RESEARCH PAPER

Selfcare Practices among Uncontrolled Rural Diabetes Patients Attending Primary Health Centre, Puducherry

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ABSTRACT

Background: Self-care practices are fundamental to effective diabetes management and optimal glycaemic control. However, inadequate self-management remains a major challenge among rural populations, contributing to poor diabetes outcomes and increased risk of complications.

Objectives: To assess self-care practices among uncontrolled diabetes patients attending a rural Primary Health Centre (PHC) in Puducherry and to determine the association between self-care practices and glycaemic control.

Methods: A cross-sectional study was conducted among 156 uncontrolled diabetes patients selected through simple random sampling from a rural PHC in Puducherry. Self-care practices were assessed using a validated Self-Care Practice in Diabetes Mellitus (SCPDM) questionnaire covering diet, physical activity, sleep, foot care, doctor visits, habits, precautionary measures, and treatment adherence. Data were analysed using descriptive statistics and Chi-square test, with $p<0.05$ considered statistically significant.

Results: Among the participants, 67.0% had unsatisfactory glycaemic control and 33.0% had satisfactory control. Good self-care practices were observed for diet (16.6%), physical activity (14.7%), sleep (22.4%), foot care (9.6%), and precautionary measures (14.7%). Good treatment adherence was reported by 51.3% of participants, while 53.0% exhibited unfavourable habits. Significant associations were found between glycaemic control and dietary practices (p=0.0004), sleep (p=0.0003), foot care (p=0.0001), doctor visits (p=0.007), habits (p=0.015), and treatment adherence (p=0.001).

Conclusion: Self-care practices among uncontrolled rural diabetes patients were suboptimal across several domains. Strengthening diabetes self-management education and behaviour-change counselling at the primary healthcare level may improve glycaemic control and reduce diabetes-related complications.

Keywords: Diabetes mellitus, Self-care practices, Glycaemic control, Rural health, Primary Health Centre, Treatment adherence

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INTRODUCTION:

Diabetes mellitus (DM) is one of the most challenging chronic non-communicable diseases worldwide, imposing substantial health, social, and economic burdens on individuals and healthcare systems. The International Diabetes Federation (IDF) estimated that approximately 537 million adults aged 20–79 years were living with diabetes globally in 2021, and this number is projected to rise to 643 million by 2030 and 783 million by 2045[1]. India, often referred to as the "diabetes capital of the world," contributes significantly to the global diabetes burden, with more than 101 million individuals affected by the disease[2]. The increasing prevalence of diabetes in rural areas, previously considered relatively protected from lifestyle-related disorders, has emerged as a major public health concern[3].

Active patient participation in self-care behaviors is necessary for effective diabetes control, which goes beyond medication. Self-care behaviors include taking prescription drugs as directed, maintaining a nutritious diet, exercising frequently, self-monitoring blood sugar, taking care of one's feet, quitting smoking, and getting regular checkups[4]. These methods, which are acknowledged as the cornerstone of managing diabetes, are essential for attaining ideal glycaemic control, averting complications, enhancing quality of life, and lowering medical costs[5]. As a crucial part of diabetes care, the American Diabetes Association advises regular self-management behaviours[6].

A significant percentage of patients still have poor glycaemic control despite improvements in diabetes care and the availability of evidence-based management guidelines. Uncontrolled diabetes raises the risk of both macrovascular problems like coronary artery disease and stroke as well as microvascular problems including retinopathy, nephropathy, and neuropathy[7]. Inadequate self-care habits have been shown in numerous studies to be one of the main causes of poor glycaemic outcomes, especially in settings with limited resources[8].

Rural populations face unique challenges in diabetes self-management. Limited access to healthcare facilities, lower health literacy, financial constraints, inadequate diabetes education, cultural beliefs, and reduced availability of specialized diabetes services often hinder the adoption of appropriate self-care behaviors[9]. Furthermore, disparities in healthcare infrastructure and socioeconomic conditions may contribute to poorer diabetes outcomes among rural residents compared with their urban counterparts[10]. In India, studies have reported suboptimal adherence to recommended self-care activities among individuals with diabetes, particularly in rural communities, leading to inadequate glycaemic control and increased disease burden[11].

Primary Health Centres (PHCs) serve as the first point of contact for healthcare services in rural India and play a pivotal role in the prevention, diagnosis, treatment, and follow-up of chronic diseases such as diabetes. Understanding the self-care practices of patients attending PHCs is essential for developing targeted interventions aimed at improving diabetes outcomes. Although several studies have explored diabetes self-management in different regions of India, evidence focusing specifically on uncontrolled diabetic patients residing in rural areas of Puducherry remains limited. Moreover, there is a paucity of data examining the pattern and determinants of self-care behaviours among this vulnerable population.

Assessing self-care practices among uncontrolled rural diabetes patients attending primary health centres in Puducherry is therefore important to identify gaps in diabetes self-management and to inform context-specific strategies for strengthening patient education and support. The findings of the present study may contribute to the development of tailored interventions that enhance self-care behaviours, improve glycaemic control, and reduce the burden of diabetes-related complications in rural communities.

OBJECTIVES

1. To determine the selfcare practices of diabetes patients with uncontrolled glycaemic control attending primary health centre, Puducherry
2. To determine the association between glycaemic control and self-care practices among the study participants

MATERIALS AND METHODS

The study was conducted among diabetes patients registered and receiving treatment for atleast 3 months in the past one year in a primary health centre, Puducherry. A total of 453 Diabetes patients were registered based on the above mentioned criteria, out of them 212 patients had ideal glycameic control (FBS:80-110 mg/dl and or PPBS: 120-140 mg/dl and/or HbA1C: <7%) 64 had Satisfactory glycameic control(FBS:111-125 mg/dl and or PPBS:141-180 mg/dl and/or HbA1C: ≥ 7 - <8%) 177 had unsatisfactory glycaemic control(FBS:>125 mg/dl and/or PPBS>180 mg/dl and/or HbA1C: ≥ 8%). For the study purpose, the patients who fall under ideal control were considered to have Controlled diabetes and those who fall under satisfactory and unsatisfactory glycaemic control were considered to have uncontrolled diabetes.

The present study considers only the uncontrolled diabetes patients, out of total 241 uncontrolled diabetes patients, 156 patients were selected by simple random sampling method. The self-care practices were assessed using a content validated questionnaire. The self-care practice questionnaire contained 8 components namely Diet, Physical activity, Sleep, Foot care, Doctor visit, Habits, Precaution measures, Treatment adherence. Each component was given scoring and classified as Good, Moderate and Poor except the Habit component which was classified as Favourable and Unfavourable Habits. The scoring details mentioned in Table 1. The data was analysed using Open Epi. Frequency and proportion was used for the descriptive analysis and Chi-square test was used to determine the association between the self-care practice and the glycaemic control, p value < 0.05 was considered statistically significant.

Table 1: Self Care Practice Diabetes Mellitus (SCPDM)

S. No	SELF CARE COMPONENTS	No. of questions	CLASSIFICATION based on SCORING	CLASSIFICATION based on SCORING	CLASSIFICATION based on SCORING
1	Diet	16	>35	Moderate : 20-35	Poor <20
2	Physical activity	3	Good >5	Moderate: 3-5	Poor: < 3
3	Sleep	2	Good: 5-6	Moderate: 3-4	Poor:0-2
4	Foot care	3	Good > 5	Moderate : 3-5	Poor <3
5	Doctor visit	3	Good: 6-7	Moderate : 3-5	Poor: 0-2
6	Habits	3	Fvaourable:0	Unfavourable: 1-3	
7	Precaution measures	4	Good :6-8	Moderate: 4-7	Poor:0-3
8	Treatment adherence	1	Good:3	Moderate:1-2	Poor:0

RESULTS:

Among the 156 diabetic patients, majority of them belonged to the age category of 51-65 years (57.7%) and there was higher proportion of females, 99(63.5%) compared to males 58(37.2%). Most of them were Hindu,145(92.3%) by religion and had higher proportion of participants belonging to Class I socio economic class 98(62.8%). [Table 2]

Table 2: Distribution of participants based on baseline characteristics (n=156)

S. No	Parameter	Frequency (%)
1	**Age category**	
	35-50 years	35(22.4%)
	51-65 years	90(57.7%)
	>65 years	31(19.9%)
2	**Gender**	
	Male	58(37.2%)
	Female	99(63.5%)
3	**Religion**	
	Hindu	145(92.3%)
	Christian	9(5.7%)
	Muslim	2(1.3%)
4	**Socio economic class (Modified BG Prasad classification)**	
	Class I	98(62.8%)
	Class	40(25.6%)
	Class III	19(12.2%)

Out of 156 diabetic patients, it was noted that proportion of participants with Unsatisfactory glycaemic control was higher than proportion of participants with satisfactory glycaemic control,67% vs 33% respectively [Figure 1]

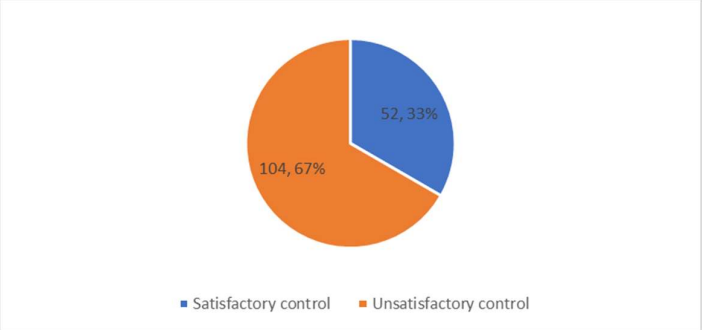

Figure 1: Distribution of participants based on glycaemic control (n=156)

Only 16.6% of subjects had healthy eating habits when their diabetes mellitus self-care practices were evaluated. It was also discovered that a smaller percentage of participants had good levels of physical activity, adequate sleep, appropriate foot care practices, and good precautionary measures (14.7%, 22.4%, 9.6%, and 14.7%, respectively).[44].9% of the individuals were found to have a moderate level of self-care practice in relation to doctor visits.[51].3% of the individuals showed good treatment adherence practices. [Figure 2]

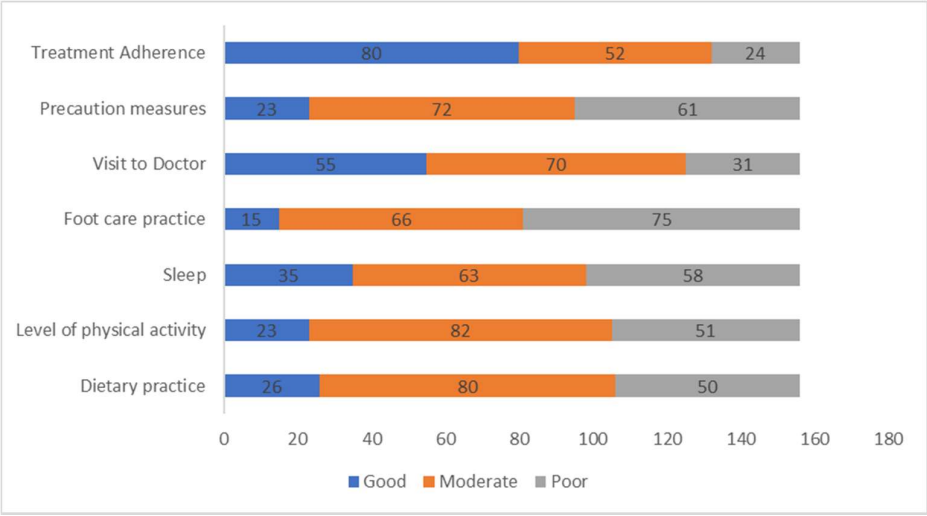

Figure 2: Distribution of participants based on self-care practices in Diabetes mellitus (n=156)

Proportion of participants having Unfavourable habits was higher than those who had favourable habits, 53% vs 47% respectively [Figure 3].

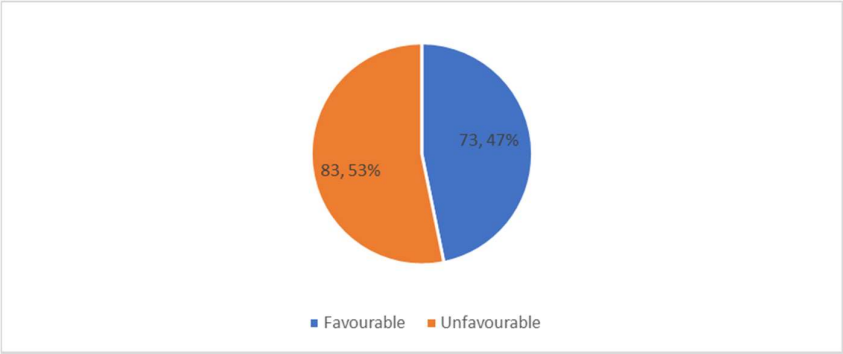

Figure 3: Distribution of participants based on habits (n=156)

The self-care practices in diabetic patients was compared between those who had satisfactory control and those who had unsatisfactory control based on their glycaemic status. Chi square test was used to assess the significance and p value < 0.05 was considered statistically significant.

It was noted that the proportion of participants with good and poor dietary practices was higher among patients with Unsatisfactory control compared to those with satisfactory control, 19.2% vs 11.5%, 42.3% vs 15.4%, whereas moderate dietary practice was higher among patients with satisfactory control compared to Unsatisfactory control, 73.1% vs 40.4% and it was found statistically significant with a p value of 0.0004. The proportion of participants with good and moderate level of physical activity was higher among patients with satisfactory control compared to those with unsatisfactory control, 15.4% vs 14.4%, 53.8% vs 51.9%, whereas those with poor level of physical activity was higher among unsatisfactory control compared to satisfactory control, 33.6% vs 30.8% respectively, however this was statistically insignificant with a p value of 0.935. The proportion of participants with good and moderate sleep was higher among patients with satisfactory control compared to those with unsatisfactory control,32.7% vs 17.3%, 51.9% vs 34.6% , whereas those with poor sleep was higher among unsatisfactory control compared to satisfactory control,48.1% vs 15.4% respectively and it was statistically significant with a p value of 0.0003. The proportion of participants with good and moderate foot care practices was higher among unsatisfactory control compared to satisfactory control,10.6% vs 7.7% and 52.9% vs 21.1% respectively, whereas poor footcare practices was more in satisfactory control compared to unsatisfactory control patients 71.2% vs 36.5% respectively and this was found statistically significant with p value of 0.0001.

Good and poor practice pertaining to visit to Doctor was found in higher proportion among unsatisfactory control compared to satisfactory control,38.5% vs 28.8% and 25% vs 9.6% respectively, whereas moderate practice pertaining to visit to Doctor was more in satisfactory control compared to unsatisfactory control patients 61.5% vs 36.5% respectively and this was found statistically significant with p value of 0.007

The proportion of participants with favourable habits was higher among patients with satisfactory control compared to unsatisfactory control, 65.4% vs 37.5% and it was found statistically significant with p value of 0.015

Good and poor practice pertaining to undertaking Precaution measures was found in higher proportion among satisfactory control compared to unsatisfactory control,17.3% vs 13.5% and 40.4% vs 38.5% respectively, whereas moderate practice pertaining to undertaking Precaution measures was more in unsatisfactory control compared to satisfactory control patients 48.1% vs 42.3% respectively and however this was found statistically insignificant with p value of 0.831

The proportion of participants with good treatment adherence was high among satisfactory control patients compared to unsatisfactory 73.1% vs 40.4% whereas those with moderate treatment adherence was higher among unsatisfactory control compared to satisfactory control patients 41.3% vs 17.3% and 18.3% vs 9.6% respectively and this was found statistically significant with a p value of 0.0005[Table 3]

Table 3: Association between Self-Care Practices in Diabetes Mellitus and Glycaemic Control (n=156)

S. No	Self-care Practice Parameters	Satisfactory Control (n=52)n(%)	Unsatisfactory control (n=104)n(%)	Significance Chi square (p value)
1	Dietary practices			15.2 (0.0004)
	Good	6(11.5%)	20(19.2%)	
	Moderate	38(73.1%)	42(40.4%)	
	Poor	8(15.4%)	42(42.3%)	
2	Level of Physical Activity			0.13(0.935)
	Good	8(15.4%)	15(14.4%)	
	Moderate	28(53.8%)	54(51.9%)	
	Poor	16(30.8%)	35(33.6%)	
3	Sleep			16.19(0.0003)
	Good	17(32.7%)	18(17.3%)	
	Moderate	27(51.9%)	36(34.6%	
	Poor	8(15.4%)	50(48.1%)	
4	Foot care practices			17.19(0.0001)
	Good	4(7.7%)	11(10.6%)	
	Moderate	11(21.1%)	55(52.9%)	
	Poor	37(71.2%)	38(36.5%)	
5	Visit to Doctor			9.86(0.007)
	Good	15(28.8%)	40(38.5%)	
	Moderate	32(61.5%)	38(36.5%)	
	Poor	5(9.6%)	26(25%)	
6	Habits			4.796(0.015)
	Favorable	34(65.4%)	39(37.5%)	
	Unfavorable	18(34.6%)	65(62.5%)	
7	Precaution measures			0.363(0.831)
	Good	9(17.3%)	14(13.5%)	
	Moderate	22(42.3%)	50(48.1%)	
	Poor	21(40.4%)	40(38.5%)	
8	Treatment Adherence			14.9(0.001)
	Good	38(73.1%)	42(40.4%)	
	Moderate	9(17.3%)	43(41.3%)	
	Poor	5(9.6%)	19(18.3%)	

DISCUSSION:

In the current study, majority (57.7%) of the participants belonged to the age group between 50-65 years and also had higher proportion of participants to be Hindu by religion 92.3% similar to the study findings of Rekha T et al [12] who also reported higher number of participants belonging to age > 55 years (64.5%) and had higher proportion of Hindus (78.5%).

According to Uma Maheshwari R et al.,[13] 76.9% of patients followed a healthy diet plan, which was significantly higher than the results of our current study, which indicated that just 16.6% of patients had appropriate dietary practices. This large discrepancy between the two studies may be the result of participant variability, since Uma Maheshwari R et al., (2013) included participants with ideal glycaemic control in their study, whereas we only included participants without ideal glycaemic control in the current study. This decreased percentage of dietary practices in people with uncontrolled diabetes shows how important it is to focus more on diet-related lifestyle modification behaviors in order to achieve optimal control.

Lee SW et al.,[14] concluded in their study, that Poor sleep practices were associated with poor glycaemic control, this finding was similar to our current study finding which also showed the proportion of participants with poor sleep practice was higher among those who had unsatisfactory glycaemic control compared to those who had satisfactory glycaemic control, 48.1% vs 15.4% and it was statistically significant.

The results of the current study, which also revealed a higher proportion of participants in unsatisfactory glycaemic control who had poor practice in visiting the doctor compared to satisfactory glycaemic control patients, were statistically significant with a p value of 0.007. Al Nozha OM et al.,[15] reported that glycaemic control was lower among those who had fewer doctor visits or who delayed doctor visits compared to those who had more doctor visits or visited on scheduled dates.

Current study precaution measure was found to be 14.7%, which was nearer to the study by Durai et al.,[16] who reported 21% precaution measures to avoid hypoglycaemia among their participants Basu S et al.,[17] in a meta-analytical study reported that 11-68% of non-adherence to medication was seen in diabetes patients, current study supporting the evidence also showed 15.4% of the participants to have poor treatment adherence.

The proportion of participants having good footcare practices was very less, 9.7% in the current study, which was similar to the study conducted by Selvaraj K et al.,[18], who also reported only 8.6% of their participants to have adequate foot care practices.

CONCLUSION:

The present study findings have concluded that having a significant association with various self-care parameters and glycaemic control, patient attending the primary health centre can have a behaviour change counselling program on regular basis in addition to the medical management for better glycaemic outcome.

ACKNOWLEDGMENT

We would like to thank all participants involved in the study.

ETHICS STATEMENT

The study received approval from Institutional Ethics Committee [IEC No.128/SVMCH/IEC-Cer/March 24].

INFORMED CONSENT STATEMENT

Informed consent was obtained from all the study participants and the study conforms to the standards currently applied in

India. The protection of human subjects' privacy rights has been maintained.

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