

TREATMENT SATISFACTION FOR TYPE 2 DIABETES PATIENTS IN JAZAN, SAUDI ARABIA

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Abstract

Background and Objectives: Diabetes mellitus type 2 (T2DM) causes significant morbidity and mortality. Obesity, sedentary lifestyle, and population aging are all key contributors to the global rise in T2DM incidence. Furthermore, diabetic complications demand a disproportionate amount of healthcare resources. The goal of diabetes therapy is to maintain quality of care through illness prevention. Maintaining patient satisfaction is another critical part of treating patients with chronic illnesses. Treatment satisfaction is an essential indicator of treatment quality and is a component of quality of care measurement. The main purpose of this study is to assess the treatment satisfaction for type 2 diabetes patients in Jazan, Saudi Arabia.

Materials and Methods: This study is a cross-sectional study conducted among 380 type 2 diabetes patients at a diabetic center in Jazan, Saudi Arabia. The self-administered questionnaire included a socio-demographic questionnaire and the Diabetes Treatment Satisfaction Questionnaire (DTSQ).

Results: Treatment satisfaction was significantly associated with the living place ($p=0.004$), working status ($p=0.007$), chronic disease ($p=0.001$), treatment method ($p<0.001$), and time of diagnosis ($p<0.001$). The patients' mean score on the DTSQ was 30.05 ± 6.51 , representing good treatment satisfaction. Most patients reported their satisfaction with the treatment factors. However, the patients reported the lowest mean scores in the hyper- and hypoglycemia factors. The results also revealed a significant negative correlation between patients' satisfaction scores and their age and blood sugar (HbA1c) levels and a positive correlation between age and blood sugar (HbA1c) levels.

Conclusions: Healthcare providers can use this information to understand patients' needs and customize treatments accordingly. Factors such as age, living place, working status, chronic disease, treatment method,

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and duration of diabetes should be taken into account to create a tailored treatment plan that meets each patient's specific requirements, leading to better health outcomes and improved patient satisfaction.

Keywords: Treatment satisfaction; diabetes mellitus; Type 2 diabetes; DTSQ.

Introduction

Diabetes mellitus type 2 (T2DM) causes significant morbidity and mortality. A sedentary lifestyle, obesity, and population aging are all key contributors to the global rise in T2DM incidence. Furthermore, diabetic complications demand a disproportionate amount of healthcare resources. Lifestyle changes (exercise and diet) and aggressive treatment of hyperglycemia, hypertension, and dyslipidemia are among the strategies used to lower the disease burden in T2DM patients [1].

Insulin therapy is frequently required for patients with T2DM due to the diseases continual reduction in cell function [2]. Insulin production declines with time. Thus, patients must begin Insulin therapy. International cooperation of several registries from various nations has tried to understand better the global pattern of managing diabetes and its consequences [3]. Recent T2DM management guidelines highlight the importance of treating individuals with T2DM individually and the need to attain and maintain target Glucose levels [4].

Poorly controlled type 2 diabetes mellitus (DM) is associated with increased vascular complications rates, impaired patient quality of life, less satisfaction with treatment, and greater healthcare expense per patient. However, Patient satisfaction is low, especially in developing nations, which impacts glycemic control and treatment results. Several studies have found critical characteristics contributing to diabetes treatment satisfaction [5].

The value of researching treatment satisfaction is widely established; in fact, many healthcare institutions have included patient satisfaction surveys in initiatives intended to raise standards of care. One of the most important metrics for evaluating the quality of care is treatment satisfaction, which is a procedural component. Furthermore, it has been discovered that higher levels of satisfaction are connected with reduced body weight, lower hemoglobin A1c (HbA1c) values, and higher rates of compliance. These findings imply that higher levels of satisfaction are linked to improved clinical results [6].

A crucial component of successful therapy and a significant determinant of treatment results is treatment satisfaction. Treatment satisfaction plays a

significant role in influencing health-related decisions, including adherence, in patients with diabetes. Furthermore, there is a connection between better glycemic control and decreased morbidity and treatment satisfaction [7].

Global data indicate an endemic growth in the incidence of diabetes, primarily from type 2 diabetes (T2DM), with a predicted 112% increase in the Middle East and North Africa and 48% increase globally between 2017 and 2045. In particular, the previous 20 years have seen a rise in the prevalence of diabetes in the Levant region, with prevalence in Jordan and Lebanon reaching about 12% and 8%, respectively. The World Health Organization (WHO) has projected a significant increase in diabetes prevalence in both countries by the year 2030 [8].

There is a diabetic epidemic going on in the Middle East right now. When considering worldwide data, the highest prevalence of diagnosed diabetes is currently found in Gulf Cooperation Countries (GCC), with estimates reaching 24%, 23%, and 20% of the population in Saudi Arabia, Kuwait, and Qatar, respectively [9].

In Saudi Arabia, 18.3% of adult population members had type 2 diabetes in 2020 [10]. On the other hand, Saudi Arabia lacks information regarding the management of diabetes, and data from international registries are insufficient. According to studies conducted in Saudi Arabia in 2009, most T2DM patients did not achieve the recommended glycemic objectives of 7% (53 mmol/mol) for glycated hemoglobin (HbA1c), indicating a discrepancy between worldwide guidelines/recommendations and actual practice [11]. The goal of diabetes therapy is to maintain quality of care through illness prevention. Maintaining patient satisfaction is another critical part of treating patients with chronic illnesses. Treatment satisfaction is an essential indicator of treatment quality and is a component of quality of care measurement [12].

The prevalence of diabetes has increased significantly in Saudi Arabia in recent years, increasing the risk of complications, mortality rates, and healthcare spending. This situation highlights the need to properly analyze current diabetes management practices in Saudi Arabia and to implement specific initiatives to improve the quality of care for these patients. Achieving optimal medication adherence requires a high level of treatment satisfaction, which is characterized as the cognitive evaluation of whether a therapy meets or surpasses the patient's subjective expectations. It is just one of several patient-reported outcomes (PROs) that are important to medical Professionals in order to comprehend patients' viewpoints regarding the medications they are currently taking. PROs can also be utilized to evaluate the impact of illness

and treatment on a patient's functioning, well-being, and everyday life [7]. This study aimed to assess the treatment Satisfaction for Type 2 diabetes patients in Jazan, Saudi Arabia.

Materials and Methods

Study Design, Study Area and Population:

This cross-sectional study was conducted at a diabetic center in Jazan, Saudi Arabia. The target population is DM type 2 patients attending the center for treatment between March 2024 and June 2024. Participants were recruited by convenience sampling from diabetic patients meeting the inclusion criteria who are attending the center during the study period.

Inclusion Criteria

- Patients with type 2 diabetes attending the diabetic center.
- Saudi and non-Saudi diabetes patients.
- Both adult males and females with type 2 diabetes and willing to participate.

Exclusion Criteria

- Diabetic patients not attending the diabetic center Clinics.
- Patients who refuse to participate in the study.

Data collection tool

The data was collected using a socio-demographic questionnaire and a valid Diabetes Treatment Satisfaction Questionnaire (DTSQ) License ref CB1442 DTSQs © Prof Clare Bradley 9/93. Arabic version for Saudi Arabia 28.07.08 (from standard UK English rev. 7/94) Health Psychology Research, UK. Patients were approached at the center, and the study goals and procedures were explained. Those who were willing to participate, they signed a consent form and anonymously completed the questionnaires.

The self-administered questionnaire consists of three sections. The first section introduces the study's purpose and reassurance of confidentiality. The second section discusses sociodemographic characteristics, including age, gender, nationality, education level, marital status, place of residence, work status, smoking, monthly income, and medical history of diabetes. The third section is the Diabetes Treatment Satisfaction Questionnaire (DTSQ), used to evaluate patient satisfaction with diabetes treatment. It consists of eight questions, each scored on a scale of zero to six, where zero means "very dissatisfied" and six means "very satisfied." The questionnaire comprises two factors. The first factor assesses treatment satisfaction and consists of six questions (Q 1, 4, 5, 6, 7, and 8). These questions ask about the patient's "satisfaction with current treatment", "flexibility", "convenience", "understanding of diabetes", "recommend treatment to others" and "willingness to continue treatment". The second factor consists of two questions (Q 2 and 3), which assess the burden of hyper- and hypoglycemia, respectively, with zero meaning "none of the time" and six meaning "most of the time." Treatment satisfaction is evaluated by adding the scores of the questions yields to a total score of 48, with a higher score indicating greater treatment satisfaction.

Statistical Analysis

The data was analyzed using the IBM SPSS Statistical Package for the Social Sciences 26. In descriptive statistics, the frequency and percentages were used for qualitative variables, and the mean and SD were used for quantitative variables. A test of normality was carried out to determine the appropriate statistical test. Then, the Kruskal-Wallis and Mann-Whitney U tests were used to compare and evaluate the differences in treatment satisfaction among the study groups. Spearman's correlation test was calculated to identify significant Associations between variables. A P value less than 0.05 was considered an indicator of statistical significance.

Results

A total of 380 patients participated in the survey, and all of them were Saudi nationals. Among the participants, 58.7% were male and 41.3% were female. The age range of the participants varied from 25 to 80, with an average age of 52 and a standard deviation of 10.5. Notably, most patients (59.5%) lived in cities, and 78.9% were married. In terms of education, more than half of the participants had completed a bachelor's or postgraduate degree. It was found that 73.2% of the respondents were employed, and 67% earned more than 5000 SAR per month.

The majority of patients (62.6%) use pills as a treatment method for diabetes. Moreover, nearly two-thirds of the participants (67%) had been diagnosed with diabetes for more than five years, and 42.4% of them had been diagnosed with another chronic disease besides diabetes. Additionally, 42.1% of the participants were smokers. Table 1 describes the participants'

sociodemographic characteristics and association with the treatment satisfaction score. Furthermore, the patients' last cumulative blood sugar reading ranged from 5.6 to 10, with an average of 7.57 and a standard deviation of 0.84.

There was no significant association between treatment satisfaction and gender, education level, marital status, income, and smoking. However, treatment satisfaction was significantly associated with living place ($p=0.004$) and working status ($p=0.007$). The results indicate that patients residing in cities are more satisfied with their treatment than those living in villages. Additionally, patients who are employed also express higher levels of treatment satisfaction as compared to those who are unemployed. Furthermore, the results revealed a significant association between treatment satisfaction and having another chronic disease ($p=0.001$). Patients who did not have any other chronic disease were significantly more satisfied with their treatment compared to those who had another chronic condition (Table 1).

Additionally, the results revealed that treatment satisfaction was significantly associated with treatment method ($p<0.001$) and time of diagnosis ($p<0.001$). Patients who had been diagnosed with diabetes for less than five years tended to have higher treatment satisfaction. In addition, patients who used pills or diet had higher treatment satisfaction.

The patients' total scores on the DTSQ questionnaire ranged from 9 to 43, with a mean score of 30.05 ± 6.51 , representing good treatment satisfaction. Table 2 displays the statistical data related to the eight items of the DTSQ. Most patients reported their satisfaction with the treatment, as the factor that assesses the treatment satisfaction (items: 1, 4, 5, 6, 7, 8) indicates high satisfaction levels. However, the patients have reported the lowest mean score for item 2, which pertains to the burden of hyperglycemia, and item 3, which relates to hypoglycemia (Table 2).

The Spearman correlation test was conducted to investigate the association between the satisfaction levels of patients undergoing treatment and their age and blood sugar (HbA1c) levels. As shown in Table 3, the results revealed a significant negative correlation between the satisfaction scores of patients and their age and blood sugar (HbA1c) levels, with a correlation of -0.21 and -0.45, respectively. Additionally, a significant positive correlation was found between age and blood sugar (HbA1c) levels ($r=0.5$) (Table 3).

Discussion

As obesity rates and unhealthy lifestyle continue to increase worldwide, the prevalence of diabetes is also rising at an alarming rate. This trend is especially evident in Saudi Arabia, where cases have significantly increased in recent years. To ensure that type 2 diabetes patients receive the best possible treatment, it is important to assess their treatment satisfaction. Therefore, this study was conducted in Jazan, Saudi Arabia, to evaluate the treatment satisfaction of type 2 diabetes patients. The study aimed to compare treatment satisfaction with socio-demographic data and patient-related factors.

The results revealed that several factors, including gender, education level, marital status, income, and smoking, did not have any significant association with treatment satisfaction. However, the study found that place of residence and employment status significantly impacted their satisfaction with the treatment. Patients residing in urban areas reported higher levels of satisfaction with their medical treatment, suggesting that the quality of medical care in cities surpasses that in rural areas. This disparity underscores the challenges and differences in healthcare access and delivery between urban and rural settings. Employed patients also reported higher satisfaction levels with their treatment than the unemployed. Furthermore, the study found that patients without chronic disease were significantly more satisfied with their treatment than those with chronic conditions. This finding suggests that patients with chronic diseases may require specialized treatment and care to improve their satisfaction levels. Moreover, the study found that patients who had been diagnosed with diabetes for less than five years had higher satisfaction levels with their treatment than those who had been diagnosed for a longer period. This finding can be attributed to the fact that newly diagnosed patients may receive more attention and support from healthcare Professionals, leading to higher satisfaction levels. Furthermore, the study found that patients who used pills or diet as a treatment method were more likely to report higher satisfaction levels with the treatment. These imply that the type of treatment method significantly impacts the patient's perception of the treatment effectiveness.

The results indicated that most patients reported good treatment satisfaction. Most patients reported their satisfaction with the treatment, as the factor that assesses the treatment satisfaction indicates high satisfaction levels. However, the patients reported the lowest mean scores in the hyper- and hypoglycemia factors, which suggests that the treatment may need to be adjusted in these areas. This finding was consistent with a previous study conducted among Diabetes patients, which also demonstrated that Most patients suffered from hyper- and hipoglicemia and were significantly discomfort regarding treatment

Table 1. Sociodemographic characteristics and association with the treatment satisfaction score.

Characteristics	Frequency (%)	Mean±SD	Mean Rank	U ¹ /KW ²	P-value
Gender				15634	0.074
Male	223 (58.7%)	29.67±6.71	182.11		
Female	157 (41.3%)	30.59±6.20	202.42		
Education level				10.710	0.057
Uneducated	13(3.4%)	25.54±9.36	117.38		
Elementary	9(2.4%)	27.22±6.18	138.78		
Middle school	28(7.4%)	28.07±6.85	168.23		
High school	87(22.9%)	29.93±6.72	188.55		
Bachelor	195(51.3%)	30.72±6.12	199.38		
Postgraduate	48(12.6%)	30.46±6.13	200.44		
Marital status				1.754	0.625
Single	15 (3.9%)	29.67±11.27	183.33		
Married	300 (78.9%)	30.09±6.39	191.86		
Divorced	19 (5%)	27.95±6.95	159.82		
Widow	46 (12.1%)	30.78±4.97	196.62		
Living place				14359	0.004
City	226 (59.5%)	30.80±5.81	203.96		
Village	154 (40.5%)	28.95±7.31	170.74		
Work				11624.5	0.007
Yes	278(73.2%)	30.69±5.92	199.69		
No	102(26.8%)	28.31±7.66	165.47		
Monthly income				5.520	0.063
<5000 SAR	125 (32.9%)	28.98±7.10	171.71		
5000-10000 SAR	181(47.6%)	30.62±6.09	199.29		
>10000 SAR	74 (19.5%)	30.46±6.33	200.74		
Smoking				17003	0.57
Yes	160 (42.1%)	30.32±5.94	194.23		
No	220 (57.9%)	29.85±6.91	187.79		
Treatment method				22.333	<0.001
Pills	238 (62.6%)	30.85±5.79	204.38		
Insulin	101 (26.6%)	28.13±7.22	157.87		
Diet	22 (5.8%)	32.86±7.02	239.11		
Pills, insulin, and diet	19 (5%)	26.95±7.46	133.76		
When were you diagnosed with diabetes?				30.309	< 0.001
< 5 years	124 (32.6%)	31.71±5.79	223.75		
5-10 years	149 (39.2%)	30.10±6.16	184.84		
>10 years	107 (28.2%)	28.06±7.25	159.85		
Do you have another chronic disease?				14123	0.001
Yes	161 (42.4%)	28.76±7.07	168.72		
No	219 (57.6%)	31.00±5.91	206.51		

1 Mann-Whitney U test

2 Kruskal-Wallis test

Table 2. Descriptive statistics of DTSQ items.

Item	Mean±SD	Treatment satisfaction (%)						
		0	1	2	3	4	5	6
1- How satisfied are you with your current treatment?	4.22±1.78	2.1%	12.4%	7.9%	2.6%	16.6%	30.0%	28.4%
2- How often have you felt your blood sugar level has recently become unacceptably high?	2.53±1.77	8.2%	28.2%	23.2%	10.5%	10.8%	11.3%	7.9%
3- How often have you felt your blood sugar level has dropped unacceptably low recently?	1.91±1.83	28.4%	22.9%	18.4%	7.4%	8.7%	10.0%	4.2%
4- How appropriate has the treatment been for your recent condition?	4.27±1.67	0.8%	10.8%	8.4%	4.5%	17.9%	30.8%	26.8%
5- How flexible has your treatment been recently?	4.15±1.58	2.6%	5.8%	9.7%	8.7%	20.8%	33.2%	19.2%
6- How satisfied are you with your diabetes awareness?	4.25±1.56	1.1%	6.6%	8.4%	11.1%	21.6%	25.5%	25.8%
7- Would you recommend this type of treatment to someone else who has the same type of diabetes as you?	4.38±1.67	1.8%	4.5%	7.9%	14.2%	10.3%	33.2%	28.2%
8- How satisfied are you with continuing treatment with the current method?	4.30±1.84	2.4%	10.8%	9.5%	5.3%	12.6%	22.9%	36.6%

Table 3. Spearman correlation results.

Spearman rho	Age	HbA1c	DTSQ score
Age	1	0.503	-0.215
HbA1c	0.50	1	-0.452
DTSQ score	-0.21	-0.452	1

[13].

The results also revealed a significant negative correlation between patients' satisfaction scores and their age and blood sugar (HbA1c) levels. This suggests that older patients and those with higher blood sugar levels were less satisfied with their treatment. This is consistent with a previous study that revealed HbA1c levels increase significantly with age [14].

In addition, the study found a significant positive correlation between age and blood sugar (HbA1c) levels, indicating that older patients tended to have higher blood sugar levels. These findings suggest that healthcare providers should consider patients' age and blood sugar levels when assessing their satisfaction with treatment and making any necessary adjustments.

Conclusions

This study assessed treatment satisfaction among patients with type 2 diabetes in Jazan, Saudi Arabia. Additionally, the study investigated the socio-demographic and patient-related factors associated with treatment satisfaction. By analyzing these factors, healthcare providers can gain a deeper understanding of patient's needs and preferences, allowing them to customize treatments to suit each patient's requirements better. This research highlights that healthcare providers should consider a wide range of factors that may

impact patient satisfaction with treatment, such as age, living place, working status, chronic disease, treatment method, and duration of diabetes. By considering these factors, healthcare providers can create a tailored treatment plan that meets each patient's specific needs and expectations, ultimately improving patient satisfaction and better health outcomes.

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Institutional Review Board Statement: The study was conducted in accordance with the Declaration of Helsinki, and approved by the Ethics Committee of Jazan Health (No. 2412 on 04/02/2024). Informed

Consent Statement: Informed consent was obtained from all subjects involved in the study.

Data Availability Statement: The data presented in this study are available on request from the corresponding author.

Conflicts of Interest: The authors declare no conflicts of interest.

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