Online ISSN: 3107-8079

KSV Journal of Pharmacy and Health Sciences

(Managed by K. B. Institute of Pharmaceutical Education and Research, Gandhinagar-382023, Gujarat, India)

Open Access

Research article

KNOWLEDGE, ATTITUDE, AND PRACTICE OF DIABETES PATIENTS: A SURVEY BASED, PROSPECTIVE, OBSERVATIONAL STUDY

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Abstract

Background: Diabetes is metabolic disease associated with major complications like cardiovascular diseases, nephropathy, peripheral neuropathy and other autonomic neuropathy. The Knowledge, Attitude and Practice (KAP) of diabetic patients in real world is important to assess because the extent of KAP will lead to enhanced outcomes in diabetic control and further prevents the development of disease associated complications.

Objective: To assess the knowledge of diabetes patients regarding disease and medications. Another objective was to assess the attitude and practice of diabetes patients regarding medication adherence, lifestyle modification and monitoring disease.

Methodology: A prospective, observational, multicenter study was conducted in 500 diabetic patients during OPD visit at hospitals. Diabetic patients were enrolled. Demographic data, educational status, medication history and medical history were recorded. KAP data were collected according to the Google form.

Results:

Out of 500 diabetic patients, 347 (69.4 %) were males and 153 (30.6%) were females. The age range of 51 to 60 year had highest number of patients. Majority of diabetes patients had medical history of 2-5 years followed by 5-10 years. More than 73 % of patients showed positive family history of diabetes from father side followed by mother side. Hypertension was the most common comorbidity followed by obesity and others (more than 50 %) of patients. Most common prescribed medicine was metformin. Out of 3 components of KAP, the higher % of patients with highest score were in Attitude category (56 %) followed by knowledge category (5.4 %) and least patients with higher score were in Practice category (2 %).

Conclusion:

It can be concluded that actual practices amongst diabetic patients regarding their medication adherences and disease monitoring is poor. Patients had higher score in attitude but implementing them into practice was difficult.

Keywords: Knowledge, Attitude, Practice, Diabetes

Article Info: Received on 01/11/2025, Review Completed on 27/11/2025, Accepted on 11/12/2025

Cite this article as:

Shah PA, Patel VN, Mansuri JM, Makwana PS, Chaudhary JL. Knowledge, attitude, and practice of diabetes patients: a survey based, prospective, observational study. KSV Journal of Pharmacy and Health Sciences 2025;2(2):37-45

Available from:

Volume 2, Issue 2 [July 2025 to December 2025] | KSV Journal of Pharmacy and Health Sciences

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Introduction

Diabetes mellitus encompasses a range of metabolic disorder caused by either impaired insulin secretion or a diminished insulin effect, often simultaneously chronic hyperglycaemia associated with diabetes can lead to long tern damage of various organ, particularly the eyes, kidney, nerves, heart and blood vessels (1, 2). Chronic complication of diabetes mellitus often involves the development of retinopathy which can result in vision loss as well as nephropathy that may lead to renal failure, peripheral neuropathy that put individual at risk of amputation and foot ulcers. Automatic neuropathy is less common but serious complication that result in gastroenteropathy, cardiac and sexual dysfunction. Patients with diabetes are particularly susceptible to vascular condition, chiefly cardiovascular disease. (3). Abnormalities in carbohydrate, lipid, and protein metabolism arise from the critical role of insulin as an anabolic hormone. Uncontrolled diabetes may result in a state of stupor, coma, and potentially death if left untreated due to ketoacidosis or, more rarely, nonketotic hyperosmolar syndrome (4). A Knowledge, Attitude and Practices survey is a crucial tool that relies on a questionnaire-based evaluation of quantitative and qualitative data obtained from participants who frequently suffer from illness. A Knowledge, Attitude, and Practices (KAP) survey captures the stated views of patients. Revealing the misconceptions or misunderstandings of participants could hinder better therapy outcomes, which may be mitigated by healthcare providers implementing patient counselling services. A person's understanding on a particular subject constitutes a set and level of knowledge.

The way the person views the information is also a factor. Knowledge of one's own disease condition is logically beneficial for better therapeutic goals in patients, but it does not assure that this will drive a patient's behaviour. Attitude refers to a tendency or inclination towards something. This influences the patient's approach to their disease conditions. Observable practices or behaviour are noticeable actions of a patient in response to certain conditions. Attitudes are not always as apparent as practices. An individual's observable actions in response to a stimulus are referred to as practice or behaviours. Patient practices related to health issues such as vaccination, screening procedures, substance abuse, and addiction, among others, can be evaluated using standardised questions and quantified. Research has frequently shown a weak or non-existent relationship between attitudes and practices in numerous studies (5). A KAP study aids in evaluating shifts in knowledge, attitude, and practices among both the community and healthcare professionals concerning diabetes and its related complications, such as retinopathy. The guide helps researchers and healthcare professionals to implement policy changes, program modifications, and counselling adaptations, ultimately achieving the desired outcomes in diabetes management

A study on knowledge, attitudes, and practices (KAP) related to diabetes in Iranian in-patients with type-2 diabetes mellitus found that patients with a longer duration of diabetes, those who developed diabetic retinopathy, and those receiving insulin therapy had a higher KAP score (6). A KAP study conducted among diabetic patients in Tamil Nadu found that the patients in the study had a poor understanding of diabetic retinopathy.

A lack of awareness about the necessity for screening for retinopathy was a significant obstacle to regular screening (7). Assessing the knowledge, attitudes, and practices of type 2 diabetes mellitus (DM) in the Saurashtra region revealed that many individuals inaccurately believe that diabetes can be cured through bitter substances and that allopathic medications are detrimental to one's health. Many people also have a number of misconceptions about insulin (8). Findings of a KAP study among diabetics and non-diabetics visiting homeopathic hospitals in West Bengal indicated that overall percentages of knowledge, awareness, and self-care practices were sub-optimal. Studies revealed that individuals with diabetes possesses greater knowledge and understanding of the condition compared to those without it (9). A hospital-based KAP study conducted in Karnataka discovered that a considerable proportion of participants held positive views about diabetes, yet their actions did not align with this knowledge (10). The aim of the present study was to evaluate the level of knowledge among diabetes patients concerning the disease and its associated medications. The goal was also to evaluate patients with diabetes in terms of their attitude and practices towards medication compliance, altering their lifestyle, and monitoring their condition.

Methodology

The observational, prospective and multi-center, survey-based study was conducted in diabetic patients for duration of 4 months. Total 500 male and female diabetic patients having age ≥ 18 year and with history of diabetes for at least 6 months were included in survey. The study sites were 3 in Ahmedabad city of Gujarat. Sites were approved by Ethics Committee and permission was obtained from the sites. The data was collected using google form. The form contained two parts. Part 1 included collection of demographic and socioeconomic data which included data of patients such as gender, age, educational qualification, smoking, alcohol, diet, and sugar preference. Part 2 contained 3 categories viz. Knowledge, Attitude and Practice (KAP) questions (total 25 questions).

Knowledge category contained 10 questions (6 questions regarding diabetes and 4 questions regarding medicine), Attitude category contained 5 questions (regarding medication adherence, lifestyle modification and monitoring disease) and Practice category contained 10 questions (regarding medication adherence, lifestyle modification and monitoring disease).

This questionnaire was filled by conducting a face-to-face interview. Questions may be multiple choice questions or had only 2 to be answered as YES or NO. Score was calculated from KAP questionary. Highest possible score in Knowledge, Attitude and Practice category was 25, 5 and 33. The total maximum score possible for all 3 categories was 63 **(TABLE 1).** Patients were categorised as per the score obtained and falling into particular range and category of KAP.

Ethics Approval: The protocol titled "Evaluation of Knowledge, Attitude and Practice in Patients of Diabetes" was approved by K. B. Institute of Pharmaceutical Education and Research-Institute Ethics Committee (KBIPER-IAEC) (Protocol No. KBIEC/2019/137B).

Statistical analysis: For demographic, socioeconomic and KAP data were presented as absolute value (%). Chi -square test was performed to find association between variables. P-value < 0.05 was considered as statistically significant.

Results

Out of 500 diabetic patients, highest % of patients were found in age group of 51 to 60 year (30.8 %) followed by patients in 41-to-50-year range (25.8 %). Male patients were higher in than female patients (69.4 vs 30.6 %). Married patients were highest (88.6 %) followed by widow/widower, Unmarried and divorcee. Highest number of patients fall into "Higher secondary education" category (34.6 %) followed by UG/Degree or diploma holders (32.4 %), then educational categories like primary education, PG (Masters or equivalent) and Ph.D. With respect to occupation, most of the diabetic patients were doing business (37 %) followed by other work profile (30.8 %) and then doing job (25.6 %) **(Table 2).**

Most of the patients had history of diabetes from 2 to 5 year (42.2 %), followed by 5 to 10 years (24.4 %), > 10 years (16.8 %), 1 to 2 years (13.8 %), 6 months to 1 year (2.8 %) respectively. Family history of diabetes was present in 82 % of patients. More than half of the patients had family history of diabetes from father or father and other relatives (56.1 %) followed by history from Mother alone/ Mother and other relatives (19.3 %). Patients for whom history of DM from both parents were 7.1 %. Regarding substance abuse, 88 % of patients had no history followed by smoking (9 %) and tobacco (2.3 %). None of the patients had alcohol abuse. The highest used medications in diabetic patients were metformin alone or in combination with other drugs (31 %) followed by sulfonylurea category (20.2 %) and then others (**TABLE 3).**

Hypertension was the most common comorbidity found in 38.4 % patients followed by hypertension with other comorbidity and then obesity. Preventive and treatment measures taken by diabetic patients include (97.4 %) with medications alone followed by diet (89.6 %), exercise (36 %), yoga and meditation. Most of the patients monitored diabetic control, every 3 months (53.2 %) followed by every 6 months (27 %). Almost 48.8 % patients "visited clinical only when required" which was highest. Highest number of patients used to test FBS and PPBS measurement for monitoring diabetes (51.6 %) followed by HbA1c (27 %). Majority of the patients had no specific reason for medication non-adherence (34 %) followed by forgetfulness (23.8 %) **(TABLE 4).**

TABLE 1: KAP Categories with scoring and interpretation

Percentage Marks obtained in each category	Interpretation	Knowledge Range of score	Attitude Range of score	Practice Range of score
100 %	Excellent	21-25	5	25-33
80 %	Very good	16-20	4	19-24
60 %	Good	11-15	3	13-18
40 %	Moderate	6-10	2	7-12
20 %	Poor	1-5	1	1-6

TABLE 2: Demographic data of diabetic patients

Age-wise distribution	Age range (years)	**N (%)**
	18 to 30	30 (6)
	31 to 40	77 (15.4)
	41 to 50	129 (25.8)
	51 to 60	154 (30.8) *
	61 to 70	79 (15.8)
	71 to 80	27 (5.4)
	81 to 90	4 (0.8)
Gender wise distribution	**Gender**	**N (%)**
	Males	347 (69.4) *
	Females	153 (30.6)
Marital status	**Category**	**N (%)**
	Married	443 (88.6) *
	Unmarried	10 (2)
	Divorcee	1 (0.2)
	Widow/widower	46 (9.2)
Educational Qualification	**Category**	**N (%)**
	Illiterate	25 (5)
	Primary education	105 (21)
	Higher secondary education	173 (34.6) *
	UG (Degree or diploma)	162 (32.4)
	PG (Masters or equivalent)	30 (6)
	Ph.D.	5 (1)
Occupation	**Category**	**N (%)**
	Job	128 (25.6)
	Business	185 (37) *
	Retired	33 (6.6)
	Other work profile	154 (30.8)

Data expressed as percentage. * Indicates the highest number of patients in particular category (N=500)

TABLE 3: Medical history, family history, history of substance abuse and medication history

Medical history	Months	N (%)
	6 months to 1 year	14 (2.8)
	1 to 2 years	69 (13.8)
	2 to 5 years	211 (42.2) *
	5 to10 years	122 (24.4)
	> 10 years	84 (16.8)
Family history	**Presence of diabetes in family**	**N (%)**
	Yes	410 (82) *
	No	90 (18)
Family history (N= 410)	**Presence of DM in family member**	**N (%)**
	Father alone/Father +any sibling/Father + spouse	230 (56.1) *
	Mother alone/ Mother+ any sibling/ Mother + spouse	79 (19.3)
	Father and Mother both	29 (7.1)
	Brother alone	28 (6.8)
	Sister alone	2 (0.5)
	Spouse alone	42 (10.2)
History of Substance abuse	**Category**	**N (%)**
	Alcohol	0 (0)
	Tobacco	12 (2.4)
	Smoking	45 (9) *
	Tobacco + Smoking	3 (0.6)
	None	440 (88) *
Medication history	**Antidiabetic drugs in DM patients**	**N (%)**
	Acarbose/ Voglibose/Miglitol alone or in combination with other drugs	35 (7)
	Canagliflozin/Empagliflozin/Dapagliflozin alone or in combination with other drugs	79 (15.8)
	Citagliptin/ Saxagliptin/ Linagliptin alone or in combination with other drugs	22 (4.4)
	Glipizide/ Glibenclamide/ Glimepiride/ Nateglinide/ Repaglinide alone or in combination with other drugs	101 (20.2)
	Insulin alone or with other drugs	64 (12.8)
	Metformin alone or in combination with other drugs	155 (31) *
	Other drugs	44 (8.8)

Data expressed as percentage. * Indicates the highest number of patients in particular category (N=500)

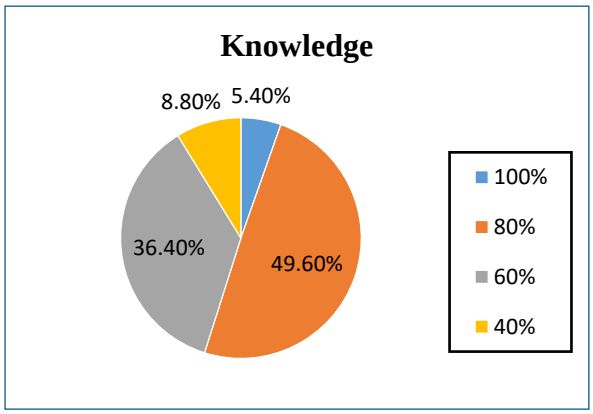
TABLE 3: Medical history, family history, history of substance abuse and medication history

Comorbidity	Comorbidity present	N (%)
	Hypertension alone	192 (38.4) *
	Hypertension, Obesity	25 (5)
	Hypertension + other (Angina attack/hyperlipidemia/other)	27 (5.4)
	Obesity	23 (4.6)
	Obesity + other	6 (1.2)
	Angina attack	34 (6.8)
	Hyperlipidemia	13 (2.6)
	Other (chronic kidney disease, thyroid, cancer/gynecological disorders)	22 (4.4)
	None	158 (31.6)
Measures	**Preventive and treatment measures**	**N (%)**
	Medication alone	487 (97.4) *
	Diet	448 (89.6)
	Exercise	180 (36)
	Meditation	4 (0.8)
	Yoga	27 (5.4)
Monitoring	**Frequency of monitoring glycemic control**	**N (%)**
	Every week	16 (3.2)
	Every month	35 (7)
	Every 3 months	266 (53.2) *
	Every 6 months	135 (27)
	Once in a year	32 (6.4)
	Occasionally	16 (32.2)
Visits	**Frequency of visit to clinic**	**N (%)**
	Monthly	15 (3)
	Every 3 months	106 (21.2)
	Every 6 months	135 (27)
	When required	244 (48.8) *
Lab tests	**Lab tests used by patients to monitor glycemic control**	**N (%)**
	Fasting blood sugar (FBS)/ FBS + Hemoglobin A1c (HbA1c)	8 (1.6)
	FBS, Post prandial blood sugar (PPBS)	258 (51.6) *
	Glucose tolerance test	40 (8)
	HbA1c	135 (27)
	HbA1c, Random blood sugar (RBS)	2 (0.4)
	PPBS	16 (3.2)
	RBS	41 (8.2)
Reasons	**Reasons for non-adherence**	**N (%)**
	Forgetfulness	119 (23.8)
	Polypharmacy	39 (7.8)
	Polypharmacy+ Forgetfulness	63 (12.6)
	Travelling	25 (5)
	Travelling+ Forgetfulness/ Polypharmacy	84 (16.8)
	None	170 (34)

Data expressed as percentage. * Indicates the highest number of patients in particular category (N=500)

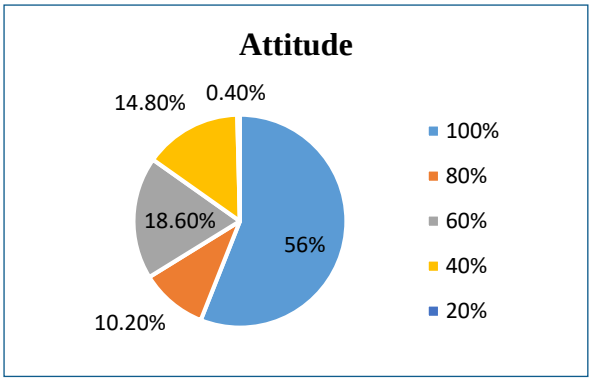
Highest number of patients (49.6 %) received 80 % (very good range) score in Knowledge category. The % of patients who received 100 % (excellent), 60 % (good) and 40 % (moderate) score were 5.4 %, 36.4 % and 8.8 % respectively. None of the patients received "poor" score category **(FIGURE 1).**

Figure 1: Percentage of patients having % of score received in Knowledge category; Data expressed as %, * indicates highest % of patients in particular score



Highest number of patients (56 %) received 100 % (excellent) score in Attitude category. The % of patients who received score of 80 % (very good), 60 % (good), 40 % (moderate) and 20 % (poor) were 10.2 %, 18.6 %, 14.8 % and 0.4 % respectively **(Figure 2).**

Figure 2: Percentage of patients having % of score received in Attitude category; Data expressed as %, * indicates highest % of patients in particular score



Highest number of patients (53.8 %) received in 80 % score (very good) in Practice Category. The % of patients who received score of 100 % (excellent), 60 % (good) and 40 % (moderate) were 2 %, 43.8 % and 0.8 % respectively.

There was significant association was found between age and knowledge (P < 0.05). Same strong significant association was found between age and knowledge (P < 0.05). no significant association was found between age and attitude **(TABLE 5).**

Figure 3: Percentage of patients having % of score received in Practice category; Data expressed as %, * indicates highest % of patients in particular score

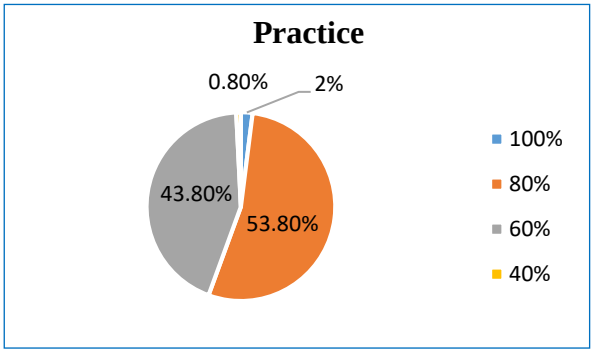


TABLE 5:
Association between Age and individual KAP Category

Variables	Chi table Value	Chi test Value	p-Value	
Age and Knowledge	7.81	20.09*	0.0002	< 0.05
Age and Attitude	9.49	35.86*	<0.0001	< 0.05
Age and Practice	7.81	6.853	0.0767	NS
Data expressed as chi square value, * indicates statistically significant (P-value < 0.05), N=500				

Discussion

Diabetes and its complications are preventable by early and timely measures. Educating the DM patients is the first and foremost step towards optimization of therapy, better control and preventing progress of complications. By changing their level of knowledge, by developing positive attitude which ultimately results into real-time practice leads to increased self-care and decrease disease burden and economic burden. It helps to design the strategic measures which results into increased practice outcomes (8).

In our study, majority of the patients were males (347 out of 500), which shows high prevalence of disease in male gender. This was similar to previous study Nordström et al. (11). Majority of patients were married (443 out of 500). This was similar to previous study Asmelash et al (12). The majority of patients had higher secondary education (173 out of 500). This was similar to previous study Shah et al (8). Majority of patients were doing business. In our study majority of diabetes patients had medical history of 2-5 years (211 out of 500). Most of the patients showed positive family history of diabetes from father side (259 out of 500) followed by mother side (107 out of 500) as per

similar findings from Upadhyay et al (13). Majority of the patients showed comorbidity of hypertension. This was similar to previous study Uthman et al (14). Majority of the patients were having no substance abuse (440 out of 500). Most common prescribed medicines were found to be metformin and its combinations followed by glipizide, glibenclamide, glimepiride and canagliflozin, empagliflozin, dapaglifozin. Majority of the patients were controlling diabetes only by medication (487 out of 500), the same was reported by Koley et al (9). Majority of the patients were measuring their glycemic control every 3 months (266 out of 500) most of patients were aware about monitoring their glycemic control every 3 months. Most of the patients were visiting the clinic only when required (244 out of 500). Majority of the patients were not able to adhere to their medications due to forgetfulness. Majority of the patients were going for post prandial blood sugar test (274 out of 500) followed by fasting blood sugar test (266 out of 500). This was similar to previous study Niroomand et al (6). Only 5.4 % of patients were having 100 % knowledge score (27 out of 500), 56 % of patients were having 100 % of attitude (280 out of 500) and only 2% of patients were having 100 % practice score (10 out of 500). This shows that patients' attitude towards diabetes is good but knowledge is less and practice is still poor.

The gaps between KAP amongst type DM patients visiting Primary Health Care Centers was found in study conducted by Mahzari et. al in Saudi Arabia (15). Poor knowledge affects practice even through with high extent of attitude in diabetics, this was reported by Le et. al (16). Knowledge, attitude and practice score of the patients between the age of 41-60 years were more because in our study the ratio of patients between the age of 41-60 years were more as compared to the patients between the age of 18-40 years. Association between "age vs knowledge" and "age vs attitude" was significant but no association between "age vs practice". Scores of KAP improves and associated with age especially in old adults as compared to young adults was shown in diabetic Gujarati population as reported by Solanki et al (16).

Conclusion

Poor Practice scores show need of better communication to patients, counselling to improve practice towards disease. We can conclude that there is immense need to educate people about the disease and aware them the need of totally adhering to their medications, monitoring the disease at proper interval of time and need of lifestyle modifications. A better educational program can improve the patients' attitude and knowledge.

Financial disclosure statement

Study was supported by KBIPER, Gandhinagar

Conflicts of interest

None declared.

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