



## A Study on Knowledge, Attitude, and Practice of Lifestyle Modifications among T2DM Patients Attending Tertiary Care Centre

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### Abstract

**Background:** The prevalence of T2DM is increasing exponentially due to lifestyle changes. Although there are multiple groups of drugs and several guidelines, most of the patients do not achieve glycemic targets. Though lifestyle modifications form the basis of management of T2DM, previous studies have shown that the practices of these changes have been poor among patients.

**Aim of The Study:** To assess the knowledge, attitude, and practice of lifestyle modifications among T2DM patients in a tertiary care center

**Methodology:** A cross-sectional study based on a questionnaire was conducted among Type 2 diabetes patients attending the department of diabetology in a tertiary care center in South India.

**Results:** There were 314 participants in the study. Almost 60% of patients belonged to the age group of 41-60 years. 51% belonged to an urban area and 65% had finished high school education. 56% of the study population had fair knowledge about lifestyle modifications and 55% had fair attitude. However, lifestyle practices were poor in 64% of the study population.

**Conclusion:** The present study reveals that though the knowledge and attitude towards lifestyle modifications are fair among the study population, they are poor when it comes to practice

**Keywords:** Diabetes Mellitus, Knowledge, Attitude, Practice, Lifestyle Modification

### Introduction

Diabetes mellitus (DM) is a chronic non-communicable metabolic disease characterized by a raised blood plasma glucose level. It has an important public concern nowadays due to a dramatic increase in incidence and prevalence.<sup>1</sup> It is a syndrome of hyperglycemia resulting from an absolute or relative deficiency or decreased effectiveness of the circulating insulin. According to WHO estimates globally, DM is a risk factor for premature mortality, cardiovascular and kidney diseases associated with unhealthy nutrition, physical inactivity or insufficient exercise, cigarette smoking, excessive consumption of alcohol, and inappropriate sleeping experience. Type 2 Diabetes Mellitus (T2DM) is widely

recognized as “chronic syndrome with glucose intolerance as its hallmark due to Insulin deficiency or Insulin resistance or both and characterized by both metabolic and vascular complications” and it accounts for more than 90 percent of diabetes cases worldwide. The prevalence of T2DM is increasing exponentially due to lifestyle changes, consumption of calorie-dense foods, and urbanization. According to International Diabetes Federation 2019 data, the global prevalence is approximately 9.3%. Globally India ranks second with 77 million people living with Diabetes with a prevalence of 7-10 % and in Tamil Nadu it is as high as 10.4%. The number of adults living with Diabetes is expected to increase due to

aging, urbanization, and lifestyle changes like transitions in traditional diet and lack of physical activity. Though the concept of etiopathogenesis of T2DM has evolved from “diabesity” to “triumvirate” to “ominous octet” to “egregious eleven”, the core mechanisms of T2DM are Insulin resistance and dysfunction of beta cells. Multiple guidelines and numerous drugs are available for the management of diabetes, yet very few patients achieve target HbA<sub>1C</sub> of 7% and can maintain good glycaemic control. A possible reason for real-life failure in achieving glycaemic control could be the lack of lifestyle changes, especially dietary practices among patients. Lifestyle modifications include medical nutrition therapy, an increase in physical activity, and quitting alcohol and smoking. This study aims to assess and analyze the knowledge, attitude, and practice of lifestyle changes among our diabetes patients. This study will help in identifying myths and beliefs among diabetes patients that may hinder glycaemic control.

**Methodology:** This is a cross-sectional study conducted in the Institute of diabetology, Madras medical college, Chennai, Tamil Nadu from December 2020 to March 2021. After obtaining Ethical committee approval was obtained from the Institutional ethical committee, Madras Medical College. Patients were enrolled in the study only after obtaining informed consent after explaining the study details in the local language. Adults with T2DM who attend diabetology OPD routinely undergo fasting and postprandial blood sugar, fasting lipid profile, HbA<sub>1C</sub>, serum creatinine, and thyroid profile at regular intervals. The following inclusion and exclusion criteria were used for patient selection.

**Inclusion criteria:** Adult T2DM patients with fasting blood sugar of more than 200mg/dl on two or more glucose-lowering agents (GLA) were included in the study.

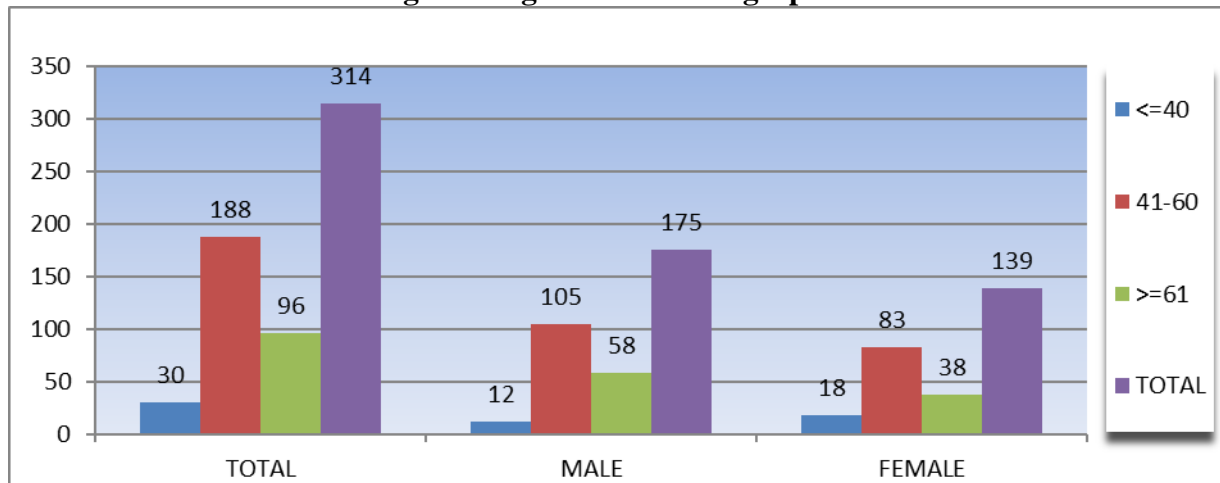
**Exclusion criteria:** Patients with Type 1 Diabetes Mellitus, organ failure, acute or chronic infections, on steroid therapy, and pregnant mothers were excluded from the study. After obtaining informed consent, patients who were enrolled in the study were

given a questionnaire to assess their knowledge, attitude, and practice on lifestyle modifications. Height, weight, waist and hip circumference, and blood pressure were measured for the study participants. BMI  $\geq 23.0$  kg/m<sup>2</sup> was taken as overweight as per guidelines for the Asian population. The questionnaire was translated into the local language and given to the patients. KAP questionnaire and scoring: An initial pilot study was conducted among 30 diabetes patients on oral glucose-lowering agents with poor glycaemic control and questions were framed based on the pilot study. During the pilot study, it was found that most of the patients lacked knowledge of medical nutrition therapy and had erroneous dietary habits. A set of seven, eight, and nine questions were finalized for assessing knowledge, attitude, and practice respectively. The questions were based on day-to-day lifestyle practices in the community with an emphasis on dietary habits. Each question was given a score based on the response and finally, the scores were evaluated.

**Statistical Analysis:** The participants who fulfilled the inclusion criteria were given the KAP questionnaire translated into the local language and the responses to all the questions were obtained. The data collected were tabulated in an MS Excel sheet. Descriptive statistics were used that included frequency distribution, charts, and percentage analysis.

**Results:** A total of 314 patients participated in the study. Male preponderance was noted in the study population. 55.7 % (n=175) of the study participants were males and 44.3 % (n=139) were females. The majority of patients were in the age group of 41-60 years. The mean age of the study participants was 45.45 years. 9.5 % of patients (n=30) were below 40 years ; 59.9% of patients (n=188) were between 41-60 years and 30.5% of patients (n=96) were above 60 years. 51.2% of the study participants (n=161) belonged to the urban area. Almost 65 % of the participants ( n=206 ) had received education up to high school.

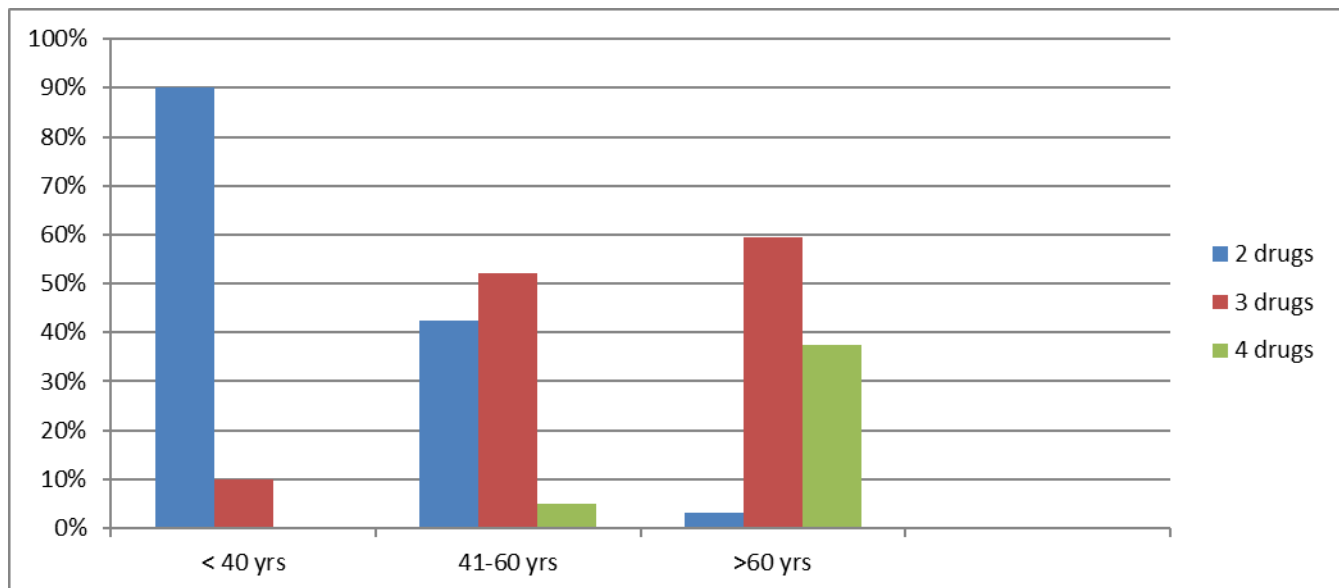
**Figure 1 Age and sex demographics**



Graph :1 The duration of diabetes among study participants ranged from 1 to 18 years with a mean of 6.25 years. Among the total participants (n=314), 35% of patients were on two drugs, 51% of patients were on 3 drugs and 14% were on 4 drugs for

diabetes. 90 percent of the patients below 40 years were on 2 drugs for diabetes. 52.7% of patients between 41-60 years and 59.4% of patients above 60 years were taking 3 drugs. Almost 37.5% of patients aged above 60 years were on 4 drugs

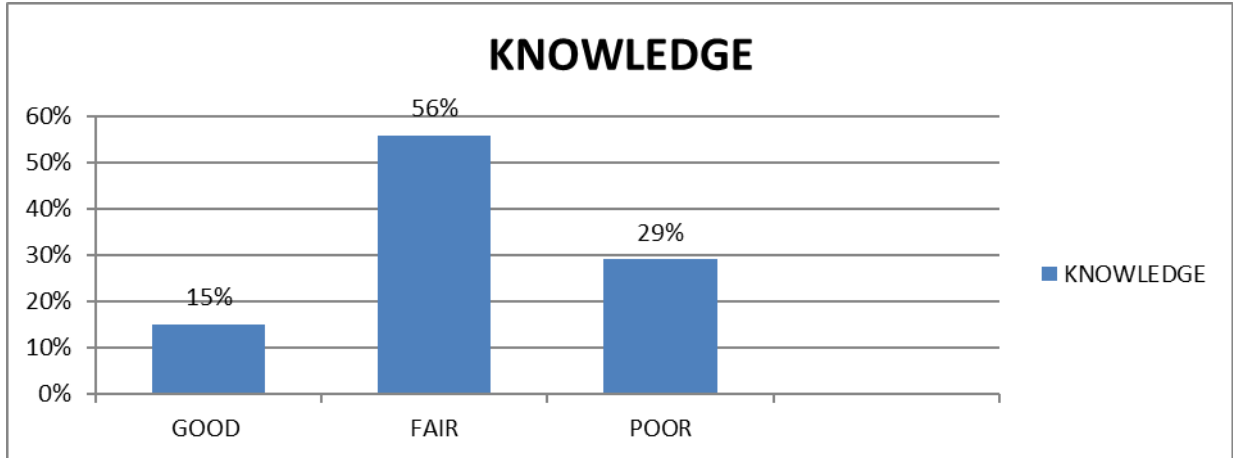
**.Graph:2 Age And Drug Distribution**



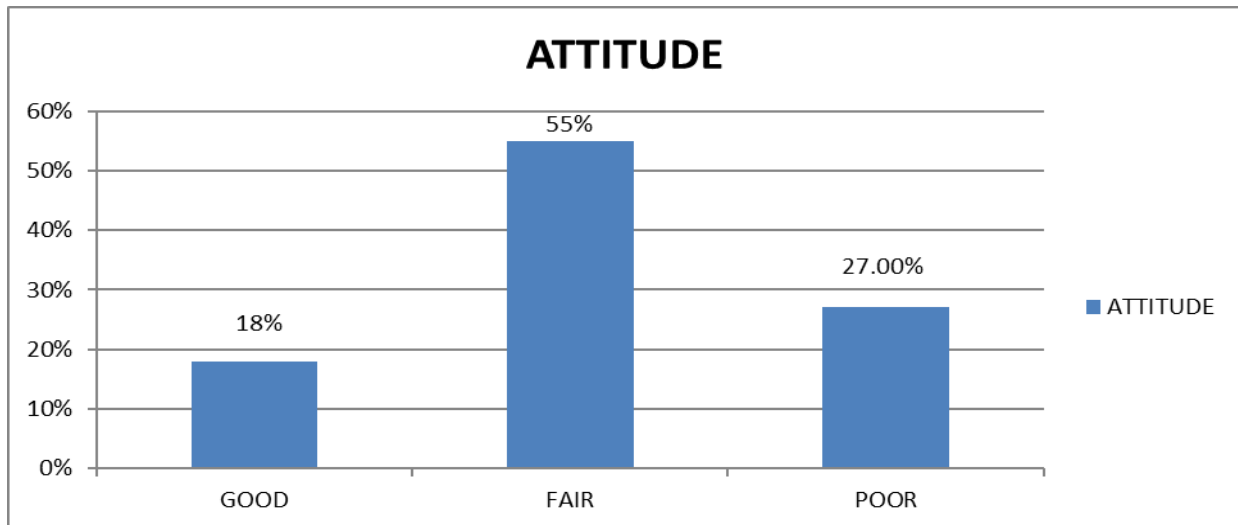
Graph:2 54 % of the patients had family h/o diabetes. Systemic hypertension and obesity were the two co-morbidities commonly observed among the study participants. The mean fasting blood sugar of the participants was 230 mg/dl and the mean HbA1c was 9.87 %. 24 % of the patients taking 2 drugs, 48% of patients taking 3 drugs, and 40 % of the patients taking 4 drugs had HbA1C more than 10%.15 % of

the participants had good knowledge of lifestyle modifications while 56% had fair knowledge and 29 % had poor knowledge. Similarly, only 18 % has a good attitude towards lifestyle modifications while 55 % and 27 % had fair and poor attitudes respectively. Practices of lifestyle changes were good in only 6%, fair in 30%, poor in 64% of study participants.

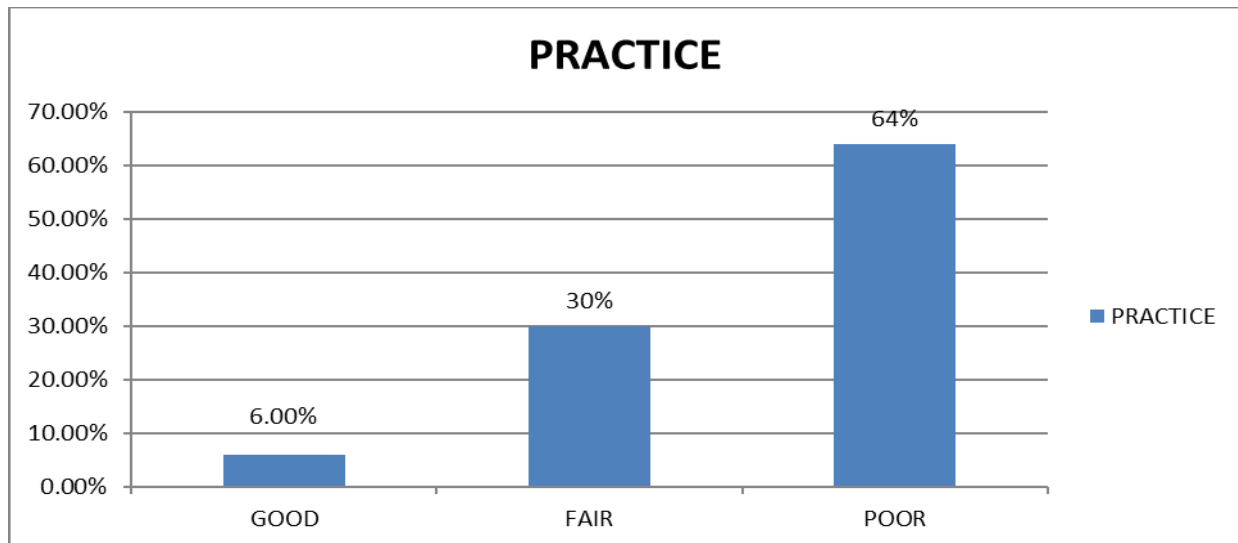
**Graph :3 Knowledge Of Lifestyle Modifications Among Study Patients**



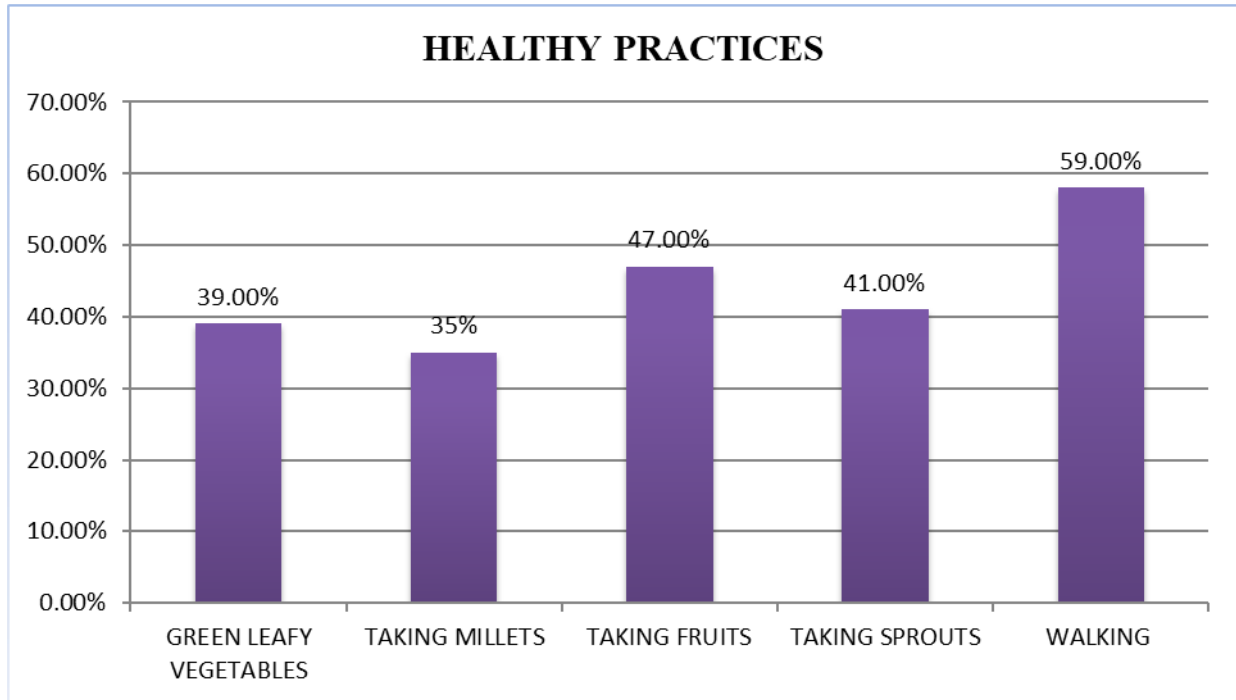
**Graph 4: Attitude On Lifestyle Modifications Among Study Participants**



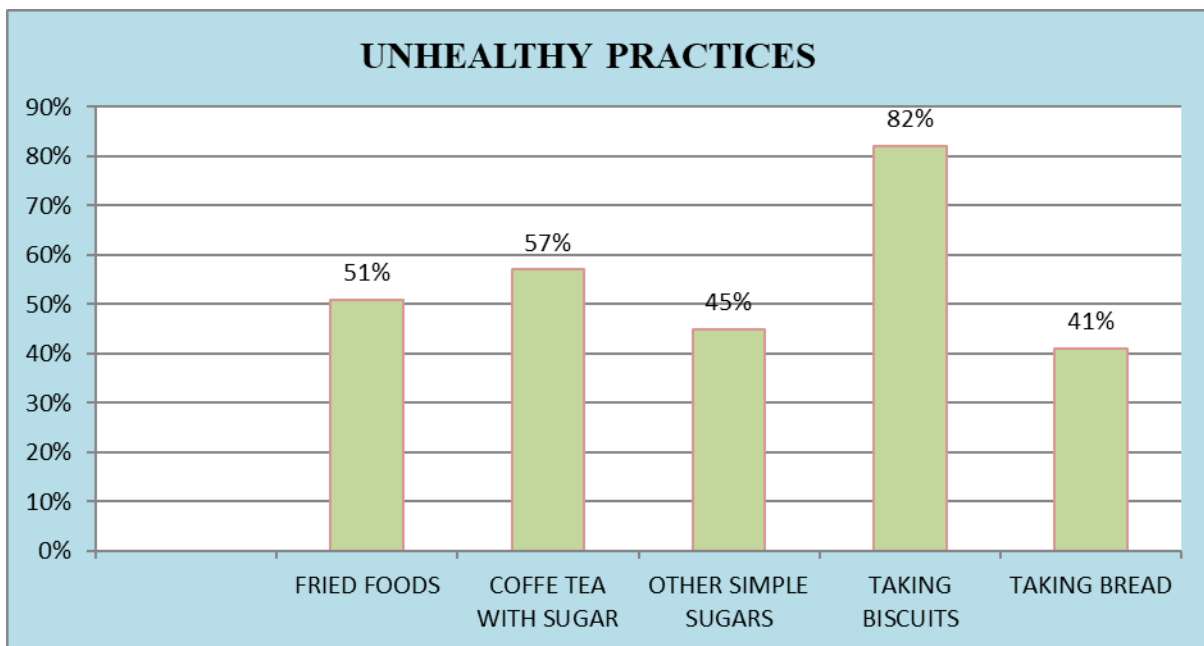
**Graph 5: Practice Of Lifestyle Modifications Among Study Participants**



**Graph 6: Healthy Practices Among Study Participants**



**Graph 7: Unhealthy Practices Among Study Participants**



**Discussion:**

In the present study, 59.8% of the patients belong to the age group 41-60 years reflecting the general age trends in the community. Almost 97% of patients above 60 years of age were on 3 or more OGA. This study shows that as the age of the patient advances

and the duration of diabetes increases, the number of drugs needed for glycaemic control also increases. Population studies have shown that almost 50% of the diabetes population fail to achieve the glycaemic targets. Though most of the patients adhere to drug therapy, the achievement of glycaemic

targets is far from reality. The present study was done to assess the knowledge, attitude, and practice of lifestyle changes in patients with uncontrolled diabetes who were on two or more drugs. The knowledge about T2DM has been fair in 56 % of patients and poor in 29% of patients. This is similar to previous few studies which have shown average knowledge about the disease among T2DM patients. 29 % of the patients didn't know why they developed diabetes and another 20 % attributed to work stress and family stress for the development of diabetes. 37% attributed diabetes to their parents. 57 % of the diabetes patients presumed walking as the only lifestyle modification for diabetes, throwing light on their poor knowledge of medical nutrition therapy. Almost 80 % of the patients didn't have the knowledge that excessive red meat can cause diabetes. The attitude towards lifestyle was fair in 55% of patients. This is in line with previous studies. The attitude towards smoking and alcohol is good among patients with 84% of patients responding that smoking and alcohol have to be quit after the onset of diabetes. Similarly, the attitude towards drug compliance is also good with 71% of patients responding that drugs should not be skipped during functions and festivals. Almost 52 % of patients responded that biscuits and Rusk can be added routinely for snacks while another 58 % responded that palm sugar and palm jaggery can be substituted for sugars. Around 87 % of patients responded that millets are good for diabetes patients but only 35 % regularly used millets in the diet. The main reason for hesitancy in using millets was a lack of attitude and cost. The lifestyle practice in the present study among diabetes patients is poor in 64% of study participants. This is similar to previous studies which showed poor lifestyle practices. Walking is the only good practice followed by the majority ( 59 %) of patients. 72 % of males and 44 % of females practiced regular walking for 30 minutes for at least 5 days a week as recommended by American Diabetes Association(ADA). The practice of taking green leafy vegetables at least 3 days a week was followed by only 39% of patients. Regular intake of sprouts and fruits was seen in less than 50 percent of patients in our study. Both lacks of knowledge regarding fruit intake in diabetes and cost were reasons for poor practices. The most important practices that influenced glycaemic control were adding sugar in

coffee/tea seen in 57% of patients and taking other simple sugars like palm sugar and palm jaggery is seen in 45 % of patients. Honey, jaggery, palm sugar, and palm jaggery are common alternatives to table sugar used by patients in this part of the country. According to ADA 2019 recommendation, intake of simple sugars and processed foods should be limited. The lack of knowledge and attitude towards simple sugars and processed foods results in faulty dietary practices. The practice of taking biscuits is seen in 82% of patients. Taking biscuits and fried foods as snacks is a common practice seen in the majority of patients and it plays a significant role in impairing glycaemic control. Red meat intake of 3 days a week or more was mainly seen in patients younger than 60 years. The lack of knowledge that higher red meat intake can cause diabetes is accompanied by faulty practice. Although 6% of the study population (n=19) had good practice as per the questionnaire, the HbA1C of these patients was still above 9%. Further analysis of data revealed that 72% of them has simple sugar intake in the form of table sugar or palm sugar, jaggery, and palm jaggery that significantly altered glycaemic control. Further studies are required to analyses individual dietary practices in diabetes. As per ADA, medical nutrition therapy alone can reduce HbA1C by 0.5-2 %. (16) Lifestyle changes play a pivotal role in the management of diabetes since they address the basic pathophysiology of T2DM namely insulin resistance and beta-cell dysfunction. Beta-cell dysfunction which is now increasingly recognized as de-differentiation and transdifferentiation of beta cells is primarily due to chronic calorie-dense nutrition causing glucotoxicity and lipotoxicity. Physical inactivity increase Insulin resistance in the skeletal muscle. Hence lifestyle practices play a major role in the causation, disease progression, effective management, and prevention of complications of diabetes. T2DM and its complications pose a high economic burden on the patients, their families, and the country. Knowledge and practice of effective lifestyle practices will help in reducing the cost of treatment and prevent complications.

### Conclusion:

This study in a tertiary care center shows the gap between knowledge and practice of lifestyle modification in diabetes. The knowledge and attitude towards lifestyle practices especially dietary practices

are only average and practices are poor. There is increased intake of simple sugar among diabetes patients that affect their glycaemic control even with good drug compliance. Further studies are required to explore the flaws in dietary practices adopted by the patients based on their traditional and cultural beliefs and western influences. Both physicians and patients should attach significance to healthy dietary practices.

### Limitations:

This is a small cross-sectional study in a single tertiary care center with a major proportion of participants from urban areas. Large Multicentre studies across different geographical regions encompassing rural, semi-urban, and urban areas are required to reflect the real scenario.

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