

Association between Self-Care and Complications among Patients with Type 2 Diabetes Mellitus: A Cross-Sectional Study

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Abstract

Background: Self-care is essential for diabetes patients to keep control of the disease and avoid complications. Self-care can help minimize these complications. **Objectives:** The study endeavored to examine type 2-diabetic patients' knowledge regarding self-care management and to determine the association between self-care management and the disease complications. **Materials and Methods:** This study was a quantitative research of cross-sectional design on a sample of 151 patients who visited the endocrine and diabetes center in Al-Dewaynia Teaching Hospital, Iraq. Data were collected by demographic questionnaire and the Diabetes Self-Care Scale (DSCS). **Results:** The results showed that there was a significant association between the diabetes self-care management and both diabetic foot and neuropathy (0.002 and 0.005), respectively, whereas it was no association between the diabetes self-care management with retinopathy, cardiovascular problems, nephropathy, and hepatic problems at any significant level. **Conclusion:** The study revealed that individuals' adherence to self-care management of type 2 diabetes is very poor. Enhancing patients' and community's regarding changing the lifestyle is essential.

Keywords: Association, complication and type 2 diabetes mellitus, self-care

INTRODUCTION

Diabetes is a global health issue.^[1] Diabetes is a chronic metabolic disorder caused by defects in insulin deficiency or action, requiring continuous medical care and dedication. The chief aim of treatment is to ensure glycemic control during the day, to prevent acute and chronic complications, to solve the accompanying problems, and thus to improve the expected survival and quality of life in patients with diabetes.^[2]

In its 10th Diabetes Atlas published in 2021, the International Diabetes Federation reported that 537 million adults worldwide have diabetes. This number, which means that approximately one in every 10 people has diabetes,^[3] is thought to be 783 million in 2045.

More than 60% of the world's diabetic population resides in Asia, where the prevalence of the disease is on the rise.^[4] In 2011, India has the highest prevalence (8.3%) and second-largest number (>60 million) of people with type 2 diabetes in the world. Six of the 10 countries that have the greatest diabetes prevalence are in the "Middle East

Kuwait, Lebanon, Qatar, Saudi Arabia, Bahrain, and the United Arab Emirates". About 20.5 million individuals have diabetes and another 13.7 million have impaired glucose tolerance (pre-diabetes).^[5]

Diabetes is a "silent disease" until organ damage occurs. Diabetes self-care is poor from home-based activities such healthy diet, activity, and adherence to medication to preventative care. Assessing patient knowledge of diabetes, its complications, and self-care improves medication compliance and reduces disease complications.^[6] The International Diabetes Federation indicated that diabetes is a critical health issue. People with diabetes mellitus (DM) face chronic hyperglycemia, which can lead to a variety of complications.^[7]

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Submission: 09-Mar-2023 **Accepted:** 12-Apr-2023 **Published:** 02-Feb-2024

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How to cite this article: Hermis AH, Muhaibes FJ. Association between self-care and complications among patients with type 2 diabetes mellitus: A cross-sectional study. Med J Babylon 2023;20:762-5.

Access this article online

Quick Response Code:



Website:
<https://journals.lww.com/mjby>

DOI:
10.4103/MJBL.MJBL_286_23

Diabetes is related to problems such retinopathy, nephropathy, neuropathy, and cardiovascular disease, which can lead to chronic mortality and morbidity.^[8]

Diabetes type 2 is a result of the combination of environmental, genetic, and behavioral risk factors. Diabetes can also be caused by the hormonal environment during pregnancy, genetic problems, infections, and drugs.^[9] Diabetes self-care includes self-monitoring of blood glucose (SMBG), diet, exercise, and medication compliance. Self-care practices and life cycle changes are also considered. Good diabetes care and short- and long-term outcomes depend on a number of self-care behavior, including glycemic control. Clinical recommendations emphasize adherence, physical activity, diet, and SMBG.^[10]

The objective of this study was to examine the associations between diabetes self-care and complications in type 2 diabetes patients.

MATERIALS AND METHODS

Setting

This research is a quantitative study of cross-sectional design that conducted at the diabetic and endocrine center in Al-Dewaynia Teaching Hospital, Iraq.

Research subject

This study was conducted between April 25, 2022 and January 25, 2023. The populations in our study were patients with diabetes type 2. A total of 151 patients were participated. The inclusion criteria were having a history of diabetes type 2 of more than one year after diagnosis and age more than 20 years.

Instrument

The instrument used in the study was composed of two aspects:

1. Demographic variables (age, gender, marital status, and level of education) and clinical variables (disease duration, type of treatment, family history of T2D diabetes, and body mass index [BMI]).
2. Diabetes Self-Care Scale (DSCS):

Lee and Fisher^[11] of the United States developed the diabetes self-care scale in 2005 to determine the self-care levels of individuals diagnosed with DM. The level of Cronbach alpha of the original scale was 0.80. The findings of the pilot study showed that the reliability of the Iraq version of the scale was ($r = .82$) after application on ten patients with type 2 DM. The scale is a 4-option Likert-type scale and contains 35 items. The minimum score is 35 and the maximum score is 140; the higher the score, the better the self-care level in patients with diabetes. The items in the scale include feeding time and status, doing regular physical activity, using treatment as recommended, measuring and recording blood glucose,

going to doctor follow-ups for blood glucose control, foot care and understanding its importance, personal hygiene methods, and having knowledge about diabetes and the complications it may cause.

Statistical analyses

Statistical analysis of the data was performed using the SPSS 22.0 package program (SPSS, IBM Company, Chicago, Illinois). Numerical data were demonstrated as mean, standard deviation (SD), minimum, and maximum values and distribution data are as number (n) and percentage (%). In the analysis of data, descriptive statistics and independent t tests were used for association analysis. Statistical significance level was considered significant when $P < 0.05$.

Ethical consideration

Ethics committee approval was obtained with the decision of Babylon University, Nursing College Ethics Committee as well as the technical section in Al-Diwaniyah Health Directorate to obtain official permission to carry out the study. After that verbal consent was obtained from the patients, data were gathered through face-to-face interview method, while height and weight by the researchers.

RESULTS

Diabetes is a chronic health problem whose importance is increasing day-by-day in the world due to its increased frequency and the adverse health consequences it causes in the patient's life. With the rapid change in lifestyle, the prevalence of type 2 diabetes is increasing rapidly in all societies. Diabetes negatively affects individuals of all ages.

The results showed that of 151 diabetic patients, 84 (55.6%) were women and 67 (44.4%) were men. The mean age of the patients in the study was 53 ± 10.8 years. 47 patients (31.1%) were unable to read and write [Table 1].

The duration of the disease between 7 and 10 years was 72 (47.7%) as the highest percentage. Regarding the type of treatment, 79 (52.3%) received insulin highest percentages of the patients had heredity history of the disease as (father—63 (41.7%) and mother—49 (32.5%). Among the participants, nine (6%) were underweight, 28 (18.5%) were normal, 54 (35.8%) were overweight, 40 (26.5%), and 20 (13.2%) were severely obese [Table 2].

Regarding the distribution of the participants in respect to self-care management; 88 (58.3%) had low self-care, 58 (38.4%) had moderate self-care, and 5 (3.3%) had high self-care score [Table 3].

The prevalence rates of cardiovascular, retinopathy, neuropathy, diabetic foot, nephropathy, and hepatic as complications of diabetes were 32 (21.2%), 63 (41.7%), 39 (25.8%), 21 (13.9%), 11 (7.3%), and 2 (1.3%), respectively [Table 4].

Table 1: Demographic data (n = 151)

Demographic data	Rating and interval	n (%)
Age	20–29	11 (7.3)
	30–39	20 (13.2)
	40–49	26 (17.2)
	50 +	94 (62.3)
Gender	Male	67 (44.4)
	Female	84 (55.6)
Marital status	Single	20 (13.2)
	Married	100 (66.2)
	Separated	5 (3.3)
	Divorced	6 (4)
	Widowed	20 (13.2)
Education	Unable to read and write	47 (31.1)
	Read and write	21 (13.9)
	Primary school graduate	31 (20.5)
	Intermediate school graduate	9 (6)
	Secondary school graduate	12 (7.9)
	Institute graduate	20 (13.2)
	College graduate	11 (7.3)

Table 2: Clinical data (n = 151)

Clinical data		n (%)
Disease duration	<3 years	11 (7.3)
	3–6 years	36 (23.8)
	7–10 years	72 (47.7)
	>10 years	32 (21.2)
Type of treatment	Oral antidiabetics	43 (28.5)
	Insulin	79 (52.3)
	Oral antidiabetics and insulin	23 (15.2)
	Oral antidiabetics before and insulin now	6 (4)
Heredity of the disease	Father side	63 (41.7)
	Mother side	49 (32.5)
	Non	39 (25.8)
	Under weight	9 (6)
BMI	Normal weight	28 (18.5)
	Over weight	54 (35.8)
	Obese	40 (26.5)
	Severely obese	20 (13.2)

Table 3: Assessment of diabetes self-care

Self-care level	n (%)	Mean ± SD	Min	Max
Low	88 (58.3)	71.84 (14.79)	44	133
Moderate	58 (38.4)			
High	5 (3.3)			
Total	151 (100)			

DISCUSSION

The present study result found no association between the self-care of diabetes and retinopathy, cardiovascular

Table 4. DM complications and diabetes self-care scale

DM complications	n (%)	Mean (SD) score of self-care	P
Retinopathy			
Yes	63 (41.7)	71.90 ± 11.21	0.097
No	88 (58.3)	71.80 ± 16.96	
Neuropathy			
Yes	39 (25.8)	78 ± 8.83	0.002
No	112 (74.2)	69.70 ± 15.84	
Cardiovascular problems			
Yes	32 (21.2)	68.15 ± 8.587	0.112
No	119 (78.8)	72.84 ± 15.94	
Diabetic foot			
Yes	21 (13.9)	64.52 ± 7.180	0.005
No	130 (86.1)	72.99 ± 15.42	
Nephropathy			
Yes	11 (7.3)	67.36 ± 6.975	0.304
No	140 (92.7)	72.15 ± 15.24	
Hepatic problems			
Yes	2 (1.3)	85.5 ± 10.60	0.190
No	149 (98.7)	71.66 ± 14.78	

Independent sample *t* test

*Values in bold are significant at $P < 0.05$

problems nephropathy, and hepatic problems, whereas evidence was found of an association between diabetes self-care and neuropathy and diabetic foot.

This result was similar with the findings of Mehravar and colleagues study that found a significant association between the diabetic self-management and neuropathy (adjusted odds ratio = 0.64; 95% confidence interval = 0.45–0.92; $P = 0.01$).^[12] Also Laxy *et al.*^[13] study found relationship between diabetes self-management scores and diabetic neuropathy risk.

The education level has a direct association with self-care; the lower the level of education, the less knowledge about self-care activities. Education has a role in social inequality in health service access. Hence, those with a poor education level may have greater difficulties acquiring access to self-care information and learning regarding self-care.^[14] This could be one of the causes behind the low self-care level among the present study sample.

In conclusion, due to the chronic nature of the disease, people with diabetes should adhere to self-care behaviors for the length of their lives. These behaviors include healthy eating, medical therapy follow-up, and continuous glucose monitoring to adjust the diet, a maintainable activity level, and medication adherence. Appropriate lifestyle changes and self-care behaviors are important to the prevention and management of diabetes, which can lead to serious consequences.

Hence, physician, diabetes nurses, and family support are required for providing continuous education.

CONCLUSION

Since patients with lower health literacy obtained lower self-care scores, and given the significance of self-care behaviors in diabetes management and control, it is crucial to increase awareness and subsequently self-care patterns by providing individuals with health facilities, education, and social and family support. Further investigations to find preventive solutions for complications with marginal relationships with self-care are important.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

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