

Evaluation of Knowledge, Attitude and Practices towards Diabetes and Determinant Factors of Diabetic Knowledge among Diabetic Patients: A Study in South India

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Abstract Background: Diabetes Mellitus is a multifactorial metabolic disorder characterized by hyperglycaemia which on long standing results in microvascular and macrovascular complications. Knowledge, attitude and practices concerning diabetes mellitus are imperative to minimize the prevalence and morbidity associated with diabetes mellitus. **Materials & Methods:** This cross-sectional study was conducted at a teaching rural hospital among 100 known diabetic patients visiting the hospital for regular check-up. The self-administered questionnaire collected the data to assess knowledge, attitude and practices towards diabetes and knowledge determinant factors. Participant's socio-demographic characteristics including gender, level of education and duration of diabetes was reported using descriptive statistics. Mean and SD was used to express the age, anthropometric measurements, glucose levels and knowledge score. The response of knowledge, attitude and practice questions was expressed as frequency and percentage. The logistic regression analysis was done to determine the association between gender, age group, educational status and duration of diabetes with knowledge score. The level of statistical significance was set at $p < 0.05$. **Results:** Of the total 100 participants, 52%

were males and 135 were illiterate. 77% had good knowledge of diabetes symptoms, risk factors, complications, life style modifications and glucose monitoring. 77%, 88% and 76% had good knowledge, positive attitude and good practices respectively. The regression analysis showed increased odds of good knowledge among females [(1.552 (0.559 - 4.311))] and in subjects with diabetes of more than 5 years [1.090 (0.278 - 4.264)]. Further the analysis showed that the knowledge on diabetes was poor as participant's age advanced [OR: 0.281(0.065 - 1.217) & OR: 0.199 (0.046 - 0.864)]. Additionally, there were increased odds of good knowledge in participants with increase in educational level. **Conclusion:** Majority of the participants had good knowledge, positive attitude and good practices, however there is still scope for improvement in the areas such as inclusion of regular exercise, periodic lipid profile analysis and eye examination.

Keywords Attitude, Diabetes Mellitus, Diabetes Knowledge Questionnaire, Knowledge, Practices

1. Introduction

Globally, prevalence of diabetes among adults has drastically risen from 4.7% in 1980 to 8.5% in 2014[1]. World Health Organisation anticipates that diabetes will be the 7th leading cause of death by 2030[2]. This emphasizes the need to look at the factors which improve outcomes for patients with diabetes mellitus and in particular, the factors which contribute to improved glycaemic control.

Knowledge, attitude and practices concerning diabetes mellitus are imperative to minimize the prevalence and morbidity associated with diabetes mellitus. Diabetes education is considered as an essential tool, as its management largely depends on knowledge, motivation and ability to practice self-care in daily activities [3].

Many studies report that diabetic patients having good knowledge and motivated to do self-care achieve better glycaemic control. However, there is difference of opinion on effectiveness of method of health instruction and educational efforts undertaken [4-6]. It is a well-liked assumption that good KAP would equate to adequate glycaemic control in diabetes, but it may not be related to reality [7-8].

Further there is a paucity of evidence regarding impact of diabetic knowledge on glycaemic control among diabetic patients in rural South India. In this regard the present study was designed to assess the level of knowledge, attitude and practices and also to determine the association of age, gender, educational level and duration of diabetes with diabetic knowledge among type 2 diabetic patients.

2. Materials & Methods

This cross-sectional study was conducted at a teaching rural hospital after approval by the institutional ethics committee. 100 diabetic patients both male and female aged > 40 years diagnosed diabetes as per the American Diabetes Association (ADA) criteria [9] visiting the hospital for regular check-up were enrolled in the study. Subjects who did not consent to participate in the project, type 1 DM, pregnant women or with intellectual impairment were excluded.

A pre-designed and validated KAP questionnaire was used as a tool. The questionnaire has been used in previous KAP studies among diabetics and has proven to be reliable [3,7,10]. A small pilot test was carried out in a sample group of 10 participants to assess the appropriateness and clarity of the questionnaire.

The questionnaire had a total of 25 questions (knowledge -14, attitude - 5, and practice - 6). Each correct response was given a score of 'one' and the wrong response a score of 'zero'. A score of 8 and above was considered as good knowledge. Similarly, for attitude and practices a score of ≥ 3 were categorized as having positive attitude and good practices.

Statistical Analysis

Data was analysed using the SPSS, version 18. Participant's socio-demographic characteristics including gender, level of education and duration of diabetes was reported as frequency and percentage. Mean and SD were used to express the age, anthropometric measurements and glucose levels.

The response of knowledge, attitude and practice questions was expressed as frequency and percentage. The logistic regression analysis was done to determine the association between gender, age group, educational status and duration of diabetes with knowledge score. The level of statistical significance was set at $p < 0.05$.

3. Results

3.1. Sociodemographic Profile of the Study Participants (Table 1)

Of the 100 study participants, 52% were males and 48% were females. As for the variable of educational status of the participants, 38% were graduates followed by higher secondary (26%), primary education (23%) and the least was being illiterate (13%). Further 85% of the subjects had diabetes duration of < 5 years and 40% were above the age of 60 years. (Table 1)

Table 1. Socio-demographic profile of the study participants

Variables	Categories	Frequency / %
Sex	Male	52
	Female	42
Age group	40-50	30
	51-60	30
	61	40
Educational status	Illiterate	13
	Primary education	23
	Higher Secondary	26
	Graduate	38
Duration of diabetes	≤ 5 years	85
	> 5 years	15

3.2. Anthropometric Details of Study Participants (Table 2)

There was no statistical difference between the mean BMI values of males and females. Even though the mean fasting plasma glucose value was high in females and postprandial plasma glucose was high among males, the difference was not statistically significant (p value - 0.23 & 0.80 respectively)

Table 2. Mean values of anthropometric measurements and plasma glucose of the participants

Parameters	Male (N=52)	Female (N=48)	P value
Height (cm)	169 ± 7	160 ± 7.66	0.0001*
Weight (Kg)	66 ± 12	58 ± 9.91	0.0005*
Waist circumference (cm)	98 ± 16	95 ± 19.46	0.40
BMI (Kg/M ²)	23 ± 4	23 ± 4.55	1.00
FPG (mg/dL)	156.52 ± 44.01	170 ± 66.6	0.23
PPPG (mg/dL)	241.46 ± 74.27	237 ± 89.87	0.80

BMI- Body Mass Index, FPG- Fasting Plasma Glucose, PPPG – Post Prandial Plasma Glucose. *-statistically significant

3.3. Knowledge of Study Participants (Table 3 & 4)

More than 3/4 of the study population had given correct response to knowledge items like symptoms of diabetes (76%), risk factors and complications (72%), other organs involved if diabetes is not treated (77%), accurate methods of monitoring diabetes by blood glucose estimation (77%) and life style modifications like consuming balance diet and medication (987%) and reducing weight, avoiding alcohol and smoking (85%) (Table 3). Out of 100 participants, 77% had good knowledge towards diabetes. (Table 4)

Table 3. Correct responses to knowledge items on diabetes among the study participants

Knowledge questions	Male n=52 N (%)	Female n=48 N (%)	Overall n=100 N (%)
Diabetes is a condition in which the body contains higher level of blood sugar than normal	41	37	78
The major causes of diabetes are hereditary, obesity, and unhealthy eating habits	37	32	69
The symptoms of diabetes are frequent urination, increased thirst, and hunger	38	38	76
Diabetes, if not treated, will cause damage to other organs such as heart, eyes, kidneys, and foot ulcers	39	38	77
The most accurate method of monitoring diabetes is checking blood glucose levels	39	38	77
In a diabetic patient, high blood pressure can worsen the risk of heart attack, stroke, kidney, and eye problems	37	35	72
A diabetic patient should measure his or her blood pressure regularly	41	43	84
The lifestyle modification required for diabetic patients is weight reduction, stopping alcohol consumption, and smoking	45	40	85
A diabetic patient should have his or her eyes checked every year	38	35	73
The important factors that help in controlling blood sugar are controlled and planned diet, and medication	45	42	87
Regular urine tests will help in knowing the amount of proteins in your urine and functional status of kidneys	42	32	74
A regular exercise regimen will help in blood glucose control	41	37	78
A well-balanced diet include carbohydrates, proteins, fruits, and fibres	45	40	85
Diabetes is a curable disease	25	13	38

Table 4. Level of Diabetic knowledge among the participants

	Male N (%)	Female N (%)	Overall N
Poor Knowledge (≤ 7 score)	9 (17.3)	14 (29.2)	23
Good Knowledge (>8 score)	43 (82.7)	34 (70.8)	77
Total	52 (100)	48 (100)	100

3.4. Attitude of Diabetic Patients in This Study (Table 5 & 6)

Out of the total participants, 83% were aware that missing a diabetic medication dose will have a negative effect on their disease control and 89% reflected that it is necessary to keep in contact with their physician regularly. Even though 81% of the study participants followed controlled and planned diet, only 40% were involved in regular exercises.

Table 5. Correct responses to attitude items on diabetes among the study participants

Attitude items	Correct response		
	Male	Female	Overall
Exercise regularly? (Y)	30	10	40
Following a controlled and planned diet? (Y)	40	41	81
Missing doses of your diabetic medication will have a negative effect on your disease control? (Y)	45	38	83
Blood sugar levels fall below normal when you are taking drugs? (Y)	45	43	88
Should keep in touch with your physician? (Y)	46	43	89

Table 6. Level of Attitude towards diabetes among the study participants

	Male N (%)	Female N (%)	Overall N (%)
Positive attitude (≥ 3 score)	48 (92.3)	40 (83.3)	88
Negative attitude (< 3 score)	4 (7.7)	8 (16.7)	12
Total	52	48	100

Table 7. Diabetic practices of the study participants

Variables	Male (n=52)	Female (n=48)	Overall (n=100)
Regular visit to physician (≤ 1 month)	41	33	74
Blood sugars estimation (≤ 1 month)	44	38	82
Serum lipid estimation (≤ 6 months)	37	27	64
Urine analysis (≤ 1 month)	39	35	74
Blood pressure examination (≤ 1 month)	40	34	74
Eye examination (≤ 6 months)	37	33	70

3.5. Practices of the Study Participants (Table 7 & 8)

Components like ‘visiting the physician regularly, ‘checking the blood glucose, lipid profile and urine analysis’, examination of blood pressure and eye’; were included to assess the practices towards diabetes. An appreciable percentage of participants had regular visit to the physician (74%). Additionally, the 82% and 64% of the

study participants got their blood glucose and lipid analysis done within 1 and 6 months respectively. Further, 74% & 70% of the participants also got their blood pressure and eye examination done within 1 and 6 months respectively. Among the total 100 study participants, 76% of them had good practices.

Table 8. Practices towards diabetes control and care among the study participants

	Male N (%)	Female N (%)	Overall N (%)
Good Practice (>3 score)	41 (78.8)	35 (72.9)	76
Poor Practice attitude (≤ 3 score)	11 (21.2)	13 (27.1)	24
Total	52 (100)	48 (100)	100

3.6. Factors Associated with Diabetic Knowledge among Study Participants (Table 9)

The regression analysis showed increasing odds of good knowledge among females [(1.552 (0.559 - 4.311))] and also among participants with duration of diabetes of more than 5years [1.090 (0.278 - 4.264)]. Further the analysis showed that the knowledge on diabetes was poor as participant’s age advanced [OR: 0.281, CI: 0.065 - 1.217 & OR: 0.199 (0.046 - 0.864)]. Additionally, there was increased odds of good knowledge in participants with increase in educational level and was more with secondary education [OR: 3.964, CI: 0.692 - 22.686] (Table 9)

Table 9. Bivariant and Multivariant analysis of factors associated with Knowledge on Diabetics among diabetic patients.

	Knowledge		OR (CI)
	Good	Poor	
Gender			
Male	36	16	Reference
Female	35	13	1.552 (0.559 - 4.311)
Age group (years)			
40-50	27	3	Reference
51-60	19	10	0.281 (0.065 - 1.217)
> 61	25	16	0.199 (0.046 - 0.864)
Educational status			
Illiterate	7	6	Reference
Primary	12	11	0.699 (0.156 - 3.123)
Secondary	23	3	3.964 (0.692 - 22.686)
Graduate	29	9	1.897 (0.453 - 7.938)
Duration of diabetes (years)			
≤ 5	60	25	Reference
> 5	11	4	1.090 (0.278 - 4.264)

4. Discussion

The present study reports the knowledge, attitude and practices towards diabetes control and also explores the determinants of diabetic knowledge among diabetic patients in the rural settings.

4.1. Knowledge

Diabetic patients with poor knowledge and poor glycemic control are susceptible for developing long term complications. Improving diabetes knowledge of diabetic people might allow achieving better glycemic control. The present study showed comparatively good knowledge (77%) among diabetic patients, unlike most studies from developing countries which reported poor knowledge of diabetes among diabetic patient and public [10]. This reasonable level of knowledge may be attributed to higher literacy rate (87%) found among the participants of present study, even though this study didn't explore the source of knowledge acquisition on diabetes.

A very few studies have evaluated the impact of health education and awareness program on KAP and glycemic control in type 2 diabetes. They have shown that there is a reduction in glycate haemoglobin [3,11-12] and increase in mean KAP scores after imparting health education [13-15]. A study by Asmelesh D et al [16] concluded that more than half of the study subjects had good KAP towards glycemic control and showed that only occupational status and marital status were significantly associated with KAP towards glycemic status.

4.2. Attitude

The current study showed 88% of the participants with positive attitude towards diabetes, however it was very low (40%) when considering the point of doing exercise regularly. A study conducted by Daniel Asmelash et al [16] reported 76.2% having good attitude towards glycemic control. The present study findings regarding attitude towards diabetes was higher than the studies undertaken in India [17] and other countries [18,19]. Even though the present study was conducted among the rural population, the positive attitude was high which may be due to better access to health education programs conducted by this teaching hospital. Further, awareness on health benefits of undertaking exercise regularly should be emphasized while providing health care services in the hospital and also during community health education campaign.

4.3. Practices

More than 3/4 of the study population had good practices towards diabetes. About 82% of the subjects were getting their blood glucose checked regularly, however the study didn't explore regarding self-monitoring of glucose. This result is in accordance with the study done by Bruce P among diabetic patients attending tertiary care hospital at

Kulasekheram [2], but study by Sangra et al [10] and Upadhyaya et al [20] reported lower level of practices towards diabetes. Study done among the general population also has shown that around 30% have regular screening for diabetes with annual blood glucose measurements [21]. Asmelash D et al [16] reported that factors like occupational status, educational status and marital status of the participants were significantly associated with practices towards glycemic status.

Adequate knowledge, attitude and practices are vital to enhance the self-care skills among diabetic patients. Previous studies have demonstrated that management of diabetic are strongly associated with adequate knowledge and well correlated with reduction in glyated haemoglobin [3,22]. Apart from medications, non-pharmacological interventions and adequate knowledge, attitude, and practices among diabetic patients become paramount importance in diabetes management. Health education is essential in resource poor primary care settings wherein diabetes pose great financial burden and calls for urgent participation of clinicians and health care workers to inform and motivate diabetic patients and to propagate healthy lifestyle practices vital for achieving glycemic control.

4.4. Limitation of the Study

The present study is a single centric study with a small sample size, hence results may not be generalized to the population.

5. Conclusions

The present study provides a snapshot of the current state of knowledge, attitude and practices related to diabetes among diabetic patients. Majority of the participants had awareness and knowledge about the diseases, missing a diabetic medication and its complications, and also, about the lifestyle modifications like consuming balance diet, medication, reducing weight, avoiding alcohol and smoking. However, there is a scope for improvement in the areas such as inclusion of regular exercise, regular lipid profile analysis and eye examination.

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Conflict of Interest

NIL

Financial Support

NIL

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