Open Access   Research Article

Assessment of Self-Care Practices among Type 2 Diabetic Patients in a Secondary Care Teaching Hospital

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ABSTRACT

Background: Diabetes is one of the major health problems worldwide that can be effectively managed by good self-care activities like medication adherence, exercise, monitoring of blood glucose, foot care and diet. **Objectives:** The study assessed the self-care activities of diabetic patients using summary of diabetes self-care activities scale (SDSCA) and the variables (Age, gender, educational level, socioeconomic status (SES)) associated with it. **Methods:** A cross-sectional descriptive study was undertaken in 400 Type 2 diabetic patients. Self-care practices of the patients were evaluated by using SDSCA and correlation with variables were determined statistically. **Results:** Among 400 diabetic patients about 215 (53.75%) had an average score of self-care. Self-care was poor in 184 (46%) subjects, and only 1 subject (0.25%) scored good. Blood sugar monitoring was the highest (100%) followed by medication adherence (92.75%) whereas inadequate levels of self-care were reported in foot care (1.5%), and physical activity (31.5%) domains. A significant positive correlation was found between self-care practices and socio-demographic variables such as age (r=0.298, p=0.000), income (r=0.490, p=0.000) occupation (r=0.433, p=0.000), education (r=0.582, p=0.000), and Socio-Economic status (r=0.599, p=0.000). **Conclusion**: The study revealed higher level of adherence to self-care activities in terms of blood sugar monitoring and medication taking behaviour in the current setting, but self-care in other domains such as foot care is critically low. Age, education and Socio-Economic status seems to affect the self-care practice by the patients.

Keywords: Diabetes, Diabetes self- care, Diabetic foot care, Summary of diabetes self-care activities (SDSCA) score.

INTRODUCTION

Diabetes mellitus (DM) is a metabolic disorder which is characterised by the presence of chronic hyperglycaemia with disturbance of protein, fat, and carbohydrate, metabolism [1]. According to WHO at least 285 million people are already affected with DM and it is the major reason for 3.2 million deaths, six deaths every minute and 8700 every day and it is said that this number will increase by 42% in developing countries and by 70% in developed countries by 2030 [2]. Exclusive of increased health care cost and morbidities diabetes is allied with many fatal life-threatening complications such as microvascular, macrovascular and combination of both. These complications include diabetic retinopathy, nephropathy, peripheral neuropathy, cardiovascular diseases, diabetic foot and peripheral artery disease [3]. The primary objective in the management of diabetes is to avert or minimise chronic diabetic complications [4]. Non pharmacological treatment is a fundamental element of diabetes care and includes self-management, medical nutrition therapy (MNT), smoking cessation, physical activity and psychosocial support. With the help of health care practitioners diabetic patients should concentrate more on how to enhance lifestyle modifications throughout the different stages of disease in order to augment diabetes care[5]. Diabetes can be controlled by a combination of five different activities such as diet modification, education, physical activity and exercise, medication adherence, and discipline. A diabetic will need to take a nutritionally well balanced diet with some regulations to maintain health. The goal is to keep the body healthy and to maintain blood glucose level within the normal range. It is vital for all diabetic and their family members to learn about the illness and help to support the diabetic in making several life style changes that are required of him/her. The American diabetes association recommends that adult diabetic patients should involve in two and half hours or more of physical activity weekly, for at least 3 days a week, with no more than two consecutive days with no activity[5]. Exercise or physical work is very important in controlling diabetes. It relieves stiffness of limb and muscle and help enhancing circulation of blood. It enhances action of insulin and stimulates insulin secretion[6]. Patient's adherence to their anti-diabetic medications is a demanding and essential factor to avert troublesome complications and to minimize the health care resource utilizations[7] . One of the major barrier to effective DM management which contribute suboptimal blood glucose control is poor treatment adherence[8]. Poor medication adherence can have adverse consequences for the provider,

the physician, the patients and the stability of the health care system [9]. Medication adherence is a crucial factor to attain optimal diabetes control and to prevent morbidity and mortality[10]. Successful management of diabetes even under the most ideal circumstances requires great discipline[11]. It is the key to diabetes management. A diabetic must maintain discipline during his /her entire life[6]. Diabetes is a persistent lifestyle disease, which requires lifelong commitment. Hence it is imperative to promote self-care practices among diabetics, as these practices help in minimising or delaying the complications of diabetes. Self-care in DM is a transformative process which helps in developing awareness and knowledge by learning to live with the complex nature of the DM in a social context. Self-care practices include proper eating practice, regular exercise, medication adherence, a regular medical follow up, regular blood sugar level checking and other blood parameters, fundus examination, daily self-foot examination and regular ECG monitoring[12]. Diabetes self-care requires life style modifications along with the support of health care practitioner to achieve a greater level of self-confidence to lead a successful behaviour change[13]. Diabetic complications can be developed due to poor self-care knowledge and poor long term metabolic control[14]. Self-management need procurement of skill and knowledge necessary to conveniently engage in a complex set of behaviours aimed at managing health, such as medication adjustment and self-monitoring, in the context of daily living [15].

MATERIALS AND METHODS

A cross – sectional descriptive study was conducted at the out- patient department of KC general hospital Malleswaram, Bangalore from September 2018 to February 2019. All diabetic patients of age > 20 years of either gender, who are on anti-diabetic drugs for at least one year were included. While diabetic inpatients, patients with gestational diabetes, too ill to be interviewed, patients with psychiatric disorder and who refused to participate in the study were excluded. The objectives of the study were described to the participants and an informed written and signed consent was collected in Kannada. Data collecting tools included modified patient profile form , Modified Kuppuswamy socio-economic scale) and SDSCA questionnaire. Socio-economic status of the participants was calculated using Modified Kuppuswamy scale. Summary of Diabetic Self-care Activity Scale developed by Toobert and collegues [16] in the year of 1999 in US was used to assess self-care practices of the patients. It is a self-report questionnaire of DM self-

management that consist of five elements of diabetes care such as: foot care, blood sugar monitoring, general diet, physical activity and medication adherence during the past seven days. The instrument which was originally written in English was translated into local language (Kannada) and back-translated to English by a person who is not related with this study for appropriateness of the translation. This questionnaire measured five domains. In the diet domain, there are five questions such as, frequency of consuming fat rich foods, frequency of consuming fruits and vegetables, frequency of following a heallthful eating plan, and frequency of spacing carbohydrates evenly through the day. The physical activity domain included questions regarding work related and leisure- time physical activity. Similarly monitoring of blood sugar level domain consists of two questions regarding self-monitoring of blood sugar levels over the past seven days and also performing self-monitoring of blood sugar levels according to the advice of health care provider. Foot care domain covers questions regarding soaking of feet, washing of feet, drying in between the toes, inspection of feet daily and inspecting sandals or shoes every day. Medication adherence domain contains questions related to consumption of prescribed oral hypoglycaemic drugs and insulin administration. Self-care activities in each domain were scored from 0 to 7. Except soaking of feet and intake of fat rich foods all the other questions were positively scored. In the diet domain; if a patient had adhered to self-care activities for more than 75% in a week, satisfactory self-care will be achieved. Similar scoring methods were used for foot care domain. The exercise domain was said to be satisfactory only if the patient had performed free-time and work related physical activity for at least 20 minutes at least for 5 days in a week. If a patient doesn't perform self-monitoring of blood sugar in the past three months this domain would be considered as unsatisfactory. The medication taking behaviour of the population was considered satisfactory, if the patient adhered to prescribed medications for six days of a week. Spearman's coefficient of correlation was used to find out the correlation between SDSCA score and variables.

RESULTS

A total of 400 patients were assessed for diabetic self-care activities during the study period. Males comprised approximately 56.75% (227) of the sample. About 123 (30.75%) of the study participants were in the age group of 55-64 years and the mean age of patients was 56.03±11.79 years. Demographic details of the diabetics are depicted in Table No.1.

Table 1: Socio-demographic characteristics of patients (N=400)

| SI No.	Domains	Variables	Percentage of patients (Number of patients)
1	Age group	15-24	_
		25-34	3 % (12)
		35-44	15.7 % (63)
		45-54	24.5 % (98)
		55-64	30.75 % (123)
		≥65	26 % (104)
2	Gender	Male	56.75 % (227)
		Female	43.25 % (173)
3	Marital status	Single	2.5 % (10)
		Married	97.5 %(390)
4	Psychosocial habits	Smoking	5.25% (21)
		Alcoholic	4.5% (18)
		Both	6.75% (27)
		Nil	83.5% (334)

Table 1(Continues): Socio-demographic characteristics of patients (N=400)

SI. no	Domains	Variables	Percentage of patients (no. of patients)
5	Educational status	Illiterate	28.5% (114)
		1st -4th std	12.5% (50)
		5th-7th std	15% (72)
		8th-10th std	28.25% (113)
		11th-12th std/ diploma	7.25% (29)
		PG/UG	5.5% (22)
		Profession/ honours	-
6	Socio-economic status (Modified Kuppuswamy scale)	Upper	-
		Upper middle	1.75% (7)
		Lower middle	12% (48)
		Upper lower	62.25% (249)
		Lower	24% (96)

Analysis of self-care activities

Total score

When the total self-care of the subjects was calculated it was found that, the majority (53.75%) of diabetic patients had an average score of self-care. Total self-care scores are shown in figure1. Table No.2 depicts the distribution of total score among different socio-economic class (Using Modified Kuppuswamy socio-economic scale 2018). 1 (0.25%) participant who scored good belonged to the lower-middle class. 140(35%) respondents from upper-lower class scored average.
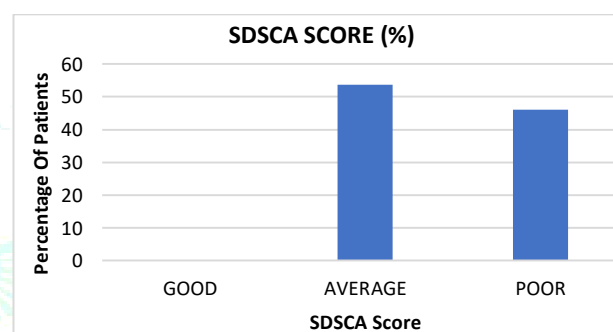
Figure 1: SDSCA Score distribution (N=400)

Table 2: SDSCA Score according to Socio-economic status (N=400)

Socio-economic status	Good (Number of patients)	Average (Number of patients)	Poor (Number of patients)
Upper	–	–	–
Upper-middle	–	1 % (4)	0.75 % (3)
Lower-middle	0.25 % (1)	7.25 % (29)	4.5 % (18)
Upper-lower	–	35 % (140)	27.25 % (109)
Lower	–	10.5 % (42)	13.5 % (54)

Domain wise assessment of self-care activities

Good dietary behaviour was present in only 152 (38%) participants. 274 (68.5%) participants did not practice recommended level of physical activity in the past week. As shown in Table 3 all the patients monitored their glycaemic level at least once in the past three months. Foot care was the least identified self-care activity by the patients. Only 6 (1.5%) subjects examined their feet at regular intervals whereas 394 (98.5%) participants scored poor in the foot care domain. 371(92.75%) participants were adherent to the recommended antidiabetic medications.

Table 3: Domain-wise self-care practices (N=400)

SI No	Domain	Satisfactory (Number of patients)	Non-satisfactory (Number of patients)
1	Diet	38 % (152)	62 % (248)
2	Foot care	1.5 % (6)	98.5 % (394)
3	Physical activity	31.5 % (126)	68.5 % (274)
4	Blood sugar monitoring	100 % (400)	–
5	Medication	92.75 % (371)	7.25 % (29)

Statistical analysis

Spearman's coefficient of correlation was done to examine the association between diabetes self-care activities with socio-demographic variables such as age, gender, marital status, education, occupation, income, socio-economic status and duration of diabetes. The data were analysed using SPSS

version 17. The results from the analysis as given in Table 4 shows that the total self-care practice score was found to have a significant positive correlation with age (r= 0.298, p= 0.000), education (r= 0.582, p= 0.000), occupation (r= 0.433, p= 0.000), income (r= 0.490, p= 0.000), and socio-economic status (r= 0.599, p= 0.000).

Table 4: Correlation of self-care practices with variables (N=400)

	Age	Gender	Marital status	Education	Occupation	Income
Total score	0.298** 0.000	-0.157** 0.002	0.056 0.267	0.582** 0.000	0.433** 0.000	0.490** 0.000
	Smoking	Alcohol	None	Both	SES status	Family history
Total score	-0.211** 0.000	-0.001 0.977	0.116* 0.020	0.017 0.736	0.599** 0.000	0.197** 0.000

Domain-wise total score

Correlation between domain-wise total score and study variables showed a significant positive correlation between diet total score and education (r=0.126,p=0.012), socio-economic status (r= 0.143, p=0.004) whereas age, gender, marital status, duration of DM had no significant correlation.

A significant positive correlation (r=0.135,0.007) existed between total foot care score and education but there were no correlation with respect to age, gender, marital status, SES and duration of DM. Adherence to medication had no correlation with any of the above mentioned study variables (Table No.5).

Table 5: Domain-wise correlation of self-care practices with variables (N=400)

	Age	Gender	Marital status	Duration of DM	Education	SES
Diet	0.087 0.082	0.045 0.0364	-0.033 0.509	0.036 0.469	0.126* 0.012	0.143** 0.004
Foot care	0.046 0.356	0.054 0.279	-0.033 0.506	0.018 0.727	0.135** 0.007	-0.098 0.051
Medication	0.042 0.403	0.058 0.245	-0.019 0.706	0.007 0.895	-0.043 0.394	0.041 0.416
Exercise	0.000 1.000	0.000 1.000	-0.573* 0.028	-0.967** 0.002	0.777* 0.014	-0.577* 0.028

DISCUSSION

In this study among 400 type 2 diabetes patients only 0.25% were having good self-care practices, while majority of the patients (53.75%) had average score for self-care which was inconsistent with the study conducted by Nazila *et al* where they found that majority of patients (63.6%) had poor self-care score due to inadequate blood sugar testing, irregular medication intake and lack of physical activity[17]. In the present study population 46% had a poor self-care score this poor score was attributed to various reasons like lack of family support, poor knowledge, lack of time, financial constraints, age related problems, sedentary work as given by patients upon interview. Medication adherence was adequate in 92.75% (n=371) of patients in the present study, and this is similar to a study conducted by Kalaiselvi Selvaraj *et al* where they revealed a greater level of medication adherence in 95.6% of patients[3]. Only 38% of patients followed good dietary behaviour in the present study, which is similar to a study done by Sasi ST *et al* [18]. Several studies suggest that diet is an effective factor in controlling, and improving the quality of life in T2DM [19,20]. Diabetic patients worldwide are routinely instructed to adopt a healthy eating behaviour, that demanded adjustments in food habits, beliefs and meal patterns on a long-term basis [21]. We found that 68.5% (n=274) patients participated in our study had done regular exercise, which is comparatively better to the study

done by Suguna A et al in a rural area of Bangalore district[22]. A study done by Dagmawit Tewahido *et al* reported that almost all participants accepted that they doesn't exercise daily. The most commonly given reasons for not performing daily physical exercise were busy work schedule, lack of motivation, lack of interest, not being able to bear gymnasium expenses and not convinced that exercise is important[23]. Adherence to exercise has been reported to be very poor typically in developing countries[24]. In the present study, Foot care was found to be lowest of all domains, only 1.5% (n=6) patients were taking care of their feet, which is similar to the study (8.6%) done by Kalaiselvi *et al*. This could be due to lack of appropriate understanding of its usefulness by patients with diabetes[3]. Patients with DM have remarkably higher risk of developing diabetic foot that can only be prevented by building awareness regarding foot-care[25].

A significant positive correlation was found between age and SDSCA score that is increase in age showed better self-care practices which is similar to a study conducted by Viji P.T *et al*[26], Zanetti *et al*[27] Xu and Pan *et al* [28]. In this study level of education was an influencing factor in self-care activities which means that patients with higher education had better self-care than others. These findings are identical to the studies conducted by Nazila *et al*[29], karters *et al*[30], connells *et al*[31], and vosoghis *et al*[32] study. A study conducted by

Idongesit reported that patients having higher educational level (and hence of higher SES) have a higher chance of acquiring knowledge from the internet, mass media and books. In addition, they have fewer difficulties in communicating with the health care professionals, and may have a good grasp of information [33]. Low education level may lead to inadequate self-management practices, lower self-efficacy and lower continuity care. Steps to upgrade literacy level would be a cost effective strategy to minimize morbidity and mortality associated with diabetes [34]. From our study it was also found that income had significant positive correlation with total self-care activities. A study conducted by Chio *et al* reported that high income was correlated with high self-care ability or low income was related with low self-care ability. The higher the income the more they take care of themselves[35]. Higher socio-economic status showed significant positive correlation with self-care activity, this was parallel to the study conducted by Veerkumar *et al*[36](0.008, 9.596).

Domain wise correlations with study variables were also done. The total diet score was found to have a significant positive correlation with education which is similar to a study conducted by Mayur Patel *et al* in which secondary level of education had significant association with consumption of diabetic diet among T2DM subjects[37]. Total foot care score had a significant positive correlation with education. Various studies reported that diabetic foot care had significant association with the level of education and diabetic foot care knowledge[38,39,40,41]. A study conducted by Mira M *et al* also reported a significant association between educational level with the extent of diabetic foot care knowledge and practice (p=0.001, 0.02 respectively)[42].

CONCLUSION

In conclusion the present study has demonstrated that the self-care practices of diabetic patients in the current setting is average (53.75%). Most of the patient had poor foot care practice (98.5%) and inadequate physical activity (68.5%). Medication adherence (92.75%) and blood glucose monitoring within the past 3 months (100%) was found to be followed by almost all patients. Self-care practice were found to have significant correlation with the age, education, SES. The study suggest that educational interventions needs to be done emphasising the importance of foot care and physical activity.

ACKNOWLEDGEMENT

CONFLICT OF INTEREST

There was no conflict of interest among the authors.

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