

Original Research Article

A cross-sectional study on knowledge and health seeking behaviour of adults with diabetes mellitus

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ABSTRACT

Background: Diabetes mellitus (DM) is a metabolic disease, involving elevated blood glucose levels. The main subtypes of DM are Type 1 diabetes mellitus (T1DM) and Type 2 diabetes mellitus (T2DM), which result from defective insulin secretion and/or action. T1DM presents in children or adolescents, while T2DM is thought to affect middle-aged and older adults.¹ An estimated 589 million adults (20-79 years) are living with diabetes 1 in 9. This number is predicted to rise to 853 million by 2050. This study aimed to determine the knowledge regarding diabetes mellitus among adults, to determine the health-seeking behaviour of adults with diabetes mellitus, to find association between level of knowledge and health-seeking behaviours of adults with selected demographic variables.

Methods: A cross-sectional survey design was adopted in the. Purposive sampling technique was used to select 100 sample. The variables of the study were the knowledge level and health-seeking behaviours. Data collection tool included a structured knowledge questionnaire and a checklist on health-seeking behaviours.

Results: The result on level of knowledge on diabetes mellitus revealed that 27% of the adults had a poor level of knowledge, 35 % of the adults had average knowledge and 38% of the adults had good knowledge regarding diabetes Mellitus. Walking was the most common wellness behaviour.

Conclusions: The level of knowledge on diabetes Mellitus among the adult participants was average. Walking was the most common wellness behaviour.

Keywords: Diabetes mellitus, Health seeking behaviour, Knowledge

INTRODUCTION

Diabetes mellitus is taken from the Greek word diabetes, meaning siphon-to pass through and the Latin word mellitus meaning sweet. A review of the history shows that the term "diabetes" was first used by Apollonius of Memphis around 250 to 300 BC. Ancient Greek, Indian, and Egyptian civilizations discovered the sweet nature of urine in this condition, and hence the propagation of the word Diabetes Mellitus came into being. Mering and Minkowski, in 1889, discovered the

role of the pancreas in the pathogenesis of diabetes. In 1922 Banting, Best, and Collip purified the hormone insulin from the pancreas of cows at the University of Toronto, leading to the availability of an effective treatment for diabetes in 1922. Globally, 1 in 11 adults has DM (90% having T2DM). The onset of type one diabetes mellitus gradually increases from birth and peaks at ages 4 to 6 years and then again from 10 to 14 years. Approximately 45% of children present before age ten years. The prevalence in people under age 20 years is about 2.3 per 1000.¹

According to a longitudinal study reported in Lancet on diabetes prevalence among adults aged 45 years and older in India was 19.8%, which amounted to 50.4 million people. Prevalence among men and women was similar (men, 19.6% and women, 20.1%). Urban diabetes prevalence (30.0%) was approximately twice as high as rural prevalence (15.0%). States with higher levels of economic development tended to have greater age-standardised prevalence. Overall, 60.1% of individuals were aware of their diabetes. Of individuals with diagnosed diabetes, 45.7% achieved glycaemic control, 58.9% achieved blood pressure control, and 6.4% (5.8-7.2) were taking a lipid-lowering medication. Diabetes prevalence was higher in states with greater levels of economic development, and in the highest-prevalence states, a third or more of individuals had diabetes.³

The etiology of diabetes is believed to be multifactorial. Many individual-level non modifiable risk factors like genetic, age, ethnicity, and family history have been prospectively associated with type 2 diabetes, but the increases in prevalence in most populations have probably been driven by a modifiable risk factors including sedentary lifestyle and/or lack of exercise, increasing prevalence of overweight/obesity, unhealthy diets (increased intake of refined grains, fat, sugar, and sweetened beverages and decreased intake of fruits and vegetables) and habits (smoking and alcohol abuse), exposure to environmental pollutants, altered intrauterine environment and mental health (stress/depression), short sleep duration, and the built environment.⁴

Diabetes is well known for its systemic impact on a wide range of diabetes-related complications, including macro vascular and microvascular complications and death among the most feared outcomes. In addition, recently diabetes is also being linked to non-traditional complications such as mental health, cancer, disability, and liver disease. Diabetic retinopathy is recognized as the most specific complication of diabetes and has been used to guide diabetes diagnostic thresholds. The relatively high prevalence of diabetic complications in developing economies like India could be due to delay in diagnosis of diabetes as well as complications, coexisting illness, inadequate health care systems, and high drug cost, particularly insulin leading to poor control of diabetes.⁴

Studies suggest that increasing the knowledge of diabetes and its risk factors among the population will likely have a substantial benefit in preventing diabetes considering the increasing burden of diabetes in India. It is necessary to understand the knowledge of diabetes risk factors complications and preventions to design culturally appropriate educational strategies.

A prospective cross-sectional study was conducted to evaluate the knowledge of diabetes mellitus (DM) among the rural residents of Erode district, Tamil Nadu, India. A total of 974 patients who were 18 years of age or older

were randomly chosen by utilizing a convenience sample technique. The diabetes knowledge was examined using modified version of the Michigan diabetes mellitus questionnaire. This study concluded that there was a statistically significant difference in knowledge of diabetes mellitus among different age groups. Hence, to prevent diabetes and its complications there is an urgent need for educational campaigns with a prioritized focus on poorer, rural, less educated populations, on proper lifestyle interventions to improve the self-care behaviour of patients.⁵

A community-based cross-sectional descriptive study was conducted among patients diagnosed with DM in an urban area of Pondicherry India. The aim of the study was to explore the health-seeking behavior among patients diagnosed with diabetes mellitus. About 109 participants were included and interviewed in this study. A simple random sampling method was used to recruit the study participants in the community. A predesigned structured questionnaire was used to collect information from the participants by conducting face-to-face interview. The findings showed that most of the respondents (56.8%) seek treatment from a private health facility. The most common comorbidity that was reported in this study was hypertension (59.6%). The participants in the study shared unhealthy diet (55%), family history (25.7%), sedentary lifestyle (23.9%), and obesity (17.4%), which were the risk factors of diabetes mellitus. Only 12.8% of participants were testing their blood glucose level at monthly intervals and eight participants were on irregular medication, and among them, three participants told that they were irregular on treatment because their blood glucose levels were normal. This study concluded that, the level of awareness on diabetes among the participants was not satisfactory though the overall treatment-seeking behavior is found to be satisfactory. This study recommended to plan and implement various Information, Education and Communication (IEC) activities in the study area to increase the awareness.⁶

One of the first study from India to report on the awareness and knowledge of diabetes on a representative sample of four regions of the country, representing a population of over 200 million people. The following are the significant findings: (1) Overall only about 50% of the population of the four regions of India studied have heard of a condition called diabetes. (2) A significant disparity exists in the level of knowledge of diabetes between the different regions studied. (3) In rural areas, the awareness and knowledge about diabetes are significantly lower than in urban areas. (4) Females had low awareness rates compared with males in all regions except Chandigarh. (5) Not surprisingly, there is better knowledge of diabetes among the self-reported diabetic population compared with the general population in all four regions studied. (6) However, even among known diabetic subjects, knowledge levels are not satisfactory. (7) Based on a composite knowledge score, among the population studied, Tamil Nadu had the highest and Jharkhand the

lowest score, while among self-reported diabetic subjects, Maharashtra had the highest and Tamil Nadu had the lowest score.⁷

Another study was conducted in Dakshina Kannada District, Karnataka India, to explore health care seeking behavior among persons with diabetes mellitus and the factors influencing such behaviors. In this study, a qualitative research method was applied to explore the health care seeking behaviors among 14 individuals (8 males and 6 females) with diabetes mellitus. A snowball sampling technique helped in identifying willing participants aged 18 years and above in this study. The findings revealed unsatisfactory health care seeking behaviors among the majority of the patients. The majority of the interviewees in the study admitted not seeking regular medical attention to various reasons. The main reason for poor health care seeking behaviors were financial constraints, where the interviewees expressed their unwillingness to use the limited family resources. Other reasons include lack of family support and distance to health care facilities. The study concluded that the health seeking behaviors among persons with diabetes mellitus in Dakshina Kannada is similar to the rest of India and other developing nations. The unsatisfactory health care seeking behaviors is linked to the socio-economic situation such as income, level of poverty, and family support.⁸

The need for studying diabetes among adults is imperative due to its rising prevalence, complex nature and significant impact on morbidity, mortality, and economic burden. As diabetes affects millions worldwide, understanding its multifaceted aspects is crucial for effective prevention, management and treatment. Therefore, the present study was undertaken to assess the knowledge of diabetes among adults in the urban and rural areas of a selected community.

This study aimed to identify the knowledge regarding diabetes mellitus among adults, and to determine the health-seeking behaviour of adults with diabetes mellitus. Also, to determine the association between level of knowledge of adults with selected demographic variables, and to determine the association between health-seeking behaviours among adults with diabetes with regard to demographic variables.

METHODS

A qualitative research approach was considered for the present study. A cross-sectional survey design was used. The setting for data collection was urban areas of Kengeri, Bangalore, India.

Individuals with diabetes mellitus was the target population. Accessible population included, adults in the age group of 18-60 years with diabetes mellitus in the urban areas of Kengeri.

Purposive sampling technique was used to select 100 sample for the study. The variables of the study were the knowledge level and health-seeking behaviours.

The samples were selected with the following predetermined criteria:

Inclusion criteria

Adults in the age group of 18-60 years, adults diagnosed with diabetes mellitus, adults who were willing to participate in the study, and adults available at the time of data collection were included.

Exclusion criteria

Children and pregnant women, and cognitively impaired adults were excluded.

The data collection tools used in this study were a questionnaire on sociodemographic variables and knowledge items on diabetes mellitus. The items on demographic variables were age, gender, source of information, diagnosis, duration of diagnosis and family history regarding diabetes. The section on knowledge items regarding diabetes included questions regarding, dietary intake and management. There were 18 items. Each item had four options with one answer. The score for correct response was "one" and incorrect was "zero". Thus, maximum obtainable score was 18.

Score interpretation

The checklist consisted of items assessing the health-seeking behaviours of adults with diabetes mellitus. The total knowledge score ranged from 0 to 18 and was interpreted as follows: 0-5 indicated poor knowledge, 6-12 indicated average knowledge, and 13-18 indicated good knowledge.

Ethical considerations

Permission was obtained from relevant authority to conduct the study in the community. Verbal consent was taken from adults participating in the study.

Data collection procedure

Permission from the concerned authorities was obtained to conduct the study. The data collection period was in the month of May 2023. The total sample for the study consisted of 100 adults in the age group of 18-60 years with diabetes mellitus in the urban areas of Kengeri. The investigators approached the selected participants and handed over the questionnaires. The data collection tools used in this study are the Questionnaire and the Checklist which was administered after obtaining verbal consent from the adults. Participants took 30 minutes to complete filling the tools.

RESULTS

Description of demographic variables of adults

In the present study 57% belonged to the age group of 51-60 years, 23% belonged to the age group of 41-50 years, 16% belonged to the age group of 31-40 years and only 4% belonged to the age group of 18-30 years. As per gender, 60% were female and the remaining 40% were male adults. Source of knowledge on diabetes mellitus showed that 22% of the adults had knowledge from newspapers, 18% of the adults from television, 47% of the adults from family members and 13% of the adults from other sources. Majority (60%) of adults were diagnosed by routine check-ups 13% of the adults were diagnosed by opportunistic screening, 19% during acute illness and 8% by other methods. Duration of diagnosis was 1 year for 12% of the adults 51% of the adults were diagnosed since 1-2 years, 22% of the adults were diagnosed since 2-3 years and 15% of the adults more than 3 years. Family history showed that 20% of the adult's fathers had diabetes, 34% of the adult's mothers had diabetes, 17% of the adult's siblings and 29% of the adult's other family members had diabetes (Table 1).

Table 1: Frequency and percentage distribution of adults according to demographic variables.

Variables	Options	Frequency (n=100)	Percentage
Age in years	18-30	4	4
	31-40	16	16
	41-50	23	23
	51-60	57	57
Gender	Male	40	40
	Female	60	60
Source of knowledge	Newspaper	22	22
	Television	18	18
	Family	47	47
	Others	13	13
Diagnosis	Opportunistic screening	13	13
	Acute illness	19	19
	Routine check-up	60	60
	Others	8	8
Duration in years	1	12	12
	1.1-2	51	51
	2.1-3	22	22
	More than 3 years	15	15
Family history	Father	20	20
	Mother	34	34
	Sibling	17	17
	Others	29	29

Description of level of knowledge of adults on diabetes mellitus

The distribution of adults as per level of knowledge on diabetes mellitus revealed that 27% of the adults had a poor level of knowledge, 35% of the adults had average knowledge and 38% of the adults had good knowledge regarding diabetes mellitus (Figure 1).

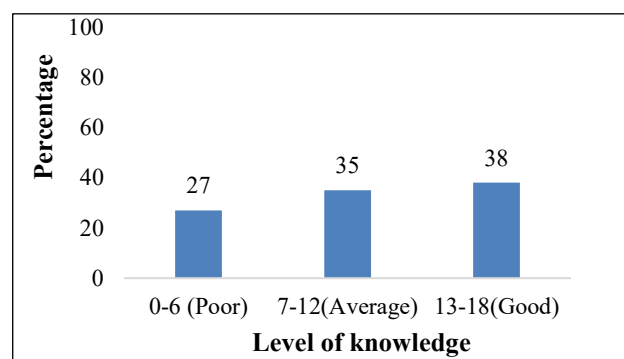


Figure 1: Percentage distribution of adults as per level of knowledge on diabetes.

Description of health seeking behaviours of adults with diabetes mellitus (Table 2)

Walking

About 6% of the adults do not have the habit of walking, 63% of the adults walk daily, 23% of the adults walk once in a week, 8% of the adults walk twice in a week.

Exercise 62% of the adults do not exercise, 7% of the adults exercises daily, 19% of the adults exercises once in a week, 10% of the adults exercises twice in week and 2% of the adults exercises thrice in a week.

Yoga 84% of adults do not practice yoga, 2% of adults do yoga daily, 4% of adults does yoga once a week, 7% of the adults do yoga twice a week and 3% of the adults do yoga thrice a week.

Meditation 86% of adults do not meditate, 2% of the adults meditate daily, 2% of the adults meditate once a week, 5% of the adults meditate twice a week and 5% of the adults meditate thrice in a week.

Smoking

About 75% of the adults did not smoke, 8% of the adults smoke daily, 6% of the adults smoke once a week, 4% of the adults smoke twice a week and 7% of the adults smoke thrice in a week.

Alcohol

87% of the adults do not consume alcohol, 2% of the adults consumes alcohol daily, none of the adults

consumes alcohol once in a week, 6% of the adults consumes alcohol twice in a week and 5% of the adults consumes alcohol thrice in a week.

Taking medication

14% of the adults did not take medication, 48% of the adults take medication daily, 27% of the adults take medication once in a week, 9% of the adults take medication twice in a week and 2% of the adults take medication thrice in week.

Sugar monitoring

About 11% of adults do not practice sugar monitoring, 8% of adults monitor sugar daily, 33% of adults monitor sugar once a week, 26% of adults monitor sugar twice a

week and 22% of the adults monitor sugar thrice in a week.

Weight monitoring

46% of adults do not practice weight monitoring, 1% of adults monitor weight daily, 7% of adults monitor weight once a week, 12% of adults monitor weight twice a week and 34% of adults monitor weight thrice in a week.

Visit to doctor

All of the adults visited doctor, 19% of the adults visits doctor once in a month, 39% of the adults visits doctor once in 2 months, 25% of the adults visits doctor once in 3 months and 17% of the adults visits doctor once in 6 months.

Table 2: Frequency and percentage distribution of adults as per health seeking behaviours.

Variables	Options	Frequency (n=100)	Percentage
Walking	No	6	6
	Daily	63	63
	Once in a week	23	23
	Twice in a week	8	8
	Thrice in a week	-	-
Exercise	No	62	62
	Daily	7	7
	Once in a week	19	19
	Twice in a week	10	10
	Thrice in a week	2	2
Yoga	No	84	84
	Daily	2	2
	Once in a week	4	4
	Twice in a week	7	7
	Thrice in a week	3	3
Meditation	No	86	86
	Daily	2	2
	Once in a week	2	2
	Twice in a week	5	5
	Thrice in a week	5	5
Smoking	No	75	75
	Daily	8	8
	Once in a week	6	6
	Twice in a week	4	4
	Thrice in a week	7	7
Consumption of alcohol	No	87	87
	Daily	2	2
	Once in a week	-	-
	Twice in a week	6	6
	Thrice in a week	5	5
Medication	No	14	14
	Daily	48	48
	Once in a week	27	27
	Twice in a week	9	9
	Thrice in a week	2	2
Sugar monitoring	No	11	11

Continued.

Variables	Options	Frequency (n=100)	Percentage
	Daily	8	8
	Once in a week	33	33
	Twice in a week	26	26
	Thrice in a week	22	22
Weight monitoring	No	46	46
	Daily	1	1
	Once in a week	7	7
	Twice in a week	12	12
	Thrice in a week	34	34
Visit to doctor	No	-	-
	Once in a month	19	19
	Once in 2 months	39	39
	Once in 3 months	25	25
	Once in 6 months	17	17

Table 3: Association between level of knowledge and demographic variables of adults (n=100).

Demographic variables	Knowledge score			Total	χ^2	df	P value
	Poor	Average	Good				
Age in years							
18-30	0	2	2	4	41.743	6	2.007
31-40	1	9	6	16			
41-50	7	5	11	23			
51-60	21	17	19	57			
Total	29	33	38	100			
Gender							
Male	10	12	18	40	39.811	6	4.961
Female	15	23	22	60			
Total	25	35	40	100			
Source of information							
Newspaper	15	4	3	22	8.690	6	0.192
Television	7	6	5	18			
Family	0	21	26	47			
Others	5	4	4	13			
Total	38	35	27	100			
Diagnosis							
Opportunistic screening	6	5	2	13	3.363	6	0.762
Acute attack	0	4	15	19			
Routine check-up	30	24	6	60			
Others	3	1	4	8			
Total	39	34	27	100			
Duration of diagnosis in years							
1	4	3	5	12	10.333	6	0.111
1-2	23	13	13	49			
2-3	5	10	7	22			
More than 3 years	6	9	2	17			
Total	38	35	27	100			
Family history							
Father	6	9	5	20	0.891	6	0.989
Mother	11	11	10	32			
Sibling	8	4	6	18			
Others	13	11	6	30			
Total	38	35	27	100			

Table 4: Association between health-seeking behaviours and demographic variables of adults.

Demographic variables	Health seeking behaviours		Total	χ^2	Df	P value
	Poor	Good				
Age in years						
18-30	2	2	4	11.875	6	0.064
31-40	1	15	16			
41-50	1	21	22			
51-60	3	55	58			
Total	7	93	100			
Gender						
Male	-	40	40	0.673	6	0.995
Female	1	59	60			
Total	1	99	100			
Source of information						
Newspaper	2	20	22	1.975	6	0.921
Television	-	18	18			
Family	2	45	47			
Others	1	12	13			
Total	5	95	100			
Diagnosis						
Opportunistic screening	-	13	13	8.602	6	0.197
Acute attack	3	16	19			
Routine check-up	1	59	60			
Others	-	8	8			
Total	4	96	100			
Duration of diagnosis in years						
1	-	12	12	19.088	6	0.004*
1-2	1	48	49			
2-3	1	21	22			
More than 3 years	-	17	17			
Total	2	98	100			
Family history						
Father	2	22	24	4.079	6	0.665
Mother	-	28	28			
Sibling	1	17	18			
Others	4	26	30			
Total	7	93	100			

*Significant at 0.05 level

Association between level of knowledge and demographic variables of adults

Table 3 shows that there was no association between the level of knowledge and demographic variables of adults as p value for all variables was higher than 0.05 level and no statistical significance was observed.

Association between health-seeking behaviours and demographic variables of adults

There was significant association between the demographic variable duration of diagnosis of diabetes mellitus and health-seeking behaviour of adults as the p value of 0.004 was less than 0.05 level of significance. There was no association between other demographic

variables and health-seeking behaviours of adults (Table 4).

DISCUSSION

Present study was done to explore the health seeking behaviours of 100 adults with diabetes mellitus in a selected community. The findings of the study with regard to health seeking behaviours of adults showed that more than fifty percent of the adults were between the age group of 51 to 60 years. This observation correlates with the effect that adult-onset diabetes mellitus is usually after 45 years. Sixty percent participants were females.

The findings related to level of knowledge on diabetes revealed that 27% of the adults had a poor level of knowledge, 35 % of the adults had average knowledge

and 38% of the adults had good knowledge regarding diabetes mellitus. This is similar to the study done by Deepa et al who reported that overall urban residents had higher awareness rates (58.4%) compared to rural residents.⁷ Kaur et al study revealed that 90% had average knowledge.⁹

Findings of the present study on level of knowledge was in contrast to the finding of Deepali et al wherein out of 120 diabetics, 55.8% had more than 80% knowledge regarding diabetes mellitus and its complications, 37.5% patients had 60-79% knowledge and only 6.7% patients had less than 60% knowledge.¹⁰ In contrast another study by Reddy R and Kodi VK showed that the majority of participants demonstrated good knowledge (62%).¹⁴

With regard to wellness behaviour majority practiced walking daily. Other practices namely yoga, meditation or other exercise was not adopted by majority of the adults. Similar finding was observed in the study by Vaishnavi, Balakrishnan, Mishra, Amit Kumar where in 61.5% did not exercise regularly.⁶ Walking is most convenient health behaviour component for adults as it does not require much effort, it can be practiced at convenient time, it is affordable, does not require supervision or training as in Yoga or Meditation.

Findings related to habits of smoking and alcohol consumption in the present study showed that majority did not have these habits. This may be related to the fact that in the present study 60% of the diabetic adults were female. Only 2% reported consuming alcohol. This finding is in coherence to a study done in France which reported that there were significantly fewer smokers among individuals with diabetes, but more former and fewer never smokers. Smoking more than 15 cigarettes/day was more common among those with diabetes and they were more tobacco dependent than those without diabetes. 28.7% of persons with diabetes and 39.5% without diabetes reported having already tried electronic cigarettes. Alcohol consumption was significantly less common among respondents with diabetes than those without diabetes.¹¹

A little less than 50% of adults were taking regular daily medications whereas 14% of the adults did not take medication. This is in contrast to that reported by Vaishnavi, Balakrishnan; Mishra, Amit Kumar who studied health-seeking behaviour of patients with diabetes mellitus in an urban area of Pondicherry.⁶ They reported that about 92.7% of patients were taking their medicines regularly. Also, another study done in Tirupati, Andhra Pradesh, India by Ajeetha et al reported contrasting finding which found that among the 216 participants, 82.9% were adherent while 17.1% were non-adherent to medications.¹²

With regard to blood sugar monitoring majority practiced at different frequency per week only 11% did not monitor sugar. This finding is similar to the findings of study by

Mishra et al, wherein they reported that only 12.8% of participants were testing their blood glucose level at monthly intervals and eight participants were on irregular medication, and among them, three participants told that they were irregular on treatment because their blood glucose levels were normal.⁶ Study concluded that, the level of awareness on diabetes among the participants is not satisfactory though the overall treatment-seeking behaviour is found to be satisfactory among the study participants.⁶

The relation between weight and type 2 diabetes mellitus is very strong, and research findings show that the patients with type 2 diabetes mellitus are overweight or obese, and obese people are at the highest risk of developing type 2 diabetes mellitus.¹³ In our study with regard to weight monitoring, 46% of adults did not practice weight monitoring.

Item on visit to doctor showed, that all of the adults visited doctor, further, 19% of the adults visited doctor once in a month, 39% of the adults visited once in 2 months, 25% of the adults visited doctor once in 3 months and 17% of the adults visited doctor once in 6 months.

There was a significant association between the demographic variable duration of diagnosis of diabetes mellitus and health-seeking behaviour of adults as the *p* value of 0.004 was less than 0.05 level of significance.

This study has few limitations. The study relied on self-reported data, which may be subject to recall bias. Data on the socioeconomic status of the participants was not collected, which may be related to health-seeking behaviour. The results of the study cannot be generalised as sample size was small.

CONCLUSION

Diabetes is a manageable condition, and with proper care and attention, individuals with diabetes can lead active and healthy lives. This study was conducted to assess the knowledge and health seeking behaviour of diabetes mellitus among adults. The study showed that the level of knowledge on diabetes among the adult participants was average. Walking was the most common wellness behaviour. There was no regular practice of other wellness component such as yoga, meditation, exercise. Information, education and communication activities must be carried out to increase the awareness level among the target population so that the health-care-seeking behaviour could be modified toward a positive health status. In this study, on assessment of the knowledge of the adults, it was found that some of them did not have detailed information on diabetes. Hence this study recommends that, healthcare professionals who work in the community areas should educate diabetic patients through the application of visual, auditory and tactile aids to improve knowledge and health seeking behaviours and self-care related to diabetes mellitus.

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Ethical approval: The study was approved by the Institutional Ethics Committee

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