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Original article

EFFECT OF PHYSICAL ACTIVITY ON THE LEVEL OF DIABETES AWARENESS AND ACCEPTANCE OF DIABETES PATIENTS

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Abstract

Aim: In this study, the effect of physical activity on diabetes and awareness level of diabetic patients was investigated.

Methods: This study was planned as descriptive relational. The study was carried out in diabetes patients residing in Selçuklu district of Konya province. A total of 81 diabetic patients who agreed to participate in the study constituted the sample of the study. The questionnaires were delivered to the participants via social media; After the sample quorum was reached, the data collection process was terminated. In data collection; Personal information form prepared by the researchers and questioning socio-demographic characteristics, International Physical Activity Questionnaire and Diabetes Awareness and Acceptance Scale were used. The results were evaluated at 95% confidence interval and $p<0.05$ significance level.

Results: The mean age of the individuals was 32.76±9.58, 63.0% were women, 60.5% were married, 76.5% were university or higher, 67.9% did not work in any job, 54% It was found that 0.3% of them evaluated their income status as medium and 51.9% of them perceived their health as good. The physical activity total score of the individuals was found to be 1222.70±617.37, and 16.1% were found to be inactive and 83.9% active. Individuals' mean total score of awareness and acceptance scale in diabetes patients is 70.65±10.80, mean score of awareness and acceptance scale awareness sub-dimension in diabetes patients is 41.70±8.55, and mean score of awareness and acceptance scale acceptance sub-dimension in diabetes patients is 28, It was found to be 95±5.95. A strong positive relationship was found between the acceptance and awareness of diabetes and the level of physical activity.

Conclusions: It can be said that as the average score of the acceptance and awareness level of diabetes increases, the level of physical activity also increases.

Key words. Adults, physical activity level, diabetes.

Introductıon

Type 2 diabetes is an important health problem with an increasing prevalence all over the world (IDF, 2019; Cowie et al. 2021). According to the report of the International Diabetes Federation (IDF), there are 537 million diabetes patients between the ages of 20-79 in the world, and 9 million (14.5%) in Turkey (IDF, 2021). The increase in the incidence of this disease is associated with an increase in morbidity and mortality. Therefore, the aim of diabetes treatment is to reduce mortality and prevent complications (Gong et al., 2019; American Diabetes Association (ADA), 2023). In the relevant literature, it is reported that the awareness of individuals with type 2 diabetes, their acceptance of the disease and having sufficient knowledge/skills are important in diabetes management (Schmitt et al., 2014; Ngan et al. 2021). Acceptance of a chronic disease such as diabetes is of great importance in the correct management of this disease. This acceptance will lead to changes in the individual's lifestyle and diabetes self-care and will facilitate the continuation of treatment and care for diabetes patients (Besen and Esen 2011; Ngan et al. 2021). Accepting the disease as a part of one's life and integrating the psychosocial effect of the disease with its emotional burden is expressed as "diabetes acceptance" (Najafi Ghezeljeh et al., 2022). Acceptance of diabetes is a psychological adjustment to the potential limitations that typically accompany a chronic condition and ultimately leads to integrating a chronic condition into one's lifestyle. However, non-acceptance of the disease may cause non-adherence to the disease and delay the treatment process (Schmitt et al., 2014; Najafi Ghezeljeh et al., 2022). In a study, it is reported that low diabetes acceptance is associated with poor self-care and glycemic control (Schmitt et al., 2014). Awareness and acceptance of diabetes can be affected by many factors. When the literature is examined, in addition to individual characteristics (age, gender, educational status…) (Al Bshabshe et al., 2020; Belsti et al., 2019; Şahin and Cingil 2020), it is also important for the individual to make physical activity a lifestyle in the awareness and acceptance of diabetes. . It is stated that regular physical activity, which is important in the management of type 2 diabetes, provides blood sugar control, reduces cardiovascular risk factors, and regulates body weight by reducing body fat percentage and increasing lean mass (Amanat et al., 2020; Batrakoulis et al., 2022). In addition, regular physical activity has been reported to improve β-cell function, insulin sensitivity, vascular function, and gut microbiota, all of which reduce disease risk as well as better diabetes and health management (Batrakoulis et al., 2022; Kanaley et al., 2022).). Sampath Kumar et al. (2019)

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emphasizes that a structured exercise intervention program is effective on insulin resistance in type 2 diabetes in a systematic and meta-analysis study. In this study, it is thought that examining the relationship between physical activity and diabetes awareness and acceptance level will contribute to intervention studies on the subject.

For these reasons, in this study, to determine the level of physical activity, diabetes awareness and acceptance of individuals with type 2 diabetes; The aim of this study was to examine the effect of physical activity on the level of awareness and acceptance of diabetes.

Research Questions

1. What are the sociodemographic characteristics of individuals with type 2 diabetes?
2. Does the level of awareness and acceptance of diabetes change according to the socio-demographic characteristics of individuals with type 2 diabetes?
3. Is there a relationship between the level of awareness and acceptance of diabetes and physical activity level of individuals with type 2 diabetes?

Methods

Type of Research

This study was planned as descriptive relational.

Location and Features of the Research

The study will be carried out in diabetes patients residing in Selçuklu district of Konya province.

Study Group of the Research

The sample size in the study was calculated in the G*Power 3.1.9.2 analysis program. With an effect size of 0.4315503, 95% power, 5% margin of error, Atik et al. (2022), the total diabetes disease awareness and acceptance scale was calculated as at least 72 in the study. A total of 81 diabetic patients who agreed to participate in the study constituted the sample of the study.

The inclusion criteria of the study were between the ages of 18-65, diagnosed with type 2 diabetes for at least six months;

Exclusion criteria are individuals with a psychiatric diagnosis.

Data Collection Technique and Tools

The data of the research were collected through Google Forms. Before delivering the questionnaires to the individuals, the forms were tested in terms of usability and technical functionality. The questionnaires were delivered to the participants via social media and the data collection process was terminated after the sample quorum was reached. In data collection; Personal information form prepared by the researchers and questioning socio-demographic characteristics, International Physical Activity Questionnaire and Diabetes Awareness and Acceptance Scale were used.

International Physical Survey (UFAA)

In this study, the short form of the International Physical Activity Questionnaire (IPAQ) will be used to determine the physical activity levels of individuals. International validity and reliability studies Craig et al. (2003) validity and reliability studies in Turkey were conducted by Sağlam (2010) on university students. There are 7 questions in total in the survey. 1st and 2nd questions are about vigorous activities, 3rd and 4th questions are about moderately vigorous activities, 5th and 6th questions are about walking and 7th questions about the time spent by the individual sitting. In the evaluation of all activities, the criterion is that each activity is done for at least 10 minutes at a time. A score is obtained as "MET-minutes/week" by multiplying the minute, day and MET value (multiples of resting oxygen consumption).

In calculating the energy consumption for physical activities, the weekly duration (minutes) of each activity is multiplied by the MET energy values created for the International Physical Activity Questionnaire. Walking time (minutes) was multiplied by 3.3 METs to calculate the walking score. In the calculation, 4 METs for moderate-intensity activity and 8 METs for vigorous activity were taken. Thus, the energy consumption of each individual for vigorous, moderate, walking, sitting and total physical activities was obtained in MET-min/Week unit. According to the total physical activity score, the physical activity levels of the participants were "inactive (under 600 MET-min/week), moderate (minimally active) (between 600-3000 MET-min/week) and very active (3000 MET-min/week and above)" (Craig et al., 2003, Sağlam et al. 2010).

Awareness and Acceptance Scale in Diabetes Patients

Scale Atik et al. (2022) was developed by. The scale consists of 23 items in total and is graded as a 5-point Likert scale. The first 14 items include the awareness sub-dimension and the remaining 9 items include questions about the acceptance sub-dimension. Total score of the scale; Between 23-115, awareness sub-dimension; between 14-70, the acceptance sub-dimension; It is a scale scored between 9-45. An increase in the scores obtained from the whole scale and/or the sub-dimensions means an increase in the level of awareness and acceptance. (1=never, 2=sometimes, 3=undecided, 4=often, 5=always). The Cronbach's alpha coefficient of the scale was calculated between 0.967 and Spearman-Brown coefficient between 0.893 and 0.899.

Evaluation of Data

The data of the study were evaluated using the statistical package program SPSS for Windows 22.0 (Statistical Package for Social Science). Number of units (n), percentage (%), mean±standard deviation (mean (SD)) values were

used as summary statistics. The normal distribution of the data was evaluated with the Kolmogorov–Smirnov test and the Q-Q plot. Two independent samples t-test and one-way anova and pearson correlation analysis were used in the analysis of the data. The results were evaluated at 95% confidence interval and p<0.05 significance level.

Ethical Dimension

Ethical permission was obtained from the Ethics Committee of the Faculty of Sport Sciences (Decision no: 32) for the ethical permission of the research. Before starting the research, the informed consent form of the individuals was added to the beginning of the online questionnaire and their consent was obtained.

Results

The mean age of the individuals was 42.76±9.58, 63.0% were women, 60.5% were married, 76.5% were university or higher, 67.9% did not work in any job, 54% It was found that 0.3% of them evaluated their income status as medium and 51.9% of them perceived their health as good.

The mean total physical activity score of the individuals was 1222.70±617.37, and 16.1% were found to be inactive and 83.9% minimally active. Individuals' mean total score of awareness and acceptance scale in diabetes patients is 70.65±10.80, mean score of awareness and acceptance scale awareness sub-dimension in diabetes patients is 41.70±8.55, and mean score of awareness and acceptance scale acceptance sub-dimension in diabetes patients is 28, It was found to be 95±5.95 (Table 1).

Table 1. Distribution of Individuals' Physical Activity Level and Awareness and Acceptance Scale Mean Scores in Diabetes Patients

Scales	**Number (n)**	**Percent (%)**
Physical Activity Questionnaire		
Physically inactive (Inactive) (<600 MET-min/week)	13	16,1
Moderate physical activity level (600-3000 MET-min/week) (minimal active)	68	83,9
	Ort±SS	**Min-Max**
Physical Activity Total Score	1222,70±617,37	302-1900
Awareness and Acceptance Scale for Diabetes Patients Total Score	70,65±10,80	42-91
Awareness Sub-Dimension	41,70±8,55	21-57
Acceptance Sub-Dimension	28,95±5,95	19-43

When the sociodemographic characteristics of the individuals and the total mean scores of the diabetes disease acceptance and awareness scale were examined, it was seen that the total mean score of the diabetes acceptance and awareness scale of the men was higher than that of the women, and the difference was found to be statistically significant (p<0.05). A significant difference was found between the educational status and the total mean score of the diabetes disease acceptance and awareness scale, and it was determined that the difference was due to university graduates (p<0.05). A significant difference was found between the perceived income status and the diabetes disease acceptance and awareness scale total score averages, and it was determined that the difference was due to those who evaluated their income as good (p<0.05). It was determined that the diabetes disease acceptance and awareness scale total score averages of those who perceived their health as good were higher than those who perceived their health as moderate, and the difference was statistically significant (p<0.05). Diabetes acceptance and awareness scale total score averages of individuals in the minimally active group in terms of physical activity were higher than those of physically inactive individuals, and the difference was statistically significant (p<0.05). It was found that there was no statistically significant difference between employment status and the total mean of diabetes acceptance and awareness scale (p>0.05). (Table 2).

Table 2. Distribution of Diabetes Disease Acceptance and Awareness Level Total Scores According to Sociodemographic Characteristics of Individuals

Variables	**Diabetes Disease Acceptance and Awareness Score Average**	**Test value p**
Gender		
Woman	67,39±11,40	t:0,127
Male	74,80±9,50	p:0,01*
Marital status		

Married	74,12±12,65	t:0,375
Single	67,00±9,53	p:0,03*
Educational Status		
Primary education	69,50±9,51	
High school	70,29±11,27	F:1,075
University and above	**75,85±7,90**	p:0,01*
Working Status		
Working	71,25±11,07	t:2,224
Not working	69,38±10,30	p:0,40
Perceived Income		
Good	**75,80±10,91**	F:3,047
Middle	68,29±10,76	P:0,01*
Bad	65,33±11,57	
Perceived Health Status		
Good	74,91±11,28	t:0,226
Middle	66,24±10,27	p:0,02*
Physical Activity Level		
Physically inactive (Inactive) (<600 MET-min/week)	66,61±8,91	t:1,085 p:0,001*
Low physical activity level (600-3000 MET-min/week) (Active)	74,94±11,19	

t: t test, F: One Way Anova, *p<0,05

The relationship between the level of acceptance and awareness of diabetes and the level of physical activity of individuals is evaluated in table 3. A strong positive correlation was found between acceptance and awareness of diabetes and physical activity level (r:0.698, p<0.01). It can be said that as the average score of the acceptance and awareness level of diabetes increases, the level of physical activity also increases.

Table 3. Comparison of Individuals' Diabetes Disease Acceptance and Awareness Self-Efficacy and Physical Activity Level

Variables	**Diabetes Disease Acceptance and Awareness**	**Physical Activity**
Diabetes Disease Acceptance and Awareness	1,00	
Physical Activity	r:0,698 p:0,01*	1,00

r: Pearson Correlation Analysis, *p<0,001

Discussions

Awareness and acceptance of the disease are necessary in facilitating the management of type 2 diabetes, increasing adherence to treatment, and preventing disease-related complications (Belsti et al., 2019; Najafi Ghezeljeh et al., 2022). In this context, acceptance of the disease among individuals with type 2 diabetes can be critical in controlling the disease by promoting lifestyle changes and self-care practices. Regular physical activity, which is a healthy lifestyle behavior, is one of the important factors in the management of diabetes and reducing adverse health risks (Batrakoulis et al., 2022). For these reasons, in this study, it was aimed to determine the level of physical activity, awareness and acceptance of diabetes in individuals with type 2 diabetes, and to examine the effect of physical activity on the level of awareness and acceptance of diabetes. In this study, it was determined that the total score of awareness and acceptance scale in diabetes patients was 70.65±10.80 and above the moderate level. Similar to the findings of this study, it was reported in a study that the mean score of acceptance of the disease was moderate (Çelik et al., 2020). In another study, unlike this study, it was stated that the majority of the participants had a low level of acceptance of the disease (Bal Özkaptan, 2019). According to Foma et al. (2013) also showed that participants' awareness of diabetes was low. It is thought that the differences in the results of the study may be due to the culture, region and individual characteristics of the individuals. In this study, it was determined that men, married, university graduates, and those who perceive their income and health status well have a high level of diabetes awareness and acceptance. In a study similar to the findings of this study, it is stated that there is a significant difference between the participants' disease acceptance score and their gender, educational status and economic status (Şahin and Cingil 2020). Belsti et al. (2019) reported that there is a significant relationship between awareness of diabetes complications and gender and education level. In another study, it was reported that awareness of diabetic complications is good in young patients with a high level of education (Al

Bshabshe et al., 2020). The results of this study show that individual characteristics should be taken into account in increasing awareness and acceptance of diabetes. One of the changes that may affect the level of awareness and acceptance of diabetes may be physical activity. Physical activity is a factor that minimizes adverse health risks in both healthy individuals and individuals with type 2 diabetes (Kanaley et al., 2022). In this study, it was determined that there was a strong positive relationship between the acceptance and awareness of diabetes and the level of physical activity. At the same time, in this study, it was determined that individuals who were moderately active in terms of physical activity had high diabetes disease awareness and acceptance total score averages. In line with this result, it can be said that individuals who adopt positive health behaviors such as physical activity may have better diabetes awareness and acceptance levels. In a systematic review study, it was reported that physical exercise is a less frequently performed self-care activity by individuals with type 2 diabetes (da Rocha et al. 2020). According to Portela et al. (2022), it was reported that exercise was lower in compliance with self-care activities than other activities. In line with the results of this study, it is thought that the development of intervention programs for physical activity, which is one of the self-care activities in individuals with type 2 diabetes, will also contribute positively to the level of awareness and acceptance of diabetes.

Conclusions

In our study, in which we evaluated the relationship between diabetes acceptance and awareness level of individuals and physical activity, women, those with low education level, those who evaluate their income as medium and poor, those who perceive their health as moderate and those who are inactive in terms of physical activity are in the risk group in terms of awareness and acceptance of diabetes. It has been observed that the level of acceptance and awareness of diabetes disease of individuals is above the medium level. It has been determined that they are at a moderate level in terms of physical activity. In addition, it was determined that the level of physical activity increased as the diabetes disease acceptance and awareness score averages of the individuals increased.

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