Patient Centered Perspectives On Diabetes – A Knowledge, Attitude And Practice (KAP) Study Among Indian Patients With Type 2 Diabetes Mellitus

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ABSTRACT

Background: *The effective management of diabetes is in the hands of the patient which in turn related to their knowledge, attitude toward diabetes and medication adherence. This is related to impact produced by public health interventions and education programmes.*

Objectives: *The objective of the study was to assess the knowledge, attitude, and practice towards diabetes among the type 2 diabetes mellitus patients through questionnaire.*

Materials and Methods: *This was a prospective, observational, cross-sectional study conducted in a Tertiary Care Hospital at Puducherry over a period of 6 month from March 2024 to August 2024. A Medical Compliance Questionnaire (MCQ) which was modified to suit the local situation was designed to inquire about the knowledge, attitude and practice of diabetes.*

Results: *Total 153 patients of type 2 diabetes mellitus, in which 43 males and 110 females. The majority of participants (64.7%) had duration of illness ranging from 0-5years. Hypertension is the comorbidity frequently associated which constitutes to 52.9% (81 individuals). Overall study population had moderate knowledge about diabetes with mean knowledge score of 58.5%, moderate positive attitude towards diabetes with mean attitude score of 56.3%, and poor practices towards medication adherence with practice score of 46.6%.*

Conclusion: *The knowledge and attitude towards the diabetes among the study population is quite satisfactory. But regarding the practice towards diabetes particularly on compliance and medication adherence is poor. Overall, improving diabetes related practices requires not only educating and motivating individuals but also building a supportive health care system which makes healthy behaviours easier to adopt and maintain.*

Key words: *Diabetes mellitus, hypertension, attitude score, medication adherence*

INTRODUCTION:

Diabetes is a chronic disease that occurs when the pancreas do not produce enough insulin or when the body cannot effectively use the insulin produced by it. For all age-groups people across the globe, prevalence of diabetes was estimated to be 4.4% in 2030. As per World Health Organisation (WHO), In India, there are estimated 77 million people above the age of 18 years are suffering from diabetes (type 2) and nearly 25 million are prediabetics (at a higher risk of developing diabetes in near future).[1] Type 2 Diabetes Mellitus often results from impaired insulin reception by beta cells.[2] Increased blood glucose levels, or hyperglycemia, can lead to significant lifestyle challenges, including high medication costs, reduced physical activity and various macrovascular and microvascular complications such as diabetic foot ulcers, retinopathy, nephropathy and coronary artery disease.[3]

Now-a-days, many people with diabetes mellitus are failed to achieve good glycemic control. The foremost reason for this is lack of medication adherence followed by lack of healthy lifestyle. Knowledge, attitudes and practices on diabetes play a crucial role in shaping the health behaviours and adherence to medications. KAP assessments can identify gaps in awareness, misbeliefs and poor health practices that hinder early diagnosis and disease control.[4]

This study was aimed to assess the knowledge, attitude and practices related to diabetes among diabetes patients through questionnaire. This data will help in designing public health interventions and education programmes on diabetes.

MATERIALS AND METHODS:

A prospective, observational, cross-sectional study conducted in a Tertiary Care Hospital at Puducherry after getting approval from Institutional Ethics Committee (NO. IEC/C-P/ 18 /2024) over a period of 6 months from March 2024 to August 2024 with a total sample size of 153 patients. They were interviewed after getting informed consent through a Medical Compliance Questionnaire (MCQ) which was modified to suit the local situation. All type 2 diabetic patients aged ≥ 18 years along with various other Co-morbidities (including Hypertension, coronary artery disease, etc.,) in either out-patient or in-patient wards were the targets of the study. Those who refused to participate in the study were excluded.

Study Tool:

A Medical Compliance Questionnaire (MCQ) which was modified to suit the local situation was designed to inquire about the knowledge, attitude and practice of diabetes. This was given in both English and local vernacular language.

Demographic profile: Collected data on age, sex, and occupation.

Medical History: Documented period of illness, co-morbidities, personal history including smoking and alcohol use (noting the local context of Puducherry), history of alternative medications, and current treatment regimens.

Knowledge on Diabetes: Included 10 items which focuses on awareness about diabetes and its complication, misconceptions on diabetes and importance of medication adherence. Correct knowledge were given the score of 1 point, whereas the incorrect / Do not know were given 0 point.

Attitude towards Diabetes: Included 10 times which focuses on attitude towards medication adherence, lifestyle modification, routine follow ups. For scoring Likert scale has been used. Which consists of strongly agree-5, Agree – 4, Neutral – 3, Disagree – 2, Strongly disagree -1. For 10 attitude statements, maximum score was 50.

Practice towards Diabetes, Treatment Information: Assessed the availability and affordability of prescribed medications. Lastly, information on the medical compliance profile was collected by using the Medical Compliance Questionnaire (MCQ) which was modified to suit the local situation. Appropriate behaviour was given a score of 1 and inappropriate/ absent practices was scored as 0.

STATISTICAL ANALYSIS:

All collected data were entered into Microsoft Excel and analyzed using SPSS software 23.0V. Descriptive Statistics were used to summarize sociodemographic variables, knowledge, and attitude & practice responses. Categorical variables were presented as frequencies and percentages.

RESULTS:

A total of 153 participants were included in the current study, which evaluated the Knowledge, Attitudes, and Practices (KAP) of diabetes patients. Of them, 110 were female and 43 were male, yielding a male:female ratio of 1:2.56 (Fig.1). Almost 50% of the patients lacked literacy. Strategies for gender-specific education and intervention may be impacted by this female majority. Most participants (64.7%) had been living with diabetes for 0–5 years, suggesting that they were comparatively early in the disease's progression (Fig. 2). This is a crucial time when illness management can benefit from efficient education and behavior modification programs.

Participants frequently had co-morbidities, with hypertension being the most common, affecting 52.9% of them (81 people).(Figure 3) The high prevalence of co-occurring hypertension highlights the necessity of screening for hypertension in diabetic patients as well as the need for integrated care strategies that target cardiovascular risk factors and diabetes. In contrast, 21.5% (33 people) said they had no other co-morbidities, which offers a chance to prevent difficulties in the first place by practicing good self-care.

Additionally, lifestyle choices have a significant impact on the course of disease. Although not the majority, the fact that 20 participants, or 12.4% of the total, reported drinking alcohol emphasizes the importance of educating patients about risky habits that can be changed. The comparatively low reported substance use rates in this study sample point to the possibility of effective lifestyle treatments if they are implemented early and regularly.
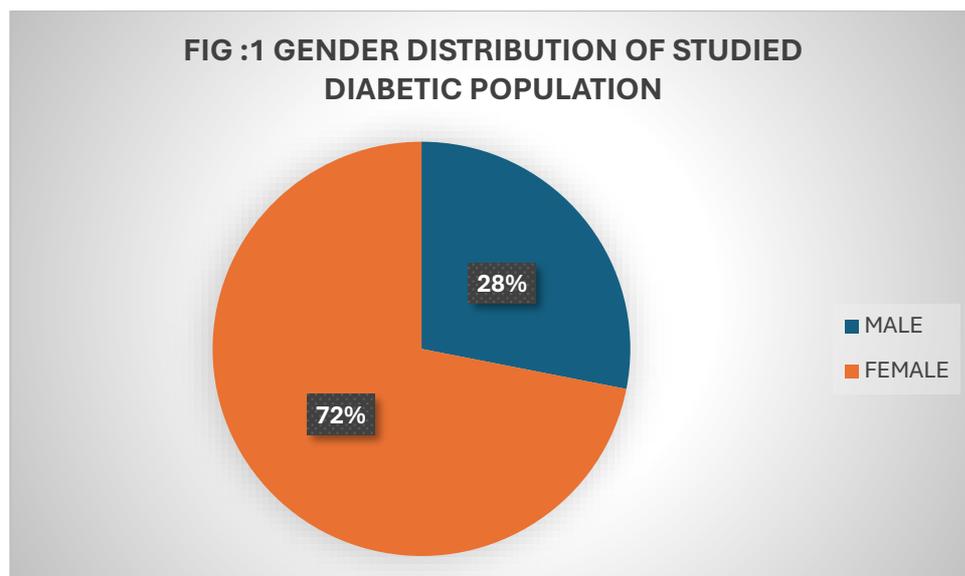
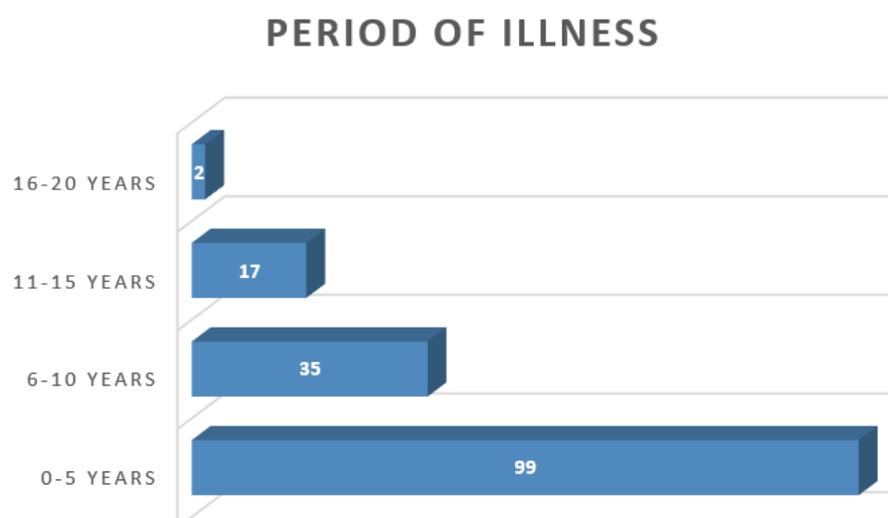**Fig. 1: Gender Distribution of Studied Diabetic Popultation**
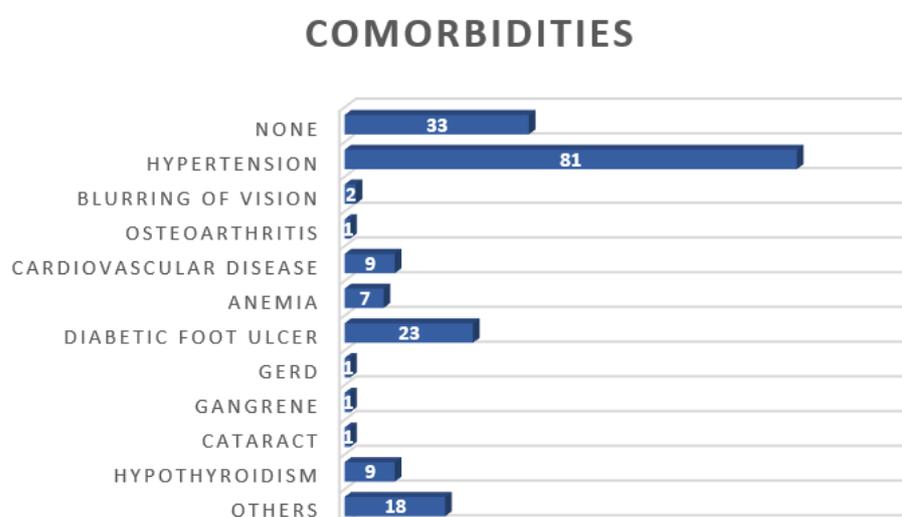

Fig. 2: Duration of illness

Fig. 3: Co-morbidities among study population

Knowledge, Attitude, and Practice (KAP):
Table 1: Knowledge on diabetes

S.No	Knowledge Statement	Correct responses (n)	Correct (%)
1.	Diabetes is a disease where the body does not control the blood sugars properly	128	83.7%
2.	There are two types of diabetes Type1/Type2	97	63.4%
3.	People with diabetes have frequent thirst, frequent urination, increased hunger, increased frequency of urination in night	103	67.3%
4	Following balanced diet and healthy lifestyle can control and prevent the occurence of diabetes	71	46.4%
5	Complete cure of diabetes is possible	58	37.9%
6	Uncontrolled Diabetes can leads to cardiovascular disease, kidney disease, diminished vision	81	52.9%
7	People with diabetes should reduce the intake of rice.	66	43.1%
8	Regular exercise like walking , doing yoga can help in managing diabetes	95	62.1%
9	Diabetes arise due to defect in pancreas which leads to insufficient secretion of insulin	90	58.8%
10	Regular monitoring of blood glucose is essential	106	69.3%

Based on the data collected from Table 1, Mean knowledge Score is 58.5% which is calculated taking into consideration only the correct knowledge about the diabetes. This represents a moderate level of knowledge on diabetes among study participants. Study participants are aware that diabetes is a disease

that deals with impaired blood glucose metabolism (83.7%). They were also aware about the symptoms of diabetes (67.3%) and they know the importance of regular blood glucose monitoring (69.3%).

Attitude on Diabetes:

Attitude questionnaire consists of

1. Diabetes is a serious metabolic disorder - 73.2%
2. Regularly medication should be taken - 42.50%
3. I should take tablets even my blood glucose is under control - 66.00%
4. I should follow balanced diet and regular exercise - 71.20%
5. I know that regular monitoring of blood glucose is essential - 47.10%
6. Family members of diabetics should be educated on diabetes - 77.80%
7. I know that regular vision examination, foot examination is must - 54.90%
8. I should follow allopathy, homeopathy or siddha but not in combination - 28.10%
9. Managing diabetes is difficult - 33.30%
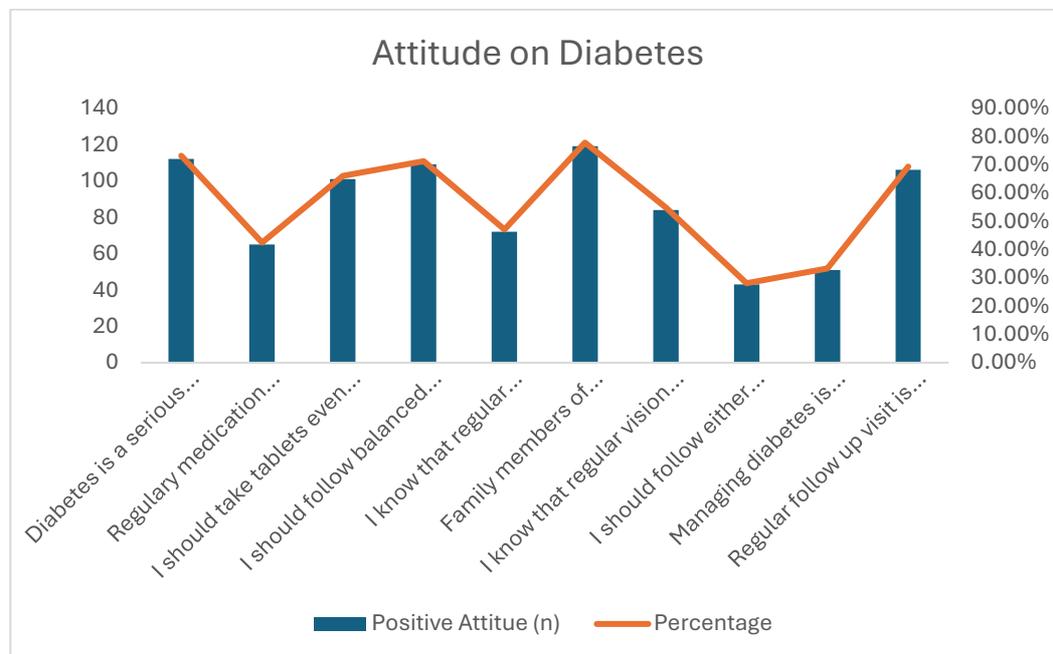10. Regular follow up visit is essential - 69.3%

Fig. 4: Positive attitude towards Diabetes

According to the data gathered, the study population's mean attitude score is 56.3% (Fig. 4), which is determined just by considering positive attitudes (i.e., agree and strongly agree). This suggests that the population has a relatively favourable attitude toward managing their diabetes. Nearly all people (73.2%) strongly believe that diabetes is a serious illness. The majority had favourable attitudes toward family education (77.8%) and maintaining a healthy diet and exercise routine (71.2%). Medication adherence (66.0%) and follow-up care (69.3%) are comparatively well-received. However, 42.5% of the sample group does not recognize the need for daily medicine. Therefore, it's crucial to teach the value of taking their medications on a regular basis.

Practice among the Diabetic Patients

Among the diabetic patients surveyed, 11.1% (17 individuals) reported the use of alternative medicine, including systems under AYUSH such as Ayurveda, Yoga, Unani, Siddha, and Homeopathy, while the remaining 88.9% (136 individuals) did not use any form of alternative medicine.

Regarding medication adherence, 51% (78 individuals) never forgot to take their medicine, whereas 40.5% (62 individuals) sometimes forgot, and 8.5% (13 individuals) often forgot. In decisions regarding medication dosage, 81.7% (125 individuals) never decided to reduce their dosage on their own, while 15% (23 individuals) sometimes did, and 3.3% (5 individuals) often made such decisions.

Among patients who felt better, 71.2% (109 people) never missed a dosage, 24.8% (38 people) occasionally missed it, and 3.9% (6 people) frequently missed their medication. Regarding adverse effects, 80.4% (123 people) never stopped taking their prescription because of them, 13.7% (21 people) occasionally did, 3.9% (6 people) frequently did, and 0.7% (1 person) always did.

Sixty-six percent (101 people) said they never forgot to take their prescription when traveling, compared to 28.8% (44 people) who occasionally forgot, 4.6% (7 people) who frequently forgot, and 0.7% (1 person) who always forgot.

Lastly, stock-out at home was a minor issue for most, with 78.4% (120 individuals) never missing their medication due to stock-out, 17.6% (27 individuals) sometimes missing it, 4.5% (7 individuals) often missing it, and only 0.65% (1 individual) always missing it due to stock-out.
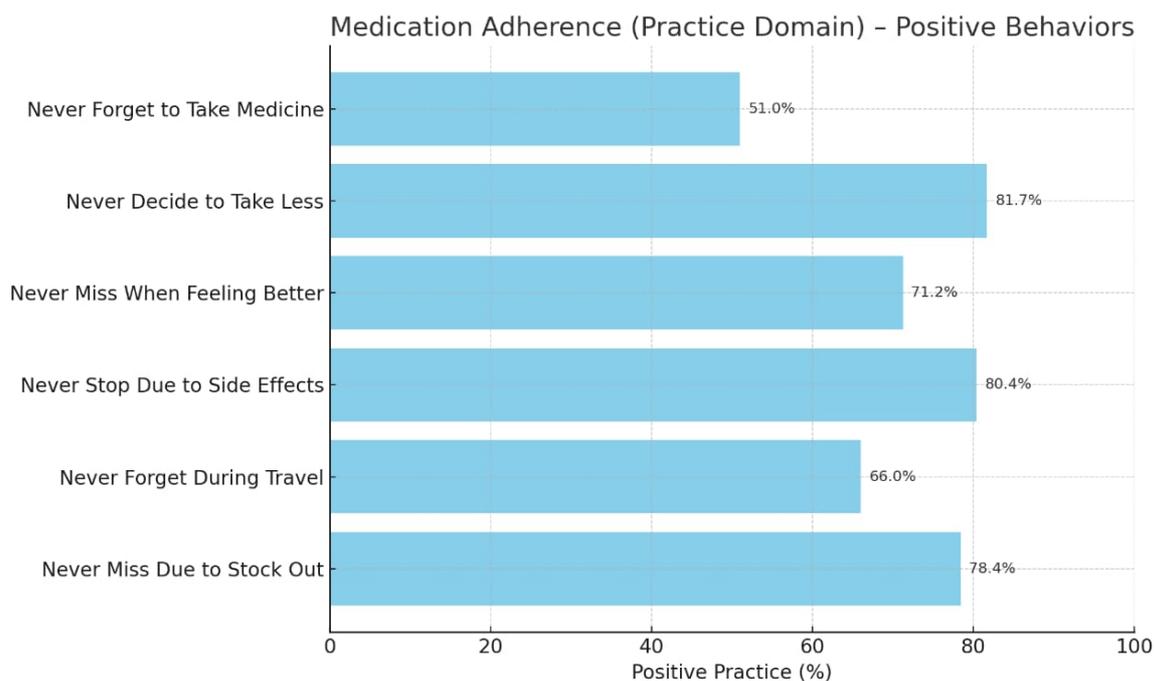

Fig 5: Positive Practice behaviour among Diabetic patients.

Mean Practice score is 46.6 % which is poor practice score, which is calculated taking into consideration only the positive appropriate behaviour. Based on the above data, majority of the study population did not practice self adjustment of dosage. (81.7%). Nearly 80% of the people never stopped the medication upon occurrence of side effects without the knowledge of physician, Nearly 78.4% of individuals never miss medication due to stock out.(Fig:5)

DISCUSSION:

This study provides insight into the knowledge, attitude and practices related to medication adherence among patients with diabetes mellitus. A knowledge score of 58.5% aligns with the Nagar et al., study in Central India, in which he reported that approximately 49.3% of patients had moderate knowledge on diabetes.[5] In this study, participants showed adequate knowledge on the general diabetes concepts, but understanding of prevention, complications and chronic management remained limited. This mirrors finding with the Suresh Babu et al., study where only about half of the study population correctly knew the causes and complications of Diabetes. [6]

In the present study, the attitude score is 56.3% indicates moderate positive attitude towards diabetes and its management, but key areas such as medication adherence, regular monitoring of blood glucose lag behind. H.M.M Herath et al., study in Sri Lanka found that despite moderate to high knowledge, around 88-90% of population expressed poor attitude and reluctancy towards diabetes management.[7] Similarly, Vrinda et al., study in Bengaluru emphasized that knowledge alone does not translate into motivation for healthy lifestyle behaviours.[8]

In the present study, the mean practice score is 46.6%, approximately 19.6% of patients had intentionally stopped their medication, while 28.7% missed dose upon feeling better, this indicates the significance of intentional non-adherence to medications. These findings are comparable to those reported by Kassahun et al., in Ethiopia where 24% of diabetic patients reported non-adherence due to perceived improvement in symptoms.[4]

In present study, 18.3% patients attempted to reduce their medication dosage by their own without the knowledge of physician. This finding is comparatively similar to Garcia-Perez et al study, where self-adjustment of diabetic medicine dosage is prevalent in 22% of diabetic patient in Spain, indicating the significance of adequate patient counselling. [9]

In present study, 22.75% stopped their medication due to stockouts at home. This findings align with Alqarni et al., study in Saudi Arabia where supply chain disruptions and lack of medication access were leading factor in non-adherence.[10] Additionally, forgetfulness due to travel accounts for 34.1% indicating the lack of knowledge about the disease and its complications.

Gender differences were noted, with a high prevalence of Diabetes among females compared to males, with a gender ratio of (110:43). This finding is contradictory to Kassahun et al., study where diabetes prevalence is more in male with percentage of 61.8% compared to females.[4] In Wabe et al., study also, they commented that diabetes prevalence is more in males 51.83%.[11] In our study, regarding co-morbidities associated with DM, the most prevalent was Hypertension, affecting 52.9% of patients. This also aligns with Wabe et al., study, where the most frequent co-morbidity associated with diabetes is Hypertension which accounts for 61.2%. This highlights the need for screening for hypertension among diabetics.[11]

In present study, in terms of medication, the most commonly used drug for managing DM was Human Insulin MIXTARD and DAONIL in Kumarapalayam RHTC and METFORMIN 500mg in hospitals, which was provided at a cost of 47 rupees for 20 tablets and ACTRAPID at a cost of 178 rupees at the hospital and was available free of charge at the affiliated Primary Health Centre (PHC). These findings align with Sekhar Mandal et al., study, where METFORMIN is the most commonly used drug among the diabetic patients in rural Bengal.[12] In Satya Abhishek Kombathula et al., study, the most commonly prescribed drug among type 2 diabetes is Metformin followed by sulfonylureas.[13]

CONCLUSION:

The findings of this study indicate a moderate level of knowledge and attitude towards diabetes among the participants, but concerningly poor level of practice. The study revealed several key insights into medication adherence among patients with Diabetes Mellitus. Approximately 19.6% of patients reported deciding to stop their medication at some point. Specifically, 28.7% of patients missed on taking their medication after they began feeling better, while 18.3% attempted to reduce their medication dosage. Additionally, 34.1% of patients forgot to take their medication when traveling, and 22.75% stopped their medication due to stock outs at home. These issues highlight the poor medication adherence and may stem from inadequate counseling and support provided to patients.

This disconnects between knowledge, attitude and practice highlights a critical gap between awareness and actual health related practices. Improvement in diabetes related practices is essential to prevent macro and microvascular complications of diabetes, to reduce economic burden to the patients in aspects of frequent hospitalization due to poor medication adherence and to reduce the overall burden on healthcare systems.

So, effective public health interventions should not only aim to enhance knowledge and attitude of diabetes and also should focus on translating this knowledge of diabetes into consistent, healthy practices through behavior change strategies, community support and assessible healthcare services.

Diabetes is a non-communicable chronic disease, so the management of diabetes is in hands of the patient which in turn is related to the impact of public health programmes. So the health care system must adopt patient-centered, multidisciplinary approach that integrates structured education, behavioral counselling and continuous follow-up. Inclusion of diabetes care teams, community health care teams and use of digital tools like mobile apps and telehealth can further enhance patient engagement and adherence. These are the things are essential for translating knowledge and attitude into effective and sustainable diabetes management practices.

REFERENCES:

1. World Health Organization. Global report on diabetes [cited Apr 21 2016]. Available from:https://www.who.int/publications/i/item/9789241565257Accessed. France; 2016.

2. American Diabetes Association. 2. Classification and Diagnosis of Diabetes: Standards of Medical Care in Diabetes—2023. Diabetes Care. 2023;46(Suppl 1):S19–S40.

3. Fowler MJ. Microvascular and Macrovascular Complications of Diabetes. Clin Diabetes. 2008;26(2):77–82.

4. Kassahun CW, Mekonen AG. Knowledge, attitude, practices and their associated factors towards diabetes mellitus among non-diabetes community members of Bale Zone administrative towns, South East Ethiopia. PLoS One. 2017;12(2) :e0170040.

5. Vivek Nagar, Pankaj Prasad, Arun Mitra, Saket Kale, Kriti Yadav, Mukesh Shukla. Assessment of knowledge, attitude and practice about diabetes among diabetes patients of tertiary care centre in central India. Int J Community Med Public Health. 2018;5(9),4065-4071.

6. Babu MS, Gowdappa HB, Kalpana T, Vidyalaxmi K, Nikhil B, Chakravarthy T. Knowledge, Attitude and Practices of Diabetic Patients - A Cross Sectional Study in a Tertiary Care Hospital in Mysore. J Assoc Physicians India. 2015 Aug;63(8):96.220-223.

7. Herath, H.M.M., Weerasinghe, N.P., Dias, H. et al. Knowledge, attitude and practice related to diabetes mellitus among the general public in Galle district in Southern Sri Lanka: a pilot study. BMC Public Health 17, 535 (2017). 01-07.

8. Vrinda, Bhat, Sulochana; Anjana, K. S.; Kavya, N.; Monica, K. P.. The Correlation between Knowledge, Attitude, and Practice Related to Diabetes Involving Ayurveda and Yoga in two Ayurveda and Allopathy Hospitals of Bengaluru. Journal of Integrated Health Sciences. 2024; 12(2): 135-141.

9. García-Pérez LE, Alvarez M, Dilla T, Gil-Guillén V, Orozco-Beltrán D. Adherence to therapies in patients with type 2 diabetes. Diabetes Ther. 2013 Dec;4(2):175-94.

10. AlQarni K, AlQarni EA, Naqvi AA, AlShayban DM, Ghori SA, Haseeb A, Raafat M, Jamshed S. Assessment of Medication Adherence in Saudi Patients With Type II Diabetes Mellitus in Khobar City, Saudi Arabia. Front Pharmacol. 2019 Nov 8;10:1306.

11. Wabe NT, Angamo MT, Hussein S. Medication adherence in diabetes mellitus and self management practices among type-2 diabetics in Ethiopia. North Am J Med Sci 2011; 3: 418-423.

12. Mandal S, Maiti T, Das AK, Das A, Mandal A, Sarkar BS, et al. Drug utilization study in patients with type 2 diabetes mellitus diabetes clinic of a tertiary care hospital in rural Bengal. Int J Basic Clin Pharmacol 2016;5:1647-54.

13. Satya Abhishek Kombathula , Sachidananda Moorthy. Prescription Pattern of Anti-Diabetic Drugs In Type 2 Diabetes Mellitus Patients at a Tertiary Care Hospital – India. Int. J. Pharm. Clin. Res. 2024; 16(8); 1105-1111