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AN OBSERVATIONAL STUDY TO ASSESS THE SELF-CARE PATTERNS IN TYPE 2 DIABETES MELLITUS PATIENTS USING SUMMARY OF DIABETES SELF CARE ACTIVITIES (SDSCA) SCALE IN A TERTIARY CARE HOSPITAL

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ABSTRACT

Background: In the recent times, type 2 Diabetes Mellitus has become a global public health problem and one of the major economic burden. Many self-care behaviours in Diabetes Mellitus patients along with medications can improve healthcare outcomes significantly. **Objectives:** The assessment of self-care patterns in type 2 diabetes patients by using self-report questionnaire known as Summary of Diabetes Self Care Activities (SDSCA) and to understand the selfcare behaviour in type 2 diabetes patients with respect to different variables. **Methods:** A prospective, observational and analytical study was conducted on patients admitted to in-patient departments of Sagar Hospitals, Bengaluru for a period of 6 months. The details about general information of patient's diagnosis, laboratory data and other information were collected. **Results:** A total of 75 patients were included in this study. There was a positive association of education with self-care recommendations like low fat eating plan, complex carbohydrate diet, eating lots of food high in dietary fibre and eating lots of fruits and vegetables. This study identified that majority of study population did not follow self-care recommendations like healthy eating plan, exercise, blood sugar testing and foot care. **Conclusion:** Our study identified inadequate counselling of lifestyle modifications and self-care recommendations in diabetes patients. We conclude that there is a need to have targeted programs to improve self-care patterns for better quality of life.

KEYWORDS: Diabetes, self-care recommendations, lifestyle modifications.

INTRODUCTION

Diabetes mellitus (DM) is a group of metabolic diseases characterized by hyperglycaemia resulting from defects in insulin secretion, insulin action, or both. The chronic hyperglycaemia of diabetes is associated with long-term damage, dysfunction, and failure of different organs - eyes, kidneys, nerves, heart, and blood vessels.[1]

In the recent times, Type 2 DM has become a global public health problem and one of the major economic burden. In India close to 69.1 million suffer from DM and it stands second place in incidence of DM after China in 2015.[2] This can be attributed to rapid cultural and social changes - geriatric populations, urbanization, and lifestyle changes. Additionally, Indians are also believed to have a greater degree of insulin resistance and a stronger genetic predisposition to diabetes.[3] According data from the Indian Heart Association, India will have 109 million people with diabetes by 2035. A study by the American Diabetes Association reports that India will see the greatest increase in people diagnosed with diabetes by 2030.[4]

The nonmodifiable etiological risk factors for Type 2 diabetes are age, race or ethnicity, family history (genetic predisposition), history of gestational diabetes, and low birth weight. The modifiable or lifestyle risk factors include increased body mass index (BMI), physical inactivity, poor nutrition, hypertension, smoking, and alcohol use, among others. Increased BMI is one of the strongest risk factors for development of diabetes. In addition, distribution of body fat, and an increased waist-to-hip ratio is also one of the contributing factors. The psychosocial factors such as depression, increased stress, lower social support, and poor mental health status also are associated with an increased risk for the development of diabetes.[5]

Self-management is defined as the individual's ability to manage the symptoms, treatment, physical and psychosocial consequences and life style changes inherent in living with a chronic condition. Self-management can also be termed as selfcare which is the ability to care for oneself and perform activities necessary to achieve, maintain or promote optimal health. In the literature, self-management and selfcare are used interchangeably. Particularly in diabetes care, self-management skills are necessary to enable patients managing their own disease.[6]

The primary goal of any diabetes treatment is better control of blood sugar levels The seven self-care behaviours essential for successful and effective diabetes self-management are: Healthy-Eating, Being-Active, Monitoring, Taking -Medications, Problem-Solving, Healthy-Coping and Reducing Risks.[7] The treatment for diabetes is continued for life long. Medication adherence is the important for managing diabetes successfully. Apart from regular medications, activities such as healthy eating, being physically active, regular monitoring of blood sugar levels, good problem-solving skills, healthy coping skills and risk-reduction behaviours are also part of the management plan.

The progression of diabetes and its complications are mainly influenced by poor awareness and practices among patients with diabetes. Regular practice of these activities is associated with good outcomes among people with diabetes. In developing countries like India, education and self-care component among patients with diabetes may lead to improved treatment outcomes and cost benefits.[8]

Diabetes Self-Care Activities (SDSCA) questionnaire

Self-care plays an important role in diabetes management. One of the instruments used to evaluate self-care in patients with diabetes is the Summary of Diabetes Self-Care Activities (SDSCA) questionnaire. This validated instrument has been designed to measure diabetes self-care activities among type 1 and type 2 diabetes mellitus patients.

This questionnaire is in the public domain and freely accessible. The revised SDSCA consists of five components on diet, exercise, blood sugar testing, foot care and smoking. In addition to these items, in expanded version there are few more questions in relation to each of the components along with items on medication practices. Among these components, we included diet, exercise, blood sugar testing, foot care and medication practices for this study. This self-report instrument measures levels of diabetes self-care across different components of the diabetes regimen over the previous seven days. The original SDSCA was a 12-item scale developed to assess four aspects of diabetes regimen: diet, exercise, glucose testing, and diabetes medications. The most recent revised version of the SDSCA questionnaire, based on seven studies, has been reduced to 11 items. The revised version added items on foot care and cigarette smoking, which may need to be modified or deleted for use in children with diabetes. It also provides 14 additional items that could be utilized to address specific self-care questions such as medication use. Respondents are asked to circle how many days in the past seven days they displayed a diabetes-specific behaviour. Response choices range from 0 to 7, with higher scores indicating better performance of self-care activities.[9]

MATERIALS AND METHODS

Study protocol: Study protocol was prepared and submitted by conducting extensive literature research. Study protocol contained information on need of study, objectives, review of literature, methodology. Study protocol was submitted to Dayananda Sagar College of Pharmacy for approval.

Study design: This is a prospective observational study.

Ethics committee approval: The study was prepared and submitted to Dayananda Sagar College of Pharmacy Ethics Committee on Human Subject Research for ethical clearance. The study was approved by Institutional Ethics Committee and issued Ethical Clearance Certificate for the same.

Study setting: The study was conducted in In-Patient Department of Sagar Hospitals, Banashankari, Bengaluru.

Study duration: The study was conducted for a period of 6 months. (June 2019- November 2019).

Study criteria The patients were enrolled into the study as per the inclusion and exclusion criteria stated in the study protocol.

Inclusion criteria: Patients of all gender above 18 years of age. Those who are willing to participate in the study. Patients diagnosed with Type 2 DM with duration of more than 1 year. Patients with or without co-morbid conditions.

Exclusion criteria: Those who are not willing to participate in the study. Those who are having cognitive defects. Those who are having speech / hearing problem. Mentally-retarded individuals and critically ill patients.

Method and collection of data: To obtain consent from the patient through informed consent form. Collection of the demographic details of the patient (name,age, sex, BMI) and data regarding diagnosis, prescribed drugs, indication and their route of administration and number of days of stay in case of inpatients. Assessment of self-care behaviour in Type 2 DM patients by providing structured questionnaire SDSCA to patients.

Calculating scores in SDSCA filled by patients and assessing the self-care of patients. Evaluating various variables of the patients and correlating with self-care practices obtained from self-care questionnaire. The obtained data will be subjected for suitable statistical analysis.

RESULTS

A total of 75 diabetic patients were included in the study based on inclusion and exclusion criteria.

Socio-demographic characteristics

In the study population maximum number of patients belonged to 46-60 years age group (56%) followed by patients from 30-45 years (24%) and least number of patients belonged to 72-90 years age group. Out of 75 patients, majority (58.7%) were found to be of the male gender and 41.3% were found to be of the female gender. Highest number of patients (50.7%) had education level of up to secondary school, least number of patients (2.7%) were illiterate. Most of the patients in the study population were non-alcoholic (78.7%).

Table 1: Socio-demographic characteristics.

VARIABLES	CATEGORY	FREQUENCY (n=75)	PERCENTAGE
Age	30-45	18	24
	46-60	42	56
	61-75	13	17.3
	76-90	2	2.7
Gender	Male	44	58.7
	Female	31	41.3
Education	Primary and below	18	24
	Up to secondary school	38	50.7
	Graduate and above	17	22.7
	Illiterate	2	2.7
Alcohol	Yes	16	21.3
	No	59	78.7

Knowledge about diabetes mellitus

In this study maximum number of patients (40%) had DM since more than 10 years and least number of patients (16%) had DM for the last 2 years. Most of the patients (69.3%) were hypertensive. Most of the patients in this study (66.7%) did not have or were not aware of family history of diabetes. Maximum number of subjects (72%) in this study did not have glucometer.

Table 2: Knowledge questionnaire.

VARIABLES	CATEGORY	FREQUENCY (n=75)	PERCENTAGE
Duration of DM	2 to 5 years	16	21.3
	6 to 10 years	17	22.7
	More than 10 years	30	40
Hypertension	Yes	52	69.3
	No	23	30.7
Family History	Yes	25	33.3
	No	50	66.7
Glucometer	Yes	21	28

SDSCA questionnaire

For ease of understanding, general diet has been categorized into poor, average and good. Maximum number of study population (53.3%) were consuming an average general diet. Maximum subjects of our study (72%) had an average specific diet and 28% had a good specific diet. Maximum subjects (69.3%) had poor exercise routine, and least (8%) of them had good exercise routine. Maximum number of subjects (76%) had not tested their sugar levels in the last 7 days. Most of the study subjects (64%) did not follow routine foot care. Maximum number of subjects (88%) were non-smokers.

Table 3: Knowledge about diabetes mellitus.

VARIABLES	CATEGORY	FREQUENCY (n=75)	PERCENTAGE
General Diet	Poor	17	22.7
	Average	40	53.3
	Good	18	24
Specific Diet	Average	54	72

	Good	21	28
Exercise	Poor	52	69.3
	Average	17	22.7
	Good	6	8
Blood Sugar Testing	Yes	18	24
	No	57	76
Foot Care	Yes	27	36
	No	48	64
Smoking	Yes	9	12
	No	66	88

SDSCA - self-care recommendations

Maximum number (76%) of subjects did not follow Low-fat eating plan. Many subjects (82.67%) did not follow a complex carbohydrate diet. Maximum number of subjects (88%) reduced the number of calories they ate to lose weight. Maximum study subjects (57.3%) did not eat lots of food high in dietary fibre. Most of the subjects (77.33%) did not include lots of fruits and vegetables (at least 5 servings per day) in their diet. All patients ate very few sweets like desserts, non-diet sodas and candy bars.

All the patients in the study were compliant to their diabetic medications. The knowledge about the footcare was negligible in patients. All the patients in the study were non-smokers/they did not provide true information about smocking history.

Table 4: SDSCA questionnaire.

VARIABLES	CATEGORY	FREQUENCY (n=75)	PERCENTAGE
Low fat eating plan	Yes	18	24
	No	57	76
Complex Carbohydrate Diet	Yes	13	17.3
	No	62	82.6
Reduced Calorie	Yes	66	88
	No	9	12
Dietary Fibre	Yes	32	42.7
	No	43	57.3
Fruits & Vegetables	Yes	17	22.6
	No	58	77.3
Sweets	No	75	100

Statistical application

When Statistics was applied using SPSS software (version 19) between some parameters to detect the significant relationship.

1. General Diet and Age (p = .045) There was a significant difference in the proportion of people following good general diet with increase in age.
2. Education: There was a significant association between education and following self-care recommendations (a) Low-fat eating Plan (p value = 0.032) (b) Complex Carbohydrate Diet (p value =0 .033) (c) Reducing calories to lose weight (p value = 0.032) (d) Consumption of food high in dietary fibre (p value = 0.034) (e) Consumption of Fruits and Vegetables (p value = 0.04) 3]
3. Disease Duration: There was a significant association between disease duration and parameters like (a) Hypertension (p value = 0.013) (b)Calorie Consumption (p value =0.027) (c) Medication Adherence (p value = 0.021).
4. There is a significant difference in the proportion of people having hypertension, reducing calories and adhering to medications with increase in the duration of disease.

DISCUSSION

The study was conducted to assess the self-care patterns in Type 2 DM patients in various departments of Sagar Hospitals, Bengaluru, using SDSCA questionnaire.

A total of 75 patients were included in the study which was conducted from June 2019-Novemember 2019. Age was found to be an important risk factor for diabetes. The age of the subjects ranged from 37 to 89, the mean age being 64 years with a standard deviation of 11.53.

The incidence of Type 2 DM was highest (56%) among the 46-60 years age group. This finding is similar to findings of the study conducted by Marinho FS et al.[10] (65years). The prevalence of diabetes in this age group is related to the lifestyle, obesity, poor diet, sedentary lifestyle, co-morbid conditions might be a reason for higher prevalence in this group. Reduction in the incidence of diabetes in the age group of 61-75 years and 76-90 years can be attributed to the fact that people followed good general diet and healthy lifestyle.

In the study population, 59% of the sample size were male. In males, higher exposure to risk factors might be one of the reasons. Women tend to have better health consciousness which might also be one of the reasons. This observation was contradictory to the observation by Marinho FS et al, where 64% of the sample size were found to be female.[10]

In the study population, 20% of the subjects were found to be alcoholic. This is an important parameter as alcohol like sweet wine and beer can increase sugar levels and excess consumption decreases the effectiveness of insulin, which leads to high blood sugar levels.

More than 50% of the subjects had studied at least up to secondary school. This finding was found to be higher in comparison with studies conducted by Mogre V et al.[11] The urban setup of the study maybe one of the reasons for this observation.

This finding was found to be lesser than finding of study conducted by Marinho FS et al.[10]

Knowledge about diabetes mellitus

In this study, 40% of the subjects were found to be diagnosed with Type 2 DM since more than 10 years. Nearly 70% of the subjects had hypertension as the comorbid condition. The same finding was reported by Kushwaha A S, et al. where 62.3% of the patients were hypertensive.[12] Diabetes and hypertension share common pathways such as sympathetic nervous system, renin angiotensin androsterone system, oxidative stress, adipokines, insulin resistance and peroxisome proliferator activated receptor. These pathways interact and influence each other and may cause a vicious cycle.

In the study population, nearly 67% of the subjects did not have or were not aware of family history of diabetes. Family History of diabetes is an important risk factor of diabetes, but the collection of this data was limited as subjects who were older did not know about their parents' disease status because of inadequate medical care during their time and mostly sibling disease status was collected.

In the study population, 28% of the subjects had a glucometer but its usage was restricted because of reasons like forgetfulness, lesser priority and apprehension about the reliability of the values. Inadequate medical care, financial status, lack of awareness and general discomfort in pricking blood regularly limited its use.

Similar observation was reported by Kushwaha A S et al, where most of the subjects (86.6%) were not given any advice by their health care staff on the mode and frequency of having their blood sugar checked.[12] No patient believed that they were ever hospitalized due to diabetes alone. Though diabetes is the primary reason for increase in hospitalization of subjects, they believed that they were never admitted for diabetes alone and did not give it as much importance.

SDSCA Questionnaire

Almost 23% of the subjects had a poor general diet and 54% of them had an average general diet. This shows a wider scope of counselling for healthful eating plan. Out of 75 patients, 72% of the subjects had an average specific diet i.e. ate an average amount of fruits and vegetables and consumed red meat or full-fat dairy products on a consistent basis. This can be attributed to lack of knowledge about healthy diet. This observation contradicts with the results of the study conducted by Rajashekharan et al. where most of the patients followed good general diet habits.[8]

From the results obtained, nearly 70% of the subjects had a poor exercise routine. This could be due to busy schedule, general lethargy, old age and lesser awareness about exercise in the subjects. Similar to this study, the adequate physical activity among our study participants was quite low (9%) in a study conducted by Mohandas A, et al. in Delhi.[13]

Maximum study subjects (76%) did not test their blood sugar levels in the last 7 days. This can be attributed to lesser access to medical care and not prioritizing regular blood sugar testing for better health outcome. The studies conducted by Mohandas A, et al., Raithatha S J et al., also observed blood sugar testing was the most deficient self-care activity among diabetic patients.[13,14]

Among the subjects, more than 85% of the subjects did not follow foot care. This study contradicts the observation by Marinho FS et al., where more than half the (59.3%) study subjects followed good foot care.[10] This could be due to lack of awareness among diabetes patients about maintaining good foot care practices to reduce foot related injuries, infection or amputations.

A total of 12% of the study population were found to be smokers. This study revealed that smokers weren't given much counselling about importance of stopping smoking nor were they referred to smoking cessation program. Contrary to this observation, smokers were more in number in studies conducted in Pune and Bangalore by Raithala AS, et al. and Suguna A, et al. respectively.[14,15]

SDSCA - Self Care Recommendations

Among the study population, maximum number of subjects did not follow self-care recommendations like low fat eating plan (76%), complex carbohydrate diet (83%), eating lots of food high in dietary fibre (57%) and eating lots of fruits and vegetables. A large number of the study population did however reduce the number of calories they ate to lose weight (88%). Not enough counselling was given to patients regarding better eating plans. This observation is similar to the a community based study conducted in Delhi by Mohandas A, et al.,

where self-care activities regarding specific diet were poor.[13]

Most of the patients participating in the study were not aware about the type of exercises they have to perform for their health benefit. The next question in the SDSCA self-care recommendations questionnaire was about the dipstick method and examining the colour change and urine glucose test is not relevant in the present situation. When question about the foot care was asked >85% of patients were not aware and not being counselled about the foot care. There were very few smokers in among the study participants.

Statistical Association between Education & self-care

In this study, there was a significant association between education and self-care recommendations like low-fat eating plan, complex carbohydrate diet, reducing calories in diet to lose weight, Consumption of food high in dietary fibre and consumption of fruits and vegetables. There is a significant difference in the proportion of people following these self-care recommendations with increase in education. This observation is due to higher self-awareness about the disease among the higher educated group.

Statistical Association between Disease Duration and Other factors

There was a significant association with duration of diabetes and medication adherence. This result coincides with the study result of Marinho FS et al.[10] Diabetes patients were found to have good adherence to medication. As the dosage regimen was regular. Longer duration of diabetes also showed a significant association with reduced calories consumption. This can be attributed to better advice given to subjects by caretakers and society.

CONCLUSION

This study brought to our notice that Type 2 DM in the study area was a significant problem. It also revealed that lifestyle risk factors were highly prevalent and significantly associated with the disease. There is plenty of scope for control of risk factors, self-care recommendation and motivation/education for risk factor modification/prevention.

There is also a need for early detection of pre diabetes and established diabetes and for the treatment of the effected individuals through appropriate community-based screening and treatment strategies. This study provided useful data for planning and implementing lifestyle modifications and self-care recommendations for diabetes in the hospital.

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