



Original-Article

Assessment of level of awareness of diabetes mellitus and its complications in diabetic patients- A questionnaire-based study in a tertiary care centre

Authors

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Abstract

Background: *Diabetes Mellitus currently is expected to affect 642 million people by the year 2040. There are 69.1 million adults with diabetes in India at present. Diabetes has thus become a great economic challenge as it drains between 5 – 25 % of the family income of an average Indian. Most of the diagnosed cases have poor glycemic control due to lack of awareness. Assessing the level of awareness is of utmost importance as increased awareness is the key to prevention of the disease and its complications.*

Methods: *Questionnaire based cross sectional study was conducted at General Medicine outpatient department. Newly diagnosed and known cases of diabetes for 5 years who were within the age group of 20 years to 80 years were included. 24-item Diabetes Knowledge Questionnaire (DKQ-24) from the Starr County Texas diabetes education study was used for this study.*

Results: *A total of 201 patients were included in the study. Knowledge scores were categorized into three levels indicated by poor, moderate and good level of knowledge. 32% had good knowledge, 45% had moderate knowledge and 23% had poor knowledge about diabetes. In this study we found that age of the patient, duration of diabetes, educational status and occupational status significantly influence the awareness levels.*

Conclusion: *Awareness of diabetes plays an important role in the diagnosis and control of the disease. In our study we were able to identify certain areas where lack of knowledge was critical. The findings could be used in an integrated programme to improve patient self-management.*

Keywords: *Diabetes mellitus, Diabetes knowledge questionnaire, Disease status, Knowledge.*

Introduction

Diabetes mellitus (DM) is a metabolic disorder characterized primarily by hyperglycemia. It is associated with abnormalities in carbohydrate, fat, and protein metabolism, which results in chronic

complications, including microvascular, macrovascular, and neuropathic disorders¹. DM can be caused either by decreased pancreatic production of insulin or insulin resistance in target tissues². It currently affects 415 million people

worldwide, which is expected to increase to 642 million by the year 2040. The WHO estimates that diabetes will be the seventh main cause of death by 2030³. There are 69.1 million adults with diabetes (20-79 years) in India at present. The prevalence rate of diabetes in India is 8.7%, which is expected to double by the year 2040.⁴

Diabetes has thus become a great economic challenge as it drains between 5 – 25 % of the family income of an average Indian, which translates to 2.2 billion US dollars per annum.⁵ Almost 50% of the cases of diabetes mellitus remain undiagnosed until complications appear. Most of the diagnosed cases have poor glycemic control due to lack of awareness. Persistently uncontrolled blood sugars can lead to serious micro and macro vascular complications. Studies have consistently shown that improved glycemic control and strict metabolic control can delay or prevent the progression of complications associated with diabetes.

Assessing the level of awareness regarding diabetes mellitus is of utmost importance as increased awareness is the key to both primary and secondary prevention of the disease and its complications. This study therefore was conducted to assess the awareness regarding diabetes among diabetic patients visiting the outpatient department of our institute.

Materials and Methods

Aim and Objective

The aim of this study was to assess the knowledge regarding diabetes and its complications among diabetic patients attending general medicine department of Sri Manakula Vinayagar Medical College and Hospital, Puducherry. This study also identifies the correlation between knowledge regarding diabetes and treatment compliance among diabetic patients.

Study Design

Questionnaire based cross sectional study was conducted at a tertiary health care setup of Department of General Medicine at Sri Manakula

Vinayagar Medical College located at Kalitheerthalkuppam in Pondicherry.

Study Population

Newly diagnosed and known cases of diabetes for 5 years who were attending General medicine OPD and within the age group of 20 years to 80 years and willing to be a part of this study were included in this questionnaire based study. Sample size was calculated as 201 patients.

Methodology

The study was started after obtaining approval from institute ethical and scientific committee. The details of the patient will be entered in the study proforma. Patients were interviewed and their details were entered in a specially designed data collection form. The questionnaire contained information about socio demographic characteristics and 24-item Diabetes Knowledge Questionnaire (DKQ-24) from the Starr County Texas diabetes education study *was used for this study⁶. The responses were given in a format of “Yes”, “No”, or “I don’t know”. Knowledge scores were categorized into three levels indicated by poor (0-8), moderate (9-16) and good (17-24) level of knowledge.

Statistical analysis

The data collected were entered in excel sheets and SPSS Licensed Statistical software 16 was used for analysis. Continuous Data is represented as percentage. Non parametric tests were used for analysis. The level of significance was taken at 5% level.

Results

A total of 201 patients were included in the study. The age of the study participants ranges from 20 to 80 years. Out of the 201 study participants 116 (57%) were males and 85 (47 %) were females. 19 % (n=38) of the study population were illiterate, 67 % (n=135) had school level education, 14 % (n=28) had graduation or above. (Table 1)

Table 1: Distribution of patients based on educational status

S.No	Education level	Percentage (%)	Number
1	Illiterate	19	38
2	School education	67	135
3	Graduation	14	28

Among the study participants, 41 % (n=83) were dependent, 44% (n=88) were daily waged and 15% (n=30) were professionals. (Table 2)

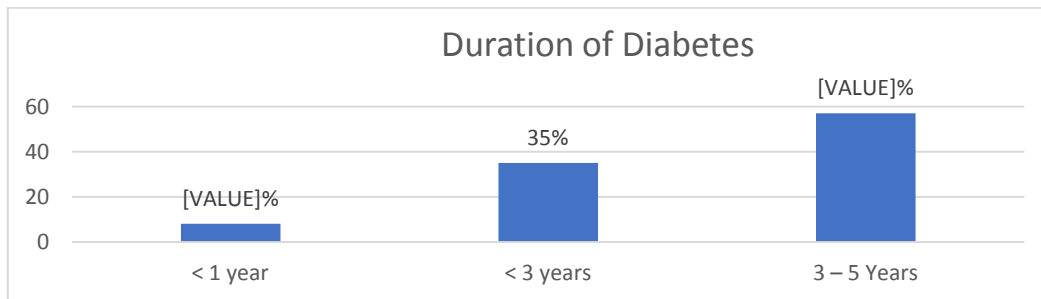
Table 2: Distribution of patients based on Occupation

S.No	Occupation	Percentage (%)	Number
1	Dependent	41	83
2	Daily wage	44	88
3	Professional	15	30

Among the 201 patients, 8% (n=16) had diabetes for less than a year, 35% (n=70) had duration

between 1 to 3 years and 57% (n=115) had duration between 3 to 5 years.

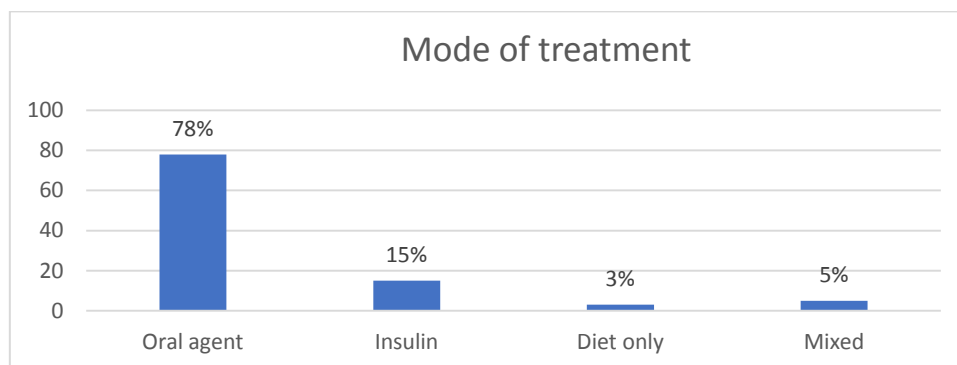
Fig 1 – Duration of diabetes



Regarding the mode of treatment, 77% (n=155) of the patients were taking only oral hypoglycemic agents, 15% (n=30) were using insulin, 5% (n=10)

were on both oral hypoglycemics and insulin and 3% (n=6) were on diet modifications alone.

Fig 2 - Mode of treatment



24-item Diabetes Knowledge Questionnaire (DKQ-24) from the Starr County Texas diabetes education study was used for this study. The responses were given in a format of “Yes”, “No”, or “I don’t know”.

78% (n=157) of the participants answered that eating too much sugars was the cause of diabetes. At the same time, 73% (n=147) participants responded that in diabetes, there is lack of effective insulin in the body.

Majority of the participants, around 92% (n=185) agreed that blood sugar levels rises in untreated diabetes.
65% (n=131) participants responded correctly that diabetes could not be cured.

84% (n=169) patients were aware about the normal fasting blood sugar values.
95% (n=191) patients were not aware that two types of diabetes exist. (Table 3)

Table 3 – Knowledge regarding types of diabetes mellitus

S.No	There are two main types of diabetes: Type I and Type II	Percentage (%)	Numbers
1	Correct	3	6
2	Wrong	2	4
3	Don't Know	95	191

50 % of the participants responded that regular medication is more important than diet and exercises to control diabetes (Table 4).

Table 4 – Knowledge regarding medication, diet and exercise

S.No	Medication is more important than diet and exercise	Percentage (%)	Number
1	Correct	45	91
2	Wrong	50	100
3	Don't Know	5	10

Regarding symptomatology and complications of diabetes, 69% were aware that diabetes causes poor circulation and 96% were aware about poor wound healing among diabetics.
55% were aware about the renal complications in diabetes and 77% were aware about the neuropathic complications of diabetes.

Based on the data collected from the questionnaire, we found that 32% (n=64) had good knowledge, 45% (n=91) had moderate knowledge and 23% (n=46) had poor knowledge about diabetes. (Table 5)

Table 5 – Total score

S.No	Total score	Percentage (%)	Numbers
1	GOOD	32	64
2	Moderate	45	91
3	Poor	23	46

Through the analysis, we found that duration of the disease significantly influences the final score. In the 1 – 3 years duration group, 80% of the participants had either good or moderate score and in the 3 – 5 years duration group, 81% of the

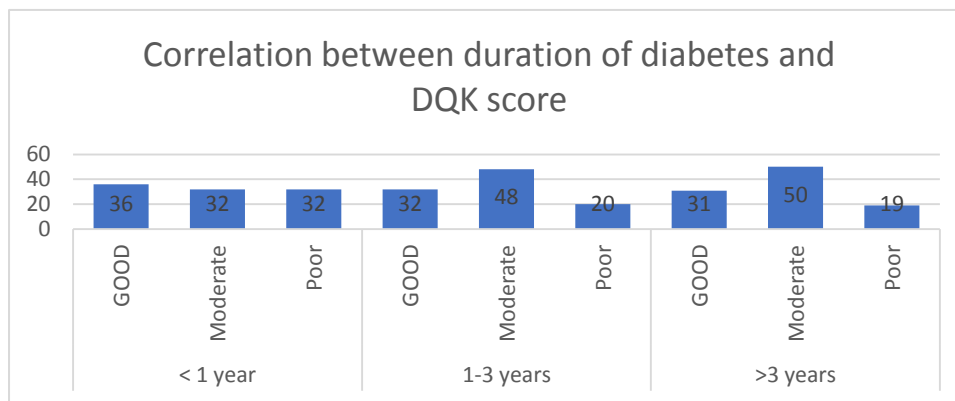
participants had good or moderate scores and this was statistically significant. Only 68% of the less than 1 year group had good or moderate scores. (Table 6)

Table 6 – Association between duration of diabetes and DQK score

S.No	Duration of Diabetes	Final score	Percentage	P value
1	< 1 year	GOOD	36	0.841
		Moderate	32	
		Poor	32	
2	1-3 years	GOOD	32	0.05*
		Moderate	48	
		Poor	20	
3	3 – 5 years	GOOD	31	0.02*
		Moderate	50	
		Poor	19	

Data expressed in percentage Non parametric test was used * p <0.05 statistically significant

Fig 3 – Duration of diabetes and DQK score



In this study we found that 79% of participants in the less than 35 years age group had either good or moderate score which was statistically significant. Also around 69% of participants in the elderly age

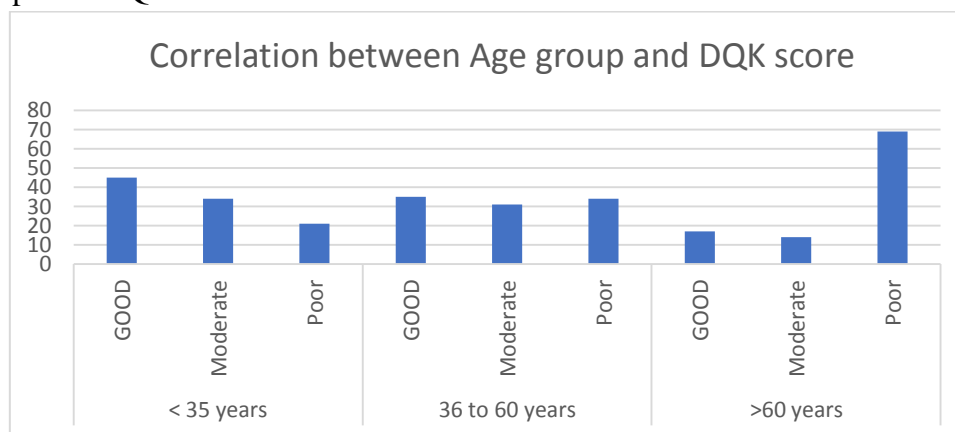
group od above 65 years had poor knowledge score. The 36 to 60 years age group showed no significant difference between good, moderate and poor scores. (Table 7)

Table 7 – Association between age group and DQK score

S.No	Age group	DQK score	%	P value
1	< 35 years	GOOD	45	0.04*
		Moderate	34	
		Poor	21	
2	36 to 60 years	GOOD	35	0.78
		Moderate	31	
		Poor	34	
3	>60 years	GOOD	17	0.032*
		Moderate	14	
		Poor	69	

Data expressed in percentage Non parametric test was used p <0.05 statistically significant

Fig 4 – Age groups and DQK score



This study revealed that 83% of the patients in the illiterate group had poor knowledge about diabetes which had statistical significance. Also 87% of the patients belonging to postgraduate and above

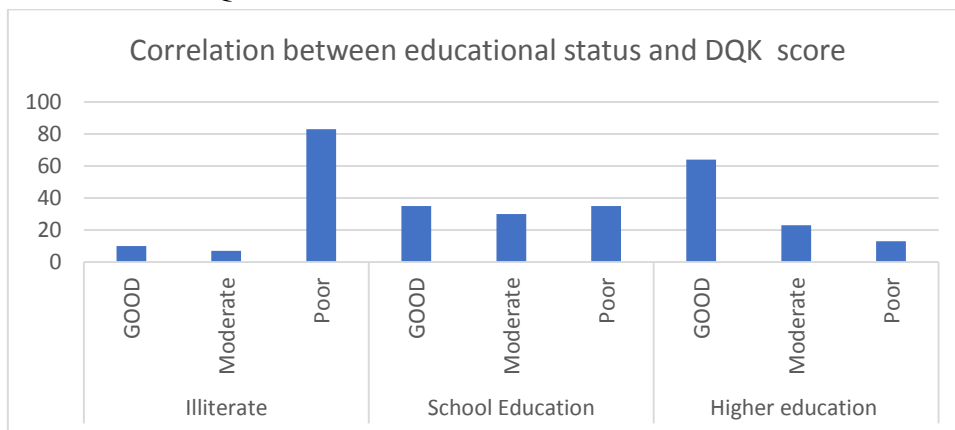
education level had good or moderate knowledge scores. This was also found to be statistically significant. (Table 8)

Table 8 – Association between educational status and DQK score

S.No	Educational status	Score	Percentage	P value
1	Illiterate	GOOD	10	0.05*
		Moderate	7	
		Poor	83	
2	School Education	GOOD	35	0.91
		Moderate	30	
		Poor	35	
3	Higher education	GOOD	64	0.001*
		Moderate	23	
		Poor	13	

Data expressed in percentage Non parametric test was used p<0.05 statistically significant

Fig 5 – Educational status and DQK score



In this study, 51% of the patients belonging to the dependent group were found to have poor DKQ score where as 95% of the patients belonging to professional group had either good or moderate

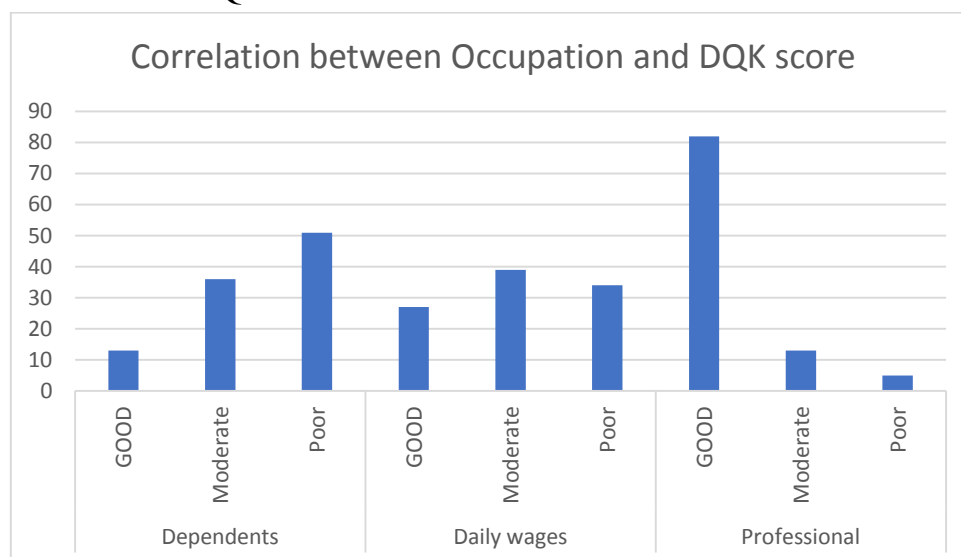
knowledge. This shows that occupational status of the patient had a significant influence on their knowledge regarding the disease.

Table 9: Correlation between Occupational status and DQK score

S.No	Occupation	Score	Percentage	P value
1	Dependents	GOOD	13	0.05*
		Moderate	36	
		Poor	51	
2	Daily wages	GOOD	27	0.78
		Moderate	39	
		Poor	34	
3	Professional	GOOD	82	0.002*
		Moderate	13	
		Poor	5	

Data expressed in percentage Non parametric test was used p<0.05 statistically significant

Fig 6- Occupational status and DQK score



Discussion

Diabetes mellitus is emerging as a major public health concern in today’s world.^{7,8} Globally, it affects more than 371 million people where more than 70.3 million are living in South East Asia. Health education for patients suffering from chronic diseases is an important source to improve their self-care practices. Diabetes related self-care practices, such as, healthy eating practices, being physically active, blood glucose monitoring, and adhering to the recommended euglycemic therapy, can benefit patients in achieving desired glycemic control^{9,10}. Research has found that less frequent self-care behaviors were evident among particularly high-risk diabetic patients with lower educational levels¹¹. Another study revealed that among primary care patients with type 2 diabetes, poor health literacy was independently associated with worse glycemic control and higher rates of retinopathy¹².

The present study was a questionnaire based study to assess the knowledge regarding diabetes among diabetic patients attending General Medicine department in a tertiary care health care facility located in rural Puducherry. This institute caters the health care requirements of rural population in Puducherry as well as rural population of Villupuram district of Tamil Nadu. This study mainly focused the diabetic population within five years of diagnosis for assessment of knowledge.

The study population included patients in the age group between 20 years to 80 years of age. There was no significant difference in the DKQ (Diabetes Knowledge Questionnaire) score between male and female genders.

This study revealed that the younger age group had significantly better knowledge scores when compared with the elderly population. This finding was consistent with the studies reported by Shrestha N et al in Nepal¹³, Arora S et al. in Latino patients¹⁴, Al Adsani A et al. in Kuwaiti patients¹⁵ and Jasper US et al. in Nigerian diabetics¹⁶.

This study revealed significant association between educational status of the individual and DQK score. Patients belonging to the illiterate group had worst DQK score when compared to the group with graduate level and above educational status. This finding is similar with Nigerian diabetics where those who never attended school scored lowest and those with tertiary education obtained highest score of diabetes knowledge. A better educated person may be more inquisitive while being counselled or educated on diabetes¹⁶.

Our study revealed significant association between duration since diagnosis and DQK score. Participants belonging to the 1-3 years duration and 3-5 years duration had better score when compared to the recently diagnosed individuals.

This was consistent with the study reported by Arora S et al¹⁴, Al Adsani A et al¹⁵ and Feleke SA et al¹⁷. However Jasper US et al in Nigerian diabetics showed no significant association between occupation and knowledge status¹⁶.

Occupation was significantly associated with knowledge in this study, with professionals scoring better score than dependents. This is almost in line with Shrestha N et al conducted in Nepal¹³ and Jasper US et al conducted in Nigerian diabetics¹⁶. The plausible justification is that professionals are better educated and have greater contact with education materials.

In this study we were able to make out important observations regarding perception of participants regarding knowledge, practices and treatment of diabetes. 78% of the participants believed that eating too much sugar cause diabetes and 73% believed that there is lack of insulin in diabetes. 53% of the participants do not know about organ involved in insulin secretion. 92% of the participants agreed that sugar levels rises in untreated diabetics and 68% believed diabetes has hereditary preposition. 29% of the participants believed that diabetes is curable.

84% of the participants had good idea about normal blood sugar values. 61% of the participants believed regular exercise reduces need for insulin where as 50% of the participants believed that medication is more important than diet and exercise. Only 3% of the participants had knowledge about types of diabetes.

69% of the participants were aware about the vascular complications of diabetes and 96% were aware about wound healing complications. 55% were aware about renal complications and 77% were aware about neurological complications.

48% of the participants were not aware about symptoms of high blood sugars and 35% were unaware about hypoglycemia symptoms. 27% considered that diabetic diet contains special food and 12% were unaware about diabetic diet.

Certain limitations were noted in this study. This study was a single centre hospital based study, so the findings could not be generalized to the entire

country. Also this was conducted in a small population who have similar cultural beliefs and practices. The findings are based on self-reported data from participants which limits the validity of the data. Limitation includes the possibility of self-reporting bias, as patients might be unwilling to reveal deficiencies in the self-care practices and may not be accurate all the time.

Conclusion

The purpose of this study was to asses the knowledge level of diabetic patients about diabetes, its management and complications. Understanding the patient's level of knowledge is of utmost importance to formulate educational programs to enable the patients to follow a healthy lifestyle, maintain treatment compliance and detect complications early. Health care providers should be able to identify signs of denial such as trying to hide the problems associated with diabetes. Fear of the diabetes diagnosis may be due to lack of diabetic knowledge. Awareness of diabetes plays an important role in the diagnosis and control of the disease. In our study, even though majority of our patients had either good or moderate knowledge, there were certain areas where lack of knowledge was critical This study has helped identify areas where there were gaps in patient knowledge. The findings could be used in an integrated programme to improve patient self-management. A recommendation for further study is to replicate the study in a larger sample.

Conflict of interest: None declared.

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