

**Original research article****Self-care activities amongst patients with type 2 diabetes mellitus in north Karnataka: A hospital based study**

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**Abstract**

The rising prevalence of diabetes all over the world, especially in the Indian sub-continent needs self-care from patients to prevent complications. Self-care of the diabetics include, eating healthy food with restriction of calories, physical activities, regular monitoring of blood sugar levels, medications, lifestyle modifications. Multiple studies have shown that regular self-care and adequate precautions are associated with good outcomes. To study the practice of self-care activities among the type 2 diabetics. It is a cross-sectional descriptive study. A modified version of SDSCA was used for the assessment. Patients attending outpatient services in the hospital were interviewed after obtaining the consent. Statistical analysis was done using Microsoft Excel 2016 and SPSS 20.1 trial version. Chi-square test and Student's t-test was used in the present study. 38% patients followed healthy eating plan, 51% of them did some physical activity for at least 30 minutes a day. 92% participants adhered to oral hypoglycemic treatment. 97% participants took insulin on whole week. 67.8% participants washed feet. 22.6% examined the feet for whole week. The health care providers should emphasize on the importance of the educating the diabetic patients regarding the complications.

**Keywords:** Diabetes Mellitus, Self-Care, SDSCA

**Introduction**

There has been steady increase in the prevalence of diabetes all over the world, the same trend is also observed in India.

It is predicted by the International Diabetes Federation (IDF) that the prevalence of diabetes would increase worldwide to 8.8% and 592 million adults will be affected by the year 2035 [1]. It is predicted that by year 2035 about 109 million people will be diabetic in India [1]. The treating team aims towards adequate control of sugar levels and prevent the complications in patients. In most cases the treatment is life-long and in many of the cases there may be use of multiple drugs so that good control is achieved. However several studies have shown that patients have poor adherence to treatment [2-4].

The patients have a very important and active role in self-care. Complications such as diabetic nephropathy; diabetic retinopathy and neuropathy can be prevented by controlling of blood sugar levels.

A good quality of life can be achieved by maintaining good control of diabetes. Poor awareness and practices of the patients influence the progression of diabetes and its complications. Diabetes self-care include various domains such as, eating healthy food with calorie restriction, being physically active, regular monitoring of blood sugar, regular medications, appropriate life style modifications [5]. Multiple studies have found that regular self-care and sufficient precautions are associated with the good outcomes [6, 7]. Indian patients have limited access to resources and also the treatment costs are also increasing for diabetes [8-10].

Among the diabetic patients the financial and beneficial outcomes may be increased by increasing the self-care component. However, the practices of self-care among the Indian diabetic patients are limited [11-14].

Multiple studies have shown poor compliance of self-care among diabetic patients, in spite of advices by healthcare providers. However, such studies to identify the lacunae are less and need further research.

Therefore, this study is done to assess the practice of self-care activities among the diabetics in this particular area of the current study.

**Methods**

**Study Setting**

The present study is a hospital-based cross-sectional descriptive study. The study was undertaken in patients attending the outpatient department of tertiary care hospitals in Bagalkot. The study duration was for six months from May 10, 2022, to October 25, 2022.

**Inclusion Criteria**

Patients with established Type 2 diabetes mellitus for at least the last one year who were on treatment were considered for the study.

**Exclusion Criteria**

Patients who did not give consent, non-respondents were excluded from the study. Patients who were seriously ill or bed ridden were excluded from the study.

**Consent**

Informed and written consent was obtained from all the study participants. The participants were explained about the study in their own language and interviewed after taking informed consent. Confidentiality was maintained at all times.

**Sample Size**

A sample size was calculated considering the prevalence of diabetes in Karnataka as 10.22% [15], a sample size of 170 was obtained. Sample size was calculated using the formula,  $n = 4pq/l^2$ ; where  $n = 146$  with 5% permissible error. Expecting 10% of non-compliance, the total sample size of 161 was obtained which was rounded off to 170 patients.

**Sampling:** Simple random sampling was done to reach the sample size, wherein the out-patient cases attending the tertiary care hospital in the hospital for follow-up of diabetes mellitus were considered and data was collected.

**Study instruments**

To assess the self-care activities of the questionnaire, the revised version of summary diabetes self-care activities questionnaire (SDSCA) was used with some modifications [16] which was validated. Pilot study was done and necessary changes were done to comply with data collection. The validated questionnaire contained five components: diet, exercise, blood sugar testing, foot care and smoking [17]. In the expanded version there are few more questions in relation to each of the components including the medication practices. In the present study diet, exercise, medication practices and foot care were included. Under each section, the participants were asked how often they practiced self-care in past seven days. Their responses were scored on a scale of 0-7. Data regarding the socio-demographic profile of the participants such as age, gender, marital status, literacy level, smoking and alcohol consumption, socioeconomic status, etc. were collected and the socio-economic status of the participants was calculated using Modified B G Prasad scale [18].

**Statistical Analysis**

Data was entered into the excel spreadsheet. Data was expressed in terms of proportion or percentages. The mean score was compared using independent student t test Variables showing the statistically significant association with the outcome variable ( $P < 0.005$ ) was considered as potential determining factors.

**Results**

In the present study, the total participants were 170; among them, 46% were male participants and 54% were females. Most of the study participants, that is, about 42.6%, belonged to the age group of 61-70 years followed by 22% in 41-50 years. Majority of the subjects, that is, 33% of the study participants, had a history of diabetes for less than 10 years and 22% had a history of more than 10 years. About 84% of the study subjects were on oral hypoglycemic agents (OHA) and 16% on both insulin and OHAs and none of them were on insulin alone. Most of the study participants, that is, 44.5% belonged to Class II socioeconomic status, 31.4% belonged to Class III, and only 2.5% belonged to Class V according to modified BG Prasad classification.

**Table 1:** Table showing the percentage of the study participants following self-care components

Self-Care Components	N	%
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Following healthy eating plan on all days of the week	60	35.29
Incorporating fruits or vegetables in diets on all days of the week	34	20.00
Consumption of fried foods on all days of the week	20	11.76
Consumption of high fat diet on all days of the week	09	5.29
At least 30 minutes of physical activity on daily basis	70	41.18
Specific exercise session other than the routine physical activity on daily basis	15	08.82
Blood sugar testing at least once in last 3 months	140	82.35
Adherence to oral hypoglycemic agents on all days of week	160	94.12
Adherence to insulin injections agents on all days of week	167	98.24
Washing feet on all days of week	105	61.76
Drying in between the toes on all days of the week	90	52.94
Examining feet on all days of the week	55	32.35
Inspecting the inner surface of the foot wear on all days of week	20	11.76

In the present study 35.29% of the patients were following healthy eating plan, only 20% of the study participants were incorporating fruits or vegetables in diets on all days of the week. 11.76% of the participants consumed fried foods on all days of the week, about 5.29% of the study participants consumed high fat diet on all days, 41.18% of the participants did some form of physical activity for at least 30 minutes each day. About 8.82% of the participants did Specific exercise session other than the routine physical activity on daily basis. Whereas 82.35% of the participants said they got the blood sugar testing done in last 3 months. 94.12% of the participants adhered to the oral hypoglycemic treatment on all days. 98.24% of the participants took insulin on all days of week. 61.76% of the participants washed feet and 52.94% of them dried the spaces between the toes on all days of week. 32.35% of them examined the feet and only 11.76% examined the inner surface of the footwear on all days of the week as shown in the table 1.

**Table 2:** Table showing the Self-Care Component of Diet, Physical Activity and Foot Care

Self-Care Component	Less Than 10 Years	More Than 10 Years	#t value	p value
<b>Diet</b>				
Eating Plan	4.53±1.31	5.54± 0.41	3.441	<b>0.001*</b>
Fruits And Vegetables In Diet	4.81±1.30	4.92±1.41	0.375	0.659
Fried Food	3.45±1.40	3.2±1.43	0.082	0.918
High Fat In Diet	1.14±1.21	1.41±1.73	0.803	<b>0.028*</b>
<b>Physical Activity</b>				
Daily Physical Activity	4.74±1.45	4.40±1.32	1.171	0.512
Other Exercise Sessions	2.74±1.33	3.24±1.53	1.322	0.387
<b>Foot Care</b>				
Washing Feet	5.40±0.42	5.57±0.41	1.049	0.846
Drying Between The Toes	4.31±0.52	4.65±0.42	1.532	0.144
Checking Feet	4.46±1.57	4.57±1.81	1.329	0.380
Inspecting Inner Surface Of The Shoes	3.34±1.22	3.83±1.47	1.451	0.248

#Unpaired t test was used to compare mean and Standard deviation.

\*p value of <0.05 was taken as statistically significant.

The mean days of the self-care components of the patients of diabetes with less than ten years and more than ten years was compared as shown in the table 2. More than 10 years group followed the eating plan for longer time in a week with 5.54± 0.41 days and the patients with duration less than 10 years followed it for 4.53±1.31 days in a week, this difference was statistically significant.

Diabetics with longer duration had higher intake of fruit and vegetables, although it was not statistically significant. Patients with longer duration of diabetes had more high fat diet compared to the <10-year duration diabetes this was not statistically significant. High fat in diet was more in patients with shorter duration i.e. 1.41±1.73, and longer duration diabetics had lower intake of fat which was 1.14±1.21, this was statistically significant.

When physical activity components were compared the patients with <10 years duration had higher daily physical activity with 4.74±1.45 days in comparison to 4.40±1.32 days in longer duration diabetics, this was not statistically significant. The patients with longer duration of diabetes had 3.24±1.53 days of other physical exercise sessions compared to 2.74±1.33 days of <10-year duration diabetic. Statistically this was not significant. With regards to foot care, the longer duration diabetics washed feet for 5.57±0.41 days in comparison to shorter duration diabetics of 5.40±0.42 days. The longer duration diabetics, dried their toes, checked their feet and inspected the inner surface of the shoes for more number of days as compared to the <10 year diabetics, although these were not statistically significant.

**Discussion**

The dietary component of the self-care was observed to be low in the present study, as less than half of the study participants followed healthy eating plan. Other studies by Padma *et al.*<sup>[14]</sup> and D Rajasekharan

found similar results <sup>[19]</sup>. In our study 20% of the study participants incorporated fruits and vegetables in diet on all days. In a study by D Rajashekar <sup>[19]</sup>, it was seen that 26.2% incorporated fruits and vegetables in diet on all of the week. Gopichandran *et al.* <sup>[11]</sup> found similar results. Although it is recommended by the WHO (World health organization) that at least 400 grams of fruits and vegetables should be consumed per day. In the present study only about 5.29% of the patients consumed fat diet on all days, our findings were consistent with the findings of study by Gopichandran *et al.* <sup>[11]</sup> and it was slightly higher in study by D Rajashekar (6.2%) <sup>[19]</sup>.

In the present study only about half the total number of study participants did At least 30 minutes of physical activity on daily basis. In a study by D Rajashekar <sup>[19]</sup> only 43.4% of them did a 30 minutes exercise every day and 17.6% carried out a separate exercise session apart from daily exercise. Similar findings were observed in studies conducted in India and abroad <sup>[11, 20]</sup>. About 82.35% of the patients said that they monitored their blood sugar levels once in every 3 months, many studies showed similar results <sup>[11, 21]</sup>.

In the current study most of the study participants adhered to the oral hypoglycemic drugs and insulin regimens 94.12% and 98.24% respectively. D Rajashekar <sup>[19]</sup> *et al.* found that Adherence to oral hypoglycemic drugs was (60.4%) and insulin injections were (66.9%) where as Gopichandran *et al.* <sup>[11]</sup> reported the adherence rate of 79% which was lower than our study. Most of our study population washed and dried their feet i.e. 61.76% and 52.94% respectively. Whereas only 32.35% of them examined their feet daily and only 11.76% of the patients inspected inner surface of their footwear on all days of week. D Rajasekharan *et al.* <sup>[19]</sup> found that the practice of washing of feet every day and drying between the toes was (70.7%) and (64.8%) respectively. Nadia Saeed in Pakistan <sup>[22]</sup> reported that only 20% of the participants practiced washing feet on a daily basis and 23% dried their feet. Similar findings regarding Examining feet on all days of the week and Inspecting the inner surface of the foot wear on all days of week were observed in studies conducted elsewhere <sup>[22]</sup>.

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#### Conclusions and Recommendation

In our study the aspects of adherence to treatment and monitoring of the blood sugar on regular basis was found to be satisfactory, other aspects need more attention by the patients. The health care providers should emphasize on the importance of the educating the diabetic patients regarding the complications. Education regarding preventive steps that they should take to prevent complications should be given. Future research needs to be done in larger sample size, especially in community to get more diverse view about the self-care practices.

#### References

1. Atlas D. International diabetes federation. IDF Diabetes Atlas, 6th edn. Brussels, Belgium: International Diabetes Federation; c2013. p. 147.
2. Shobana R, Augustine C, Ramachandran A, Vijay V. Improving psychosocial care: The Indian experience. *Diabetes Voice*. 2004;40:19-21.
3. Chew LD. The impact of low health literacy on diabetes outcomes. *Diabetes Voice*. 2004;49:30-2.
4. Kalyango JN, Owino E, Nambuya AP. Non-adherence to diabetes treatment at Mulago Hospital in Uganda: Prevalence and associated factors. *Afr Health Sci*. 2008;8:67-73.
5. Ramachandran A, Snehalatha C, Baskar AD, Mary S, Kumar CK, Selvam S, *et al.* Temporal changes in prevalence of diabetes and impaired glucose tolerance associated with lifestyle transition occurring in the rural population in India. *Diabetologia*. 2004;47:860-4.
6. American Association of Diabetes Educators. AADE guidelines for the practice of diabetes self-management education and training (DSME/T). *The Diabetes Educator*. 2009 Nov;34(3):84S-107S.
7. Shobhana R, Begum R, Snehalatha C, Vijay V, Ramachandran A. Patients' adherence to diabetes treatment. *J Assoc Physicians India*. 1999;47:1173-4.
8. Kapur A. Economic analysis of diabetes care. *Indian Journal of Medical Research*. 2007 Mar;125(3):473-82.
9. Loganathan AC, John KR. Economic burden of diabetes in people living with the disease; a field study. *J Diabetol*. 2013;3:4.
10. Rayappa PH, Raju KN, Kapur A, Bjork S, Sylvest C, Kumar KM. Economic cost of diabetes care the Bangalore Urban District Diabetes Study. *Int. J Diabetes Dev Ctries*. 1999;19:87-97.
11. Gopichandran V, Lyndon S, Angel MK, Manayalil BP, Blessy KR, Alex RG, *et al.* Diabetes self-care activities: a community-based survey in urban southern India. *National Medical Journal of India*. 2012 Jan;24(1):14.
12. Priya D, Hiwarkar PA, Khakse GM, Wahab SN. Self-health care practices among type 2 diabetes patients attending diabetes clinic in India: A descriptive cross-sectional study. *Int. J Recent Trends Sci. Technol*. 2012;4:116-9.

13. Kaur K, Singh MM, Kumar, Walia I. Knowledge and self-care practices of diabetics in a resettlement colony of Chandigarh. *Indian J Med Sci.* 1998;42:341-7.
14. Padma K, Bele DS, Bodhare TN, Valsangkar S. Evaluation of knowledge and self-care practices in diabetic patients and their role in disease management. *Natl. J Community Med.* 2012;3:3-6.
15. Somappa HK, Venkatesha M, Prasad R. Quality of life assessment among Type 2 diabetic patients in rural tertiary centre. *Int. J Med Sci. Public Health.* 2014;3:414-7.
16. Toobert DJ, Hampson SE, Glasgow RE. The summary of diabetes self-care activities measure: Results from 7 studies and a revised scale. *Diabetes Care.* 2000;23:943-40.
17. Jalaludin MY, Fuziah MZ, Hong JY, Mohamad Adam B, Jamaiah H. Reliability and validity of the revised summary of diabetes self-care activities (SDSCA) for Malaysian children and adolescents. *Malays Fam Physician.* 2012;7:10-20.
18. Modified BG Prasad socioeconomic Scalw. Available at status. <http://prasadscaleupdate.weebly.com/> [Accessed on 14/5/2022].
19. Rajasekharan D, Kulkarni V, Unnikrishnan B, Kumar N, Holla R, Thapar R. Self-care activities among patients with diabetes attending a tertiary care hospital in Mangalore Karnataka, India. *Annals of medical and health sciences research.* 2014 Feb;4(1):49-64.
20. Hailu E, Wudineh HM, Belachew T, Birhanu Z. Self-care practice and glycaemic control amongst adults with diabetes at the Jimma University Specialized Hospital in south-west Ethiopia: A cross sectional study. *Afr. J Prim Health Care Fam Med.* 2012;4:34-9.
21. Guo XH, Yuan L, Lou QQ, Shen L, Sun ZL, Zhao F, *et al.* A nationwide survey of diabetes education, self-management and glycaemic control in patients with type 2 diabetes in China. *Chin Med J (Engl.).* 2012;124:4174-80.
22. Saeed N, Zafar J, Atta A. Frequency of patients with diabetes taking proper foot care according to international guidelines and its impact on their foot health. *J Pak Med Assoc.* 2010;60:732-4.