

Knowledge Of Diabetes And Self Care Practices In Chronic Diabetic Patients Attending A Tertiary Care Teaching Hospital In India

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Abstracts: With an alarming increase in the incidence of Diabetes, India is now being considered as 'Global Diabetes Capital'. Patient's knowledge regarding Diabetes and self-care practices are crucial to the success of any Diabetes Control Programme. Aims: To assess knowledge of Diabetes and self-care practices in chronic Diabetic patients. Materials and Methods: Hospital based cross sectional study involving 100 diabetic patients. Structured pre-tested questionnaires were employed. Responses that differed amongst various categories (gender, education and duration of Diabetes) were analysed using appropriate statistical test. Results: 58% were aware that diabetes can affect eyes, 54% aware about renal complications of DM and 44% knew that DM is a cardiovascular risk factor. 44% knew that annual eye examinations were essential for early diagnosis and treatment. Only 14% were aware of annual urine-protein check and only 30% got their lipids checked annually. 67% had regular BP checks and 28% did regular foot check. 40% knew their target sugar levels. Only 5% were aware of HbA1C test. 84% patient knew about hypoglycaemia and its treatment. 47% thought that DM is curable. An educational level of middle school or higher and duration of DM longer than 5 years was associated with higher score. Conclusion: There remains largely inadequate knowledge about Diabetes, its complications and importance of annual screening for complications. The importance of better glycaemic control and regular screening for complication should thus be emphasized by comprehensive education and awareness which will no doubt help in reducing the mortality and morbidity due to DM. [Mehta P et al NJIRM 2014; 5(2) :91-97]

Key Words: Diabetes, Knowledge, Self-care practices, Complications

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Introduction Diabetes is a globally burdensome non communicable disease. Worldwide the total number of people with Diabetes is projected to rise from 382 million in the year 2013 to 592 million in year 2035.¹ This rapid increase in the prevalence of diabetes mellitus is a major public health concern worldwide. Persistent elevated blood glucose levels lead to micro vascular and cardiovascular complications which substantially increase the morbidity and mortality associated with the disease. 80% of diabetics live in low and middle-income countries thereby creating a strain on the financial and medical resources of these countries.¹ In India, about 50.9 million people suffer from diabetes, and this figure is likely to go up to 80 million by 2025, making it the 'Diabetes Capital' of the world.² The International Journal of Diabetes in Developing Countries says that there is an alarming rise in the prevalence of diabetes, which has gone beyond epidemic form to a pandemic one. Lifestyle and behaviour, as well as individual genetic predisposition, influence the risk of developing Diabetes and thereby its prevalence in a community. Besides, uncontrolled Diabetes can

affect almost any organ/system of body and is a major economic burden for the society.

Despite such high prevalence, patient's knowledge on diabetes, its treatment and its complication still remain a major challenge, particularly in context of developing countries like India. It is rightly said that 'Prevention is better than Cure'. Prevention is important because the burden of the diabetes and its complications on health care and its economic implications are enormous, especially for a developing country like India. Patient education is always considered an essential element of DM management. Studies have consistently shown that improved glycaemic control and strict metabolic control can delay or prevent the progression of complications associated with diabetes. Evidences suggest that patients, who are knowledgeable about DM self-care, have better long term glycaemic control. Thus it is indispensable to ensure that patient's knowledge, attitudes and practices are adequate. The needs of diabetic patients are not only limited to adequate glycaemic control but also correspond with preventing complications,

disability limitation and rehabilitation. However patients often lack the knowledge and skills to self-manage their condition.

The importance of self-management skills in diabetes care has been stressed by the American Diabetes Association (ADA).³ Patients with diabetes, however, often lack sufficient knowledge about their disease and thus frequently have poor self-management skills.⁴ Studies have indicated that poor health literacy may be particularly important barrier to chronic disease care and good health outcomes.^{5,6} There have been many recent advances in the management of Diabetes. Though most of the medical practitioners are aware of the standard management of Diabetes, there is not ample data on patient's understanding of Diabetes and its complications, attitudes and practices. Such studies can no doubt help in development of future health education programs or interventions targeting the disease. Thus in view of the enormous health care burden of Diabetes, we ought to know what the patient actually understands of Diabetes and its complications. Working in a General Hospital which delivers services to all strata's of society but mainly to lower socioeconomic class and patients of nearby villages whose knowledge is usually on lower side, we feel it is important to check patient's understanding and motivation for Diabetes control. This study can really give us an insight as to what patient actually knows about their illness. This will not only help us improve Diabetes control in the individual patient but will also decrease the burden of Diabetic complications in the community. It will also guide us to cater better Diabetes care.

Aims and Objectives

1. To assess knowledge of diabetes (i.e. risk factors, symptoms, management and complications) among chronic diabetic patients.
2. To know self-care practice in chronic diabetes patients.

Materials and Methods:

Study Design and Setting:

This was a cross-sectional study done to determine the knowledge of DM, its complications and self-care practices among Diabetic population attending our hospital, a tertiary health care

hospital in Vadodara City, India. The hospital provides services free of charge and the target population includes people living in close proximity to the hospital, local city population as well as nearby villages.

We included all consenting adult diabetic patients (age \geq 18 years) with a duration of Diabetes of at least 6 months or more. Diabetes was defined as fasting venous plasma glucose (FPG) >126 mg % (7.0mmol/L) or a random venous plasma glucose >200 mg% (11.1mmol/L) in a patient with characteristic sign and symptoms of diabetes or confirmed on repeat testing if patient asymptomatic. Total 100 patients were included in the study. All patients were provided with an information sheet in vernacular language, given verbal explanation of the nature of study by the researchers and written consent obtained prior to enrolment.

Inclusion and Exclusion criteria:

Inclusion Criteria –1) Adult patients (18 years onwards) 2) Type 1 or Type 2 DM 3) Duration of Diabetes more than 6 months

Exclusion Criteria – Patients with Dementia, severe psychotic illness and learning disabled patients were excluded for ethical reasons as cannot give consent.

Ethics approval: This study was conducted according to the principles of the Helsinki declaration. Institutional Ethics Committee approval was taken prior to starting the study.

Data Collection and Analysis: Structured validated questionnaires were employed for this purpose. Privacy and confidentiality was ensured during the process. The questionnaire was first piloted on 20 patients who regularly attended the clinic. These patients were excluded from the study. The questionnaire was designed in all 3 languages – English, Gujarati and Hindi. The first part of the questionnaire covered the patient's demographic information which included: Age, sex, level of education, type of Diabetes and duration of Diabetes. The second part of the questionnaire included questions to determine patient's knowledge about Diabetes, its management, importance of regular blood monitoring whilst the

third part included questions on complications of DM and importance of annual screening for their early detection and self-care practices. Scores were given for each question with maximum attainable score of 40. Scores for each patient were calculated by cumulating points given for correct answers given by the patient. Overall Diabetes Knowledge was graded as very good (score >30), good (21-30), average (11-20) and poor (<=10). We also compared and documented responses that differed in a statistically significant manner amongst the various categories like gender, educational level and duration of Diabetes. Student's t test and Pearson's correlation coefficient was used to study correlation between Overall Diabetes Knowledge Score with gender (male/female), duration of Diabetes and Educational Status.

Results:DEMOGRAPHIC DATA: A total of 100 patients were included in the study. The demographic data is shown in table 1. Age ranged from 35 years to 85 years in the sample with 97% patients having type 2 DM. About 40 % patients were either illiterate or had less than fourth standard of school education. Most of the respondents (52%) had duration of disease between 1 to 5 years.

Table 1- Socio-demographic profile of the population studied

	N (%)
Age (years)	
<45	13
46-65	61
>65	26
Sex	
Male	55
Female	45
Educational Status	
Illiterate	23
<= 4 th Standard	15
5 th to 7 th Standard	22
8 th to 12 th Standard	31
College	9
Duration of Diabetes	
< 1 year	24

1-5 years	52
5-10 years	16
>10 years	08

Risk Factors for Diabetes Mellitus: Only 53% of the respondents knew that DM is a chronic disorder that as of now has no cure. Rest of them i.e. 47% were under the impression that Diabetes is curable and that they could stop medications after few years. Only 44% patients knew that DM could be hereditary. Of the study participants 92% correctly indicated that regular exercise helps in better diabetes control and that lack of exercise is risk factor for development of DM. 83% were aware that intake of high sugar food could predispose to development of DM.

Management and Treatment Targets: 96% respondents knew the right timings to test for DM i.e. fasting and postprandial sugar testing. 66% were aware of regular urine testing for sugar. 44% gave a correct response of the target fasting plasma glucose level and 51% knew of the correct postprandial glucose level. Only 5% were aware the glycosylated haemoglobin test and its use for monitoring DM. 94% patients saw doctor regularly but out of them only 89% knew the importance of regular blood check for monitoring of Diabetes.

Complications of DM: The awareness regarding various complication of DM is as shown in table 2.

Table 2: Knowledge of Diabetes Complications

Complications	Male	Female	Total (%)
Eye	33	25	58
Kidney	27	27	54
Heart	24	20	44
Stroke	18	13	31
Foot	26	19	45
Nerves	21	11	32

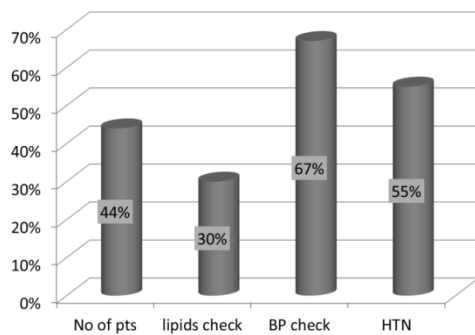
Eye Complications: 58% patients knew that DM can affect your eye but only 44% were aware of the importance of annual eye examination.

Kidney Complications: 54% patients knew that DM can affect kidney and lead to renal damage but again only 47% were aware that regular blood testing for kidney function could be done for early

diagnosis and prevention of renal disease. With regards to urine protein testing only 14 % were aware of this test, though 66% were knew about the regular urine testing for sugar.

Cardiac Complications:As regards the cardiac complication of DM, 44% respondents knew that DM is a risk factor for developing heart disease. However, only 30% were aware of the importance of regular lipid profile testing. As far as Blood Pressure checking was concerned, surprisingly almost 67% got their BP checked at regular interval. However this high number may be due to the fact that about 55 % had coexisting Hypertension. (See Fig 1)

Fig-1 Knowledge of cardiac complication and monitoring



CNS COMPLICATIONS:32% respondents were aware that Diabetes can affect nerves leading to neuropathy while 45 % knew that it can affect the foot leading to foot ulcers respectively. However in spite of being aware of the fact that Diabetes can affect foot only 28% did regular foot check. 18 males and 13 females knew that DM is a risk factor for developing stroke.

HYPOGLYCAEMIA:84 patients knew about the symptoms/signs of hypoglycaemia and treatment as well.

Overall Diabetes Knowledge Scoring: The scores were divided into very good, good, average and poor as in table 3. More than 50% patients scored between 21 and 30, whilst only 3% had scores <10.

Statistically significant correlation was observed between educational status and the overall score (Pearson correlation coefficient 0.428). (Table 4)

Similarly longer duration of Diabetes was associated with a better score (statistically significant, Pearson correlation coefficient 0.513). However there was no statistically significant difference in scores in male and female subgroups.

Table-3 Diabetes knowledge scores at different cut-offs among the study group of patients

Knowledge score	Grade	No of patients
31 to 40	Very Good	15
21 to 30	Good	57
11 to 20	Average	25
0 to 10	Poor	3

Table-4 Knowledge scores among the study group of patients by duration of diabetes from the time of diagnosis

Duration of diabetes (years)	No of patients	Overall Knowledge Score (Mean)
<1	26	17.7
1-5	56	25.6
>5	18	29.56
Total	100	23.37

Discussion:It is essential that diabetic patients should possess good knowledge about their illness in order to improve their self-management skills and thereby prevent complications. Research has found that less frequent self-care behaviours were evident among particularly high-risk diabetic patients with lower educational levels.^{5, 6} Another study revealed that among primary care patients with type 2 diabetes, poor health literacy was independently associated with worse glycaemic control and higher rates of retinopathy.⁷

There is growing evidence highlighting the importance of self-management skills in diabetes, and the ADA has endorsed self-management education as the process of providing the person with diabetes with the knowledge and skills that are necessary for self-care, management of crisis and implementation of lifestyle changes.³

Many of our findings in the various knowledge areas were consistent with the findings of other

studies, such as the knowledge that diabetes can be inherited (44%). Even in other studies, in which the overall diabetes knowledge did not appear to be adequate, participants had stated that diabetes was an inheritable disease.⁸ Despite the fact that the majority of patients had diabetes for more than 5 years a major proportion (47.0%) of the participants thought that diabetes could be cured and they can stop medication after few years. This agrees with evidence from other studies which indicated that 38.2% in Saurashtra, Gujarat state and 49.5% in Ludhiana believed that diabetes could be cured.^{9, 10}

Although the overall mean knowledge score was satisfactory, it is noteworthy that only 44.0% knew the normal range of fasting blood sugar and 66.0% knew that blood sugar should be measured regularly to assess control. This is also consistent with other studies done in the South Asian region where the majority of patients did not know the ideal blood glucose target levels.^{10, 11, 12} Again, only 5% were aware of the glycosylated haemoglobin test and its use for monitoring DM. This is similar to that documented by Dr. M Gulabani et al.¹⁰

Table 5 : Knowledge of diabetes among the study group (n = 100)

Questions	% who answered correctly
Know that diabetes could be inherited	44%
Know that diabetes is incurable	53%
Know that regular exercise is helpful to control diabetes	92%
Know the importance of dietary regulation in addition to medication for diabetes control	83%
Know that blood sugar should be measured regularly to assess control	89%
Know about the glycosylated haemoglobin test and its use for monitoring DM	5%
Know the normal range of fasting blood sugar	44%
Know the normal range of post prandial blood sugar	41%
Know that chronic complications could occur with diabetes	70%
Know about regular BP check	67%

Know of the importance of the regular lipid profile testing	30%
Know about urine protein test	14%
Know that regular examination of feet should be done	28%
Know that annual eye examination should be done	44%
Able to recognize symptoms of hypoglycaemia	84%

A high proportion of our participants (92.0%) did know that regular exercise is helpful to control type 2 diabetes. It is also noteworthy that 83.0% knew that it is important to control the diet in addition to taking medication for diabetes. In a similar study conducted in Pakistan it was reported that only 28% of diabetic thought dietary modification was important while only 6% believed that weight loss was important in the management of diabetes.⁸

It was reassuring that in this study, 84% patients knew about the symptoms/signs of hypoglycaemia and its timely treatment. This is in contrast to the study in Ludhiana where only 51.5% knew about the symptoms of hypoglycaemia.¹⁰

On the other hand, it was quite alarming to note that although the great majority of patients knew that diabetes can lead to chronic complications (70.0%), vast majority were unaware of the annual screening tests for prevention, early detection and treatment of these complications. To be specific, 32% respondents were aware that diabetes can affect nerves leading to neuropathy and 45% knew that it can affect the foot leading to foot ulcers but only 28% actually did regular foot check-up. A study carried out in Pakistan found that knowledge about diabetic foot care was poor in 30.7% of diabetics.¹³ Also concerning is that, even though diabetes is currently the leading cause of new cases of blindness in adults in many industrialized countries and an increasingly more frequent cause of blindness elsewhere¹⁴, only 58% patients in our study knew that DM can affect eyes and only 44% were aware of the importance of annual eye examination to prevent diabetic retinopathy. Patients' knowledge about diabetic eye disease was also poor in other studies carried out in the South Asian region. Hoque et al. in Bangladesh, for

example, found that only 4.9% of their study participants were aware about diabetic eye disease.¹⁵ He also reported that 13% knew about the renal complication. Renal complication was least known to patients in another similar study carried out by Shah VN et al., in Saurashtra, India.⁹ This is in contrast to our study where in about 54% patients knew that DM can affect kidney and lead to renal damage. However, only 47% were aware that regular blood testing for kidney function could be done for early diagnosis and prevention of renal disease. Gul N et al., have also reported quite low awareness about eye and renal complications in his study.¹¹ As regards the cardiac complication of DM, 44% respondents in our study knew that DM is a risk factor for developing heart disease. This is almost similar to that reported by Hoque et al.¹⁵ Statistically significant correlation was observed between educational status and the overall score (Pearson correlation coefficient 0.428). Similar finding were observed in other studies too.¹⁵ Similarly longer duration of Diabetes was associated with a better score (statistically significant, Pearson correlation coefficient 0.513). However there was no statistically significant difference in scores in male and female subgroups. This is in contrast to other studies wherein men had significantly higher score than women.^{10,12} The advantage of our study was that the male to female ratio was almost equal; 45% were females and 55% were males and patients from both urban and rural areas were included. The patients also had different educational level and the duration of Diabetes had a vast variation. There were some limitations to our study that should be noted. This study was a small study conducted at a general hospital on 100 patients. Besides majority patients were of type 2 Diabetes. Therefore the good knowledge reported here may not be representative of the community as there may be diabetics who do not visit the hospital.

Conclusion: In conclusion, although overall knowledge about diabetes among our patients was adequate, there were critical gaps in knowledge. In particular, knowledge about the management of diabetes and diabetic complications was poor. This study has helped identify areas where there were gaps in patient knowledge. The findings could be used to design Patient Diabetes Education

Programme to improve patient self-management as very few patients actually receive formal diabetes education. Since this study was conducted at a single community health care centre in an urban area, the results do not reflect the knowledge of the general population and further studies are required particularly in different settings to identify patient educational needs and methods to improve self-management of diabetes. Increased efforts thus need to be put to develop easily accessible diabetes education programs which can no doubt decrease the morbidity and mortality associated with Diabetes.

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