Self-Care Practices and its Effect on Glycemic Control among Type II Diabetes Mellitus Patients

Rupendra Pal Singh Rathore[1], Ravi Shekhawat[2], Anubhav Sharma[3], Sunil Gora[1], Kapil Garg[4], Mayank Jain[5]

[1]PG Resident, Department of Community Medicine, Jhalawar Medical College, Jhalawar

[2]Senior Medical Officer, CHC Tarnau, Nagaur

[3]Senior Resident, Department of Community Medicine, Government Medical College, Alwar

[4]Assistant Professor, Department of Community Medicine, Jhalawar Medical College, Jhalawar

[5]Professor, Department of Community Medicine, Jhalawar Medical College, Jhalawar

Abstract

Background: Diabetes is a non-communicable disease that necessitates daily self-management through the establishment and maintenance of a continuum of care in order to achieve optimal health outcomes. It is commonly understood that diabetes self-care practice is critical in the management of the disease. However, the magnitude and determinants of self-care practices are not well evaluated at the community level.

Objectives: To access the level of self-care practice and its effect on glycemic control among type 2 diabetes mellitus patients.

Method: A community based cross-sectional study was conducted at Urban field practice area of Jhalawar Medical Colleg during May 2023 to October 2023 on 440 confirm patients of Type II DM. Pretested semi structured questionnaire was used for obtaining information regarding socio demographic profile, disease history, Diabetes Self-Management Questionnaire (DSMQ). Blood sample was collected following standard protocol for HbA1c to measure their glycemic control of patient.

Results: Out of 440 diabetics, 58.4% were male and 41.6% were female. Mean age of the patients was 52.48±10.8 years. Mean duration of diabetes was 9.88 ± 4.34 years. More than half of the diabetics (262, 59.55%) had good glycaemic control. Most common self care activity was taking medication (82.5%) as advised. DSMQ sum scale was significantly different among good and poor glycemic control groups (p value=0.01).

Conclusion: Nearly half of patients following self care diabetes management practices. Diabetes self-care practices are significantly associated with good glycemic control among diabetics.

Keywords: Diabetes, DSMQ, Glycemic control, Self-care practice.

Introduction

Diabetes (DM) is one of commonest metabolic disorder and has a high burden (13.5% in women and 15.6% in men) in India. [1] Ageing populations, growing urbanisation, dietary changes, decreasing physical activity and unhealthy behavior are all contributing to the rise of DM. [2] Indians have a tendency to develop and raise insulin resistance, higher abdominal adiposity (greater waist circumference in spite of lower body mass index), greater prevalence of impaired glucose tolerance, adding to a higher risk of growing disease at a comparatively younger age. [3]

DM is associated with complications such as cardiovascular diseases, nephropathy, retinopathy and neuropathy, which can lead to chronic morbidities and mortality. [4] Poor glycemic control and inadequate adherence to self care activities lead to development of microvascular and macrovascular complications usually in the second decade of hyperglycemia. [5]

Successful management of DM is a challenge for physician. He should identify a target level of glycemic control for each patient, provide the patient with educational (nutrition and exercise, monitoring the level of glycemic control, foot care) and pharmacologic (Oral Hypoglycemic Agents, insulin or combination) resources necessary to reach this level along with monitoring of complications.

[6] In countries with limited resources like India, treatment costs for diabetes are constantly rising. The self-care component may lead to improved therapeutic and economic outcomes. [7]

Self care in diabetes is defined as behaviors undertaken by people with or at risk of diabetes in order to successfully manage the disease on their own. [8] The role of patients in the management of diabetes is critical in terms of dietary modifications, lifestyle changes, medication compliance, regular foot care, monitoring of blood sugars and avoidance of addiction, etc. [9] The prognosis of the patients with DM largely depends on the complications seen in the natural course of illness. Stringent adherence to self care activities is the mandatory step in the management of DM to delay the occurrence of all micro and macrovascular complications.

Material and Methods:

Study design: A community based cross-sectional study.

Study setting: Study was conducted at Urban field practice area of Jhalawar Medical College, Jhalawar which is situated at Jhalarapatan and consist approximately 42,832 population.

Study duration: Six months (May 2023 to October 2023).

Study population: All confirm patients of Type II DM aged above 18 years and residing at study setting.

Inclusion criteria:

1. Confirm cases of Type II DM and started on treatment for at least one year.
2. People aged 18 years and above.
3. Willing to participant in study and give written consent.

Exclusion criteria:

1. Seriously ill patients (not able to answer or dependent on others for care).
2. Pregnant women.

Sample size and sampling technique: Considering 50% patients of DM type II are following self-care practice, sample size was 400 by using formula $4pq/l^2$. Considering non response rate as 10 % (10 % of 400=40), final sample size was considered as 440. Based on record maintain at UHTC, a list of Type II DM was prepared. By using simple random sampling method (lottery method), 440 patients was selected.

Study tools: Pretested semi structured questionnaire was used for obtaining information regarding socio demographic profile, disease history, Diabetes Self-Management Questionnaire (DSMQ). The DSMQ[10] has four subscales: Dietary Control (items 2, 5, 9, 13), Glucose Management (items 1, 4, 6, 10, 12), Physical Activity (items 8, 11, 15), and Health Care Use (items 3, 7 and 14); and described on a Likert Scale, scaling from 0 (does not apply) to 3 (very much applies) to originate a summed score for a Sum Scale. Overall rating for self-care is item sixteen and also added in sum scale' only.

Method of data collection: Based on inclusion and exclusion criteria, 440 confirm cases of type II DM were enrolled in study. After obtaining informed written consent, diabetic patients were interviewed regarding diabetes self-care practices (over the period of last eight weeks) through a structured questionnaire. Collected information's were recorded in individual proforma. Blood sample was collected following standard protocol for HbA1c to measure their glycemic control of individual patient.

Ethical consideration: The present study was conducted after getting permission from the institutional ethic committee of Jhalawar Medical College, Jhalawar. Inform written consent was taken from participants before enrollment.

Statistical analysis: The data were collected and entered in Microsoft excel worksheet. SPSS version 23.0 was used for data analysis. Mean, standard deviation and student t test was used for analysis.

Results:

Out of 440 diabetics, 257 (58.4%) were male and 183 (41.6%) were female. Mean age of the patients was 52.48±10.8 years. Mean duration of diabetes was 9.88 ± 4.34 years. More than half of the diabetics (262, 59.55%) had good glycaemic control. About 82.5% took diabetes medication as advised while only 50.68% subjects recorded their blood sugar levels regularly. To achieve optimal levels of blood sugar level diet plan and exercise is followed by 59.55% and 57.05%. Only 53.86% patients keep all doctors' appointments. (Table 1)

Table 1: Adherence of Self-Care Activities among Diabetes Patients.

Questions about Self-Care Activities (Over the Last 8 Weeks)	Applies to Me Very Much (%)	Applies to Me to a Considerable Degree (%)	Applies to Me to Some Degree (%)	Does Not Apply to Me (%)
I check my blood sugar levels with care and attention.	59 (13.4)	164 (37.3)	88 (20)	129 (29.3)
The food I choose to eat makes it easy to achieve optimal blood sugar levels	53 (12)	209 (47.5)	63 (47.5)	115 (26.1)
I keep all doctors' appointments	106 (24.1)	131 (29.8)	98 (22.5)	105 (23.9)
I take my diabetes prescription (e.g. insulin, tablets) as advised.	203 (46.1)	160 (36.4)	44 (10.0)	33 (7.5)
Occasionally I eat lots of sweets or other foods rich in carbohydrates.	55 (12.5)	75 (17.0)	201 (45.7)	109 (24.8)
I record my blood sugar levels regularly	96 (21.8)	128 (29.1)	78 (17.7)	138 (31.4)
I tend to avoid diabetes-related doctors' appointments.	47 (10.7)	63 (14.3)	89 (20.2)	241 (54.8)
I do regular physical activity to achieve optimal blood sugar levels.	105 (23.9)	146 (33.2)	72 (16.4)	117 (26.6)
I strictly follow the dietary recommendations given by my doctor or diabetes specialist.	118 (26.8)	99 (22.5)	105 (23.9)	118 (26..8)
I do not check my blood sugar levels	112 (25.5)	56 12.7	97 22.0	175 39.8
I avoid physical activity, though it would get better.	57 (13.0)	42 (9.5)	107 (24.3)	234 (53.2)
I tend to forget to take or skip my diabetes medication (e. g. insulin, tablets). Diabetes medication / insulin is not required as a part of my treatment.	49 (11.1)	113 (25.7)	123 (28.0)	155 (35.2)
Sometimes I have real 'food binges'	32 (7.3)	90 (20.5)	223 (50..7)	95 (21.6)
Regarding my diabetes care, I should see my medical practitioner (s) more often.	31 (7.0)	49 (11.1)	103 (23.4)	257 (58.4)
I tend to skip planned physical activity.	60 (13.6)	60 (13.6	100 (22.7)	220 (50.0)
My diabetes self-care is poor.	84 (19.1)	130 (29.5)	135 (30.7)	91 (20.7)

Table 2: Comparison of the DSMQ self-care activities in patients with HbA1c ≤ 7.0%, and >7.0%

DSMQ self-care activities	HbA1c ≤ 7.0% (Mean±SD)	HbA1c >7.0% (Mean±SD)	Total (Mean±SD)	P value
Glucose Management	1.58±0.58	1.31±0.42	1.47±0.47	0.001
Dietary Control	1.37±0.67	1.23±0.64	1.31±0.66	0.02
Physical Activity	1.15±0.69	1.0±0.58	1.09±0.65	0.01
Health-Care Use	1.03±0.67	0.96±0.63	1.0±0.66	0.24
DSMQ Sum Scale	1.31±0.45	1.21±0.42	1.27±0.43	0.01

*Student t test was used as test of significance and p value < 0.005 was considered significant.

Significant differences was found in subscales of self care activities such as glucose management, dietary control and physical activity among diabetics having good glycemic control and poor glycemic control (p value <0.005) although difference in health care use was insignificant (p value=0.24) in these two groups. DSMQ sum scale shows significant differences among these two groups (p value=0.01).

Discussion

To find the level of self-care practice and its effect on glycemic control among type 2 diabetes mellitus patients, a cross-sectional study was carried out on

440 diabetic patients residing at urban field practice area. Out of 440 diabetics, male were at higher percentage (58.4%) than female (41.6%). Mean age of the patients was 52.48±10.8 years while mean age at onset of diabetes was 43.84±09.10 years. Mean duration of diabetes was 9.88 ± 4.34 years. Good glycaemic control was fond in more than half of the diabetics (262, 59.55%). Among diabetics having good glycemic control and poor glycemic control, self care activities such as glucose management, dietary control and physical activity was significantly different (p value <0.005) although difference in health care use was insignificant (p value=0.24) in these two groups. DSMQ sum scale shows significant differences among these two groups (p value=0.01).

Andreas Schmitt et al assessed DSMQ in 261 diabetic patients and found average age of patients was 52 ± 15 years, 44% were female, a mean BMI of 30 ± 7 kg/m2, and a mean HbA1c value of 8.6 ± 1.5%. The comparison of patient groups with good glycaemic control, medium glycaemic control and poor glycaemic control revealed significant differences regarding both the DSMQ sum scores as well as the subscale scores. [11]

Vanitha Durai et al [12] conducted study on 390 type 2 diabetes patients. The mean age of the participants was 56.17 (10.4) years. Of them, 73.3% were female. Dietary advice was followed by 53.5%, while physical activity, regular medicine, feet care and blood glucose was monitor by 46%, 57.2%, 25% and 90% of participants. Dietary modifications and glucose management is associated with a lower HbA1c while physical activity was not associated with lower HbA1c levels.

A cross-sectional study was undertaken to observe the adherence to self-care management among 92 diabetes by Mohammad Suhail Khan et al. [13] Among participants, mean age was 53.37 years, 53.0 % were male and 47.0 % were female. In contrast to present study, higher percentage of patient were practicing self care activities(dietary advice 93.5%, doctors' appointments as recommended 100%, 95.7% took diabetes medication as advised and 88.0 % subjects recorded their blood sugar levels regularly).

Jwalant Joshi et al [14] conducted study on 178 diabetics and found good glycaemic control was observed in patients with dietary adherence (OR = 6.81, 95% CI = 2.71 to 17.16), medication adherence (OR = 4.59, 95% CI = 1.3 to 16.24) and regular exercise (OR = 3.65, 95% CI = 1.62 to 8.19). Similar result was found by Sasi ST et al [15] and Durai V et al. [16] They also reported that patients following dietary recommendation and taking medication regularly had good glycaemic control. However, compliance to physical activity and regular blood glucose monitoring were not associated with glycaemic control.

Conclusion

Taking diabetes medication as par prescription is most common self care activity followed by diabetic patients while regular blood sugar monitoring, diet plan and physical exercise was done by nearly half of the patients. Diabetes self-care practices are significantly associated with good glycemic control among diabetics.

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