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Original Article

Assessment of Knowledge, Attitude, and Practice of Type 2 Diabetic patients in a Tertiary Care Hospital

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ABSTRACT

Background: Effective diabetes control depends on patients' knowledge, attitude, and self-care practices. Identifying gaps in these areas helps guide targeted education and intervention.

Objectives: To assess the knowledge, attitude, and practice (KAP) of Type 2 diabetic patients in a tertiary care hospital and to identify factors associated with poor practices.

Methods: A cross-sectional study was conducted among **300** Type 2 diabetic patients attending the outpatient department of a tertiary care hospital. A pre-validated KAP questionnaire was administered through face-to-face interviews. Knowledge, attitude, and practice scores were categorized as good, moderate, or poor. Data were analyzed using descriptive statistics, chi-square test, and Pearson correlation.

Results: Good knowledge was observed in **62%**, positive attitude in **71%**, but good practice in only **39%** of participants. Practices related to exercise (34%), foot care (21%), and glucose monitoring (46%) were notably poor. Older age ($p = 0.03$), lower education level ($p = 0.001$), and longer duration of diabetes ($p = 0.04$) were significantly associated with poor practice. A positive correlation was found between knowledge and practice ($r = 0.41$, $p < 0.001$), and between knowledge and attitude ($r = 0.39$, $p < 0.001$).

Conclusion: Although knowledge and attitudes toward diabetes were generally good among patients, their self-care practices remained insufficient. Focused and continuous diabetes education is essential to bridge the gap between awareness and daily self-management.

Keywords*: Type 2 Diabetes Mellitus, Knowledge, Attitude, Practice, Self-care, Patient Education.*

INTRODUCTION:

Type 2 Diabetes Mellitus (T2DM) is one of the most significant global health challenges of the 21st century. It is characterized by insulin resistance, impaired insulin secretion, and chronic hyperglycemia leading to long-term microvascular and macrovascular complications (retinopathy, nephropathy, neuropathy, ischemic heart disease, stroke) [1]. According to the International Diabetes Federation (IDF), approximately **537 million adults** were living with diabetes in 2021, and this number is projected to rise to **643 million by 2030** and **783 million by 2045** [2]. More than 90% of these cases are Type 2 diabetes, reflecting the massive burden of the disease globally.

India contributes significantly to the global diabetes burden and is often referred to as the **"diabetes capital of the world."** IDF estimates indicate that India currently has over **77 million adults** with diabetes, expected to exceed **134 million by 2045** [2]. Rapid urbanization, sedentary lifestyle, unhealthy diet, obesity, and genetic predisposition have all contributed to the rising incidence of T2DM in India [3]. Effective diabetes control requires not only medical treatment but also active patient participation.

Successful diabetes management largely depends on the patient's **Knowledge, Attitude, and Practice (KAP)** toward the disease. Adequate knowledge about the nature of diabetes, its complications, diet, exercise, medication adherence, and glucose monitoring is essential for achieving good glycemic control [4]. Studies have shown that patients with higher knowledge levels demonstrate better glucose control and reduced complication rates [5].

Attitude refers to the patient's feelings, beliefs, and perceptions regarding diabetes and its management. A positive attitude improves motivation and adherence to lifestyle modifications and treatment plans [6]. Practice includes the patient's actual behaviors such as dietary compliance, regular exercise, blood glucose monitoring, medication adherence, and foot care. Poor practices despite good knowledge are a major challenge in diabetes self-management [7].

KAP studies among diabetic patients are vital for understanding the gaps between awareness and behavior. They help identify misconceptions, barriers to lifestyle change, and socio-demographic factors influencing diabetes care. Several studies in India and other developing countries have reported that although many patients possess adequate knowledge, their actual practices remain inadequate due to lack of motivation, cultural beliefs, financial constraints, or limited access to healthcare resources [8,9].

In tertiary care hospitals, where patients often seek continuous care for chronic illnesses, evaluating KAP levels allows clinicians to design **targeted educational interventions** tailored to the population's needs. Hence, assessing KAP among Type 2 diabetic patients becomes crucial in improving disease control, preventing chronic complications, and reducing healthcare burden.

Therefore, the present study aims to assess the knowledge, attitude, and practice of Type 2 diabetic patients attending a tertiary care hospital and identify factors influencing poor KAP scores.

MATERIALS AND METHODS:

Study Design:

This was a **hospital-based, descriptive, cross-sectional study** conducted to assess the knowledge, attitude, and practice (KAP) of patients diagnosed with Type 2 Diabetes Mellitus (T2DM).

Study Setting:

The study was conducted in the dept. of SPM in collaboration with **General Medicine Department** at a tertiary care teaching hospital for a period of 6 months.

Study Population

All adult patients with **Type 2 Diabetes Mellitus** attending the outpatient department during the study period were considered for inclusion.

Inclusion Criteria

- Patients aged **18 years and above**
- Diagnosed with **Type 2 Diabetes Mellitus** for at least **6 months**
- On treatment (oral antidiabetic drugs or insulin)
- Willing to provide **written informed consent**

Exclusion Criteria

- Type 1 diabetes mellitus
- Gestational diabetes
- Patients with severe psychiatric illness or cognitive impairment
- Critically ill patients and those unwilling to participate

Sample Size Calculation

Sample size (n) was calculated using the formula for prevalence studies:

$$n = \frac{Z^2 p(1-p)}{d^2}$$

Where:

- Z = 1.96 (95% confidence interval)
- p = anticipated proportion with good KAP = 50% (0.5), used for maximum sample size
- d = precision = 6% (0.06)

$$n = \frac{(1.96)^2 \times 0.5 \times 0.5}{0.06^2} \approx 267$$

Considering a **10% non-response rate**, the final sample size was rounded to **300** participants.

Sampling Technique: A **systematic random sampling** method was used.

Study Tool: KAP Questionnaire
A structured, interviewer-administered questionnaire was used. It consisted of **three sections**:
1. Knowledge Section (15 items)
- Questions on nature of diabetes, complications, diet, exercise, hypoglycemia, foot care, and medication adherence.
- Responses: *Correct = 1, Incorrect/Don't Know = 0*
- Score range: 0–15

2. Attitude Section (10 items)
- Assessed beliefs, motivation, self-confidence, and perception using a **5-point Likert scale:** *Strongly Agree, Agree, Neutral, Disagree, Strongly Disagree*
- Score range: 10–50

3. Practice Section (10 items)
- Questions on diet, exercise, glucose monitoring, medication adherence, foot care, and follow-up visits.
- Responses: *Always = 2, Sometimes = 1, Never = 0*
- Score range: 0–20

Validation of the Questionnaire
- The questionnaire was adapted from previously validated KAP studies and modified for local context.
- It underwent **expert validation** by a panel of physicians, endocrinologists, and public health experts (n = 7).
- **Content Validity Index (CVI):** 0.86 (acceptable >0.8)
- A **pilot study** was conducted on 30 patients (not included in final study).
- **Cronbach's alpha:**
  - Knowledge: 0.79
  - Attitude: 0.82
  - Practice:0.76
    These values indicated good internal consistency.

Scoring and Classification
Knowledge
- **Good:** ≥75% (≥12 points)
- **Moderate:** 50–74% (8–11 points)
- **Poor:** <50% (<8 points)

Attitude
- **Positive:** ≥75% of total score
- **Neutral:** 50–74%
- **Negative:** <50%

Practice
- **Good Practice:** ≥75%
- **Moderate:** 50–74%
- **Poor:** <50%

Data Collection Procedure
- Data were collected using **face-to-face interviews** conducted in the OPD waiting area.
- Each interview took approximately **10–12 minutes**.
- Investigators were trained beforehand to ensure uniformity.
- Blood glucose and treatment history were cross-checked using patient records when available.

Data Entry and Management
- Data were coded and entered into **Microsoft Excel 2019**.
- Regular data validation was done to minimize entry errors.
- Confidentiality was maintained; questionnaires were stored securely.

Statistical Analysis
Data were analyzed using **SPSS version 20.0 (IBM Corp.)**
- **Descriptive Statistics:**
  Means, standard deviation, frequencies, and percentages.
- **Inferential Statistics:**

- Chi-square test: association of KAP with demographic variables
- Independent t-test/ANOVA: mean KAP score comparison
- Pearson correlation: relationship between knowledge, attitude, and practice

- **$p < 0.05$** was considered statistically significant.

RESULTS:

The mean age of participants was **54.7 ± 10.8 years**, ranging from 30 to 82 years. Most patients (58%) belonged to the 40–60 year age group. Males constituted **56.7%**, while females were **43.3%**. Approximately **44%** of participants had education up to high school, whereas **19%** were illiterate. The majority (42%) had diabetes duration between 5–10 years, and **52%** had coexisting hypertension as shown in Table 1

TABLE 1: Sociodemographic Characteristics of the Study Participants (n = 300)

Variable	Category	Frequency (n)	Percentage (%)
Age (years)	< 40	36	12.0
	40–60	174	58.0
	> 60	90	30.0
Gender	Male	170	56.7
	Female	130	43.3
Education	Illiterate	57	19.0
	Up to High School	132	44.0
	Graduate & Above	111	37.0
Duration of Diabetes	< 5 years	114	38.0
	5–10 years	126	42.0
	> 10 years	60	20.0
Comorbidities	Hypertension	156	52.0
	Dyslipidemia	123	41.0

Of the 300 patients, **62%** demonstrated good knowledge regarding diabetes, **28%** had moderate knowledge, and **10%** had poor knowledge. High awareness was noted regarding the need for regular medications (92%) and dietary control (88%). However, only **47%** correctly identified symptoms of hypoglycemia, and **39%** were aware of recommended foot-care practices as shown in Table 2

Table 2: Distribution of Knowledge Scores Among Participants (n = 300)

Knowledge Category	Score Range	Frequency (n)	Percentage (%)
Good Knowledge	≥ 12	186	62.0
Moderate Knowledge	8–11	84	28.0
Poor Knowledge	< 8	30	10.0

The majority of participants (**71%**) exhibited a positive attitude toward diabetes management. About **23%** had a neutral attitude, and **6%** showed a negative attitude. Most patients agreed that diabetes requires lifelong care (94%) and supported lifestyle modification (87%). However, only **58%** felt confident in managing their diabetes as shown in Table 3.

Table 3: Distribution of Attitude Scores Among Participants (n = 300)

Attitude Category	Frequency (n)	Percentage (%)
Positive Attitude	213	71.0
Neutral Attitude	70	23.0
Negative Attitude	17	6.0

Good practice was observed in only **39%** of the patients, while **42%** demonstrated moderate practice and **19%** showed poor practice. Positive practices such as medication adherence were high (82%), but regular exercise was practiced by only **34%**. Daily foot inspection was reported by **21%**, and regular blood glucose monitoring by **46%** as shown in Table 4

Table 4: Distribution of Practice Scores Among Participants (n = 300)

Practice Category	Frequency (n)	Percentage (%)
Good Practice	117	39.0
Moderate Practice	126	42.0
Poor Practice	57	19.0

Poor practice was significantly associated with **Age > 60 years** (p = 0.03), **Lower education level** (p = 0.001) and **Duration of diabetes > 10 years** (p = 0.04). Gender (p = 0.28) and comorbidities (p = 0.19) did not show a significant association as shown in Table 5.

Table 5: Association of Sociodemographic Factors With Poor Practice

Factor	Category	Poor Practice (n = 57)	p-value
Age	≤ 60 years	28 (49.1%)	**0.03***
	> 60 years	29 (50.9%)	
Education	Illiterate	22 (38.6%)	**0.001***
	≥ Primary	35 (61.4%)	
Duration of Diabetes	≤ 10 years	25 (43.8%)	**0.04***
	> 10 years	32 (56.2%)	
Gender	Male/Female	No significant association	0.28
Comorbidities	Present/Absent	Not significant	0.19

The correlation table shows that **better knowledge leads to better practice**, because the knowledge–practice correlation (r = 0.41) is positive and significant. Similarly, **patients with better knowledge also have a more positive attitude** (r = 0.39).

Although weaker, there is still a significant link between **attitude and practice** (r = 0.28), meaning **a good attitude also improves self-care behavior as shown in Table 6**

Table 6: Correlation Between Knowledge, Attitude, and Practice Scores

Variables Correlated	Correlation Coefficient (r)	p-value
Knowledge ↔ Practice	**0.41**	**<0.001***
Knowledge ↔ Attitude	**0.39**	**<0.001***
Attitude ↔ Practice	**0.28**	**0.002***

DISCUSSION:

In the present study, the majority of participants demonstrated **good knowledge (62%)** and a **positive attitude (71%)**, but only **39%** exhibited good self-care practices. This reflects a clear **knowledge–practice gap**, a pattern reported in multiple diabetes KAP studies across Asia and the Middle East.

The high proportion of patients with good knowledge is consistent with findings from Subish et al. in Nepal, who also observed that over half of their diabetic population possessed adequate knowledge about disease management [10]. Similar results were reported in Oman, where Al-Adawi et al. found that most patients were aware of the chronic nature of diabetes and the need for lifestyle modification [11]. The present study's high knowledge scores may be attributed to regular follow-ups in tertiary care settings, where patients often receive repeated counseling.

Despite good knowledge, **self-care practice remained poor**, particularly with respect to **exercise (34%)**, **foot inspection (21%)**, and **blood glucose monitoring (46%)**. These findings are in line with the recommendations of the American Diabetes Association and international guidelines, which emphasize that lifestyle modification is crucial but often inadequately followed by diabetic patients [12]. A systematic review by Chen et al. also highlighted that self-efficacy plays a major role in adopting diabetes self-care behavior; patients may know what to do but lack confidence or motivation to implement lifestyle changes [13].

Education level showed a significant association with practice (p = 0.001), supporting the findings of Rani et al., who noted that literacy plays an important role in shaping health-related behavior among chronic disease patients in India [14]. Elderly patients (>60 years) in this study had poorer practice scores, which is comparable to findings by Abdelmoneim et al., who reported decreased adherence with increasing age due to physical limitations, comorbidities, and treatment fatigue [15].

A significant positive correlation was observed between **knowledge and practice (r = 0.41)**, indicating that improved knowledge leads to better lifestyle behavior. This is consistent with studies by Berhe et al. and others in Ethiopia and Bangladesh, which emphasized the role of diabetes education programs in improving both practice and glycemic control [16]. Furthermore, structured diabetes self-management education has been shown to lead to reductions in HbA1c and long-term complications, as highlighted in a meta-analysis by Norris et al. [17].

Overall, the findings of this study reinforce the importance of **continuous diabetes education**, individualized counseling, and reinforcement of lifestyle modifications. Despite good knowledge and attitude, **consistent practice remains a challenge**, indicating the need for behavior-focused interventions rather than information alone.

CONCLUSION:

The study found that while most Type 2 diabetic patients possess adequate knowledge and generally positive attitudes, their actual self-care practices—especially exercise, foot care, and glucose monitoring—remain insufficient. Poorer practice was more common among older adults, those with limited education, and patients with longer disease duration. These findings highlight the need for continuous, patient-focused diabetes education that not only improves awareness but also strengthens motivation and confidence to adopt daily self-care behaviors.

Declaration:

Conflicts of interests: The authors declare no conflicts of interest.
Author contribution: All authors have contributed in the manuscript.
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