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Self-care practices among known type 2 diabetic patients in Haldwani, India: a community based cross-sectional study

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ABSTRACT

Background: The prevalence of diabetes worldwide is expected to rise to 9.9% by 2045 and with this rising prevalence raises the need for good self-care practices by patients themselves, which play a key role in effective management and prevention of complications.

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Methods: Present community-based cross-sectional study was conducted among 168 type 2 diabetes mellitus patients by interviewing them using a structured questionnaire assessing their self-care practices using summary of diabetes self-care activities (SDSCA) scale. Different domains were diet, exercise, blood glucose monitoring, medication compliance, foot care and smoking and responses were graded according to number of days in previous week a particular self-care activity of a domain was followed. Data analysis was done with help of SPSS version 21.

Results: Mean age of diabetic patients in this study subjects was 54.37 ± 13.24 years. 43.45% respondents have poor self-care practice scores. Bivariate analysis showed that self-care practices were significantly poorer among the diabetic patients less than 60 years of age, residing in rural area, either illiterate or studied till primary/intermediate, had diabetes for less than a year and were taking treatment from public health facilities. Poor self-care practices were insignificantly related with gender, marital status, occupation, monthly family income, type of family, food habits, hypertension as comorbidity, family history, BMI and mode of diagnosis. Multivariate analysis indicates that age, education and duration of diabetes are significant predictors for self-care practices.

Conclusions: Self-care practices among diabetic patients were poor among 43.45% patients and there is a need for improving them across all assessed domains.

Keywords: Self-care practices, Type 2 diabetes mellitus, SDSCA

INTRODUCTION

Diabetes, a global epidemic, has been estimated to affect approximately 424.9 million people between 20-79 years of age worldwide in 2017, with type 2 diabetes accounting for about 90% of all cases, and this figure is predicted to increase to 628.6 million by 2045. Currently India is considered the diabetes capital of world and there are approximately 72.9 million people suffering from diabetes in India. With this rising prevalence rises the

need for good self-care practices among those diagnosed with diabetes to effectively manage the disease on their own for improved health outcomes. Self-care is multidimensional and execution of practices are required in multiple domains including diet, physical activity, medication adherence, blood glucose monitoring, foot care, smoking and other lifestyle changes to achieve good glycaemic control. Despite this fact, self-care is poorly followed or sustained either due to knowledge deficit, socio-demographic factors or inadvertently, as reported in previous studies. Hence the present study was conducted

to assess self-care practices among known diabetic patients.

METHODS

This community based cross-sectional study was conducted among diagnosed type 2 diabetic patients residing in field practice areas associated with medical college. All patients who came to attention during house to house survey within study period from April to June 2014, and agreed to participate in study, were included to assess their self-care practices regarding diabetes. Total 168 type 2 diabetes mellitus patients were finally included in present study and interviewed using a structured questionnaire containing socio-demographic information, diabetes characteristics and questions assessing self-care in diabetes derived from trivial modification of revised version of SDSCA scale given by Toobert et al.² SDSCA questionnaire contains items related to six different domains of self-care including diet, exercise, blood glucose monitoring, medication compliance, foot care and smoking. Although SDSCA measure is a self-report instrument, but in this study the responses for different items were recorded by interviewer according to number of days in previous week a particular self-care activity of a domain was followed on a scale of 0-7. More number of days reflected the better self-care practices and to allow for comparison in terms of percentages the given self-care activity was considered good if it was followed on most of days (≥5 days) in a week. If patients were sick during the past 7 days, then they recalled back to the last 7 days when they were not sick. Number of items in six domains included for calculating scores were diet (5 items), exercise (2 items), blood glucose monitoring (1 item), medication compliance (1 item), foot care (2 items) and non-smoking behaviour (1 item). Total number of days recorded as response for each item in a domain/subscale was designated as score itself for diet, exercise, medication compliance, foot care and for blood glucose monitoring and non-smoking behaviour scores were either 0 or 7, and then total score was obtained by adding all scores divided by total number of items giving equal weightage to each. Finally total scores ranged from 0 to 7 for each patient and scores less than 5 were considered poor. Data was analysed using SPSS version 21. Multivariate analysis using logistic regression was used to find the variables which could predict poor self-care practices among diabetic patients. Cox and Snell R Square for the model was 27.6% and internal consistency analysis for reliability of scale used showed Cronbach's alpha equal to 0.68, which was acceptable. 2-tailed p<0.05 was considered significant.

RESULTS

Mean age of study subjects was 54.37±13.24 years. Out of 168 diabetes patients studied, 74 (44%) were females and 94 (56%) were males. 80 (47.6%) and 88 (52.4%) were respectively from rural and urban areas. Majority of

respondents 86 (51.2%) were between 40-60 years of age, 28 (16.7%) were less than 40 years of age, and 54 (32.1%) were above 60 years of age. Majority of study patients 156 (92.9%) were married, and belonged to joint family 92 (54.8%). As stated by them, majority 64 (38.1%) had studied till intermediate, 42 (25%) were graduates, while 28 (16.7%) had studied till primary and rest 34 (20.2%) were illiterates. According to their occupation, majority 66 (39.3%) were housewives in our study, 38 (22.6%) in service, 24 (14.3%) in business and rest were either farmers, retired or unemployed. Income per month was above 15000 in 82 (48.8%), 10000-15000 in 50 (29.8%), 5000-10000 in 24 (14.3%) and less than 5000 in 12 (7.1%). 92 (54.8%) were consuming mixed diet and remaining 76 (45.2%) were vegetarian. In majority of study participants 56 (33.3%) duration of diabetes was 1-5 years, followed by more than 10 years in 52 (31%), and in remaining duration of disease was either between 5-10 years, or less than one year. Regarding the important comorbidity, hypertension was present in 76 (45.2%) patients and diagnosis of diabetes was incidental in majority 94 (56%). Concerned risk factors, family history of diabetes was present in 52 (31%) and, 92 (54.8%) had BMI greater or equal to 25 kg/m². 76 (45.2%) of study patients were taking treatment from private health facilities and rest from public ones (Table 1).

Among study participants 73 (43.45%) have poor selfcare practice scores. Bivariate analysis shows that selfcare practices were significantly poorer among the diabetic patients who were <40 years or between 40-60 vears when compared with those above 60 years of age (OR=0.3, p=0.027; OR=0.2, p<0.001), were from rural area as compared to urban (OR=0.2, p<0.001), were either illiterate or studied till primary/intermediate as compared to graduates, had duration of diabetes for less than a year compared to others, and were taking treatment from public health facilities as compared to others taking treatment from private facility. Poor self-care practices were insignificantly related with gender, marital status, occupation, monthly family income, type of family, food habits, presence of hypertension as comorbidity, family history of diabetes, BMI and mode of diagnosis (Table 1).

As stated by them 84 (50%) diabetic patients in present study followed specific healthful eating plan as recommended and majority 144 (85.7%) had consumed beverages without sugar on most days of past week. Other practices related to diet included consumption of five or more servings of fruits and vegetables, avoidance of high calorie foods and even spacing of carbohydrates on most days of past week, respectively followed by 80 (47.6%), 130 (77.3%) and 56 (33.3%). 88 (52.3%) responded that they had participated in at least 30 minutes of continuous physical activity on most days of past week. 120 (71.4%) had taken their recommended diabetes medication on most days of past week. Records of blood glucose test results maintained by 82 (48.8%)

and 78 (46.4%) tested blood glucose for recommended number of times. 70 (41.6%) respondents inspected their feet looking for any minor traumas, pressure marks, cracks and 24 (14.2%) inspected their footwear on most days of past week. Regarding smoking, 136 (80.9%) had not smoked during the past seven days of week. 32 (19%)

participated in spiritual discourses/ meditation to deal with stress and follow up examinations as recommended were carried out by 116 (69%). HbA1c test results during past six months were shown by 10 (5.95%) indicating fair glycaemic control (Table 2).

Table 1: Socio-demographic and clinical characteristics of respondents (n=168).

Characteristics	Frequency (%)	% with poor self-care practice score (n=73)	OR (Odds ratio)	P value	
Age (in years)					
<40	28 (16.7)	13 (46.4)	0.3 (0.1-0.8)	0.027	
40-60	86 (51.2)	48 (55.8)	0.2 (0.1-0.4)	< 0.001	
>60	54 (32.1)	12 (22.2)	1 ^{ref}		
Gender	-		-		
Female	74 (44)	30 (40.5)	1.2 (0.6-2.2)	0.500	
Male	94 (56)	43 (45.7)	1 ^{ref}		
Place of residence	` ,				
Rural	80 (47.6)	47 (58.8)	0.2 (0.1-0.5)	< 0.001	
Urban	88 (52.4)	26 (29.5)	1 ^{ref}		
Marital status			-		
Never married	6 (3.6)	3 (50.0)	0.5 (0.04-5.1)	0.560	
Married	156 (92.9)	68 (43.6)	0.6 (0.1-3.6)	0.621	
Widowed	6 (3.6)	2 (33.3)	1 ^{ref}		
Education					
Illiterate	34 (20.2)	16 (47.1)	0.3 (0.1-0.9)	0.036	
Primary	28 (16.7)	16 (57.1)	0.2 (0.08-0.6)	0.006	
Intermediate	64 (38.1)	31 (48.4)	0.3 (0.1-0.7)	0.012	
Graduate	42 (25)	10 (23.8)	1 ^{ref}		
Occupation					
Housewife	66 (39.3)	28 (42.4)	0.6 (0.2-1.5)	0.370	
Farmer	4 (2.4)	2 (50.0)	0.5 (0.06-3.9)	0.513	
Business	24 (14.3)	10 (41.7)	0.7 (0.2-2.0)	0.512	
Service	38 (22.6)	21 (55.3)	0.4 (0.1-1.0)	0.06	
Retired/unemployed	36 (21.4)	12 (33.3)	1 ^{ref}		
Monthly family inco	me				
< 5000	12 (7.1)	8 (66.7)	0.3 (0.08-1.1)	0.081	
5000-10000	24 (14.3)	14 (58.3)	0.4 (0.1-1.1)	0.09	
10000-15000	50 (29.8)	19 (38.0)	1.0 (0.5-2.1)	0.90	
>15000	82 (48.8)	32 (39.0)	1 ^{ref}		
Type of family					
Nuclear	76 (45.2)	30 (39.5)	1.3 (0.7-2.4)	0.34	
Joint	92 (54.8)	43 (46.7)	1 ^{ref}		
Food habits					
Mixed	92 (54.8)	43 (46.7)	0.74 (0.4-1.3)	0.345	
Vegetarian	76 (45.2)	30 (39.5)	1 ^{ref}		
Duration of diabetes					
<1	30 (17.9)	23 (76.7)	0.1 (0.04-0.3)	< 0.001	
1-5	56 (33.3)	22 (39.3)	0.6 (0.3-1.5)	0.35	
5-10	30 (17.9)	12 (40.0)	0.6 (0.2-1.7)	0.39	
>10	52 (31)	16 (30.7)	1 ^{ref}		
Hypertension				-	
Present	76 (45.2)	34 (44.7)	0.9 (0.4-1.6)	0.76	
Absent	92 (54.8)	39 (42.4)	1 ^{ref}		
Family history of diabetes					
Present	52 (31)	19 (36.5)	1.5 (0.7-2.9)	0.22	
Absent	116 (69)	54 (46.6)	1 ^{ref}		

Continued

Characteristics	Frequency (%)	% with poor self-care practice score (n=73)	OR (Odds ratio)	P value	
BMI (kg/m ²)					
<25	76 (45.2)	31 (40.8)	1.2 (0.6-2.2)	0.52	
≥25	92 (54.8)	42 (45.7)	1 ^{ref}		
Treatment from health facility					
Public	92 (54.8)	49 (53.3)	0.4 (0.2-0.7)	0.005	
Private	76 (45.2)	24 (31.6)	1 ^{ref}		
Mode of diagnosis					
Incidental	94 (56)	47 (50)	0.5 (0.2-1.0)	0.055	
Symptomatic	74 (44)	26 (35.1)	1 ^{ref}		

Table 2: Self-care practices of diabetes patients in present study (n=168).

Self-care practices	Frequency (%)
Diet	
Followed specific healthful eating plan (if any) on most days of past week	84 (50)
Consumed five or more servings of fruits and vegetables during past week	80 (47.6)
Avoided high calorie foods (such as red meat/full-fat dairy products including sweets and others) on	
most days of past week	130 (77.3)
Consumed beverages without sugar on most days of past week	144 (85.7)
Evenly spaced carbohydrates on most days of past week (including no skip meals, small frequent	
meals, avoiding overeating of any trigger food)	56 (33.3)
Physical activity	
Participated in at least 30 minutes of continuous physical activity as a part of daily work on most days of past week	88 (52.3)
Participated in specific exercise on most days of past week other than routine activities	78 (46.4)
Medication compliance	76 (40.4)
Taken recommended diabetes medication as prescribed on most of days during past week	120 (71.4)
Monitoring of blood glucose	120 (71.4)
Tested blood glucose, the number of times recommended by health care provider	78 (46.4)
Possess own glucometers at home and tested blood glucose for recommended number of times*	34 (20.2)
Record of blood glucose test results maintained*	82 (48.8)
Foot care	02 (40.0)
Examined feet on most days during past week looking for any minor traumas, pressure marks, cracks	
(including spaces between toes/around nails)	70 (41.6)
Dried between toes after washing feet on most days of past week*	20 (11.9)
Inspected footwear on most days during past week	24 (14.2)
Use of comfortable footwear*	61 (36.3)
Smoking/others	
Not smoked during the past seven days of week	136 (80.9)
Participation in spiritual discourses/meditation to deal with stress*	32 (19)
Follow up examinations as recommended by health care provider*	116 (69)
HbA1c examined during past six months*	10 (5.95)

^{*}not included in scoring.

Table 3: Multivariate analysis of various factors associated with poor self-care practices.

Characteristics	Frequency (%) (n=168)	Percentage with poor self-care practice score (n=73)	Adjusted OR	P value
Age				
<40 years	28 (16.7)	13 (46.4)	0.6 (0.1-2.9)	
40-60 years	86 (51.2)	48 (55.8)	0.2 (0.08-0.7)	0.015
>60 years	54 (32.1)	12 (22.2)	1 ^{ref}	
Place of residence				
Rural	80 (47.6)	47 (58.8)	0.5 (0.2-1.4)	0.225
Urban	88 (52.4)	26 (29.5)	1 ^{ref}	

Continued

Characteristics	Frequency (%) (n=168)	Percentage with poor self-care practice score (n=73)	Adjusted OR	P value		
Education						
Illiterate	34 (20.2)	16 (47.1)	0.1 (0.03-0.6)			
Primary	28 (16.7)	16 (57.1)	0.1 (0.04-0.6)	0.043		
Intermediate	64 (38.1)	31 (48.4)	0.2 (0.08-0.8)	0.043		
Graduate	42 (25)	10 (23.8)	1 ^{ref}			
Duration of diabetes (i	Duration of diabetes (in years)					
<1	30 (17.9)	23 (76.7)	0.1 (0.02-0.3)			
1-5	56 (33.3)	22 (39.3)	0.6 (0.2-1.9)	0.004		
5-10	30 (17.9)	12 (40.0)	0.5 (0.1-1.8)	0.004		
>10	52 (31)	16 (30.7)	1 ^{ref}			
Treatment from health facility						
Public	92 (54.8)	49 (53.3)	0.6 (0.2-1.4)	0.281		
Private	76 (45.2)	24 (31.6)	1 ^{ref}	0.201		

Multivariate analysis of variables found significantly associated with poor self-care practices on bivariate analysis indicates that age (p=0.015), education (p=0.043) and duration of diabetes (p=0.004) are significant predictors for poor self-care practices among diabetes patients. In other words, practices become better with advancing age, education and duration of diabetes (Table 3).

DISCUSSION

The present study among type 2 diabetic patients assessed their self-care practices regarding diabetes. Self-care includes essential activities anticipated from diabetic patients themselves to effectively manage the progression of diabetes. Studies have unswervingly shown that good self-care practices by patients with diabetes can significantly reduce the probabilities of developing longterm complications like nephropathy, neuropathy and retinopathy, cardiovascular and cerebrovascular complications. Despite this fact, adherence to these activities has been found to be poor in previous studies whether unknowingly or knowingly, which may be influenced by multiple factors. And this constantly increases the treatment cost too, which can certainly be minimised by improving self-care in diabetes management. Different aspects of self-care including healthy diet, physical activity, monitoring of blood glucose, compliance with medications and foot care, were assessed with modified SDSCA measure, and overall 43.45% patients were found to have poor self-care practices. Similar findings revealed in other studies in India using similar tool for assessment.³⁻⁵ In our study duration of diabetes was significantly related to better self-care practices, similarly Rajasekharan et al in Mangalore found better practices among participants with more duration of diabetes in few aspects, which might be due to accrued experience and exposure to self-care education measures also.⁶ Likewise disease duration had significant association with practices in study by Tol et al. In present study self-care was significantly associated with age and education, and as predictable, were better among graduates and patients above 60 years of age. Considering the role of family members in motivating the patients for better care, we had found no significant association of practices with type of family. However in a study from Delhi among middle/high-income population family income, family size, female sex and education were independent predictors of quality of diabetes care and also a wide gap exists between knowledge and implementation of effective diabetes management practices.⁸ Similarly in studies by Sharma et al and Bruce et al statistically significant association has been found between diabetes knowledge and practices. 9,10 In addition to knowledge, perception of illness by patients also significantly influence diabetes self-care, as shown by Kugbey et al in Ghana. 11 Veerakumar et al in Trichy area of Tamil Nadu found no significant association between self-care practices and gender, occupation and family history of diabetes which is similar to findings of present study. 12 On contrary better practices among males were reported in Gujarat.1

Dietary practices are crucial for glycaemic control and usually patients prefer to consume whatsoever cooked for other family members with exclusion of fatty and sweet foods. Majority 85.7% had consumed beverages without sugar on most days of past week, which is most commonly followed diet related practice in our study. Majority was not taking small frequent meals and practices like skipping of meals or, frequent consumption of some trigger foods were common. Specific healthful eating plan was followed only by 50% in this study which is less than 76.9% in a study from Thiruvallur. 14 In a study by Saleh et al in Bangladesh 90% diabetics with basic and technical knowledge had not followed recommended dietary advices. 15 Consumption of fruits and vegetables was less common practice and followed by 47.6% in present study while it was only 3% in Sullia.³ At least 30 minutes of moderate intensity activity on most days is effective in achieving good glycaemic control by reducing insulin resistance. Heterogeneous results had been observed in different studies in India, however in this study 52.3% patients followed at least 30 minutes of continuous physical activity on most days of past week. As observed in Rwanda 30% diabetics did not exercise at all and none of rest 70% exercised every day. ¹⁶

Adherence to recommended medications including oral anti-diabetic drugs and insulin injections was also poor and found only among 71.4%, which might be due to inattention or consultation from AYUSH practitioners. However Selvaraj et al in Puducherry had found high level of medication adherence as 95.6% patients had taken recommended medication for at least 6 days in a week, which might be ascribed to facility based study setting.¹⁷ Blood glucose monitoring is now becoming more adhered to due to availability of home available monitoring devices. Self-testing for recommended number of times was done by 20.2% in present study, which is consistent with study in Gujarat. 13 Foot care practices were poorest as compared to all other areas and with exception of washing of feet, other foot care practices were less commonly followed. 41.6% inspected their feet and only 14.2% inspected their footwear on most days of week in present study. Dinesh et al in Sullia found that checking the feet and inspecting the footwear were not followed by 99.5%.3 Foot care and annual eye check-ups were least practised among self-care aspects in studies from Vishakhapatnam and Yavatmal. 18,19 Similar had been observed in a study from Addis Ababa where most of patients had not even heard of what foot care is, although they had commonly suffered from injuries in feet.20 Smoking increases the risk of vascular complications in diabetes and should be quitted. Nonsmoking behaviour practised by 80.9% in present study which is similar to findings of Maheshwari et al in Tamil Nadu. 14 In all above discussed aspects, self-care needs to be improved and sustained, and should be accompanied with periodic follow up examinations.

CONCLUSION

In this study self-care practices among diabetic patients were poor and significantly associated with age, education and duration of diabetes. There is a need for improvement across all of the assessed domains, maybe possible with periodic training and behaviour change communication. Also the perceived barriers to self-care should be evaluated and patients should actively be involved in tailoring required modifications in their own routine. Media and innovative technological tools should be utilised.

Limitations

Assessment of self-care practices was based on recall and glycaemic control was not evaluated. It would have been better to assess each aspect of self-care distinctly rather than combining scores across them which lead to questionable internal consistency of used scale and therefore percentages related to different aspects were required for comparison.

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Institutional Ethics Committee

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