

Original Research Article

Self-care Activities among Diabetic patients in rural areas of Trichy District, Tamil Nadu

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Date of Submission: 20.04.2017

Date of Acceptance: 01.09.2017

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Abstract

Background: Self-care practice is the key aspect of diabetes Management. **Objectives:** To assess the level of self-care practice and to find out the factors associated with self-care practice among rural diabetes patients in Trichy district. To correlate the self-care practice level with random blood sugar of DM patients. **Methodology:** A cross-sectional study was conducted among 160 Diabetes patients in OPD of rural health centres, Sangenthi and Pullambadi during Dec 2016. A pretested semi-structured Questionnaire was adopted from Summary of Diabetes Self-care Activities (SDSCA) and Morisky adherence Scale. Data were entered in Microsoft Excel and Analysed by using SPSS Version 20. Chi-square test and Spearman correlation test were applied. **Results:** Out of 160 samples, 83 were males and 77 were females with mean age of 57.5 years. Almost half of them were in the age group of 46 -60 years (52.5%), studied upto 10th standard (59.4%) and Socio-economic class of 4 (47%). Almost 60% were obese based on BMI (≥ 25). Around 40% of subjects were having adequate self-care practice (Score ≥ 10). Self-care practice includes eating habits, physical activity, Adherence to medications, Foot care, Fundus care and investigations like Blood sugar, Lipid profile, ECG. Upper and Upper Middle class subjects were having more adequate self-care practice compare to Lower and Lower middle class ($X^2 = 9.6, P = 0.008$). Only 36% subjects were control in blood sugar level (GRBS ≤ 180 mg/dl). Negative correlation was found between self-care activity score and Blood sugar level ($r = -0.382, p < 0.001$). $\uparrow\uparrow$ Self-care activity - $\downarrow\downarrow$ GRBS level. Adequate Self-care activity was significantly associated with Glycaemic Control ($p = 0.011$). **Conclusion:** Only 40% were adequate level of self-care and significant association was found on glycaemic control. Thus there is a need of health education among diabetes patients in regarding self-care and their good practice.

Key Words: Self-care Activity, Rural, Diabetes, Glycaemic Control

Introduction:

Diabetes is characterised by a state of chronic hyperglycaemia, which is due to many environmental and genetic factor acting combinely.¹ Diabetes is the one of the most common disease whose incidence is raised so rapidly over years to become a public health problem. A worldwide study in 2015 shows that totally 415 million people have diabetes among, that India harbours 69.1 million cases with the prevalence of 8.7 % among the adult population.² India ranks among the top three countries with diabetic population.³ This tremendous raise is due to life style modification and urbanisation.

One in 20 adult deaths is due to diabetes and its related complications which have a significant impact on quality of life and economic health cost of the people. The progression of diabetes is mainly influenced by awareness and self-care practice among the patients.⁴ Self-care practice in diabetes is defined as behaviours undertaken by people with or at risk of diabetes in order to successfully manage the disease on their own.⁵⁻¹⁰ Proper self-care is the key to reduce the most of the

complications of diabetes. Self-care refers to mannerisms done by the community like proper eating practice, regular exercise, a good adherence to medication, a regular medical follow up, regular checking of blood sugar level and other blood parameters, regular fundus examination, daily self-foot examination and regular ECG monitoring.

Patients with good knowledge and good self-care practice have high chance to attain a good glycaemic control and reduced CVS risk and vice versa.¹¹⁻¹⁴ Thus, it is essential to have an awareness and proper self-care practising among the diabetic population for better life. There have been very few studies addressing self-care practices in diabetes; very few in rural areas. Suguna A et al¹⁵ have done in a Taluk hospital based setup. Since very less amount of study about self-care awareness and practice among the diabetic population in rural areas of India, Thus, this study to assess the level of self-care practice and find out the factors associated with self-care practice among rural diabetic patients in Trichy district. This study also correlates the self-care practice level with random blood sugar of DM patients.

Methodology:

A facility based Cross-Sectional Study was conducted at the month of December 2016 and January 2017. The study was conducted at the medical outpatient department of rural health and training centre at Sangenti and government primary health centre Pullambadi. These two rural health training centres situated 20 kms away from our teaching hospital. Sample size was calculated to be 160 based on prevalence of self-care practice level of 40.6%¹⁵, relative precision 20%, non-response rate of 10% with the confidence interval of 95%. Type 2 diabetic patients who are from 18 years and above and willing to participate were included in the study and those diabetic patients that were too ill to participate, pregnant women and newly diagnosed (less than six months) were excluded.

Data collection: Data were collected using a pre-test semi structured questionnaire, which contains socio demographic details, medical history, details about diabetes mellitus, various self-care practices and anthropometry measurements. This questionnaire was adopted from Summary of Diabetic Self-care Activities (SDSCA)¹⁶ on various domains of self-care. Self –care practice includes domains of eating habits, physical activity, Adherence to medications, Foot care, Fundus care and investigations like Blood sugar, Lipid profile, ECG and Blood pressure monitoring. The Domain of Eating habits include avoids high sugar containing food, avoid high fat containing food and eat more vegetables and fruits. Adherence to medication was assessed using Morisky Medication Adherence Scale-4 (MMAS-4).¹⁷ every domain of self-care was assessed and given a score of 0 or 1, except adherence to medication which is given a score of 0 – 4, which gives a total score of 14. A score of <10 is considered as not adequate self-care. A score of ≥10 is considered as adequate self-care. A spot random blood sugar test (GRBS) was done to all subjects at the time of interview after taking informed consent. This GRBS was done by using calibrated one touch glucometer. Patients with GRBS of ≤180 were considered as adequate control, and ≥181 were considered as not adequate.¹⁵

Statistical Analysis: Data were entered in excel sheet and analysed using SPSS version 20. Descriptive statistics of the Socio-demographic variables and details of diabetes were reported using frequencies and percentage. Mean with Standard deviation and Median with Inter-quartile range was given for self-care activity score and Glucose Random Blood Sugar Score. Spearman’s correlation test and Chi-square test were used to find out association between self-care activities score and glycaemic control. Pearson’s chi square test were used to find out association of self-care activities with age group, gender education, occupation, family history of diabetes, socioeconomic status, financial dependency and duration of diabetes. Spearman’s correlation test was used to find out association between self-care activities score and glycaemic control.

Results:

Socio-demographic Details: Out of 160 diabetes patients studied, 83 (52%) were males, 77 (48%) were females with mean age of 57.5 years with range 29-85 years. Around 28% of the rural diabetic population were

illiterate, 60% studied upto class 1 - 10th standard and only 13% studied higher secondary and more. One-fourth of the study population were unemployed, subjects involved in unskilled and semi-skilled occupation were 22.5% and 12.5% respectively. Nearly 35% of the study subjects were involved in own business/farming with own land/clerical job and only 5% were involved in professional activities. Most of the study population were Hindus (82.5%), Christian and Muslims were 13% and 4.5% respectively. More than half of the study population were in Upper Lower and Lower class according to Modified Prasad’s Classification 2016, more than one-fourth were in Lower middle class and the rest were in Upper middle and Upper class .

Profile of the Study Subjects: More than one-third (37.5%) of the study population have family history of Diabetes. Around one-fifth of the population were current smokers (18.8%) and current alcoholics (17.5%). Around 60% of the diabetic subjects were obese (BMI≥25) and 14% of them were overweight (BMI =23-25) according Asian BMI classification. Mean age at diagnosis of diabetes of study population was 51.8 years with standard deviation of 9.4. Around 24% (n=38) of study subjects were having diabetes six months to two years in duration, 42% were having diabetes two years to five years in duration and the rest were more than five years in duration of diabetes. Out of 160 diabetic subjects, 156 (97.5%) were being treated with Oral Hypoglycaemic agents (OHA’s). (Table 1)

Table-1 Risk factors of Diabetes Mellitus among study population (n=160)

Sl.No.	Domains	Category	Frequency	Percentage
1	Family history of diabetes mellitus	Yes	60	37.5
		No	100	62.5
2	Habits	Smoking		
		Yes	30	18.8
		No	130	81.3
		Stopped	8	26.6
		Alcoholic		
		Yes	28	17.5
3	Body mass index	No	132	82.5
		Stopped	9	32.1
		Normal(18.5-22.9)	43	26.9
4	Waist hip ratio	Overweight(23-24.9)	22	13.8
		Obese(>25)	95	59.4
		Male-Normal(<=0.9)	32	38.6
5	Central obesity(>0.9)	Central obesity(>0.9)	51	61.4
		Females-Normal(<=0.85)	12	15.6
		Central obesity(>0.85)	65	84.4

Self-care activity of diabetes: In the domain of Diet, around 80% of the study population were following avoid sweets and sugar in hot drinks like coffee, tea and three-fourth (75%) were following avoid high fat like mutton and oil foods. More than 60% were regularly ate vegetables and fruits in their diet. Around 65% of the study population were involved in moderate level of activity in daily occupation or doing exercise regularly.

Around 94% of the diabetes patients were regularly checking blood sugar by health worker. Nearly half of the study subjects (48%) were examined their feet regularly. Only 18% were done fundus examination and only 24% were testing investigations other than Blood Sugar. Ninety five percentages of diabetic patients were checking Blood Pressure every visit and only 15 % were checked ECG regularly (table 2).

Table-3: Self-care activity of diabetic patients among study population (n=160)

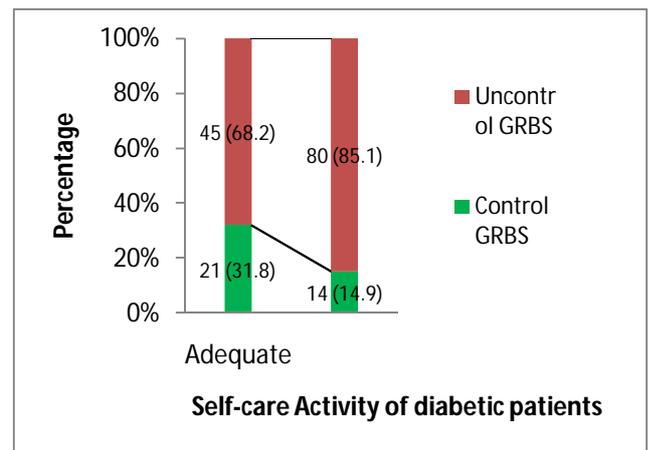
Sl.No.	Domains	Variables	Frequency	Percentage
1	Diet-Avoid sugar	Followed	128	80
		Not followed	32	20
2	Diet-Avoid fat	Followed	121	75.6
		Not followed	39	24.4
3	Ate fruits and vegetables regularly	Yes	102	63.8
		No	58	36.3
4	Doing exercise regularly	Yes	103	64.4
		No	57	35.6
5	Adherence to medications(Morisky scale)	1	5	3.1
		2	30	18.8
		3	63	39.4
		4	62	38.7
6	Check blood sugar by health worker	Regular	150	93.8
		Irregular	10	6.3
7	Self foot care examination	Followed	77	48.1
		Not followed	83	51.9
8	Fundus examination	Done	29	18.1
		Not done	131	81.9
9	Investigations other than blood sugar	Done regularly	38	23.8
		Not done regularly	122	76.3
10	Check blood pressure	Done regularly	152	95
		Not done regularly	8	5
11	ECG	Done regularly	24	15
		Not done regularly	136	85

According to Morisky scale, around 80% of the study subjects were got higher level of medication adherence (score of 3 or 4) and the rest 20% were got lower level of medication adherence (score of 1 or 2). The overall median score of self-care activity was 9 with Interquartile range was 8-10 and range was 4-14. Adequate self-care activity (score ≥ 10) was found in 41.3% and the rest 58.7% study subjects were inadequate self-care activity of Diabetes management.

Self-care activity and Glycaemic Control: Median glucose random blood sugar (GRBS) level was 196 mg/dl with Inter quartile range was 164- 236 mg/dl. Nearly 22% of the diabetic population were having good Glycaemic control (GRBS ≤ 180) and the rest 78% were not. A significant association was found between Adequate self-care activity and good glycaemic control, χ^2 value= 6.5, $p=0.011$ (Fig 1). A significant negative correlation was found between score of self-care activity and GRBS ($r=-0.38$, $p<0.001$). Increase in self-care activity would

decrease the GRBS and Glycaemic control could be achieved.

Fig 1: Association between self-care activity and glycaemic control of diabetic patients



χ^2 -Chi Square test: 6499 *-p value significant($p<0.01$)

Table 3: Association between self-care activity and other factors

Sl.No.	Domains	Variables	Self-care activity		P value	χ^2 value (df)
			Adequate	Inadequate		
1	Age group	≤ 45 years	8(42.1%)	11(57.9%)	0.671	0.799 (2)
		46-60 years	32(38.1%)	52(61.9%)		
		>60 years	26(45.6%)	31(54.4%)		
2	Gender	Male	38(45.8%)	45(54.2%)	0.227	1.462 (1)
		Female	28(36.4%)	49(63.6%)		
3	Education	No formal education	20(45.5%)	24(54.5%)	0.34	2.156 (2)
		Class upto 10 th standard	35(36.8%)	60(63.2%)		
		Higher secondary and graduates	11(52.4%)	10(47.6%)		
4	Occupation	Unemployed	15(37.5%)	25(62.5%)	0.078	8.401 (4)
		Unskilled	13(36.1%)	23(63.9%)		
		Skilled & semiskilled	4(20%)	16(80%)		
		Shop owner, farmer, clerk	30(54.5%)	25(45.5%)		
		Professional & semi-professional	4(44.4%)	5(55.6%)		
5	Socio-economic status	Lower and upper lower class	25(30.1%)	58(69.9%)	0.008*	9.596 (2)
		Middle class	21(48.8%)	22(51.2%)		
		Upper and upper middle class	20(58.8%)	14(41.2%)		
6	Financial dependency	Yes	13(35.1%)	24(64.9%)	0.389	0.743 (1)
		No	53(43.1%)	70(56.9%)		
7	Family history	Yes	25(41.7%)	35(58.3%)	0.934	0.007 (1)
		No	41(41%)	59(59%)		
8	Duration of diabetes mellitus	<2 years	12(31.6%)	26(68.4%)	0.382	1.925 (2)
		2-5 years	24(44.4%)	30(55.6%)		
		>5 years	30(44.1%)	38(55.9%)		

*-p value significant, χ^2 - Chi Square, df-degree of freedom
Association between Self-care activity and demographic variables: There were no significant association found between Age group, Gender, Education and occupation status among the study population with self-care activity of Diabetes. Similarly, Financial Dependency, Family History of Diabetes and Duration of diabetes among study subjects were also no significant association with self-care activity of diabetes. But higher socio-economic status was significantly associated with self-care of

diabetes compare to lower socio-economic class. [$\chi^2=9.6$, $p=0.008$]. (Table 3)

Discussion:

The present study is a rural health centre based cross-sectional study conducted among type 2 diabetic population in those rural areas and mainly focused about the level of self-care practice and their glycaemic control. Overall, adequate Self-care practice was found 41% of the type 2 diabetic patients in this study. This was quite comparable to study done in Bangalore by Suguna et al¹⁵, where they found 40.6% of diabetic were having moderate self-care activity and 9% were good self-care practice. Moreover, In our study around 70% of the diabetic patients followed advised on diet, this was similar to the study done in Andhra Pradesh, Padma K et al¹⁸ found 76% were followed healthful eating plan. Similarly, around 65% of the study population were involved in regular physical activity, Suguna et al¹⁵ found only in 45% of diabetic and Padma K et al found in 39%.¹⁸ This difference was due to the difference in Socio-demographic patterns and social issues. Present study was done in remote rural areas of Trichy district. But Suguna A et al was done in semi-urban areas of Bangalore and Padma K et al found in a teaching hospital of Andhra Pradesh.

Similarly, Adherence to medications was found around 77% in the present study. This was quite comparable to the study done by Suguna A et al¹⁵ (73%) and Padma K et al¹⁸ (68%). In the domain of foot care, Suguna A et al found only 4% and Padma K et al found only 13%, whereas the present study found 48% of the diabetic foot care. This may be due to the difference in social cultural difference of Tamil Nadu with other areas. In the rural areas of Tamil Nadu, the regular practice of washing the feet every time when they go inside the house from outing. Moreover, the regular advices from the doctors and health workers regarding self-care activity was changed in the recent years, awareness of foot care examination was quietly improved in the recent years. This could be the reason for increased foot care in this study.

In the domain of regular blood sugar testing, in the present study found 95% of the study population regularly checking the blood sugar by Health Worker. This is quite comparable to the study done in Andhra Pradesh by Padma K et al,¹⁸ 90.6% of study subjects testing the blood sugar regularly. Other domains like Fundus examination, Investigation other than blood sugar, Checking Blood Pressure and ECG Monitoring were done only in the present study. No other studies have found these domains. These domains were also important in the management of diabetes. Checking Blood Pressure, We all know that Diabetes and Hypertension are similar in most of the conditions. Thus checking blood pressure should be mandatory by each and every time of follow up. Similarly, Fundus examination would be important test for finding retinal changes in eyes. Investigations other than Blood Sugar like Renal Function test, Liver Function Test and Lipid Profile should be done among diabetes to rule out co-morbidities of Kidney, Liver as well as better management of diabetes status among patients.

In the present study found that there was a significant association found between self-care activity score and Glycaemic control. This was similar to various studies

done on diabetic patients. Moreover, in the present study only 22% of the diabetic patients were having glycaemic control. This finding was similar to the study done by Suguna A et al,¹⁵ where they found 25% of the diabetic patients were having good glycaemic control.

In the present study found that there were no significant association between self-care activity with age, gender, education status, Occupation status, financial dependency, family history of diabetes and duration of diabetes. Study done by Suguna A et al¹⁵; Chiau et al¹⁹; Tang et al²⁰ and Xu and Pan²¹ have found that Higher educational status were associated with better self-care. They also found that higher income status was associated with better self-care; this was similar to the present study. A significant association has been found between Upper class with self-care of diabetes.

Strengths: Most of the studies related to self-care of diabetes considered the domains of self-care included were followed advise on diet, Physical activity, Foot care, Adherence to medications, Regular Blood Sugar testing and follow up. In the present study include Fundus Examination; Investigation Other than Blood Sugar, Blood Pressure Check-up and ECG testing were also included as domains along with above domains mentioned. These domains would be giving the correct picture to manage diabetes and prevent the secondary complications like diabetic Nephropathy, Diabetic Neuropathy, Diabetic Retinopathy and CVDs. The present study was done in rural diabetes patients in the remote rural area of Trichy district also the strength of this study.

Limitations: Limitations of this study include first, the use of GRBS values to decide the glycaemic control. HBA1c could be the correct parameter for glycaemic control, but this test was not available in rural areas and affordability of test also questionable. Second, convenient sampling method was used. Third, Social desirability bias may be existed in this study while this is questionnaire based interview study.

Conclusion: Overall, adequate level of self-care of diabetes was 40% in these rural areas and self-care practices of diabetes were significantly associated with good glycaemic control. Among the Self-care practice, good practice of diet, regular physical activity, and adherence to medications was found to be around 70% of rural diabetics. Thus, all the diabetic patients should have been aware about self-care practice and further reduce the complications through proper practice.

Acknowledgement: Health Workers in Sangenthi, Pullambadi PHC for helping in data collection.

Conflict of Interest: None

Source of Funding: None

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