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A Prospective Observational Study on Impact of Patient Counselling In Reducing Complications of Type II Diabetes

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ABSTRACT:

Introduction: Type 2 Diabetes mellitus (T2DM) is a chronic metabolic disorder that significantly impacts overall health and poses a substantial risk for morbidity. This study examines the role of patient counselling in mitigating complications associated with T2DM and investigates the factors contributing to their prevalence.

Methods: Study was conducted in Vadodara, India, it involved 252 adult participants, including women with a history of Gestational Diabetes Mellitus, from November 2023 to March 2024. The study excluded individuals under 18, those with Type 1 diabetes, and patients with comorbidities or cognitive impairments. Data were collected through a validated form and analyzed using various statistical methods.

Results: The findings revealed that 44% of participants experienced complications, emphasizing the importance of monitoring Glycated haemoglobin (HbA1c) levels as a predictor of long-term glycemic control A paired T-test showed a strong positive correlation (0.99) between initial and 3-month HbA1c levels, with a significant decrease from an initial mean of 7.70 to 7.62 after three months.

Conclusion: The research highlights how effective patient education and lifestyle modifications can lead to improved glucose control and reduced complications in T2DM patients. By fostering better patient understanding of diabetes management, the study aims to inform the development of enhanced education programs and treatment strategies, ultimately improving patient outcomes and serving as a valuable resource for healthcare providers in addressing T2DM complications.

Key-words: Diabetes mellitus, Patient counselling, Complication

INTRODUCTION:

T2DM is a chronic metabolic disorder that significantly impacts overall health and poses a substantial risk for morbidity. The long-term vascular complications associated with T2DM are major contributors to both morbidity and mortality in affected individuals. Research has consistently demonstrated that reducing HbA1c levels is correlated with a decreased incidence or slower progression of microvascular complications.[1] Managing T2DM is complex and requires not only ongoing medical care but also continuous patient education and support to prevent acute issues and mitigate the risk of chronic complications.[2] Pharmacists play a vital role in diabetes management by assisting patients in achieving both therapeutic and lifestyle objectives.[3] With their expertise in medication selection, identification of drug-related issues, and patient education, pharmacists are invaluable members of a healthcare team, enhancing the quality of care

for diabetic patients.[4] Numerous studies have highlighted the beneficial role of clinical pharmacist counselling in improving glycemic control and enhancing the quality of life among individuals with diabetes.[5] Landmark trials such as the Diabetes Control and Complications Trial (DCCT)[6] and the United Kingdom Prospective Diabetes Study (UKPDS)[7-8] have conclusively shown that achieving optimal blood glucose levels significantly lowers the risk of diabetes-related complications. Patient counselling plays a vital role in empowering patients, equipping them to make informed choices about their condition and treatment. It also encourages lifestyle and dietary changes that positively impact their health outcomes. Through counselling, patients gain the necessary skills to better manage their disease and adhere to medication regimens, ultimately improving their overall well-being [9]. The main aim of this study is to examines the role of patient counselling in mitigating complications associated with T2DM and investigates the factors contributing to their prevalence.

MATERIALS AND METHODS:

Our study design was on social determinants of health in the case of T2DM patients, which is assessed through a prospective observational study in the Community of Vadodara. The duration of our study was 3 months -5 months [November 2023 – March 2024]. We have collected the data from the Community of the Vadodara, Gujarat, India. The study population was 252 patients. The study criteria were that the study will include adults aged 18 and older, specifically women with a diagnosis or history of gestational diabetes, as well as individuals diagnosed with T2DM, including those experiencing complications related to the condition. Participants must be able to commit to the study's duration and adhere to the counseling program requirements. Exclusion criteria include patients under 18 years of age, individuals with Type I diabetes, those with comorbid conditions that could influence study outcomes or hinder participation, and participants with cognitive impairments that may limit their comprehension or ability to follow counseling recommendations. A specially designed patient data collection form is prepared and validated. Data from the medical record department were compiled and subjected to statistical analysis. The results were organized into tables and visualized using various charts and graphs. MS Excel was employed for data analysis, utilizing statistical methods such as mean, standard deviation, variance, Pearson correlation, paired t-tests, and Chi-square tests.

RESULTS:

Our study involved 252 participants who met the inclusion criteria. Of the 100 female respondents, 79 (79%) reported complications, making up 40% of the total responses. In comparison, 133 out of 152 male respondents (88%) experienced complications, accounting for 60% of the overall responses.

The youngest group (18-30 years) included 59 participants, 83% of whom faced health issues, representing 23% of total responses. In the 31-45 age group, 87% of 109 participants reported complications, making up 43% of the total. Among the 41-60 age group, 85% of 60 participants experienced issues, accounting for 24% of responses. The oldest group (60+ years) had 24 participants, with 71% reporting health concerns, contributing 10% of total responses.

Among underweight participants (9 total), 89% (8 individuals) reported complications, representing 4% of all responses. In the normal weight group (28 participants), 79% (22 individuals) experienced complications, making up 11% of total responses. In the overweight group (41 participants), 78% (32 individuals) had complications, accounting for 16% of responses. Lastly, among obese participants (174 total), 86% (150 individuals) reported complications, contributing 69% to the overall responses.

In the income bracket under ₹2.5 Lakhs, 89 participants were surveyed, with 76% (68 individuals) reporting health issues, representing 35% of the total responses. The ₹2.5-5 Lakhs group had 118 participants, with a 91% incidence of health complications (107 individuals), accounting for 47% of the total. In the ₹5-7.5 Lakhs range, 81% (35 out of 43 participants) reported complications, comprising 17% of the total. The final group, earning ₹7.5-10 Lakhs, had two participants, both of whom reported health issues, contributing just 1% of the total responses.

The majority of participants, 97% (244 individuals), were diagnosed with T2DM. Of these, 13% (33 individuals) had T2DM without complications, while 87% (219 individuals) experienced complications. A small portion of the group,

2% (4 individuals) had Gestational Diabetes Mellitus (GDM), and another 2% (4 individuals) had both T2DM and GDM.

The study involved 133 individuals with a family history of the T2DM, 81% of whom experienced health complications, the other 53% are without complications of total responses. Another group of 100 individuals without a family history saw 94% report complications, making up 40% of responses. A third group of 19, uncertain about their family history, had 53% reporting complications, accounting for 8% of the responses.

The most frequently reported symptom was polyuria, affecting 80% of participants. Polydipsia and fatigue were next, observed in 59% and 55% of participants, respectively. Headaches were also common, reported by 55%. Giddiness affected 40%, while 19% experienced unexplained weight loss. Paresthesia and muscle aches were noted by 25% and 22%, respectively. A smaller group, 11%, reported progressive vision loss.

In a 252-sample population, 92% of participants adhered to their prescribed medication regimen, while 8% did not follow the treatment plan. 19% of participants received side effects like gastric irritation.

Our study results shows that 23% of participants utilize both oral and injectable forms, while 6% use only injectable forms, and 71% exclusively use oral forms. A paired T-test showed a strong positive correlation (0.99) between initial and 3-month HbA1c levels, with a significant decrease from an initial mean of 7.70 to 7.62 after three months.

A significant 74% of participants (187 individuals) modified their diets to adopt healthier eating habits. Additionally, 72% (181 participants) incorporated regular exercise into their routines, highlighting the importance of physical activity in managing T2DM. Weight loss was prioritized by 22% (56 participants), and 21% (54 participants) ceased smoking, thereby reducing a risk factor for diabetes complications. However, 7% (18 participants) did not implement any recommended lifestyle changes.

[Table 1] illustrates the correlation between different forms of addiction and the incidence of associated complications. [Table 2] highlights that the majority of participants monitor their blood sugar levels on a monthly basis.

Table 1: Relationship between various addictions and the occurrence of complications

Addiction	Complications	No complications	Total	Percentage	P-value
Alcohol	50	7	57	23%	
Chewing Tobacco	53	6	59	23%	
Smoking Tobacco	85	7	92	37%	0.04309088
None	89	23	112	44%	
Mean	69.25	10.75	80		
SD	20.60	8.18	26.70		

Table 2: Frequency of checking blood sugar level

Frequency of checking	No. of responses	Percentage
Daily Once	30	12%
Daily Twice	2	1%
Daily thrice	3	1%
Once a week	52	21%
Once a month	69	27%
Once in 3 Months	67	27%
Once a year	6	2%
Never	23	9%

[Figure 1] provides an overview of the medications prescribed for managing diabetes. [Figure 2] presents the symptoms of hypoglycemia reported by the participants, while [Figure 3] outlines the complications experienced as a result of the condition.

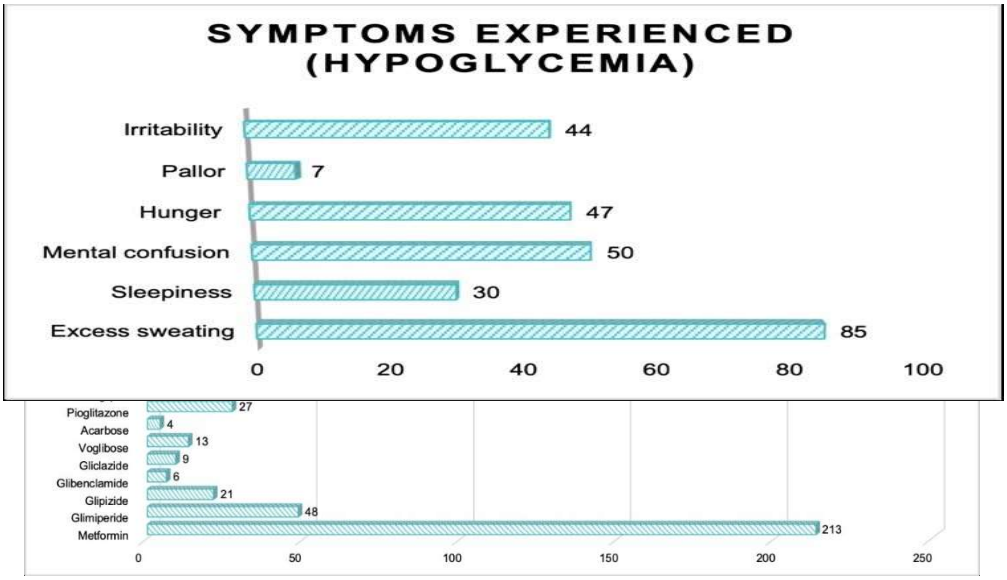
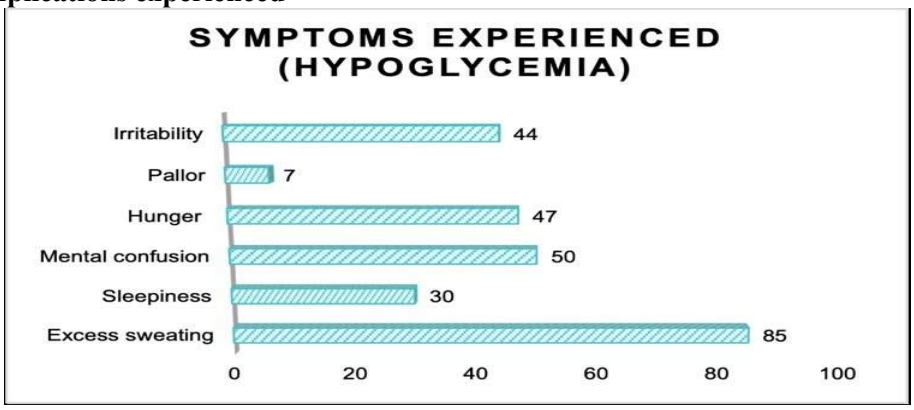


Figure 1: Medication prescribed

Figure 2: Symptoms experienced by hypoglycemia

Figure 3: Complications experienced



DISCUSSION:

Our study result shows that most of the participants were male. Mathur P et al. 2022 [10] conducted a study in Prevalence, Awareness, Treatment and Control of Diabetes in India from the Countrywide National Noncommunicable Disease (NCD) Monitoring Survey and concluded that males were more commonly affected with T2DM.Males tend to be more affected by diabetes mellitus due to a combination of biological, lifestyle, and behavioral factors. Hormonal differences, particularly lower levels of estrogen in men, may influence insulin sensitivity and fat distribution, increasing the risk of developing insulin resistance and T2DM. [11]

Our study findings show that most of the participants in the age group between 31-45 years old. Mathur P et al. 2022 [10] conducted a study in Prevalence, Awareness, Treatment and Control of Diabetes in India from the Countrywide National NCD Monitoring Survey and concluded that 31-45 years old participants were more commonly affected with

T2DM.

Our study findings shows that most of the participants in the obesity category. Karin A et al. 2022 conducted a study and concluded that most of the participants in the category of overweight. [12] Obesity is a major risk factor for diabetes mellitus, particularly T2DM, due to its impact on insulin resistance. Excess body fat, especially visceral fat around the abdomen, leads to chronic low-grade inflammation, which interferes with insulin signaling. This impairs the body's ability to use insulin effectively, causing blood sugar levels to rise. Additionally, obesity disrupts the function of insulin-producing beta cells in the pancreas, further exacerbating glucose regulation. [13-14]

Our study findings shows that most of the participants having the family history of T2DM. Individuals with a family history of diabetes are at a two to six times greater risk of developing T2DM compared to those without such a history.[15] The causes of T2DM are multifaceted; a family medical history serves as a crucial source of genomic insight, reflecting a blend of inherited genetic predispositions alongside shared environmental and lifestyle influences. [16]

Our study findings show that most of the patients have the symptoms of Polyuria, Polydipsia and fatigue. Drivsholm T et al. 2005 conducted a study in symptoms, signs and complications in newly diagnosed type 2 diabetic patients, and their relationship to glycemia, blood pressure and weight and concluded that symptoms such as abnormal thirst, frequent urination and weight loss were common. [17]

In our study 92% of participants adhered to their prescribed medication regimen. Sahoo J et al. 2022 conducted a study in Medication Adherence Among Patients of T2DM and Its Associated Risk Factors and concluded that only 34.14% of diabetic mellitus patients have good medication adherence [18]. In our study most of the participants doing regular exercise, modified their diets to adopt healthier eating habits, weight loss, smoking cessation thereby reducing a risk of diabetic related complications. Eight key categories of pharmacist-led services were identified across the studies, encompassing diabetes education, medication reviews, drug consultations and counseling, clinical interventions, lifestyle modifications, self-care management, peer support, and behavioral interventions [19].

In our study most of the participants neither using alcohol nor smoking. Smoking and alcohol consumption are common in patients with diabetes mellitus due to several factors, including lifestyle habits, stress management, and coexisting risk factors. Smoking and alcohol exacerbate the complications of diabetes by impairing blood glucose control, increasing insulin resistance, and promoting cardiovascular risks [20].

CONCLUSION:

This study highlights the rising prevalence of health complications related to early-onset T2DM due to factors like age, obesity, and lifestyle. It underscores the need for effective patient counseling to mitigate risks and emphasizes the correlation between socioeconomic status and complications. Metformin remains a primary treatment for T2DM, improving insulin resistance and glucose control. The research reveals that variations in HbA1C levels significantly influence complication risks, advocating for lifestyle modifications, medication adherence, and regular monitoring. Ultimately, these insights aim to enhance patient education programs and treatment strategies, improving outcomes for T2DM patients.

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