ORIGINAL RESEARCH

Self-Care practices among type II diabetics attending rural health training centre in Tamil Nadu

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ABSTRACT

Aim: The objective of this study was to evaluate self-care practices among diabetics attending the Rural Health Training Centre. **Methodology:** A cross-sectional study was conducted at the Diabetic Outpatient Department, Rural Health Training Centre of a Medical College Hospital, among 150 people with type II diabetes from June 2019 to August 2019. A validated semi-structured questionnaire was used to interview the participants with a sample size of 150. The summary of diabetes activities (SDCSA) scale was used to assess diabetes self-care. Glycaemic control was considered the primary outcome variable. Risk factors were considered as primary explanatory variables chi-square test was used to test statistical significance. **Results:** Among the study population, 42 (28%) participants were aged between 30 to 40 years, four (22.67%) participants were aged between 41 to 50 years, 43 (28.67%) participants were aged between 51 to 60 years, and 31 (20.67%) participants were aged 60 years and above. The univariate logistic regression analysis had shown a statistically significant association between glycemic control with risk factors like smoking, alcohol, history of diabetes, taking drugs regularly, history of treatment, test glucose, fasting blood sugar, and postprandial blood sugar. **Conclusions:** Our study findings have proven the association between self-care practices and good glycemic control.

Key words: Self-care, diabetes mellitus, non-communicable disease, blood glucose self-monitoring, risk factors.

INTRODUCTION

Around 451 million persons globally had diabetes mellitus (DM) in 2017; according to International Diabetes Federation Data [1], by 2045, the number of persons with DM is expected to rise to 693 million [1]. Both the threats of communicable and non-communicable diseases exist in India. The prevalence of type II DM has been on a constant rise. In India, 72.9 million people live with diabetes, and it is second to China in having the highest number of DM cases [1]. Type II DM is caused due to various lifestyle changes that occur among huge population groups. Dietary changes have led to the development of insulin resistance. Different lifestyle and nutritional factors precipitate DM: a high-carb diet, low fiber-rich green vegetables, fresh fruits, less physical exercise, and a sedentary lifestyle. The insulin resistance caused the development of the chronic metabolic disorder caused by persistent hyperglycemia. This hyperglycemia causes damage to various organs of the body. To prevent the complications of the disease, reasonable metabolic control has to be achieved through lifestyle modifications, medication adherence, and regular follow-up with health care [2].

The patients can do various self-care practices at their homes, such as blood glucose monitoring, foot examination, adherence and compliance to

medication, following a controlled diet, and regular exercise [3].

A study conducted by Recharla CK *et al.* [4] showed that the self-care practices among the rural area residents were poor (5.6%). Goyal *et al.* [5] showed that the self-care practices were associated with the patients' educational status and socioeconomic status. Previous literature has shown that following healthy lifestyle practices and self-care practices help keep the blood glucose level under control.[6, 7] Thereby, it can help in improving the quality of life among diabetes patients [8]. Good patient knowledge and health care practices have reduced cardiovascular risk factors and enabled reasonable glycemic control [8].

Diabetes is a chronic disease that has a significant impact on the economy of patients. By preventing the complication rates, we can reduce the economic, psychological, and physical impact of the disease. One strategy to reduce the incidence of complications is through self-care. Self-care practices are defined as behaviors practiced by people with diabetes to manage the disease on their own successfully [9]. These self-care practices are found to associate with glycemic control and thereby reduce the incidence of complications occurring due to DM [9]. Even though studies are available on self-care practices, only a few studies have explored self-care practices in rural areas.

Therefore, there is a need to assess the self-care practices pattern in rural areas. With this background, this study was planned to assess the self-care practices pattern among diabetes patients residing in rural areas and determine the factors associated with the self-care practices.

MATERIALS AND METHODS

A facility-based cross-sectional study was conducted at Rural Health Training Centre, the rural field practice area, from June 2019 to August 2019 among people with diabetes attending the diabetic outpatient department.

The people diagnosed with type 2 diabetes above 18 years and willing to participate were included in this study. The sample size was calculated based on the prevalence of self-care practice levels by Veerakumar *et al.* [10], analysis, which showed that 40% of diabetic patients had good self-care practices. The sample size was estimated to be 150 using the formula $4pq/d^2$ with a 5% significance level. A convenient sampling technique was followed by recruiting the type II DM patients attending the rural center. A structured questionnaire was used, which included sociodemographic characteristics and questions related to self-care practices. Sociodemographic variables included age, gender, religion, education, occupation, and socioeconomic status. Occupational status is classified into sedentary, moderate, and heavy workers. Socioeconomic status was classified according to the modified BG Prasad Scale 2019. [11] Smoking and alcohol status was determined by having one puff of smoke or one drink (approximately 90 ml) for the past year.

The self-care questions were adopted from the summary of diabetes self-care activities (SDSCA) questionnaire [12]. It consists of physical activity, medication, testing blood sugar, foot care, and smoking. Every domain of self-care was assessed. The questions included whether the patient routinely checked for his blood glucose, the regularity in taking drugs, frequency of skipping medications, and history of foot ulcers.

Data was collected in the diabetic outpatient department by interviewing the subjects after getting informed written consent.

Fasting and postprandial blood sugar values were checked after getting informed consent from the participants by using a semi-auto analyzer in a rural health training center during their visit. The value of 80-120 mg/dl of fasting glucose and 90-145 mg/dl of postprandial glucose is considered an adequate control [13].

Institutional Ethics Committee has approved this study. A written informed consent containing the study details was obtained from all participants, and data confidentiality was maintained.

STATISTICAL METHODS

Glycaemic control was considered the primary outcome variable. Risk factors were considered as the primary explanatory variable. Another study-relevant variable was socioeconomic status, comorbidities, self-care activities, and recommendations. Descriptive analysis was carried out by mean and standard deviation for quantitative variables, frequency, and proportion for categorical variables. Univariate binary logistic regression analysis was performed to test the association between the explanatory variables and outcome variables. An unadjusted odds ratio along with 95% CI is presented. P-value < 0.05 was considered statistically significant. The coGuide version V.1.3 [14] and R studio was used for statistical analysis

RESULTS

A total of 150 subjects were included in the final analysis.

The sociodemographic profile of the participants has been represented in Table 1.

The study participants' risk factors of type II diabetes mellitus and comorbidities have been represented. (Table 2).

The mean fasting blood sugar of people with glycemic control was 123.9±12.23, 172.56±21.42 in people without glycemic control. The mean postprandial blood sugar of people with glycemic control was 167.15±10.44, and it was 240.66±33.56 in people without glycemic control. The results have shown a statistically significant association between various self-care practices and glycemic control. (Table 3).

Table 1: summary of socio - demographic characteristics (N = 150)

Parameter	summary
Age group	
30 to 40	42(28.00%)
41 to 50	34(22.67%)
51 to 60	43(28.67%)
60 and above	31(20.67%)
Gender	
Male	50(33.33%)
Female	100(66.67%)
Religion	
Hindu	132(88.00%)
Christian	11(7.33%)
Muslim	7(4.67%)
Education	
Illiterate	26(17.33%)
Primary	22(14.67%)
Middle	35(23.33%)
High	42(28.00%)
Higher secondary	18(12.00%)
Graduates	7(4.67%)
Occupation	
Sedentary	78(52.00%)
Moderate	65(43.33%)
Heavy	7(4.67%)
Night Shifts	7(4.67%)
Family Type	
1 joint	39(26.00%)
2 Nuclear	111(74.00%)
Socio Economic Status	
Upper middle class	19(12.67%)
Middle class	53(35.33%)
Lower middle class	67(44.67%)
Lower class	11(7.33%)

Table 2: summary of risk factor &comorbidity characteristics (N = 150)

Parameter	Summary
BMI (kg/m2) (mean±SD)	25.38±2.21range (21 to 32)
Comorbidity	
Hypertension	49(32.67%)
Hypertension & CHD	2(1.33%)
CHD	1(0.67%)
Nil	98(65.33%)
Glycaemic Control	89(59.33%)
Risk factor	
Smoking	24(16%)
Tobacco	3(2%)
Alcoholic	24(16%)
History of diabetes less or equal to 5years	82(54.7%)
Taking drugs regularly	119(79.3%)
How Often skipping of medication/Weeks (mean±SD)	0.85±1.87
Self-Glucose monitoring	110(73.3%)
History Foot ulcer	10(6.7%)
History of hospitalization	15(10%)
History of treatment	
Yes	141(94.00%)
No	9(6.00%)
Fasting Blood Sugar(**mg/dL)** (mean±SD)	143.69±29.12 range (90 to 234)

Post Prandial Blood Sugar(**mg/dL**) (mean±SD)	197.04±42.79 range (132 to 324)

Table 3: Factors associated with glycemic control in study population univariate logistic regression analysis (N=150)

Parameter	Glycaemic Control		Un adjusted odds ratio 95% CI	P value
	Yes (N=89)	No (N=61)		
(Base line=No)				
Smoking (N=24)	4 (16.67%)	20 (83.33%)	0.096 (0.031-0.301)	<0.001
Tobacco (N=3)	1 (33.33%)	2 (66.67%)	0.335 (0.030-3.781)	0.377
Alcoholic (N=24)	4 (16.67%)	20 (83.33%)	0.096 (0.031-0.301)	<0.001
History of diabetes less than or equal to 5 years (N=82)	57 (69.51%)	25 (30.49%)	2.565 (1.314-5.009)	0.006
Taking Drugs Regularly (N=119)	86 (72.27%)	33 (27.73%)	24.323 (6.924-85.449)	<0.001
Skipping of medication/ Weeks (Median IQR)	0(0 to 0)	0(0 to 0)	0.489 (0.349-0.685)	<0.001
History of Treatment (N=141)	88 (62.41%)	53 (37.59%)	13.283 (1.616-109.190)	0.016
Self-glucose monitoring (N=110)	87 (79.09%)	23 (20.91%)	71.870 (16.128-320.273)	<0.001
History of foot Ulcer(N=10)	0 (0%)	10 (100%)	0.000 (0.000)	0.999
H/o hospitalization(N=15)	0 (0%)	15 (100%)	0.000 (0.000)	0.998
Fasting blood sugar	123.9±12.23	172.56±21.42	0.804 (0.735-0.880)	<0.001
Post Prandial Blood Sugar	167.15±10.44	240.66±33.56	0.770 (0.680-0.872)	<0.001

DISCUSSION

This cross-sectional study was conducted in rural field areas to study the self-care practices among type II DM patients. Our study revealed that among 150 patients looked at, 59.33% had reasonable glycemic control. Various self-care factors such as smoking, alcohol, history of diabetes, taking the drug regularly, history of treatment, test glucose, fasting blood sugar, and postprandial blood sugar had a statistically significant association with glycemic control (p<0.001).

Among the various self-care practices, 79.3% were taking drugs regularly. The glycemic control was reasonable, and the association between the regular intake of medicines and glycemic control was significant. Recharla CK *et al*. observed similar findings in their study, where the medication adherence was 70.4% [4]. The observation was consistent with other studies by Garg *et al*. (72.3%) [15] and Goyal *et al*. (71.4%) [5]. Minor variations may be due to the rural-urban divide and the characteristic of the study population.

Among the study population, 73.3% checked their blood sugar levels regularly as part of their self-care practices. This was similar to the study by Selvaraj *et al*. [16] and Rajasekaran *et al*. [17] Regular monitoring of blood sugar levels plays a significant role in the long-term maintenance of glycemic control. This acts as a proxy for determining the efficacy of the ongoing medical treatment and alerts the patient on the need for upregulating or downregulating the dosage of medication. The practice of home-based blood glucose monitoring is advised for patients who have poor connectivity to the healthcare settings. Only 6.7% of the study participants had a history of foot ulcers, which indirectly means good foot care among the study population. This was similar to the high level of foot care observed in Garg *et al*. [15] and Goyal *et al*. [5] Foot ulcers were associated with glycemic control. Among the participants who had foot ulcers indefinitely, they had poor glycemic control. The smaller number of patients with foot ulcers can be attributed to the prevalent habit of washing feet among South Indians. Poor adherence to medication puts the patients at the risk of developing foot ulcers and increases the risk of complications arising, such as gangrene of the foot requiring amputation. Hence, creating awareness regarding the foot examination, and foot cleanliness is essential.

The strength of this present study is that the various aspects of self-care have been reported using a valid scale. The limitation of this current study is the small sample size, and patients attending rural centers were recruited, limiting the generalizability. HbA1C values did not assess the long-term glycemic control.

Our study observed that self-care practices lead to the maintenance of reasonable glycemic control, and the association was statistically significant. The study's results can be utilized in advising people with diabetes on having a good self-care routine. Future studies are recommended where various self-care regimens can be devised and their efficacy in maintaining glycemic control.

CONCLUSION

Our study findings have proven the association between self-care practices and reasonable glycemic control. Poor self-care practices in rural areas can

occur due to a lack of knowledge and awareness. Instilling both is the responsibility of the health care providers. Periodic review of the patient and updating him on the glycemic control and ways to maintain it can reduce the complications caused due to the disease.

CONFLICT OF INTERESTS

None Declared

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