Original article

Diabetes self-care: A community based cross sectional study from Kollam district, Kerala

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Abstract

Introduction: Diet modification, physically activity and regular medications are reported to be positively correlated with glycaemic control and reduction of complications among people with diabetes mellitus. The current study was done to estimate the existing magnitude of noncompliance to diet, exercise, drug compliance and self care and to identify the factors affecting noncompliance among adults with type 2 diabetes mellitus in a rural population in Kollam district, Kerala.

Materials and Methods: A community based cross sectional study was conducted at Thrikovivattom Panchayath, Kollam district. Using a cluster sampling technique, 253 people with diabetes mellitus were selected and were interviewed using a structured questionnaire. Univariate and multivariate analysis of factors associated with non-compliance was done and odds ratios with confidence intervals were calculated.

Results: Compliance to drugs, exercise, foot care and diet were found among 167(66%), 64(24.1%), 54(21.3%) and 130(51.4%) respectively. In the multivariate analysis, female gender was associated with poor exercise compliance (OR 4.34, 95% CI 2.12- 8.33) and not advised by a doctor regarding diet was associated with poor diet compliance (OR 1.16, 95% CI1.03-1.30). Poor drug compliance was associated with age less than 50 years (OR 2.55, 95% CI 1.36-4.77), lesser duration of diabetes (OR 1.05, 95% CI 1.01-1.09) and not advised by a doctor regarding need for compliance (OR 1.95, 95% CI 1.18-3.88)

Conclusion: The self care behavior among people with diabetes in the current study was poor regarding exercise and foot care. A good diabetes self-management behavior change communication program at the primary care level with emphasis on motivating good self-care behaviors is needed.

Key words: Compliance, Diabetes Mellitus, Lifestyle modification, Physical activity, Self care

Introduction

Diabetes is a global escalating public health problem which causes excess mortality and morbidity as a result of long term complications.[1,2] Kerala is the 'diabetes capital of India' with a prevalence of diabetes as high as 20% ─ double the national average of 8%.[3]Diet modification, physically activity, blood sugar monitoring, regular medications are all reported to be positively correlated with glycaemic control, reduction of complications and improvement in quality of life.[4─

[6] Non-compliance with long term medication for chronic conditions has been identified as one of the reasons for failure of medical therapy and disease progression.[7] High cost of treatment, asymptomatic nature of disease, lack of knowledge on complications and forgetfulness were some of the most common reasons cited for not taking regular medications. Poor access to drugs, high cost, unequal distribution of health providers between urban and rural areas and cultural barriers further hamper self-care activities.[7-10]

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The current study was done to estimate the existing magnitude of noncompliance to diet, exercise, drug compliance and self care and to identify the factors affecting noncompliance among adults with type 2 diabetes mellitus in a rural population in Kollam district, Kerala as a baseline for initiating good self-management programmes.

Materials and Methods

A cross sectional study was conducted at Thrikovivattom Panchayath (Local Self Government Division) with a population of around 25,000 which was the rural field area of a medical college hospital. Data regarding self-care activities was collected from a sample in a cross-section of this community using cluster design.The sample size was calculated for a prevalence of positive self-management of 50% and a relative precision of 20% and a 95% confidence level. A design effect of 2.5 was used to make allowance for cluster sampling.

Thrikkovilvattom Panchayat had 23 wards (lowest political division of a Panchayat) with almost same population. Each ward was taken as a cluster and details from 11 diabetic patients were collected from each ward. Identification of the patients with diabetes was done in a systematic random sampling method with a sampling interval of one. Each house was visited and any person with diabetes identified in that house was included in the survey. Consecutive houses were contacted till the sample size in the cluster was reached. The diabetic status of the subjects was self-reported. People who were >18 years of age and independent for their activities of daily living with diabetes mellitus detected at least an year ago were included in the survey. If a door was locked the house was skipped and the closest next house was contacted.A structured questionnaire was formulated based on literature review, expert opinion and group consensus. The questionnaire covered the details of the socio demographic and health status, compliance to drug, exercise and food. The questionnaire was translated into vernacular (Malayalam) and back-translated into English to check for consistency. It was pilot tested before data collection. The interview methods were standardized.Diet compliance was defined as having a positive score of at least two out of the three of the questions- reduction in amount of daily food or calorie restriction, taking no added sugar in tea/coffee/ sweets and increase in intake of vegetables. Drug adherence was defined as not missing more than two doses in the last 15 days of all prescribed drugs. Exercise compliance was defined as a physical activity lasting for at least 20 minutes for at least 5 days of a week in almost every week in the last month. Foot care compliance was defined as always wearing slippers outside the house and usual daily care of foot and inspection for injuries.

The collected data were entered in Epi Info 2000 software and was analysed using SPSS Version 12. Descriptive statistics using frequencies and percentages was done. Univariate analysis of factors associated with non-compliance of each factors was done and odds ratios with confidence intervals were calculated. Variables were entered into a logistic regression model and adjusted odds ratios were calculated.

Results

Among the study subjects, 147(58.1%) were in the age group of 45 to 65 years and 131(58.8%) were males. Of them, 86(34%) of the study participants belonged to upper middle class family, 167(66.8%) were unskilled workers and 103(40.7%) had education up to high school level. In the study, 155(61.3%) of the participants had a family history of diabetes. Among them 76 (30%) had BMI between18.5-22.9, 67(26.5%) had BMI between 23-24.9, 70(27.7%) had BMI between 25-29.9 and

17 (6.7%) had BMI more than 30. Most of the study subjects in the sample were on Oral hypoglycaemic agents alone (59.3%). Socio-demographic characteristics of the study population were shown in Table 1.

Table 1: Socio demographic and clinical characteristics of the study population (N=253)

GENDER	FREQUENCY	PERCENTAGE
Male	131	51.8%
Female	122	48.2%
AGE		
25 -45yrs	34	13.4%
46-65yrs	147	58.1%
66-85yrs	66	26.1%
>86yrs	6	2.4%
SOCIOECONOMIC STATUS		
Upper	10	3.9%
Upper middle	81	32.01%
Lower middle	65	25.7%
Upper lower	67	26.4%
Lower	30	11.8%
EDUCATION		
Illiterate	28	11.1%
Primary	20	7.9%
Middle class	47	18.6%
High school	103	40.7%
Higher secondary	23	9.1%
Degree and above	32	12.6%
MARITAL STATUS		
Married	252	99.6%
Unmarried	1	0.4%
FAMILY HISTORY		
Yes	155	61.3%
No	98	38.7%
SYSTEM OF TREATMENT		

Modern Medicine	237	93.7%
Modern Medicine + Homoeopathy	5	2%
Homoeopathy	2	0.8%
Ayurveda	4	1.6%
Others	1	0.4%
No treatment	4	1.6%
TREATMENT MODALITIES		
Lifestyle interventions alone	27	10.7%
Oral Hypoglycemic Agents (OHA)	150	59.3%
Insulin	18	7.1%
OHA and Insulin	47	18.6%
Others	11	4.3%

Compliance to drugs, exercise, foot care and diet were found among 167(66%), 64(24.1%). 54(21.3%) and 130(51.4%) respectively. Details of diabetes self care behaviors among the study population was shown in Table 2. Among them, 152 (60.1%) were having regular follow up visit to the doctor at least once in a month, 58 (22.9%) were having follow up visits once in 3 months , 26 (10.3%) were visiting the doctor once in 6 months and 17(6.7%) has not visited any doctor during last six months.Reasons for missing doses or non compliance to diabetic medication (n= 86) was asked and the reasons reported were did not felt the need (56%), cost (12%), fear of side effects (8%), pain of injection (6%) and forgetfulness (19%). Regarding awareness about complications of diabetes mellitus,162 (64%) people were aware about the complications related to kidney,142 (56%) were aware about the effects on eyes,104 (41%) were aware about delayed wound healing,54 (21%) persons were aware about the nerve involvement while 59 (23.3%) were not aware about any complications due to diabetes mellitus.

In the study, 83.8% (212/253) of the subjects were advised on dietary modification by the treating doctor, 4% (10/253) were advised by health workers, 10.7% (27/253) got advice from the media and 9.9% (25/253) got primary dietary advice from a diabetic family member. Among them, 85.7% (217/253) were educated by the doctors regarding need for exercise and 58.1% (147/253) were educated on need for foot care. Of them, 25.29% (64/253) of the diabetic patients were not aware of foot care. 70.35% of the subjects (178/253) reported that they were educated about the possible complications of diabetes by the treating doctor.

In the study, 54.7% (116/212) of subjects who received advice regarding dietary modification from the doctor were compliant to diet while the figure was 34.1% (14/41) among those who had not received any dietary advice from doctors (p 0.016). Males (35.8%) were found to be more compliant to exercise than females (11.4%) (p < 0.001). Of those who aged more than 50 years, 72.2% (138/191) were compliant to drugs while among those who aged less than 50 years, 46.7% (29/62) were compliant to drugs (p <0.001). Among the subjects, 75.5% of the people with diabetes for more than five years duration were compliant to medications (111/147) as compared with 52.8% of persons diagnosed of diabetes of

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lesser duration (p <0.001). Study participants who received advice from doctor practiced foot care (25.6%, 38/148) better than those who did not receive advice from treating doctor (15.3%, 16/104) (p 0.050). Univariate analysis of factors associated with healthy diabetes self care behavior was shown in Table 3. In the multivariate analysis, female gender was associated with poor exercise compliance (OR 4.34, 95% CI 2.12- 8.33) and not advised by a doctor regarding diet was associated with poor diet compliance (OR 1.16, 95% CI1.03-1.30). Poor drug compliance was associated with age less than 50 years (OR 2.55, 95% CI 1.36-4.77), lesser duration of diabetes (OR 1.05, 95% CI 1.01-1.09) and not advised by a doctor regarding need for compliance (OR 1.95, 95% CI 1.18-3.88). Adjusted Odds ratios from final logistic regression models regarding factors associated with healthy diabetes self care behavior were shown in Table 4.

Table 2: Details of diabetes self care behaviors among the study population (N=253)

	Frequency	Percentage
God Dietary behavior	130	51.4%
Good Exercise behavior	61	24.1%
Good Foot care behavior	54	21.3%
Good Drug adherence	167	66%

Table 3. Univariate analysis of factors associated with healthy diabetes self care behavior

	Good dietary behavior OR (95% CI)	Good Exercise behavior OR (95% CI)	Good Foot care behavior OR (95% CI)	Good Drug adherence OR (95% CI)
Gender (Female)	0.86 (0.52-1.41)	4.31 (2.22-8.36)*	0.74 (0.40-1.37)	1.37 (0.81-2.32)
Age (<50 years)	0.98 (0.55-1.75)	0.88 (0.45-1.71)	1.40 (0.71-2.73)	2.96 (1.64-5.35)*
Educational status (less than 10th standard)	1.14 (0.55-2.37)	2.38 (1.08-5.26)*	2.05 (0.92-4.56)	1.12 (0.52-2.41)
SES (low)	1.16 (0.69-1.96)	0.61 (0.33-1.10)	0.96 (0.50-1.82)	1.24(0.72-2.13)
Duration of diabetes (less than 5 years)	1.33 (0.81-2.20)	0.80 (0.45-1.44)	0.69 (0.37-1.30)	2.75 (1.61-4.70)*
Advice given by a doctor (No)	2.33 (1.15-4.69)*	1.58 (0.62-4.01)	0.52 (0.27-0.99)*	2.13 (1.20-3.76)*

*p<0.05

Table 4. Adjusted Odds ratios from final logistic regression models regarding factors associated with healthy diabetes self care behavior

	Good dietary behavior OR (95% CI)	Good Exercise behavior OR (95% CI)	Good Foot care behavior OR (95% CI)	Good Drug adherence OR (95% CI)
Gender (Female)	0.86 (0.51-1.44)	4.34 (2.12- 8.33)*	0.88 (0.46- 1.66)	1.51 (0.86-3.12)
Age (<50 years)	1.00 (0.54-1.85)	1.28 (0.61-2.68)	1.24 (0.60-2.55)	2.55 (1.36-4.77)*
Educational status (<10th standard)	0.87 (0.39-1.93)	1.68 (0.71-4.00)	0.57 (0.23-1.37)	1.13 (0.48-2.68)
SES (Low)	1.00 (0.73-1.38)	1.18 (0.80-1.74)	0.99 (0.66-1.47)	0.82 (0.57-1.16)
Duration of diabetes more than 5 years	1.01 (0.97-1.04)	1.04 (1.00-1.09)	0.99 (0.94-1.03)	1.05 (1.01-1.09)*
Advice given by a doctor (No)	1.16 (1.03-1.30)*	1.42 (0.58-3.87)	0.915 (0.83-1.00)	1.95 (1.18-3.88)*

*p<0.05

Discussion

Non-compliance to diabetic management is expected to increase the complications and increase the cost of health care. The current study provides a perspective from a community-based sample in Kerala regarding the diabetes self- care practices.Compliance to drugs, exercise, foot care and diet were found among 66%, 24 %, 21% and 51% respectively. Though compliance to diet and drugs were found to be moderate, the compliance to exercise and foot care were low. Around a quarter of people with diabetes were not aware about at least one complications of diabetes. In the current study, 66% were compliant to diabetic drugs. The compliance to drugs varied from 32% in a study done at Saudi Arabia, 57% in a study from Kolkota, 76% in a studies from Maharashtra and Puduchery urban health centre.[9,11-13] Exercise compliance was found among 24% while the figures were 19%, 19.5% and 34% from studies done at Kolkota, urban Vellore and Puduchery respectively. [9,10,12] The studies at Puduchery and Maharashtra were done among the clinic attendees and that could be the reason for obtaining a higher compliance. Compliance to diet was seen in 51% in the current study while it was 34% in the study from Vellore and 37% in the study from Kolkota.[10,12] The higher compliance as compared to community based studies from other parts of the country could be due to the higher literacy rate and good health seeking behavior of the people of Kerala. It could also be due to variations in the tools and definitions used in different studies to elicit compliance.

Longer duration of disease and older age group were found to be associated with better drug compliance in the current study. Longer the duration of the disease, more will be the

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interactions with health care facilities. Diabetes being silent, people may not bother about the illness at earlier stages. Males were found to be more compliant to exercise than females. Females being engaged in household activities might not be able to find time to do exercise and exercise might not come to their priority at all. Though the awareness regarding diabetes complications is high as compared to studies from various other parts of the country, there is a wide scope for improvement. 25% of the people with diabetes did not know at least one complication of the diabetes and this highlights need for an intensive diabetes education and communication activities, both at clinics and at the community.

Even though many socio demographic factors can be considered as positive contributors in facilitating self-care activities in diabetic patients, role of clinicians in promoting self-care is vital. Patients often look to doctors for guidance, but it seems that many doctors are not discussing self-care activities with patients. More than 40% patients reported that foot care was not discussed with them by their clinicians. Not advised by their clinicians regarding diet and drug compliance were identified as risk factors for non- compliance in this study.

A practicing clinician should be able to identify persons at risk of non compliance like females for exercise, newly detected diabetes for drug compliance etc. and give extra attention to them to motivate self-care behaviors in them. From a public health point of view, the State needs good diabetes self-management education programmes at the primary care level with emphasis on motivating good self-care behaviors including lifestyle modification. Behavior change communications should be continuous with enhancement of motivation to change and sustain the changes. Self-report was used in this study to assess the non-compliance and this may over estimate the compliance rates. Further, patients may have problems with recall of medications taken in past 15 days. Only four of the self care behaviors were studied and many contributing factors influencing self care behaviors would have been left out. The self-care assessment tool used in this study has not been validated, but was checked for the content and construct validity by subject experts. The lack of standard measurements prevents comparison being made between studies and across populations.[14]Much work needs to be done to develop standardized, reliable and valid measurement tools.

To summarize, the self care behavior among people with diabetes in the current study were poor regarding exercise and foot care. Foot care seems to be a neglected area on clinician's advice. Advice by clinicians seems to have a positive role in improving compliance to diet and drugs. There is an awareness gap among people with diabetes regarding complications of the disease. A good diabetes self-management behavior change communication program at the primary care level with emphasis on motivating good self-care behaviors including lifestyle modifications are the need of the hour.

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