had a positive attitude and a moderate level of self-efficacy. As the diabetes attitude of the patients increased, their self-efficacy levels also increased.

Keywords: Type 2 Diabetes, Use of Insulin, Attitude, Self-Efficacy, Nursing.

JEL Classification: I10, I13, I19

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İnsülin Kullanan Tip 2 Diyabetes Mellituslu Hastaların Hastalığa Yönelik Tutum İle Öz-Etkililik Düzeyleri

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Özet: Bu araştırma insülin kullanan tip 2 diyabetes mellituslu hastaların, hastalığa ilişkin tutumları ile öz-etkililik düzeylerini belirlemek amacı ile tanımlayıcı olarak yapılmıştır. Araştırma, Ocak-Nisan 2021 tarihleri arasında bir devlet hastanesinin dahiliye polikliniklerine başvuran, dahil edilme kriterleri karşılayan ve insülin kullanan 120 tip 2 diyabet tanılı hasta ile gerçekleştirilmiştir. Verilerin toplanmasında kişisel bilgi formu, Diyabet Tutum Ölçeği ve Tip 2 Diyabet Öz-Etkililik Ölçeği kullanılmıştır. Hastaların tip 2 diyabet öz-etkililik ölçeği toplam puan ortalaması 57.25±19.07 olarak bulunmuştur. Araştırmada diyabet tutum ölçeği ve diyabet öz-etkililik ölçeği arasındaki pozitif yönde güçlü bir ilişki olduğu saptanmıştır ($p<0.05$). Tip 2 diyabet öz-etkililik ölçeği alt boyutlarından diyet + ayak kontrolü alt boyutu ile diyabet tutum ölçeği alt boyutlarından özel eğitim ihtiyacı, hastanın yaşamı üzerine etkisi, hasta uyumuna karşı tutum ve ekip bakımına karşı tutum alt boyutları arasında pozitif yönde orta düzeyde ilişki bulunurken, tip2 diyabet ciddiyeti, kan glukoz kontrol ve komplikasyonlar, hasta otonomisine karşı tutum alt boyutları arasında pozitif yönde ve yüksek düzeyde ilişki olduğu saptanmıştır ($p<0.05$). Tıbbi tedavi ve fiziksel egzersiz alt boyutunda ise diyabet tutum ölçeği alt boyutları arasında anlamlı ilişki bulunmuştur ($p<0.05$). Sonuç olarak, insülin kullanan tip 2 diyabetli bireylerin olumlu tutuma ve orta düzeyde öz yeterliliğe sahip olduğu belirlendi. Hastaların diyabet tutumları arttıkça öz-yeterlik düzeyleri de yükselmektedir.

Anahtar Kelimeler: Tip 2 Diyabet, İnsülin Kullanma, Tutum, Öz-Etkililik, Hemşirelik.

JEL Sınıflandırması: I10, I13, I19

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GENİŞLETİLMİŞ ÖZET

Araştırmanın Amacı

Bu araştırma insülin kullanan tip 2 diyabetes mellituslu hastaların, diyabet tutumları, öz-etkililik düzeyleri ve aralarındaki ilişkiyi belirlemek amacıyla tanımlayıcı olarak yapıldı.

Araştırma Soruları

İnsülin kullanan tip 2 diyabetli bireylerin diyabet tutum düzeyi nasıldır? İnsülin kullanan tip 2 diyabetli bireylerin diyabet öz-etkililik düzeyi nasıldır? İnsülin kullanan tip 2 diyabetli bireylerin diyabet tutumu ile diyabet öz-etkililik düzeyleri arasında ilişki var mıdır?

Literatür Derlemesi

Diyabetes mellitusun prevelansının son yıllarda giderek artması sonucunda hastaneye yatış ve hastalığa bağlı ölüm oranlarında da artışlar görülmektedir. Diyabet hem kronik bir hastalık olması hem de gelişebilecek komplikasyonlar açısından sürekli destek ve tıbbi bakım gerektirmektedir. Diyabet tedavisinin ömür boyu sürmesi sebebiyle hastalardan etkili bireysel tedavi yönetimi ve yaşam tarzı değişikliği yapması beklenmektedir. Bireylerin kendi sağlık ya da hastalıklarına dair inanç ve tutumları, hastalığıyla ilgili yaşam biçimi düzenlemelerine aktif olarak katılımını etkilemektedir. Diyabetli hastalardan, etkili diyabet yönetimini gerçekleştirilmesi için sahip olduğu yeterli bilgi ve beceriyi olumlu tutumlarla ilişkilendirerek davranışlarına yansıtması beklenmektedir. Diyabet hastalarında metabolik parametrelerde ve tedavide başarının sağlanmasında hemşirelik bakımı oldukça önemlidir. Hemşirelerin bakım verdikleri hastaların öz-etkililik düzeylerini etkileyen bireysel özelliklerini ve diyabete dair tutumlarını belirlemeleri, diyabetli hastaların tedavi yönetimine katkı sağlamaktadır.

Metodoloji

Araştırma, Ocak-Nisan 2021 tarihleri arasında bir devlet hastanesinin dahiliye polikliniklerine başvuran, dahil edilme kriterleri karşılayan ve insülin kullanan 120 tip 2 diyabet tanılı hasta ile gerçekleştirilmiştir. Araştırma örneklem sayısı, evreni bilinen örneklem yöntemine göre bir takvim yılı öncesinde başvuru yapan 2174 insülin kullanan tip 2 diyabet tanılı hasta baz alınarak PASS programı versiyon 11 kullanılarak hesaplanmıştır. Araştırmanın verileri; kişisel bilgi formu, Diyabet Tutum Ölçeği ve Tip 2 Diyabet Öz-Etkililik Ölçeği kullanılarak elde edilmiştir. Araştırmada elde edilen veriler Statistical Package of Social Sciences (SPSS) 25.0 paket programı ile değerlendirilmiştir. Verilerin analiz edilmesinde sayı, yüzdelik, ortalama, ortanca, standart sapma (sd), minimum, maksimum değerleri, cronbach alpha, Mann Whitney U testi, Kruskal Wallis testi ve Spearman Korelasyon testi kullanılmıştır. Anlamlılık değeri $p<0.05$ olarak kabul edilmiştir.

Bulgular ve Sonuçlar

Araştırmaya katılan bireylerin yaş ortalaması 53.32±11.42 ve %65'i kadındır. Hastaların diyabet tanı süresi 7.32±7.05 yıl ve insülin kullanma süresi 4.22±5.59 yıl olarak bulunmuştur. Hastaların Diyabet Tutum Ölçeği toplam puan ortalaması 3.68±0.71 olarak belirlenmiş ve pozitif tutuma sahip oldukları bulunmuştur. Diyabet tutum ölçeği alt boyutlarından; en yüksek puan ortalaması hastanın yaşamı üzerine diyabetin etkisi (4.11±0.71) alt boyutuna aitken, en düşük puan ortalaması tip 2 diyabetin ciddiyeti (2.54±1.42) alt boyutuna aittir.

Hastaların tip 2 diyabet öz-etkililik ölçeği toplam puan ortalaması 57.25±19.07 olarak bulunmuştur. Araştırmada Diyabet Tutum Ölçeği ve Diyabet Öz-Etkililik Ölçeği arasındaki pozitif yönde güçlü bir ilişki olduğu saptanmıştır ($p<0.05$). Tip 2 diyabet öz-etkililik ölçeği alt boyutlarından diyet+ayak kontrolü alt boyutu ile diyabet tutum ölçeği alt boyutlarından özel eğitim ihtiyacı, hastanın yaşamı üzerine etkisi, hasta uyumuna karşı tutum ve ekip bakımına karşı tutum alt boyutları arasında pozitif yönde orta düzeyde ilişki bulunurken, tip2 diyabet ciddiyeti, kan glukoz kontrol ve komplikasyonlar, hasta otonomisine karşı tutum alt boyutları arasında pozitif yönde ve yüksek düzeyde ilişki olduğu saptanmıştır ($p<0.05$). Tıbbi tedavi ile kan glukoz kontrolü ve komplikasyonlar alt boyutları arasında pozitif ve yüksek düzeyde ilişki olduğu belirlenirken, diğer diyabet tutum ölçeği alt boyutları ile orta düzeyde pozitif ilişki bulunmuştur ($p<0.05$). Fiziksel egzersiz alt boyutunda ise; tip 2 diyabet ciddiyeti alt boyutu ile pozitif yönde ve orta düzeyde ilişki bulunurken, diğer diyabet tutum ölçeği alt boyutları ile pozitif ve zayıf düzeyde ilişki bulunmuştur ($p<0.05$).

Araştırma sonucunda, insülin kullanan tip 2 diyabetli bireylerin pozitif tutuma ve orta düzeyde öz-etkililiğe sahip oldukları belirlenmiştir. Hastaların diyabet tutumu arttıkça öz-etkililik düzeylerinin de arttığı saptanmıştır. Bu sonuçlara dayanarak diyabetli bireylerin tutum ve öz-etkililik düzeylerinin belirlenmesi hemşirelik açısından önem taşımaktadır. Hemşireler, tip 2 diyabetli bireylerin negatif tutumlarının iyileştirilmesine, pozitif tutumlarının geliştirilmesine ve öz-etkililik düzeylerinin arttırılmasına yönelik hemşirelik bakımı planlanmalı ve uygulamalıdır.

INTRODUCTION

Diabetes has an ever-increasing prevalence rate worldwide and shortens life expectancy as a result of its complications. The International Diabetes Federation (IDF) reported that as of 2021, 537 million adults worldwide had diabetes, corresponding to 10.5% of the world's adult population. It is predicted that this number will reach 643 million (11.3%) in 2030 and 783 million (12.2%) by 2045. Turkey ranks first in Europe in terms of diabetes incidence, followed by Russia and Germany (IDF, 2021). The most important first epidemiological study on diabetes in Turkey is the Turkish Diabetes Epidemiology Project (TURDEP), which was published in 2002. In this project, the prevalence of diabetes was found to be 7.2% (Satman et al., 2002). In the TURDEP-2 study conducted 12 years later, including the same centres, this prevalence was found to be 13.7%. In the study, it was found that while the Eastern Anatolia Region had the highest regional prevalence but the lowest rate of in diabetes awareness (Satman et al., 2011).

The prevalence of diabetes mellitus has increased in recent years; therefore, hospitalisation and disease-related death rates have increased (IDF, 2021). These increases are mainly attributed to macrovascular and microvascular complications of the diabetes (Kowluru et al., 2015). Diabetes requires continuous support and medical care since it is a chronic disease with possible complications (Gündoğdu, 2013). Since patients with diabetes receive treatment throughout their lives, they are expected to make effective individual treatment management and lifestyle changes. For this reason, individuals' beliefs and attitudes about their own health or illness affect their active participation in lifestyle changes related to their illness (Kartal and Özsoy, 2007). Individual management in diabetes enables the person to recognise diabetes, to comply with the treatment and care plan, and to achieve an effective self-care. Individuals diagnosed with diabetes can individually manage diabetes with the social support they receive from their medical team, family and friends in their daily lives (Özcan, 2003). Furthermore, one of the important factors affecting the disease management of patients is their attitude towards the disease (Özcan, 1999).

Attitude refers to the person's long-term organised individual beliefs and behavioural tendencies. Behaviours and attitudes of diabetic patients regarding their health status are one of the important steps of treatment. It is suggested to evaluate the habits and attitudes of individuals in the treatment of patients and at the beginning of patient education. Identifying patients' negative beliefs and attitudes helps us prevent them from exhibiting negative behaviors towards diabetes (Özcan, 2003). Attitudes of diabetic patients towards the disease affect their diabetes care. Patients with low attitudes towards diabetes face more obstacles in diabetes care and they fall short of self-care compared to diabetic ones with high attitudes (Özcan, 1999). In studies conducted, diabetic patients' attitudes towards the disease and their self-efficacy levels sometimes it is considered alone and sometimes it is combined with some variables (education, laboratory, findings, demographic findings, nutrition and exercise status, etc.) has been mentioned (Samancıoğlu et al., 2017; Mohammadi et al., 2018). On the other hand, individuals with type 2 diabetes who use insulin studies examining attitudes towards the disease and self-efficacy levels together has not been found. Therefore, this research is aimed at patients with insulin-dependent type 2 diabetes mellitus. It was conducted to determine patients' diabetes attitudes and self-efficacy levels and to examine the relationship between them.

Patients with diabetes are expected to reflect their adequate knowledge and skills to their behaviours by associating them with positive attitudes in order to achieve an effective diabetes management (Gergely, 1992). Thus, it is aimed to increase the diabetic patients' adaptation to the disease by enabling them to exhibit behavioural change

as a result of determining their attitudes and false beliefs (Kara and Çınar, 2011). The concept of "self-efficacy" plays a key role in achieving the desired goals with these behavioural changes. Diabetic patients need to have sufficient level of self-efficacy to cope effectively with complex diabetes care and treatment (Erol and Enç, 2011). The studies have revealed that individuals with high self-efficacy in their health beliefs and diabetes management are more successful in their adherence to diet and treatment (Mohammadi et al., 2018; Tekin-Yanık and Erol, 2016).

Nursing care is very important in ensuring success in metabolic parameters and treatment in diabetic patients. Nurses need to determine the individual characteristics and attitudes towards diabetes that affect the self-efficacy levels of the patients they provide care to. These data contribute to the treatment management of patients with diabetes (Tekin-Yanık and Erol, 2016). It is also of primary importance that nurses support patients with empowering trainings in order for diabetic patients to have higher levels of self-efficacy and to gain positive attitudes (Samancıoğlu et al., 2017).

In TURDEP-2's data, it is known that diabetes awareness is lowest in the Eastern Anatolia Region compared to the rest of Turkey (Satman et al., 2011). In a study conducted in Şanlıurfa, it was determined that 92.2% of diabetic patients taking insulin were diagnosed with type 2 diabetes mellitus and 83% were receiving insulin therapy (Polat et al., 2017). In another study conducted in Şanlıurfa, patients with diabetes were found to have a negative attitude towards the disease (Başar and Kahraman, 2019). In a study conducted by Rashidi and Genç (2020) to compare the attitudes of patients with type 1 and type 2 diabetes, they found that patients with type 2 diabetes had lower attitudes than patients with type 1 diabetes. In another study, it was found that as patients had higher attitudes towards diabetes, their self-efficacy levels were also positively affected (Erol and Enç, 2011). A previous study conducted with diabetic patients reported that the self-efficacy levels of diabetic patients taking only oral antidiabetic drugs or only insulin were lower than the levels of those taking oral antidiabetic drug+insulin (Tekin-Yanık and Erol, 2016). In the light of this information; this study was conducted with descriptive design to determine diabetes attitudes and self-efficacy levels of patients with type 2 diabetes mellitus taking insulin.

Research Questions

1. *What is the diabetes attitude level of individuals with type 2 diabetes mellitus who take insulin?*
2. *What is the diabetes self-efficacy level of individuals with type 2 diabetes mellitus who take insulin?*
3. *Is there any correlation between diabetes attitude and diabetes self-efficacy levels of individuals with type 2 diabetes mellitus who take insulin?*

2. MATERIALS AND METHODS

2.1. Design of the Study and Sample

This is a descriptive study. The population of this study consisted of patients with type 2 diabetes mellitus who were taking insulin and applied to the internal medicine outpatient clinics of a state hospital in Şanlıurfa. The sample consisted of 120 patients diagnosed with type 2 diabetes mellitus who were taking insulin, applied to the internal medicine outpatient clinics between January and April 2021, and met the inclusion criteria. The sample size was calculated using the PASS program version 11 based on 2174 patients diagnosed with type 2 diabetes mellitus who were taking insulin and applied one calendar year ago, according to the sampling method with known population. It was aimed to reach at least 107 patients who met the inclusion criteria at significance level of $\alpha = 0.05$ and power level of 90% according to the sample calculation.

Inclusion criteria is being 18 years old and over, being diagnosed with type 2 DM and Diabetes Association (ADA) in 2019 based on established diagnostic criteria having a fasting plasma glucose (FPG) of ≥ 126 mg/dl and having HbA1C ≥ 6.5% being able to communicate. Exclusion criteria also is being under the age of 18 years, being diagnosed with type 1 DM, being diagnosed with type 2 DM but taking only oral antidiabetic drugs, being diagnosed with a psychiatric disorder.

2.2. Data Collection Tools

The data of the study were collected using a personal information form, the diabetes attitude scale and the self-efficacy scale for type 2 diabetes mellitus.

Personal Information Form

The form was prepared by the researchers upon the literature review (Erol and Enç, 2011; Tekin-Yanık and Erol, 2016). The form includes questions about the patients' socio-demographic characteristics (age, gender, marital status, educational status, etc.), disease characteristics (duration of diagnosis, duration of insulin therapy, frequency of going to the hospital for the check, complication development, etc.) and habits (frequency of meals, exercise status, smoking and alcohol consumption, etc.)

Diabetes Attitude Scale (DAS)

The scale was developed by the National Commission on Diabetes in the USA, and its Turkish validity and reliability study was conducted by Özcan et al., in 1999 (Özcan, 1999; Anderson, et al., 1990). Diabetes Attitude Scale, which is used to determine the attitudes of both diabetic patients and the diabetes care team, consists of 7 subscales (need for special training, attitude towards patient compliance, seriousness of type 2 diabetes, blood glucose control and complications, impact of diabetes on the patient's life, attitude towards patient autonomy, and attitude towards team care. This scale is used to reveal the effectiveness of education programs, the importance of patient attitude and the relationship of this attitude with behaviour. The number of items in the subscales ranges between 3 and 7. The scale items are scored with a Likert-type scoring ranging from 1 to 5. Items 5, 6, 12, 18, 23, and 24 are rated as negative and the other items as positive. Diabetes attitude score is calculated by summing the scores of all items in the scale and dividing the sum by 34. While a score of >3 points indicates positive attitude, a score of ≤3 points indicates a negative attitude. An increase or decrease in the score strengthens the attitude in that direction (Özcan, 1999). The Cronbach's alpha value is 0.70 for the overall scale. In this study, the Cronbach's alpha reliability coefficient of the DAS was found to be 0.953.

Self-Efficacy Scale for Type 2 Diabetes Mellitus

The "self-efficacy scale" was developed by Van Der Bijl et al., in 1999 in order to determine how individuals with type 2 diabetes mellitus perceive their participation in self-care activities. The original version of the scale, which is a 5-point Likert type, consists of 20 items and 4 subscales. The Cronbach's alpha value of the scale is 0.81 and its variance is 55% (Van der Bijl et al., 1999). Its Turkish validity and reliability study was conducted by Kara et al. (2006). The items of the scale are scored with likert-type scoring ranging from 1 to 5 (5=Yes, I am sure 4=Yes, 3=Neither yes nor no, 2=No, 1=No, I am not sure). In the intercultural adaptation study by Kara et al., three subscales of the scale were specified. These subscales are diet+foot control (1-9, 11, 13, 14), medical treatment (10, 12, 18-20), and physical exercise (15-17). The lowest and highest scores of the scale are 20 and 100, respectively (Van der Bijl,

et al., 1999; Kara et al., 2006). In the general evaluation of the scale, the overall mean score is obtained from the item mean scores of all subscales. While those who get a score below this general mean score are considered to have a low self-efficacy, those who get a score above the mean score are considered to have a high self-efficacy % (Van der Bijl et al., 1999). In its reliability study, the Cronbach's alpha value was 0.89. In this study, the Cronbach's alpha reliability coefficient of the scale was found to be 0.962.

2.3. Data Collection

The personal information form used in patients with type 2 diabetes taking insulin was prepared in line with the literature (Erol and Enç, 2011; Tekin-Yanık and Erol, 2016). In order to determine the intelligibility and usability of the form as well as the application plan, the preliminary application of the research was carried out with 20 patients between 05.01.2021 and 15.01.2021. As a result of the preliminary application, two questions were omitted. For this reason, patients who were taken into preliminary application were not included in the study. Interviews with the patients were conducted in an empty outpatient clinic using the face-to-face interview technique. It took approximately 30 minutes to complete the interview.

2.4. Variables of the Study

The independent variables of the study are socio-demographic characteristics, disease-related characteristics and habits. The dependent variables of the study are the mean scores of the diabetes attitude scale and self-efficacy scale for type 2 diabetes mellitus.

2.5. Data Assessment

The data were evaluated with the Statistical Package of Social Sciences (SPSS) 25.0 software. Number, percentage, mean, median, standard deviation (SD), minimum, maximum values, Cronbach’s alpha, Mann Whitney U test, Kruskal Wallis test and Spearman’s Correlation test were used to analyse the data. Significance value was accepted as $p<0.05$.

2.6. Ethical Considerations

Permission from the Chief Physician of the hospital, where the study was conducted, and the Şanlıurfa Provincial Directorate of Health (the certificate dated 22.12.2020 and numbered 24198) and approval from the Clinical Trials Ethics Committee of a university (decision dated 26.11.2020 and numbered 47073, HRU/20.19.03) were obtained. Written consent was obtained from patients who met the inclusion criteria and were voluntary.

3. RESULTS

Table 1 shows the socio-demographic and disease characteristics of the patients with diabetes mellitus taking insulin. According to these findings, it was found that the mean age of the participants was 53.32+11.42, 73.3% were in the age group of 40-64 years, 65.0% were female, 95.8% were married, 48.3% were illiterate and 85.8% lived in the province. 64.2% of the patients had a comorbidity and 58.3% were regularly taking drugs. The mean BMI of the patients was 29.65+6.10 and 36.7% were overweight.

Table 1. The Socio-Demographic and Disease Characteristics of the Patients with Diabetes Mellitus taking Insulin

Characteristics	N	%
Age (53.32±11.42)		
18-39	12	10.0 %
40-64	88	73.3 %
65 and above	20	16.7 %
Gender		
Female	78	65.0 %
Male	42	35.0 %
Marital status		
Married	115	95.8 %
Single	5	4.2 %
Education status		
Illiterate	58	48.3 %
Literate	24	20.0 %
Primary school	30	25.0 %
High School and above	8	6.6 %
Living area		
Province	103	85.8 %
District	7	5.8 %
Village	10	8.3 %
Comorbid disease		
Yes	77	64.2 %
No	43	35.8 %
Regularly taking drug		
Yes	70	58.3 %
No	50	41.7 %
BMI (29.65±6.10)		
Normal	25	20.8 %
Overweight	44	36.7 %
Class I obesity	26	21.7 %
Class II obesity	25	20.8 %
	X±SD	**Min-Max**
Height	163.93±7.48	145-184
Weight	79.22±14.22	50-120
Total	**120**	**100**

BMI: Body Mass Index

It was found that the first three comorbidities were hypertension (40.0%), hyperlipidaemia (16.7%) and asthma (16.7%), respectively, and the three most commonly used drug groups of the patients were antihypertensive, statins, and bronchodilators.

In the descriptive characteristics of the patients with diabetes mellitus taking insulin, the mean duration of diabetes diagnosis was 7.32±7.05 years, the mean duration of insulin therapy was 4.22±5.59 years, and the mean number of insulin injections per day was 3.47±0.95. The mean doses of insulin administered by the patients per day were determined as 19.14±7.31 units in the morning, 14.55±9.85 units at noon, 18.55±8.09 units in the evening, and 30.91±19.86 units at night. The mean fasting blood glucose level of the patients was 307.01±115.84 mg/dl and the mean HbA_1C level was 11.04±1.93.

It was determined that 96.7% of the patients received training on insulin use, 87.9% of the patients who received training received training from a diabetes education nurse, and 37.5% of the patients went to check-ups every three months. It was determined that 95.8% of the patients had a glucometer at home and only 75.8% of these patients measured their blood glucose at home. 88.3% of the patients injected the insulin themselves, 19.2% had deformities at the insulin injection site, 55.8% had complications related to diabetes, and the three most common complications were hypertension (28.3%), diabetic neuropathy (26.7%), and diabetic retinopathy (20%). It was determined that the patients mostly used long-acting (77.5%) and fast-acting (75.8%) insulin, and only 15.8% of them changed the type of insulin.

In the health habits of the patients, it was determined that 55.8% of the patients exercised, 49.3% did it every day, 59.2% never smoked, 50.8% ate three meals a day, 40.8% adhered to their diet and 89.2% never went to a dietician.

The DAS total mean score of the patients was 3.68±0.71. Their mean scores for its subscales were 3.98±0.68 for the need for special training, 3.60±0.55 for the attitude towards patient compliance, 2.54±1.42 for the seriousness of type 2 diabetes, 3.35±1.30 for the blood glucose control and complications, 4.11±0.71 for the impact of diabetes on the patient's life, 3.38±0.81 for the attitude towards patient autonomy, and 3.68±0.85 for the attitude towards team care. The participants' total mean score for self-efficacy scale for type 2 diabetes mellitus was 57.25±19.07. Their mean scores for its subscales were 35.19±12.49 for the diet+foot control subscale, 16.17±5.09 for the medical treatment, and 5.88±3.50 for the physical exercise.

Table 2 shows the medians of the diabetes attitude scale and its subscales according to the socio-demographic and disease characteristics of the patients.

Table 2. Distributions of the Diabetes Attitude Scale and its Subscales Scores According to Sociodemographic and Disease Characteristics of Patients with Diabetes Mellitus Using Insulin

Characteristics	Need for special training	Attitude towards patient compliance	Seriousness of type 2 diabetes	Blood glucose control and complications	Impact of diabetes on the patient's life	Attitude towards patient autonomy	Attitude towards team care	Total score
	Median	Median	Median	Median	Median	Median	Median	Median
Age								
18-39	4.07	3.42	3.50	4.25	4.30	4.10	4.13	4.00
40-64	4.00	3.58	2.00	4.00	4.40	4.00	3.88	3.81
65 and above	4.00	3.32	2.00	3.00	4.00	3.60	3.63	3.50
KW	0.145	1.560	1.844	1.451	1.400	1.626	0.971	1.179
p	0.930	0.458	0.398	0.484	0.496	0.444	0.615	0.555
Gender								
Female	4.00	3.58	2.16	4.12	4.40	4.00	4.00	3.82
Male	4.00	3.41	2.00	3.00	4.20	3.80	3.50	3.45
MWU	1501.000	1328.000	1430.500	**1198.500**	1421.500	1335.000	**1240.000**	1300.500
p	0.449	0.087	0.248	**0.015**	0.230	0.094	**0.028**	0.063
Education status								
Illiterate	4.00	3.50	2.00	3.12	4.20	3.80	3.75	3.55
Literate	3.92	3.50	2.00	3.50	4.20	3.90	4.00	3.64
Primary school	4.00	3.58	2.00	3.87	4.40	3.90	3.75	3.76
High School and above	4.28	4.00	4.00	4.25	4.80	4.20	4.50	4.17
KW	5.382	4.299	2.722	2.367	9.508	3.597	4.772	5.812
p	0.250	0.367	0.605	0.669	0.050	0.463	0.312	0.214
Comorbid disease	4.00	3.66	2.33	4.00	4.20	4.00	3.75	3.79
Yes	4.00	3.50	2.00	3.00	4.40	3.80	4.00	3.58
No								
MWU	1600.000	1424.500	1527.00	1554.500	1638.000	1637.000	1633.000	1577.500
p	0.760	0.204	0.476	0.578	0.923	0.919	0.902	0.669
Regularly taking drug								
Yes	4.00	3.66	2.66	4.00	4.40	4.00	4.00	3.82
No	3.85	3.33	2.00	2.87	4.10	3.80	3.62	3.42
MWU	1449.000	**1262.000**	1471.500	1448.000	1548.000	1462.500	1509.000	1404.500
p	0.108	**0.009**	0.133	0.106	0.279	0.124	0.197	0.066
BMI								
Normal	4.00	3.50	2.00	3.50	4.20	3.80	3.75	3.59
Overweight	4.00	3.58	2.33	4.00	4.20	3.90	3.88	3.84
Class I obesity	4.00	3.50	2.17	3.13	4.40	3.80	3.63	3.52
Class II obesity	4.00	3.67	2.00	3.00	4.40	4.00	4.00	3.59
KW	1.066	3.207	0.365	1.731	1.763	0.347	0.471	0.597
p	0.785	0.361	0.947	0.630	0.623	0.951	0.925	0.897

BMI: Body Mass Index; **MWU:** Mann-Whitney U Test; **KW:** Kruskal Wallis Test

Table 2 (Continue). Distributions of the Diabetes Attitude Scale and its Subscales Scores According to Sociodemographic and Disease Characteristics of Patients with Diabetes Mellitus Using Insulin

Characteristics	Need for special training	Attitude towards patient compliance	Seriousness of type 2 diabetes	Blood glucose control and complications	Impact of diabetes on the patient's life	Attitude towards patient autonomy	Attitude towards team care	Total score
	Median	Median	Median	Median	Median	Median	Median	Median
Complication statu								
Yes	4.00	3.66	2.00	3.50	4.40	4.00	3.75	3.64
No	4.00	3.50	2.66	3.75	4.20	3.80	4.00	3.79
MWU	1752.500	1690.500	1511.000	1703.000	1741.000	1764.500	1745.500	1719.500
p	0.903	0.652	0.157	0.700	0.854	0.953	0.873	0.767
Frequency of the patients to go to medical controls								
Never[a]	4.00	3.16	2.00	2.00	3.20	3.60	3.00	3.08
Once in a month[b]	4.00	3.66	2.66	4.25	4.40	4.20	4.12	3.91
more than once per	3.71	3.33	4.00	4.25	4.20	3.80	3.75	3.82
month[c]	4.00	3.66	2.66	4.00	4.20	4.00	4.00	3.94
Quarterly[d]	3.85	3.50	1.33	2.00	4.00	3.60	3.25	3.20
Once a year[e]								
KW	6.421	7.858	**15.410**	**13.301**	6.923	**13.723**	**12.628**	**13.854**
p	0.170	0.097	**0.004**	**0.010**	0.140	**0.008**	**0.013**	**0.008**
			e<b,d	**e<b,d**		**e<b,d**	**e<b,d**	**e<b,d**
Exercise statu								
Yes	4.00	3.50	2.66	4.25	4.40	4.00	4.00	3.82
No	3.85	3.50	1.66	2.50	4.00	3.40	3.50	3.20
MWU	1549.500	1542.000	**1239.000**	1428.500	1475.000	**1236.000**	1436.500	**1348.000**
p	0.230	0.215	**0.004**	0.065	0.110	**0.004**	0.072	**0.024**
Frequency of exercise								
Once a week[a]	4.00	3.33	2.33	3.50	4.40	3.80	3.75	3.58
2-3 times a week[b]	4.28	3.83	4.00	4.50	4.40	4.60	4.25	4.20
4-5 times a week[c]	4.35	3.66	3.00	3.50	4.40	4.30	3.87	3.89
Everyday[d]	4.00	3.50	2.66	4.00	4.00	4.00	4.00	3.82
KW	6.024	7.491	4.866	**7.978**	4.906	**8.804**	**3.584**	**8.136**
p	0.110	0.058	0.182	**0.046**	0.179	**0.032**	**0.032**	**0.043**
				b>a		**b>a,d**	**b>a**	**b>a**
Diet adherence								
Yes[a]	4.42	4.00	4.00	4.75	4.40	4.60	4.25	4.35
No[b]	3.71	3.16	1.33	2.00	3.70	3.20	3.00	3.07
Sometimes[c]	3.85	3.33	2.00	3.00	4.20	3.60	3.25	3.44
KW	**24.905**	**42.023**	**53.487**	**63.390**	**30.513**	**49.658**	**41.534**	**60.390**
p	**<0.001**	**<0.001**	**<0.001**	**<0.001**	**<0.001**	**<0.001**	**<0.001**	**<0.001**
	a>b,c	**a>b,c**	**a>b,c**	**a>b,c**	**a>b,c; c>b**	**a>b,c**	**a>b,c**	**a>b,c; c>b**

BMI: Body Mass Index; **MWU:** Mann-Whitney U Test; **KW:** Kruskal Wallis Test

Table 3 shows the score distribution of the self-efficacy scale for type 2 diabetes mellitus and its subscales according to the socio-demographic and disease characteristics of the patients.

Table 3. Distributions of Type 2 Diabetes Self-Efficacy Scale and its Subscale Scores Dimensions According to Sociodemographic and Disease Characteristics of Patients with Diabetes Mellitus Using Insulin

Characteristics	Diet+foot control	Medical treatment	Physical exercise	Total score
	Median	Median	Median	Median
Age				
18-39[a]	43.00	20.00	4.50	73.00
40-64[b]	37.00	16.00	6.00	61.00
65 and above[c]	30.50	13.00	3.00	45.50
KW	3.456	6.286	19.097	6.543
p	0.178	**0.043**	**<0.001**	**0.038**
		b>c	**b>c**	**b>c**
Gender				
Female	39.50	17.00	4.00	63.50
Male	31.00	16.00	4.00	50.50
MWU	1364.000	1620.500	1624.000	1496.500
p	0.131	0.923	0.936	0.374
Education status				
Illiterate[a]	36.50	14.00	3.50	56.00
Literate[b]	36.00	16.00	6.00	60.00
Primary school[c]	30.00	17.50	3.50	52.00
High School and above[d]	46.00	20.00	11.00	74.00
KW	2.238	9.348	**12.006**	4.638
p	0.692	0.053	**0.017**	0.326
			d>a	
Comorbid disease				
Yes	37.00	16.00	4.00	61.00
No	31.00	16.00	6.00	50.00

MWU	1483.500	1581.500	1584.500	1598.000
p	0.346	0.685	684	0.753
Regularly taking drug				
Yes	40.00	17.00	4.00	62.50
No	29.50	15.50	4.00	46.50
MWU	1438.500	1593.500	1728.500	1526.000
p	0.097	0.404	0.233	0.233
BMI				
Normal	41.00	16.00	4.00	55.00
Overweight	35.50	17.00	6.00	56.00
Class I obesity	35.50	17.00	3.00	61.00
Class II obesity	31.00	14.00	3.00	47.00
KW	0.681	4.086	5.591	1.836
p	0.878	0.252	0.133	0.607
Frequency of the patients to go to medical controls				
Never[a]	19.00	11.00	3.00	27.00
Once in a month[b]	45.00	17.00	6.00	66.00
more than once per month[c]	48.00	20.00	6.00	74.00
Quarterly[d]	42.00	18.00	4.00	64.00
Once a year[e]	29.00	13.00	4.00	44.00
KW	**16.681**	**16.093**	4.799	**16.094**
p	**0.002**	**0.003**	0.309	**0.003**
	e<b,d	**e<b,d**		**e<b,d**
Complication statu				
Yes	36.00	16.00	3.00	55.00
No	35.00	17.00	6.00	61.00
MWU	1640.500	1476.500	1434.000	1561.000
p	0.475	0.113	0.059	0.257
Exercise statu				
Yes	42.00	17.00	8.00	66.00
No	30.00	14.00	3.00	47.00
MWU	**1321.500**	**1252.000**	**570.500**	**1109.000**
p	**0.016**	**0.006**	**0.000**	**0.000**
Frequency of exercise				
Once a week[a]	29.00	15.00	4.00	49.00
2-3 times a week[b]	47.00	21.00	8.00	79.00
4-5 times a week[c]	40.00	18.00	5.00	61.00
Everyday[d]	40.00	17.00	8.00	64.00
KW	**8.181**	**8.639**	**19.050**	**11.653**
p	**0.042**	**0.034**	**<0.001**	**0.009**
	a<b	**a<b**	**a<b,d**	**a<b**
Diet adherence				
Yes[a]	47.00	20.00	8.00	74.00
No[b]	23.00	12.00	3.00	39.00
Sometimes[c]	31.00	16.00	5.00	52.00
KW	**84.714**	**55.953**	**27.181**	**80.403**
p	**<0.001**	**<0.001**	**<0.001**	**<0.001**
	b<a,c; c<a	**b<a,c; c<a**	**b<a,c; c<a**	**b<a,c; c<a**

BMI: Body Mass Index; **MWU:** Mann-Whitney U Test; **KW:** Kruskal Wallis Test

Table 4 shows the findings regarding the correlation between the characteristics of the patients and their diabetes attitude scale and self-efficacy scale for type 2 diabetes mellitus mean scores. A significant correlation was found between the age variable of the patients and the total mean score of the self-efficacy scale and the mean score of its subscales.

Table 4. The Relationship Between Age, Fasting Blood Glucose, and Duration of Insulin Use in Patients with Diabetes Mellitus Using Insulin, and Scores of the Diabetes Attitude Scale and Type 2 Diabetes Self-Efficacy Scale

Characterictic	Age	Fasting Blood glucose	Duration of Insulin Use
Need for special training	rho= 0.016 p= 0.862	rho= -0.101 p= 0.270	rho= 0.159 p= 0.083
Attitude towards patient compliance	rho= -0.086 p= 0.352	**rho= -0.246** **p= 0.007**	**rho= 0.191** **p= 0.037**
Seriousness of type 2 diabetes	rho= -0.179 p= 0.051	**rho= -0.193** **p= 0.035**	rho= 0.101 p= 0.271
Blood glucose control and complications	rho= -0.129 p= 0.160	**rho= -0.185** **p= 0.044**	rho= 0.165 p= 0.072

Impact of diabetes on the patient's life	rho= -0.093 p= 0.312	rho= -0.106 p= 0.248	**rho= 0.206** **p= 0.024**
Attitude towards patient autonomy	rho= -0.118 p= 0.198	**rho= -0.184** **p= 0.044**	rho= 0.178 p= 0.051
Attitude towards team care	rho= -0.107 p= 0.244	rho= -0.140 p= 0.128	rho= 0.143 p= 0.120
Diabetes attitude scale total score	rho= -0.123 p= 0.181	**rho= -0.189** **p= 0.039**	**rho= 0.190** **p= 0.370**
Diet+foot control	**rho= -0.216** **p= 0.018**	**rho= -0.260** **p= 0.004**	rho= 0.060 p= 0.516
Medical treatment	**rho= -0.268** **p= 0.003**	**rho= -0.309** **p= 0.001**	rho= 0.114 p= 0.216
Physical exercise	**rho= -0.317** **p= 0.000**	rho= -0.100 p= 0.277	rho= -0.152 p= 0.097
Self-efficacy for type 2 diabetes mellitus total score	**rho= -0.276** **p= 0.002**	**rho= -0.273** **p= 0.003**	rho= 0.053 p= 0.566

Table 5 shows the correlation between the patients' mean scores in self-efficacy scale for type 2 diabetes mellitus and its subscales and diabetes attitude scale and its subscales. A strong positive correlation was found between diabetes self-efficacy and diabetes attitude scale mean scores ($p<0.05$).

Table 5. The Relationship Between Diabetes Attitude Scale and Subscale of Patients with Diabetes Mellitus Using Insulin and Subscale of Type 2 Diabetes Self-Efficacy Scale

	Diet+foot control	**Medical treatment**	**Physical exercise**	**Total score**
Need for special training	rho= 0.444 p<0.001	rho= 0.467 p<0.001	rho= 0.215 p=.018	rho= 0.462 p<0.001
Attitude towards patient compliance	rho= 0.586 p<0.001	rho= 0.568 p<0.001	rho= 0.311 p=.001	rho= 0.597 p<0.001
Seriousness of type 2 diabetes	rho= 0.665 p<0.001	rho= 0.583 p<0.001	rho= 0.409 p<0.001	rho= 0.663 p<0.001
Blood glucose control and complications	rho= 0.722 p<0.001	rho= 0.684 p<0.001	rho= 0.397 p<0.001	rho= 0.726 p<0.001
Impact of diabetes on the patient's life	rho= 0.428 p<0.001	rho= 0.503 p<0.001	rho= 0.224 p<0.001	rho= 0.455 p<0.001
Attitude towards patient autonomy	rho= 0.603 p<0.001	rho= 0.598 p<0.001	rho= 0.358 p<0.001	rho= 0.629 p<0.001
Attitude towards team care	rho= 0.544 p<0.001	rho= 0.475 p<0.001	rho= 0.327 p<0.001	rho= 0.546 p<0.001
Diabetes attitude scale total score	rho= 0.673 p<0.001	rho= 0.667 p<0.001	rho= 0.375 p<0.001	rho= 0.691 p<0.001

DISCUSSION AND CONCLUSIONS

According to the participants' median score of the overall diabetes attitude scale and its subscales, it was revealed that the patients showed positive attitudes, except for the seriousness of type 2 diabetes subscale. The subscale with the strongest positive attitude was the impact of diabetes on the patient's life subscale (median: 4.30). A study in the literature yielded similar results (Akaltun and Ersin, 2016). This result indicates that the patients reflect the negative

experiences related to diabetes to their lives in the least way and they have a positive attitude towards living with diabetes. The lowest median score of the patients belonged to the seriousness of type 2 diabetes subscale (2.00). Numerous studies have reported the same result, which is compatible with the present study (Rashidi and Genç, 2020; Akaltun and Ersin, 2016). This shows that diabetic patients and their care team care less about type 2 diabetes and approach the treatment, care and educational needs of the disease less seriously.

A statistical difference was found between the gender variable of the patients and the blood glucose control and complications subscale and the attitude towards team care subscale of DAS and the median score of the female participants was higher than the score of their male counterparts. Studies in the literature support this result (Ustaalioğlu and Tan, 2017; Johnson and Whetstone, 2005). The result of the present study shows that women expect health care professionals to have a multidisciplinary approach to diabetes and are more sensitive to the control of metabolic components. A statistical difference was found between the frequency of the patients to go to medical controls and the median total score of DAS. Unlike the result of the present study, Özcan (1999), Ustaalioğlu and Tan (2017), Aslan and Korkmaz (2015) reported in their studies that there was no correlation between the frequency of medical controls and diabetes attitude. The result of this study may suggest that patients who go to medical controls more frequently pay attention to the control of metabolic components at regular intervals and their awareness of diabetes is higher. It was determined that the patients' DAS total score, attitude towards patient compliance, and the impact of diabetes on the patient's life subscales were positively correlated with the duration of insulin therapy. In a study, it was reported that individuals who did not take insulin cared less about the disease, and as the duration of insulin therapy increased, the diabetes attitude increased in a positive linear direction, and as the daily insulin dose increased, the diabetes attitude progressed in a negative linear direction (Şahin-Akgün, 2015). This result can suggest that the importance of insulin in the treatment of diabetes is better understood over time, and those who do not comprehend its importance sufficiently cannot achieve glycaemic control.

There was a statistical difference between the patients' exercise status and diabetes attitude. It was determined that patients who did exercise had higher attitudes than those who did not. This result is similar to the result of the study conducted by Özcan (1999). The values of blood glucose and metabolic components of diabetic individuals who did exercise were found to be better than those who did not (Özcan, 1999; Rashidi and Genç, 2020). As a result of this study, it can be asserted that individuals with good diabetes attitudes adopted the importance of exercise in diabetes control and include exercise in their lives. A statistical difference was found between the patients' medians of adherence to diet and diabetes attitude. It was determined that the median score was higher in those who adhered to their diet than those who sometimes adhered and never did and in those who sometimes adhered than those who never did. Similar studies in the literature have reported the same results, as well (Ustaalioğlu and Tan, 2017; Kartal et al., 2008). Based on these results, it can be thought that individuals with a good attitude towards the disease reflect this attitude on their health behaviours and habits. When the correlation between FBG, which is one of the most important values of metabolic components, and diabetes attitude was examined, it was observed in this study that those with high FBG values had a negative attitude according to the total median score of the diabetes attitude scale and median scores of the attitude towards patient compliance, seriousness of type 2 diabetes, blood glucose control and complications, and attitude towards patient autonomy subscales. In their studies, Rashidi and Genç (2020) and Kayabaşı and Korkut (2021) found no statistically significant difference. It was observed in the study by Özcan

(1999) that as FBG values of the patients increased, their scores in the subscales of impact of diabetes on the patient's life and attitude towards patient autonomy decreased. According to this result, it can be thought that those with a positive attitude achieved the metabolic control necessary to be successful in diabetes management. A statistical difference was found between the median age of the patients and their mean score of the self-efficacy scale for type 2 diabetes mellitus. This difference was associated with the fact that individuals in the age group of 40-64 years had higher level of self-efficacy than those in the 65 and over age group. The results of this study are similar to the results of the studies of Erol and Enç (2011), Mollaoğlu and Bağ (2009). The decrease in the level of self-efficacy seen in individuals suffering from chronic diseases at advanced age is associated with the emergence of biopsychosocial problems and burnout after a certain period of time (Mollaoğlu and Bağ, 2009). The result of this study can suggest that as patients get older, they fall short of performing their self-care, their learning skills get impaired, they encounter with health problems with the increase in the comorbid chronic diseases, and their level of self-efficacy lowers due to the increase in insufficient physical activity.

A statistical difference was found between the education level of the patients and the median score of physical exercise subscale of the self-efficacy scale for type 2 diabetes mellitus. Considering the total score of self-efficacy in the literature, there are similar results (Kılıç and Arslan, 2018; Gao et al., 2013). In their study, Tekin Yanık and Erol (2016) reported that as the level of education increased, the level of self-efficacy elevated. The result of this study can be associated with the increase in the level of education, the easy access to information about the disease by patients and the application of the obtained information. A statistical difference was found between the frequency of going to medical controls and their type 2 diabetes mellitus self-efficacy levels. There are studies in the literature reporting the same result (Tekin-Tanık and Erol, 2016; Aslan and Korkmaz, 2015). It was determined that those who have regular health check-ups were more successful in controlling metabolic components (Rhee et al., 2005). Based on this result, it can be suggested that patients adopt the importance of medical controls in the control of metabolic components and reflect their adaptation to the disease into their behaviours. It was determined that the self-efficacy levels of the patients who did exercise were statistically higher. Exercise is as important as medical and nutrition therapy for an effective diabetes control. In the study by Gleeson-Kreig (2006), it was concluded that physical activity performed regularly every day provided glycaemic control and prevented the development of diabetes-related complications. In addition, it was determined that the self-efficacy level was higher in the experimental group that did exercise than the control group that did not exercise. Accordingly, it can be concluded that patients regard exercise as a part of healthy life and are aware of the negative effects of physical inactivity on diabetes. A statistical difference was found between the frequency of exercise and type 2 diabetes mellitus self-efficacy levels. A randomised controlled trial reported that there was no difference in the frequency of exercise in patients with diabetes, but their frequency of exercise increased with training and telephone follow-up-SMS support (Gabish and Mohammed, 2018). According to the results of this study, it can be suggested that individuals effectively apply the recommendations they receive from the health care team and their compliance with the exercise program is good. A statistical difference was found between the dietary compliance status of the patients and their level of self-efficacy, and this difference is due to the fact that the self-efficacy levels were lower in those who never complied than those who sometimes did and in those sometimes did than those who always did. Numerous studies in the literature support this result (Erol and Enç, 2011; Van der Bijl et al., 1999; Aslan and Korkmaz, 2015). As a result of this study, it can be concluded that patients attach

enough importance to nutrition and accordingly act in their daily routines in order to achieve metabolic control and cope with the disease effectively.

In the study, a statistical correlation was found between FPG value and type 2 diabetes mellitus self-efficacy level. It was determined that individuals with low FPS values had higher self-efficacy scores. In the study by Erol and Enç (2011), it was found that diabetic patients with high fasting blood glucose had low self-efficacy levels for diabetes self-care. This result suggested that patients were successful in achieving metabolic control and maintaining health-related behaviours that also affect their self-efficacy level.

It was determined that there was a strong positive correlation between the diabetes attitudes of the patients and their self-efficacy level of type 2 diabetes mellitus. In the study by Erol and Enç (2011), it was determined that with the increasing positive attitude towards diabetes and care, the fear and anxiety of hypoglycaemia decreased, and the level of self-efficacy elevated. In another study, it was found that as the self-efficacy levels of diabetic patients towards self-care elevated, negative attitudes towards diabetes decreased and their positive attitudes increased (Aslan and Korkmaz, 2015). According to this study, it can be concluded that patients with a positive attitude towards diabetes also have high levels of self-efficacy. In a study, positive developments were recorded in the foot care behaviour of patients after taking their self-efficacy level into account while preparing educational programs (Gabish and Mohammed, 2018). As a result of this study, the patients' successful diet and foot control can be associated with the diabetes care team's expertise in diabetes and their individual responsibility in diabetes management. In a study examining the beliefs and self-efficacy of diabetic patients, it was determined that as patients' beliefs and attitudes towards health increased, their self-efficacy levels also elevated (Aydoğar and Yıldırım, 2021). The patients in this study associated their ability to maintain their diet and foot care behaviours with their positive attitudes towards assuming self-care roles and the management of metabolic components. Shabibi et al. (2017) stated that patients with type 2 diabetes mellitus had negative health beliefs and that the treatment success of those who had this attitude was low. In addition, Tekin-Yanık and Erol (2016) examined the self-efficacy levels of individuals with type 2 diabetes mellitus in their study and reported that the participants perceived diabetes as only slightly above normal blood glucose levels, and they could not achieve success in care and treatment unless they changed this belief and attitude. Based on results of this study, it can be thought that the positive attitude of the patients towards the importance of metabolic control and the development of complications in diabetes is associated with the effective medical treatment.

It was found that the attitudes of diabetic patients taking insulin towards diabetes affected their level of self-efficacy. In line with this information, it is recommended that healthcare professionals provide guidance services in order to support the positive attitudes of patients, to develop care standards for determining and improving their negative attitudes, to plan diabetes training and to repeat the planned trainings at regular intervals, to provide effective disease management in diabetics with high BMI and to reach ideal BMI values.

Limitations

The study has some limitations. The most important limitation is that it was conducted during the COVID-19 pandemic and therefore the number of outpatient clinics varied. As the renewal of reports by patients with diabetes for insulin therapy was delayed by the Ministry of Health during the pandemic, the number of patients admitted to the hospital was affected. In addition, patients refused to participate in the survey because they were afraid of being infected with COVID-19.

AUTHOR CONTRIBUTION STATEMENT

All authors have contributed equally.

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CONFLICT OF INTEREST STATEMENT

There is no conflict of interest with any institution or person within the scope of the study.

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