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THE KNOWLEDGE OF RISK FACTORS FOR CARDIOVASCULAR DISEASES AND SELF-CARE ACTIVITIES IN INDIVIDUALS WITH TYPE 2 DIABETES

TIP 2 DIYABETLI BIREYLERDE KARDIYOVASKÜLER HASTALIKLAR RISK FAKTÖRLERI BILGI DÜZEYI VE ÖZBAKIM AKTIVITELERI

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ABSTRACT

Objective: This study aimed to determine the cardiovascular disease risk factors knowledge level and self-care activities in individuals with type 2 diabetes.

Methods: This descriptive study was conducted between December 2020 and June 2021, using a total of 375 individuals with type 2 diabetes who referred to the Diabetes Polyclinic of a training and research hospital in Istanbul, Turkey and met the study inclusion criteria. Data were collected using a diabetes individual information form, the Cardiovascular Disease Risk Factors Knowledge Level (CARRF-KL) Scale, and the Diabetes Self-Care Activities Questionnaire (DSCA) and analyzed using IBM SPSS Statistics 27.0 program.

Results: The mean age of the patients was 57.35 ±12.31 years, and 50.9% of them were women. Their mean score was 14.45 ±6.67 for the CARRF-KL, whereby they had moderate level of knowledge about cardiovascular disease risk factors. In addition, their mean scores were 2.86 ±1.47, 0.35 ±1.17, 2.83 ±2.83 and 3.58 ±3.15 for the DSCA subscales of diet, exercise, blood glucose test and foot care, respectively. Among self-care behaviors, the patients paid most attention to foot care and least attention to exercise. As their knowledge of risk factors for cardiovascular diseases increased, their self-care activities increased significantly ($p<0.05$).

Conclusion: The cardiovascular disease risk factors knowledge level of individuals with type 2 diabetes was moderate, and as their knowledge of cardiovascular disease risk factors increased, their self-care activities increased significantly. Therefore, it is recommended to evaluate cardiovascular disease risk factors and self-care activities in individuals with type 2 diabetes at an early stage and to make plans to increase their knowledge levels and self-care activities.

Keywords: Cardiovascular Diseases, Knowledge, Risk Factors, Self-Care, Type 2 Diabetes.

ÖZET

Amaç: Araştırma, tip 2 diyabetli bireylerin kardiyovasküler hastalıklar risk faktörleri bilgi düzeyi ve özbakım aktivitelerini belirlemek amacıyla yapılmıştır.

Gereç ve Yöntem: Tanımlayıcı olarak gerçekleştirilen çalışma, İstanbul ilinde bulunan bir Eğitim ve Araştırma Hastanesinin Diyabet Polikliniğine başvuran ve araştırma kriterlerini sağlayan 375 tip 2 diyabetli birey ile Aralık 2020-Haziran 2021 tarihleri arasında gerçekleştirildi. Veriler 'Diyabetli Birey Tanıtım Formu', 'Kardiyovasküler Hastalıklar Risk Faktörleri Bilgi Düzeyi (KARRİF-BD) Ölçeği', 'Diyabet Özbakım Aktiviteleri Anketi-DÖBA' kullanılarak toplandı. Verilerin analizi IBM SPSS Statistics 27.0 programı kulanılarak gerçekleştirildi.

Bulgular: Çalışmaya katılan bireylerin yaş ortalaması 57.35 ±12.31 yıl olup %50,9'u kadındı. Tip 2 diyabetli bireylerin KARRİF-BD ölçek puanı ortalaması 14.45 ±6.67, DÖBA diyet alt boyut puanı 2.86±1.47, egzersiz alt boyut puanı 0.35 ±1.17, kan şekeri testi alt boyut puanı 2.83 ±2.83 ve ayak bakımı alt boyut puanı 3.58 ±3.15 olarak belirlendi. Katılımcıların en çok dikkat ettiği özbakım davranışı ayak bakımı, en az dikkat ettiği özbakım davranışı ise egzersiz olarak bulundu. Kardiyovasküler hastalıklar risk faktörleri bilgi düzeyi arttıkça özbakım davranışlarının da anlamlı olarak arttığı belirlendi ($p<0,05$).

Sonuç: Tip 2 diyabetli bireylerin kardiyovasküler hastalıklar risk faktörleri bilgi düzeyi orta düzeyde olup, kardiyovasküler hastalıklar risk faktörleri bilgi düzeyi arttıkça özbakım davranışlarının da anlamlı olarak arttığı belirlendi. Bu bağlamda, kardiyovasküler hastalıklar risk faktörleri ve özbakım davranışlarının erken dönemde değerlendirilerek bilgi düzeyleri ve özbakım davranışlarının arttırılmasına yönelik planlamaların yapılması önerilmektedir.

Anahtar kelimeler: Bilgi, Kardiyovasküler Hastalıklar, Özbakım, Risk Faktörleri, Tip 2 Diyabet.

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INTRODUCTION

Diabetes Mellitus (DM) is a chronic disease characterized by decreased insulin action due to defects in the beta cells of the pancreas and associated hyperglycemia, causing a global health problem, the frequency of DM increases rapidly (TEMD, 2020). According to the International Diabetes Federation (IDF) 2021 data, there are 537 million diabetics aged between 20 and 79 years across the world and this figure is estimated to be 784 million in 2045 (IDF, 2021). In parallel with these data, the number of individuals with diabetes increased from 7.8% to 13.7% in the last 12 years in Turkey (Satman, 2002; Satman, 2013).

Individuals with type 2 diabetes (T2DM) have a 2-4 times higher risk of cardiovascular diseases (CVD) than individuals without diabetes (TEMD, 2020). As insulin decreases in the organism, a damage occurs in the vascular wall, causing CVD (IDF, 2018). Therefore, determining the risk factors of CVD and providing diabetes management to individuals with diabetes will prevent the development of CVD (IDF, 2018). Studies of individuals with diabetes have determined that the risk for CVD decreases as the knowledge of CVD risk factors increases in individuals with diabetes (Doğan, Pakyüz & Boyraz, 2015:65; Erbulan & Pakyüz, 2018; Yılmaz, Kumsar & Çelik, 2018; Karaman, Kalkım & Yürekli, 2021).

Individuals with T2DM are exposed to modifiable risk factors such as hypertension, dyslipidemia, obesity, diabetes, sedentary life, tobacco use, alcohol consumption, unhealthy diet, and non-modifiable factors such as age, gender, family history and ethnicity (IDF, 2018). Both morbidity and mortality due to CVD can be reduced by 80-90% by controlling modifiable risk factors (Khot., et al., 2003: 898). Studies have determined a significant relationship between the CVD risk factors knowledge level and positive behavioral changes such as weight management, healthy nutrition, physical activity, and stress management (Alm-Roijer, et al., 2004; Kayanil, et al., 2009). Therefore, determining the level of knowledge about cardiovascular disease risk factors, especially in risky groups like individuals with T2DM, and encouraging them to develop self-care activities prevent the development of cardiovascular diseases (Kumsar & Yılmaz, 2017).

In addition to disease and risk information, medical nutrition therapy, exercise, self-monitoring, drug therapy, self-care behaviors should be developed, and appropriate behavioral changes should be provided for diabetes management to prevent cardiovascular complications in individuals with diabetes (Bartels, Davidson & Gong, 2007). In this context, it is important to determine and develop self-care behaviors in diabetic individuals from the moment they are diagnosed of diabetes (Kumsar & Yılmaz, 2017). Studies have determined that individuals with diabetes who have more self-care activities are more successful in diabetes management (Saleh, et al., 2012; Takele, et al., 2019). To maintain self-care activities in individuals with diabetes, diabetes nurses play a key role in diabetes management, as they evaluate both individuals with diabetes and their family by adapting a comprehensive approach (Kumsar & Yılmaz, 2017).

This study aimed to determine the CVD risk factors knowledge level and self-care activities in individuals with type 2 diabetes.

MATERIALS AND METHODS

Research Design and Sample

This descriptive study was conducted between January and December 2021. The sample of the study consisted of a total of 375 individuals who referred to the Diabetes Polyclinic of a training and research hospital, were 18 years of age and older, agreed to participate in the study, could read, write, and speak Turkish, had no communication problems, and had a diagnosis of T2DM for at least six months. The sample size was determined as a minimum of 370 using the formula 'n= N t2 p q / d2 (N-1) + t2pq'. A total of 375 individuals with diabetes agreed to participate in the study.

Data Collection and Instruments

The data were collected using a diabetes individual information form, the Cardiovascular Disease Risk Factors Knowledge Level (CARRF-KL) Scale, and the Diabetes Self-Care Activities Questionnaire (DSCA).

Diabetes Individual Information Form: The form was developed by the researcher and consisted of three parts, including sociodemographic characteristics, disease characteristics, and anthropometric and metabolic values such as fasting blood glucose-FBG (mg/dl), postprandial blood glucose-PBG (mg/dl),

blood pressure-BP (mmHg), HbA1c (%), triglyceride, LDL cholesterol, HDL cholesterol, total cholesterol measurement, and Body Mass Index-BMI.

Cardiovascular Disease Risk Factors Knowledge Level (CARRF-KL) Scale: The scale was developed by Arıkan et al. (2009). It consists of 28 items, including four items about CVD characteristics, preventability, and age factors, 15 items about CVD risk factors and nine items about the result of change in risk behaviors. The highest scale score is 28, scoring "1" for correct answers and "0" for both "wrong" and "I don't know" answers. Arıkan et al. (2009) determined the Cronbach's alpha value of the scale as 0.768. The present study used the reliability coefficient of Kuder-Richardson 20 (KR-20) to determine the reliability of the scale, and found it as 0.90

Diabetes Self-Care Activities Questionnaire (DSCA): The scale was developed by Toobert and Glasgow (1994) and revised by Toobert et al. (2000) by adding items about smoking and foot care. The Turkish validity-reliability study of this questionnaire was conducted by Coşansu and Erdoğan (2009). The DSCA consists of 11 items to examine one's diabetes self-care activities (diet, blood sugar test, exercise, foot care and smoking) between 0-7 days. A higher scale score indicates that the individual performs more self-care activities. The Cronbach's alpha reliability coefficients for the DSCA subscales of diet, exercise, blood sugar test and foot care were determined as 0.90, 0.94, 0.92 and 0.88, respectively.

Data Collection Process

The data were collected by the researcher through face-to-face interviews with individuals who had T2DM and met the inclusion criteria. Laboratory values in the questionnaire form were obtained from the patient's laboratory findings in the last three months and recorded. The height and weight of the patients were measured by the researcher using tape measure and scale. The data collection lasted about 20-25 minutes.

Ethical Considerations

For conducting the study, an ethical approval (Decision no: 20/267) was obtained from the Hamidiye Non-Interventional Research Ethics Committee and written permission from the hospital where the study was conducted. In addition, necessary explanations about the study (by informing that participant names would be kept confidential, the data would be used only for scientific purposes, participants could leave the study at any time) were made to the patients, and a verbal and written informed consent was received from all participants.

Data Analysis

The data were analyzed and reported using the IBM SPSS Statistics 27.0 program at the significance level of $p<0.05$. The distribution of the data was analyzed by the Shapiro Wilk test. Comparisons of non-normally distributed variables between two groups were performed by the Mann Whitney U test, and comparisons between three or more groups by the Kruskal-Wallis test. Post-hoc pairwise comparisons of the significant variables were made by the Dunn test. The Spearman correlation coefficient was used to examine the relationship between numerical variables. To determine the reliability of the scales, the Kuder-Richardson 20 (KR-20) reliability coefficient was used for the CARRF-KL and the Cronbach's alpha reliability coefficient for the DSCA.

RESULTS

The mean age of the patients was 57.35 ±12.31 years. Of them, 50.9% were female, 77.6% were married, 49.6% were primary school graduates, 39.5% were housewives and 77.6% had a moderate income. In addition, 62 of the patients (16.6%) were used to smoke, 3 (0.8%) used alcohol, 21 (5.6%) exercised regularly, 90 (24%) had healthy eating habits, and 274 (73.1%) had a family history of diabetes. There was a total of 163 (43.5%) patients with heart disease in the family; and 255 (68%) patients had a chronic disease accompanying diabetes, and 117 (31.2%) patients had chronic complications due to diabetes (Table 1).

Table 1. Distribution of Participants' Sociodemographic and Disease-Related Characteristics (N=375)

Descriptive characteristics		N (%)
Age	57.35 ±12.31(25-76)	
Gender	Female	191 (50.9)
	Male	184 (49.1)
Marital status	Married	291 (77.6)
	Single	84 (22.4)
Education	Primary school	186 (49.6)
	Middle school	101 (26.9)
	High school	60 (16)
	University	28 (7.5)
Occupation	Housewives	148 (39.5)
	laborer	49 (13.1)
	Civil servant	19 (5)
	Retired	104 (27.7)
	Self-employment	55 (14.7)
Economic status	High	38 (10.1)
	Middle	291 (77.6)
	Low	46 (12.3)
Smoker	Yes	62 (16.6)
	No	269 (71.7)
	Stop using	44 (11.7)
Alcohol use	Yes	3 (0.8)
	No	363 (96.8)
	Stop using	9 (2.4)
Exercise	Yes	21 (5.6)
	No	287 (76.5)
	Irregular	67 (17.9)
Healthy eating	Yes	90 (24)
	No	285 (76)
Duration of diabetes	4.26 ± 4.37 (6 ay-20 yıl)	
History of family DM	Yes	274 (73.1)
	No	101 (26.9)
History of family heart disease	Yes	163 (43.5)
	No	212 (56.5)
Other chronic disease	Yes	255 (68)
	No	120 (32)
Diabetes Complications	Yes	117 (31.2)
	No	258 (68.8)

*Data are given as mean±standard deviation(min-max).

In the patients, FBS, PBS, and triglyceride levels were close to the upper limit, and BMI values were quite high (Table 2).

Tablo 2. Distribution of Participants' Anthropometric And Metabolic Parameters (N=375)

Parameters	Mean±SD
FBG (mg/dl)	148.38 ± 51.13
PBS (mg/dl)	185.78 ± 62.85
HbA_1c (%)	7.75 ± 1.82
$_sBP$ (mmHg)	132.71 ± 18.62
$_dBP$ (mmHg)	78.91 ± 11.21
Triglyceride (mg/dl)	161.87 ± 88.09
HDL (mg/dl)	40.06 ± 15.17
LDL (mg/dl)	109.15 ± 49.01
Total cholesterol (mg/dl)	168.19 ± 50.27
BMI (kg/m^2)	30.85 ± 4.99

*Data are expressed as mean±standart deviation, FPG: Fasting plasma glucose, HbA_1c: Estimate average glucose, BMI: Body mass index, LDL:Low density lipoprotein, HDL: High density lipoprotein, $_sBP$: systolic blood pressure, $_dBP$: diastolic blood pressure.

Table 3 presents the distribution of the patients' CARRF-KL and DSCA total and subscales mean scores. Accordingly, their CARRF-KL mean score was 14.45 ±6.67, whereby they had moderate level of knowledge about cardiovascular disease risk factors. In addition, their mean scores were 2.86 ±1.47, 0.35 ±1.17, 2.83 ±2.83 and 3.58 ±3.15 for the DSCA subscales of diet, exercise, blood glucose test and foot care, respectively. Among self-care behaviors, the patients paid most attention to foot care and least attention to exercise.

Table 3. CARRF-KL and DSCA Mean Score

Scales		**Mean±SD (min-max)**
CARRF-KL		14.45 ± 6.67 (0-28)
DSCA	Diet	2.86 ± 1.47 (0-7)
	Exercise	0.35 ± 1.17 (0-7)
	Blood sugar test	2.83 ± 2.83 (0-7)
	Foot care	3.58 ± 3.15 (0-7)

*Data are given as mean±standard deviation (min-max).

Table 4 shows the correlation of the patients' CARRF-KL and DSCA mean scores. There was a statistically significantly positive correlation between their CARRF-KL total and DSCA subscales mean scores ($p<0.05$). As their CARRF-KL total score increased, their DSCA diet, exercise, blood sugar test and foot care subscales mean scores also increased significantly.

Table 4. Correlation of CARRF-KL ve DSCA Mean Scores

DSCA	**CARRF-KL**	
Variable	**r**	**p-value**
Diet	0.273	**<0.001***
Exercise	0.255	**<0.001***
Blood sugar test	0.247	**<0.001***
Foot care	0.236	**<0.001***

*The p-values of the Spearman Correlation coefficient.

DISCUSSION

The results of the study, which was conducted to determine the CVD risk factors knowledge level and self-care activities in individuals with type 2 diabetes, were discussed in the light of the literature.

In the present study, the patients' CARRF-KL mean score was 14.45 ±6.67. This mean score was determined as 19.35 ±2.99 by Yilmaz et al. (2018), 19.69 ±5.05 by Erbulan and Pakyüz (2018), 20.69 ±3.86 by Özel et al. (2021), and 17.64 ±5.83 by Karaman et al. (2021). The result of the present study is low compared to those in other studies. This may be because they were conducted by using different sample groups. Therefore, it is important to create awareness of diabetes in diverse groups by determining the reasons that affect their cardiovascular disease risk factors knowledge levels.

Self-care in diabetes is particularly important for controlling blood glucose values. Self-care activities that the individual performs voluntarily to maintain their well-being and increase their quality of life, and which can also be supported by training, form the basis of diabetes management. Nutrition, exercise, blood sugar monitoring and foot care play a significant role in diabetes self-care. In the present study, the patients' diet, exercise, blood sugar test and foot care subscales mean scores were 2.86 ±1.47, 0.35 ±1.17, 2.83 ±2.83, 3.58 ±3.15, respectively. Ekici et al. (2020) found the diabetic patients' diet, exercise, and blood glucose test and foot care subscale mean scores as 3.8 ±1.43, 2.15 ±2.01, 3.37 ±2.84 and 6.03 ± 2.02, respectively. Similarly, the patients obtained the highest and lowest mean scores for foot care and exercise, respectively.

In the present study, as the patients' CARRF-KL total mean score increased, their mean scores on the DSCA subscales of diet, exercise, and blood glucose test and foot care also increased significantly. Like our study, Khan et al. (2000) conducted a study with a total of 342 people with DM and determined that their knowledge about the disease and self-care activities were low. Kassahun et al. (2016) conducted a study with a total of 325 people with DM and found that a low level of knowledge about the disease negatively affected self-care activities. Yilmaz et al. (2018) conducted a study on individuals (N=145) with T2DM and determined that as their CARRF-KL scores increased, their healthy

lifestyle behaviors that affected their self-care activities such as nutrition and exercises also increased. Çürük et al. (2018) found equivalent results to those in the study of Yilmaz et al. (2018). Karaman et al. (2021) conducted a study with T2DM patients (N=175) and found that individuals with diabetes who received training for self-care activities had higher CARRF-KL mean score. In addition, studies conducted to determine the CVD risk factors knowledge level and self-care activities in patients with chronic diseases other than those with diabetes show that self-care activities increase as the CVD risk factors knowledge level increases. Therefore, planning to increase the CVD risk factors knowledge level and develop self-care activities by evaluating diabetic patients with a comprehensive approach is important in diabetes management.

Limitations

The results of the study cannot be generalized to the general population of individuals with T2DM as the study was conducted in only one single center in Istanbul, Turkey.

CONCLUSION

The CVD risk factors knowledge level was moderate in individuals with type 2 diabetes. They paid most and least attention to foot care and exercise, respectively. As their CVD risk factors knowledge level increased, their self-care activities increased significantly. Therefore, it is recommended to evaluate CVD risk factors and self-care activities in individuals with type 2 diabetes at an early stage and to make plans to increase their knowledge levels and self-care activities.

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Conflict of Interest

The authors report no actual or potential conflicts of interest.

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