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The Relationship Among Diabetes Stigma, Anxiety, Depression, and Diabetes Self-Care in Individuals with Type 2 Diabetes

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ABSTRACT

Diabetes-related anxiety, depression, and stigma have a greater impact on individuals with type 2 diabetes than the condition itself. Studies examining the stigma of diabetes together with depression, anxiety, and self-care are quite limited in the literature. The purpose of this study is to determine the relationship between diabetes stigma, anxiety, depression, and diabetes self-care in individuals with type 2 diabetes. This study utilized a cross-sectional, correlational methodology. The sample for this study included 200 individuals with type 2 diabetes. Data collection included the Patient Information Form, the Type 2 Diabetes Stigma Assessment Scale, the Hospital Anxiety and Depression Scale, and the Diabetes Self-Care Scale. Data were analyzed using the student t-test, one-way ANOVA, Bonferroni post hoc test, and Pearson correlation analysis. There was a positive, moderate, and statistically significant relationship between the total score of the diabetes stigma assessment scale and anxiety score ($r=0.488$, $p<0.01$), as well as a positive, moderate, and statistically significant relationship between the total score and depression score ($r=0.464$, $p<0.01$). There was a positive, very weak, and significant relationship between diabetes self-care and the total score ($r=0.144$, $p<0.05$). There was a positive, very weak, and statistically significant relationship between the total score of the Diabetes Self-Care Scale and depression score ($r=0.159$, $p<0.05$), whereas there was no statistically significant relationship with anxiety score ($p>0.05$). Diabetes self-care in individuals with type 2 diabetes is influenced by diabetes stigma, anxiety, and depression. It is recommended to plan evidence-based studies that aim to reduce these factors through experimental designs.

Keyword: Anxiety, Depression, Psychiatric Nursing, Self- Care, Type 2 Diabetes

1. Introduction

Diabetes Mellitus is a chronic disease characterized by disorders in carbohydrate, fat, and protein metabolism due to insufficient insulin secretion in the body or ineffective use of insulin (International Diabetes Federation, 2021; Turkish Diabetes Foundation, 2010; Turkish Endocrinology and Metabolism Association, 2022).The International Diabetes Federation (IDF) data estimates that 537 million people globally between the ages of 20-79 will receive a diabetes diagnosis in 2021, with a projected increase to 643 million by 2030 and 783 million by 2045 (International Diabetes Federation, 2021). Between 1998 and 2010, the number of individuals with diabetes in Turkey increased from 7.8% to 13.7% (Satman et al., 2002, Satman et al., 2013).

Individuals with type 2 diabetes (T2DM) can manage their blood sugar levels through oral antidiabetic drug use, insulin therapy, lifestyle changes, abstaining from alcohol and smoking, medical nutritional therapy, and exercise programs (Turkish Diabetes Foundation, 2010; Turkish Endocrinology and Metabolism Association, 2022). T2DM can adversely affect individuals' quality of life and treatment processes due to acute (hypoglycemia-hyperglycemia, etc.) and chronic (retinopathy-nephropathy, neuropathy, etc.) complications (Turkish Diabetes Foundation, 2010).

T2DM can lead to a decrease in individuals' physical functions and social interactions, negative emotional reactions, changes in family roles and economic and sexual problems (Kristianingrum et al., 2018). Receiving a diagnosis of T2DM can make individuals feel like they are losing their health for a prolonged period and necessitate keeping their life under control. In chronic diseases like T2DM, the need for an individual to adapt to treatment and make lifestyle changes can lead to non-acceptance of the disease and adaptation issues (Kaymaz & Akdemir, 2016). The awareness of consultation-liaison psychiatric nurses regarding the feelings and thoughts experienced by individuals with T2DM will guide the management of treatment and care provided to these individuals (Bahar & Tanrıverdi, 2018).

Individuals with T2DM may experience diabetes-related stigma, anxiety, and depression as a consequence of the disease. These mental distresses can lead to a decrease in self-care behaviors among diabetic individuals, such as irregular use of diabetes medications, non-adherence to diet, and non-compliance with exercise programs (da Rocha et al., 2020; Smith et al., 2015). As a result, individuals' quality of life and life expectancy may decrease (Kato et al., 2015). In this context, understanding how diabetes-related stigma, anxiety, and depression affect individuals' self-care and examining the relationship between these issues is crucial. Anxiety and depression are among the most common psychological problems in individuals with T2DM (Kintzoglanakis et al., 2022). Taiwan conducted a nationwide study that revealed a higher prevalence of anxiety among individuals with T2DM compared to the general population (Tu et al., 2017). Additionally, (Farooqi et al., 2019). observed that accompanying depression in T2DM increases the risk of coronary heart disease by approximately 36.8% and cardiac mortality by about 47.9%.

Stigmatization arises as a result of social cognitive stages and is often a process associated with a psychiatric diagnosis or labeling behavior (the exclusion or undesirability of an individual by society). Because society perceives diabetes as a lifestyle disease, it can blame and stigmatize individuals with T2DM for self-care behaviors such as insulin injection, diet, and blood sugar measurement. While stigma situations like mental illnesses and HIV/AIDS have been extensively researched, there is a limited scope of studies in the literature regarding diabetes-related stigma among diabetic individuals (Holmes-Truscott et al., 2016; İnkaya & Karadağ, 2021; Jackson-Best & Edwards, 2018). Although there are separate studies defining psychosocial issues like depression, anxiety, and diabetes stigmatization in diabetic individuals, research exploring their relationships is considerably limited. Akyirem et al (2023) mention that individuals experiencing diabetes stigma often experience more depression and anxiety. Holmes-Truscott et al., (2018) and Browne et al. (2013) indicate that diabetic individuals tend to conceal their illnesses to avoid stigmatization. Browne et al. (2016) and Adam & Folds (2014) note that depression reduces dietary and exercise adherence. Within this limited information, we observe that diabetic individuals can experience stigma and anxiety and depression, which can lead to adverse health outcomes and affect their self-care. Understanding diabetes stigma, anxiety, and depression in individuals with T2DM is crucial. We should investigate the impact of diabetes stigma, anxiety, and depression on diabetes self-care. The results obtained in this study are believed to contribute to consultation-liaison psychiatric nursing. The goal of this study is to illuminate future research on stigma in individuals with T2DM. We anticipate that the findings will uncover diabetes-related stigma, anxiety, and depression in diabetic individuals, thereby enhancing our understanding of how these factors impact diabetes self-care and contributing to the reduction of diabetes stigma, anxiety, and depression. It is anticipated that this will guide nursing interventions aimed at this goal, ultimately enhancing self-care and quality of life in individuals with T2DM.

2. Methods

2.1.Population and Sample

The study's population consists of individuals with T2DM who were admitted to internal medicine, chest diseases, urology-general surgery, orthopedics-eye services, and physiotherapy services at a public hospital between November 2022 and April 2023. We used the outcome criteria of diabetes self-care from Kawoun’s (2021) study to calculate the sample size. Using G-Power 3.1.9.2 software, we determined the minimum sample size required with a type 1 error of 0.05 and a medium effect size (Cohen d: 0.24) to be 184. This study employed purposive sampling. Thus, the sample of the study comprised 200 individuals with T2DM who presented to the institution during the specified dates and met the inclusion criteria.

The inclusion criteria included being willing to participate in the research, being 18 years of age or older, being literate in Turkish, having a T2DM diagnosis for at least six months, and not having any psychiatric or neurological illness (such as dementia). The exclusion criteria included a lack of willingness to participate in the research, illiteracy, and a significant physical illness other than T2DM, such as cancers that required immediate medical intervention for diagnosis.

2.2. Data Collection Tools

2.2.1.The Patient Information Form

The Type 2 Diabetes Stigma Assessment Scale, the Hospital Anxiety and Depression Scale,' and the Diabetes Self-Care Scale' were used in the data collection. The Patient Information Form was created based on literature knowledge; the form consists of two sections (Balım & Pakyüz, 2016; İstek & Karakurt, 2018; Karakurt, 2008). The first section included socio-demographic characteristics such as age, gender, marital status, education level, employment status, income, social security, body mass index, duration of diabetes, presence of individuals with diabetes in the family, degree of kinship with the individual with diabetes, comorbid conditions other than diabetes, frequency of diabetes check-ups, type of diabetes treatment, and perception of general health status. The second section asked questions about the date of T2DM diagnosis, the characteristics of the disease, the presence of any additional chronic illness, the type of diabetes treatment, the presence of T2DM individuals in the family, and other related inquiries. The patient diagnosis form consisted of 15 questions.

2.2.2. Type 2 Diabetes Stigma Assessment Scale

Browne et al. (2016) developed the Type 2 Diabetes Stigma Assessment Scale (DSAS-2) to measure the stigma faced by individuals with T2DM as a result of their illness. The Turkish validity and reliability study of the scale were conducted by İnkaya and Karadağ in 2021 (İnkaya & Karadağ, 2021). Evaluated based on preference ranging from Strongly Disagree (1) to Strongly Agree (5), the scale was a 5-point Likert scale. The lowest score achievable on the scale was 19, while the highest score was 95; as the score increased, the level of stigma related to diabetes also increased (Browne et al., 2016; İnkaya & Karadağ, 2021). There were no reverse-coded items or cutoff points in the scale. DSAS-2 comprised 19 items and had three subscales: different behaviors (items 1, 4, 7, 10, 14, 17), blaming and judging (items 2, 3, 5, 8, 12, 16, 19), and self-stigma (items 6, 9, 11, 13, 15, 18). The Cronbach's alpha value for the total score of the scale developed by Browne et al. (2016) is 0.95. The Turkish validity and reliability study conducted by İnkaya and Karadağ (2021) determined the Cronbach's alpha value for the total score of the scale as 0.92. This study determined the Cronbach's alpha value for the scale's total score to be 0.82.

2.2.3. Hospital Anxiety and Depression Scale

Zigmond and Snaith developed the Hospital Anxiety and Depression (HAD) scale in 1983. Aydemir conducted the validation and reliability of the scale in Turkey in 1997. The scale consisted of 14 items. Odd-numbered items assess anxiety, while even-numbered items assess depression. Seven items measured anxiety, and seven items measured depression. The scale was a 4-point Likert-type assessment tool, with item scores ranging from 0 to 3. However, each item had different scoring criteria: items 1, 3, 5, 6, 8, 10, 11, and 13 decreased in severity, scored as 3, 2, 1, and 0, respectively. Conversely, we scored items 2, 4, 7, 9, 12, and 14 as 0, 1, 2, 3. We obtained the subscale total scores by summing the item scores. We summed items 1, 3, 5, 7, 9, 11, and 13 for the anxiety subscale, and items 2, 4, 6, 8, 10, 12, and 14 for the depression subscale. Scores for the subscales ranged from 0 to 21. The cutoff score for the Turkish version of the HAD scale was ten for the anxiety subscale and seven for the depression subscale. Individuals scoring above these points could be considered members of the risk group (Aydemir, 1997; Zigmond & Snaith, 1983). The Turkish validity and reliability study of the scale revealed that the Cronbach's alpha coefficient for the anxiety subscale was 0.85, while for the depression subscale it was 0.77 (Aydemir, 1997). The study found that the Cronbach's alpha values for the scale's subscales were 0.88 for the anxiety subscale and 0.79 for the depression subscale.

2.2.4. Diabetes Self-Care Scale

Lee and Fisher developed the scale in 2005 to assess self-care behaviors in individuals with T2DM. Karakurt conducted the Turkish validation and reliability study of the scale in 2008. Karakurt evaluated the scale using a 4-point Likert scale, with options ranging from Never (1) to Always (4). The 4-point Likert scale determined 92 points as the acceptable minimum level for the scale. The scale yielded the lowest possible score of 35 and the highest score of 140. As scores obtained from the scale increase, the ability of patients to perform self-care activities also increased positively. The scale, which did not have subscales or reverse-worded items, has a Cronbach's alpha value of 0.80 as determined by Lee and Fisher and 0.81 as determined by Karakurt (Karakurt, 2008; Lee & Fisher 2005). This study determined the scale's Cronbach's alpha value to be 0.80.

2.3. Data Collection

Data collected by the first author. The first author distributed the research questionnaires and collected the data. The first author collected the data for this study through face-to-face interviews. We visited the wards on specific days each week, engaged with the ward nurses to identify suitable patients for the study, and then collected questionnaires from the patients' rooms. We provided information about the study to individuals with T2DM who met the inclusion criteria and voluntarily participated at the beginning of the study. We then asked them to sign an 'Informed Consent Form,' guaranteeing that the study would not disclose their names and would only use the gathered information for research purposes. The data collection time for each individual was approximately 15 to 20 minutes.

2.4. Data Analysis

We analyzed the data from the research using the free trial version of SPSS Statistics (Statistical Package for Social Sciences) for Windows 25.0. We evaluated the data using descriptive statistical methods such as frequency, percentage, mean, and standard deviation. We examined the skewness and kurtosis values to determine whether the research variables followed a normal distribution. The normality of the data was dependent on skewness and kurtosis values being within ±2 (George & Mallery, 2010). It was observed that all variables had skewness and kurtosis values within the ±2 range, indicating a normal distribution. We used parametric tests for variables that displayed a normal distribution. We employed the student's t-test to test for significant differences between quantitative variable scores from two independent samples, and one-way ANOVA to determine whether the means of more than two independent samples differed significantly. We used the Bonferroni-corrected test for pairwise comparisons of significant variables after conducting one-way analysis of variance. We used Pearson correlation analysis to examine the relationship between diabetes stigma, anxiety, depression, and diabetes self-care variables. P-values below 0.05 were considered statistically significant in the research.

2.5. Ethical Consideration

The XXX University Human Research Ethics Committee (25.08.2022-204206) granted ethical approval for the research. XXX, associated with the XXX Provincial Health Directorate (24.10.2022-229745), provided written permission for the research. We obtained verbal and written consent from individuals with T2DM who agreed to participate in the study. We obtained permission for the use of the scales owned by the research participants.

3. Results

58.0% of the participants were female, 38.0% were in the 60-69 age range, 84.5% were married, 57.5% had completed primary school, and 52.5% were unemployed. We determined that 56.5% of the participants had income equal to or higher than their expenses, and 88.5% had social security. We identified 50.0% of the participants as obese. We found that 27.5% of the participants had a diabetes duration of 5 years or less, and 66.5% had another diabetic person in their family. We found that 60.0% of the participants were first-degree relatives of the diabetic individual in the family. We determined that 55.5% of the participants had hypertension, 39.0% had heart disease, and 24.0% had lung disease. We found that 47.0% of the participants sought diabetes control when they were ill. We determined that oral antidiabetics and insulin accounted for 51.0% of the participants' diabetes treatment methods. 58.5% of the participants described their general health condition as moderate.

The average total score for the Diabetes Stigma Assessment Scale for T2DM was 33.58 ± 10.38. For the HAD Scale (Hospital Anxiety and Depression Scale), the average score for the Anxiety subscale was 4.24 ± 4.58, and for the Depression subscale, it was 3.59 ± 3.99. Additionally, the average total score for the Diabetes Self-Care Scale was 82.20 ± 11.47 (Table 1).

Table 1 The study examined the total scores and subscale scores of participants on the type 2 diabetes stigma assessment scale, hospital anxiety and depression scale, and diabetes self-care scale

Scale	**Min-Max**	$\bar{X}$**±SD**
Type 2 Diabetes Stigma Assessment Scale	19-69	33.58±10.38
Hospital Anxiety and Depression (HAD) Scale		
Anxiety subscale	0-21	4.24±4.58
Depression subscale	0-15	3.59±3.99
Diabetes Self-Care Scale	59-11	82.20±11.47

According to the HAD Scale, 85.5% of the participants had no risk of anxiety, and 77.5% had no risk of depression (Table 2).

Table 2 Participants' risk of anxiety and depression

Hospital Anxiety and Depression Scale	n	%
Anxiety risk		
Yes (<10)	171	85.5
No (≥10)	29	14.5
Depression risk		
Yes (<7)	155	77.5
No (≥7)	45	22.5

The total score of the Diabetes Stigma Assessment Scale was found to have a positive, moderate, and statistically significant relationship with anxiety scores ($r=0.488$, $p<0.01$). Additionally, there was a positive, moderate, and statistically significant relationship between the total score of the Diabetes Stigma Assessment Scale and the depression scores from the hospital anxiety and depression scale ($r=0.464$, $p<0.01$). Moreover, a positive, very weak, and significant relationship ($r=0.144$, $p<0.05$) was identified between the total score of the Diabetes Stigma Assessment Scale and diabetes self-care. These findings suggest that as the diabetes stigma score increases, anxiety, depression, and diabetes self-care scores also increase. Regarding the diabetes self-care scale, a positive, very weak, and statistically significant relationship was found between the total score of the diabetes self-care scale and the depression scores from the hospital anxiety and depression scale ($r=0.159$, $p<0.05$). However, Table 3 revealed no statistically significant relationship between the diabetes self-care scale score and the anxiety scores from the hospital anxiety and depression scale ($p > 0.05$).

Table 3 Examining the relationship between participants' diabetes stigma, anxiety and depression, and self-care variables

Scales	1	2	3	4
1. Type 2 Diabetes Stigma Assessment	1			
2.HAD Anxiety subscale	0.488**	1		
3.HAD Depression subscale	0.464**	0.745**	1	
4. Diabetes Self-Care	0.144*	0.110	0.159*	1

*p<0.05; **p<0.01; Pearson correlation test

4. Discussion

Type 2 diabetes individuals often experience issues related to diabetes stigma, anxiety, and depression, which can adversely affect their diabetes self-care and even impact mortality and morbidity rates negatively (Browne et al., 2016; Karakurt, 2008). Nurses intervene to reduce psychosocial problems observed in individuals with T2DM. Identifying these problems and determining their relationships is crucial for planning these interventions. This study aimed to determine the relationship between diabetes stigma, anxiety, and depression experienced by individuals with T2DM and their diabetes self-care. As diabetes-related stigma increases in T2DM individuals, anxiety and depression also increase.

The study found a significant and positive relationship between diabetes stigma and depression/anxiety, which aligns with findings in the literature that suggest an increase in diabetes-related stigma leads to an increase in anxiety and depression. The study concluded that an increase in stigma towards diabetes also led to an increase in anxiety and depression. Holmes-Truscott et al., 2020 mentioned that each standard deviation increase in diabetes-related stigma was associated with an approximately half-standard deviation increase in psychological distress. Individuals experiencing diabetes stigma reported more symptoms of depression and anxiety. Akyirem et al. (2023), in their systematic review and meta-analysis, stated a positive relationship between T2DM stigma and depressive symptoms. Those facing stigma might tend to isolate themselves from society and refrain from participating in social activities, attributing to themselves responsibility for their illnesses. The increased distress due to T2DM can lead to anxiety and depression in individuals.

The study found a significant yet weak positive relationship between stigma and self-care. Puhl et al. (2020) observed that individuals experiencing stigma due to diabetes faced more diabetes-specific distress but engaged in more self-care activities. Researchers attributed this to the need for individuals to perform more practices, such as insulin administration, blood sugar monitoring, and meal adjustments, to manage their blood sugar levels. This, in turn, increases the likelihood of recognizing stigma from others due to their diabetes-related actions and experiences. Puhl et al. (2020). In contrast, Holmes-Truscott et al. (2018) concluded that individuals avoided insulin administration at the workplace to avoid feeling excluded or judged by their peers. Browne et al. (2013) reported that individuals with T2DM did not want to disclose their illness to avoid stigma, leading to disruptions in essential self-care behaviors (such as skipping medication/insulin, not checking blood

sugar) or using insulin in unhygienic settings like public toilets. The discrepancy in research findings could potentially be attributed to individuals prioritizing their self-care to challenge the misconception that diabetes implies a lack of self-care.

The study found a weak but significant positive connection between self-care and depression, but no relationship between self-care and anxiety. Brazeal et al. (2022) did not find a significant relationship between anxiety, depression, and self-care. Adam et al. (2014) concluded that an increase in depressive symptoms led to a decrease in adherence to diet and exercise programs. However, this study found an association between increased depression and increased self-care for diabetes. Devarajooh & Chinna (2017) stated that depression did not affect self-care. Conversely, Alavi et al. (2018) mentioned that anxiety and depression play a significant role in self-care among elderly diabetics; an increase in anxiety and depression leads to a decrease in self-care. The low levels of anxiety and depression in society may explain the lack of significant relationships in this study.

5. Conclusion

The research determined a significant and positive relationship between diabetes-related stigma and anxiety and depression. An increase in diabetes-related stigma leads to an escalation in anxiety and depression. There was a meaningful yet low-level relationship between diabetes stigma and self-care. We observed a significant and positive relationship between depression and self-care, but found no relationship between anxiety and self-care. We can use mixed (quantitative and qualitative) methods to deeply examine the impact of diabetes stigma on individuals' quality of life. We can include individuals from various age groups, socioeconomic levels, and cultural backgrounds in our research samples, and compare the differences between individuals residing in rural and urban areas. Conduct longitudinal studies to explore the causal pathways between diabetes stigma, anxiety, depression, and self-care. This can help clarify whether reducing stigma directly impacts mental health and self-care behaviors. Investigate how cultural factors influence the relationship between stigma, mental health, and self-care. This can provide insights into tailoring interventions for specific populations, such as the Turkish community or other cultural groups.

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