

**"ASSESSING THE PRESCRIPTION HABITS OF DOCTORS
TREATING DIABETES IN INDIA: A CROSS-SECTIONAL STUDY"**

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For the partial fulfilment for the award of
The degree of Master of Business Administration
(MBA)

In

Pharmaceutical Management

By

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Under the Supervision and Guidance of

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Assistant Professor

2023

DECLARATION BY STUDENT

I hereby declare that this dissertation titled ASSESSING THE PRESCRIPTION HABITS OF DOCTORS TREATING DIABETES IN INDIA: A CROSS-SECTIONAL STUDY is the bonafide record of my original research work. I declare that it has not been submitted to any other university or institution for the award of any degree or diploma. Information derived from the published or unpublished work of others has been duly acknowledged in the text.

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To whom it may concern

This is to certify that **Aakash Mahajan** Student of **IHMR University** has successfully completed Summer Internship Project with us in the Sales and Marketing Department. Summer internship project completed on **19.05.2023** successfully.

Thanking you and assuring you for our best services always.

Name of Work/Project: **Summer internship Project**

Work Period: **20.02.2023 to 19.05.2023**

Regards,

Ajay Kumar
Manager, Jiyonwall

CERTIFICATE

This is to certify that the dissertation titled **ASSESSING THE PRESCRIPTION HABITS OF DOCTORS TREATING DIABETES IN INDIA: A CROSS-SECTIONAL STUDY** is a record of the research work undertaken by Aakash Sanjay Mahajan in partial fulfilment of the requirements for the award of the degree of MBA (Pharmaceutical Management) from the IIHMR University, Jaipur under my guidance and supervision and his approach to the research study has been sincere, scientific, and analytical.

Faculty Guide

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Date:

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I am inexpressibly obliged to Mr. Saurabh Kumar, Associate Professor and Dean SPM, IIHMR University for his upright direction and support to finish this report. It is my radiant sentiment to place on record my best regards, and deepest sense of gratitude to Mr. Vinod Tejwani, Dean- Placements & Alumni Relations IIHMR University, and Mr. Rahul Sharma, Associate Professor, my Mentor at IIHMR University.

Finally, I'd like to express my gratitude to every companion who directly or indirectly assisted me in completing this assignment. Any omission from this brief affirmation does not imply a lack of gratitude.

Thank You.

Sincerely,

Aakash Sanjay Mahajan

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ABBREVIATIONS:

DPCO	Drug Price Control Order
NLEM	National List of essential medicines
MODY	Maturity-onset diabetes of the young
DPP4	Di-Peptidyl peptidase 4
SGLT2	Sodium-Glucose co-transporter 2
OHA	Oral Hypoglycemic agents
K-ATP	Potassium Adenosine Tri-phosphate
T2DM	Type 2 Diabetes Mellitus
IDF	International Diabetes Federation
DM	Diabetes Mellitus
WHO	World Health Organization
HbA1c	Hemoglobin A1c
GLP-1	Glucagon-like-peptide.
IDF	International Diabetes Federation

ABSTRACT

Background: Diabetes is a chronic condition that is a biochemical disorder that is distinguished by different co-morbidities and requires lifelong treatment and maintenance of the level of glucose in the body and it is affecting a significant population of India. Doctors play a very important role in treating and managing diabetes in an individual and is essential to understand the prescription habit of doctors treating diabetes. Studying the prescribing habits of diabetes mellitus physicians in India can provide valuable insight into current physician practice and identify areas for improvement in diabetes management.

Method: A cross-sectional study of 3 months was conducted from March 2023- May 2023 to understand the prescribing pattern of doctors treating diabetes in India. Data collection from 70 randomly selected physicians was conducted using the cross-sectional survey approach. Specializing in diabetes care and after data collection, descriptive statistics are used to analyze the collected database.

Result: A total of 70 doctors participated in the study, Metformin (45.7%), sulfonylureas (12.9%), insulin (27.4%), and dipeptidyl peptidase-4 inhibitors (10%) were the most prescribed medications for diabetes treatment. However, variations in prescribing patterns were seen based on the doctor's specialty. Various factors influence the prescription habit, some of them include, the cost of medicine (42.9%), Side effects of the medicine (17.1%), and patient preference (28.6%). Sometimes efficacy of prescribed medicine also plays a deciding factor for 11.4% of doctors.

Doctors in India have increased the use of technology and telemedicine in their treatment methods. 54.3% of doctors consider the Role of Telemedicine and Remote Monitoring Technology essential for effective management. Accessibility, patient engagement, and convenience of care delivery were improved using technology.

Conclusion: Assessing the prescription habits of doctors treating diabetes in India provides valuable insights into how various factors affect overall diabetes management in India. Metformin, sulfonylureas, and insulin were the most prescribed medications. The importance of the cost of medicine, patient preferences, and side effects of medicines plays a significant role in shaping prescription patterns. The study also focuses on the role of telemedicine and technology in diabetes treatment.

KEYWORDS:

1. Prescription habits
2. Treatment
3. Diabetes
4. Patient engagement
5. Remote monitoring
6. Telemedicine

CHAPTER-1

INTRODUCTION

- Diabetes is a biochemical disease that lasts for a long time and can cause a variety of health problems a major reason to control diabetes throughout life. (1)
- Type 2 diabetes is progressively pervasive, and oral hypoglycemic specialists stay the essential pharmacological treatment to improve the viability and alleviate long-haul inconveniences. (2)
- Despite the government's efforts to reduce drug costs through various programs like DPCO and NLEM, there are still significant differences in drug prices. (3)
- Patterns of prescriptions encourage the rational use of drugs and are useful in determining prescription trends. (4)

Hyperglycemia is a long-lasting biochemical disease distinguished by prolonged elevated levels of glucose in the bloodstream which can cause damage to organs as the disease lasts. This condition is becoming more recognized globally and has been recognized as a major public health concern in numerous nations, irrespective of ethnic or economic status.

As per the World Health Organization (WHO), India has around 77 million adults with type 2 diabetes and an extra 25 million who have a high probability of getting the disease. After China, diabetes is the second most persistent disease in India, causing the loss of 700,000 lives in 2020 because of associated complexities. (8)

Diabetes mellitus (DM) is the most ancient ailment documented in the Egyptian manuscript (5). The disease arises from hyperglycemia and is also classified by various metabolic irregularities. It results in Difficulty in fat and carbohydrate metabolism in the body, leading to various co-morbidities.

To handle diabetes effectively, a comprehensive plan involving lifestyle changes, prescribed drugs, and constant overall check-up is necessary. However, managing diabetes in India and its accompanying conditions is difficult due to various challenges, like less awareness of the disease, its risk elements, and preventive measures, substandard healthcare system, poverty, and low medical compliance. Healthcare professionals, especially medical practitioners, have a crucial part in managing diabetes efficiently and their prescribing pattern can significantly influence the quality-of-care patients receive.

Therefore, it is important to examine the prescription pattern of physicians who treat diabetes in India to identify the areas that require enhancements in the management of diabetes. The fundamental aim of this survey is to assess the prescription habit of doctors treating diabetes in India. Additionally, the survey intends to identify the most prescribed medicines for diabetes treatment and examine the influence of telemedicine and technology in the management of diabetes.

1.1 EPIDEMIOLOGY

In 2020, there were 463 million cases of diabetes worldwide, with 88 million cases in the Southeast Asia region alone. These were reported by the International Diabetes Federation (IDF). Out of these cases, 77 million were in India. In India, the incidence of

diabetes is 8.9% (according to IDF). In Southeast Asia, India has the greatest percentage of incidence of Kind 1 diabetes in children and the second largest number of children with the disease after the United States. (7)

The count of diabetes cases in India has consistently grown over time. In people over the age of 50, the occurrence of diabetes was found to be 11.8% in National Diabetes and Diabetes Retinopathy Survey. According to the DHS survey, 6.5% of individuals under 50 had diabetes, and 5.7% had prediabetes, with identical incidence rates in the male and female populations. Urban areas have a higher prevalence of population having diabetes. People up to the age of 50 years constituted around 9% of the diabetes population whereas 14.3% of diabetic retinopathy cases were found in the age group of 50-59 years. States with advanced economies and epidemiologies, including Tamil Nadu and Kerala, have reported a high incidence of diabetes. These states also have many research institutions that carry out prevalence investigations.

Globally, around 0.5 Bn people are suffering from diabetes. Middle-income country shows the highest prevalence of diabetes with Asia as an epicentre of it. the country with the highest prevalence of diabetes has a diabetic population of 74.2 Mn. India is 2nd largest country after China. It is expected to increase by over 134 Mn cases by 2045, from which 57% will remain undiagnosed. (17)

Parameters	Statistics (2021)
People with diabetes (new cases)	74194.6
Prevalence of diabetes (%)	9.6
Undiagnosed people	39400
Undiagnosed people (%)	53
Deaths attributable to diabetes	647,831
Diabetes-related death (under 60years) %	2.8

Table 1.1: Diabetes Statistics in India (17)

According to Dr. Bharati Pravin Pawar, the Minister of State for Health, India has a combined total of 13,01,319 allopathic doctors registered with both the State Medical Councils and the National Medical Commission (NMC). Additionally, there are 5.65 lakh AYUSH doctors, 2.89 lakh registered dentists, and 33.41 lakh registered nurses practicing in the country. (19)

1.2 TYPES OF DIABETES

There are 3 main types of diabetes:

1. Type 1
2. Type 2
3. Gestational

Some other types of diabetes are prediabetics, neonatal diabetes, and maturity-onset of diabetes in the young (MODY).

Type 1 Diabetes

Diabetes type 1 is a long-lasting biochemical disease often known as juvenile diabetes or insulin-dependent diabetes. When a person has this kind of diabetes, the pancreas fails to produce insulin or produces very less insulin. Type 1 diabetes can be caused by a mix of

genetics, environmental factors, and some viruses. Type 1 diabetes is more common in children and adolescents, although it can also affect adults.

Type 2 Diabetes

When the body cannot utilize insulin, it generates or when it cannot make enough insulin, T2DM occurs in the human body. The body uses a hormone (insulin) to let glucose into cells where it is used for energy. It happens most often in middle-aged people and older people. When the body experiences insulin resistance i.e., when the body is unable to use the released insulin appropriately or in some cases when the insulin produced is not enough, this type of diabetes happens. The two main risk factors for type 2 diabetes are obesity and a sedentary lifestyle.

Gestational Diabetes

Gestational diabetes, a transient type of diabetes, impacts women during pregnancy. As pregnancy progresses, the woman's body may experience insulin resistance, where the produced insulin is not effectively utilized, or when the pancreas fails to produce an adequate amount of insulin. It can be diagnosed by a blood test 24 to 28 weeks into pregnancy. It is seen that gestational diabetes goes away after the woman gives birth.

1.3 SYMPTOMS OF DIABETES

The extent of the body's elevated blood sugar levels affects the signs and symptoms of diabetes. There may be no symptoms or indicators in some patients with pre-diabetes, gestational diabetes, or type 2 diabetes. Diabetes type 1 symptom frequently worsens more quickly. Some of the signs and symptoms of type 1 diabetes and type 2 diabetes are:

- Thirstier than usual.
- Recurrent urination
- Shedding pounds
- Ketones found in the urine.
- Feeling weak and worn out.
- Feeling irritable or having mood swings.
- Having a fuzzy vision.
- Having wounds that heal slowly.
- Getting several infections, including vaginal, skin, and mouth infections.

Type 1 diabetes has the potential to manifest at any stage of life, irrespective of age. However, it usually starts in childhood or youth. T2DM, on the other hand, is the more common kind and can appear at any age. T2DM, however, is more frequently detected in adults over 40. However, T2DM in children is increasing more quickly.

1.4 TREATMENT OF DIABETES

The main objective of diabetes management is to keep blood sugar levels within a balanced range, ensuring avoidance of both high and low blood sugar incidents. This goal can typically be achieved through making dietary adjustments, engaging in physical activity, achieving weight loss if necessary, and using suitable medications such as insulin or oral medications.

Oral hypoglycaemic used to treat diabetes are.

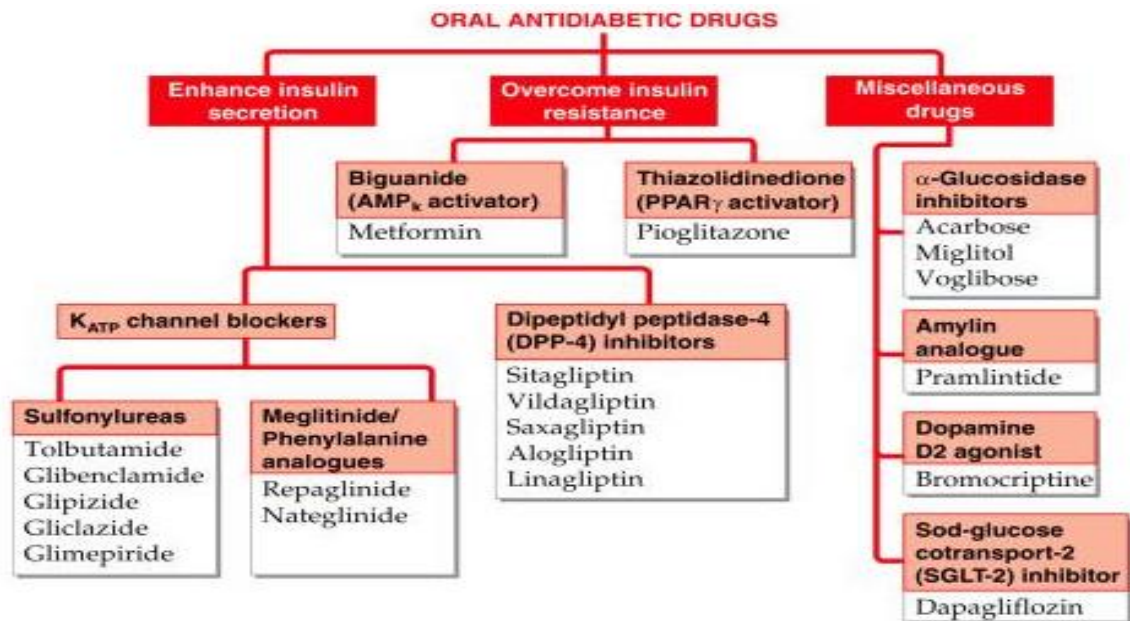


Figure 1.1 (Types of OHA) [6]

MD, K. T. (2013). *Essentials of Medical Pharmacology* (Vol. 7). New Delhi: Jaypee Brothers Medical Publishers (P) Ltd.

Types of insulin used to treat diabetes are:

INSULIN TYPES	ONSET OF ACTION	WHEN IT PEEKS	DURATION OF ACTION
Ultra rapid-acting	10 minutes	1 hour	2-4 hours
Rapid-acting	10-15 minutes	30 minutes	3 hours
regular	30 minutes	2-3 hours	3-6 hours
Intermediate-acting	2-4 hours	4-12 hours	12-18 hours
Long-acting	2 hours	Does not peak	24 hours
Ultra long-acting	6 hours	Does not peak	36 hours or longer

Table 1.1 (Types of Insulin) [18]

The cornerstone of managing diabetes is maintaining a balanced diet and engaging in regular physical activity. Even without significant weight loss, regular exercise plays a crucial role in controlling type 2 diabetes. Exercise positively affects blood sugar regulation by enhancing the body's insulin response.

CHAPTER-2

REVIEW OF LITERATURE

Sr no	Title	Authors	Objective	Method	Result
1	Article Prescribing pattern of antidiabetic drugs in type 2 and diabetes mellitus at a Tertiary care hospital in Eastern India	Alak Kumar Das, Animesh Maitiy, Dipak K. Sarkar, Aishwarya Dutta, Manab Nandy, Jinia Ghosh.	to assess the anti-diabetic medicine prescribing practices among T2DM outpatients at Medical College, Kolkata.	Three months were spent conducting a cross-sectional survey method in the departments of pharmacology and endocrinology at the Medical College of Kolkata.	Combination therapy seemed to be becoming more popular when prescribing anti-diabetic drugs. Metformin was the most given oral antidiabetic drug.
2	Cost variation analysis of oral anti-diabetic agents available in the Indian market	Sanjay Gedam, Namita Barmaiya	To locate the various anti-diabetics that are either sold alone or in combination, as well as the number of brands that are offered for each.	Observational research was performed at NSCB Medical College in Jabalpur, Madhya Pradesh, for the study.	According to the survey, there is a significant price difference between various brands of anti-diabetic medication in the marketplace like India. The government should adopt a policy that would allow for more reasonable and accessible medicine pricing for the average citizen. The cost of the recommended medications has a big impact on how well patients take their treatment.
3	Knowledge, Attitude, and Practice Towards Insulin-Self Administration Among	Melese Workneh Fego Jihad Tamir Yasin, Gezahegn mamogaga	The purpose of the study was to evaluate the knowledge, attitudes, and practices of	To evaluate the knowledge, attitude, and practice about insulin self-administration among diabetes patients at Bedele	The results demonstrate that 66.73% of the total respondents had good knowledge, and a positive attitude,

	Diabetic Patients Attending Bedele Hospital, Southwest Ethiopia, 2019/2020		diabetic patients at Bedele Hospital in Southwest Ethiopia about insulin self-administration.	Hospital, a cross-sectional study design was carried out on 196 individuals.	and 62.83% have good self-administration of insulin practices.
4	Factors Influencing Prescribing Decisions of Physicians: A Review	Majid Davari, Elahe Khorasani, and Bereket, Molla Tigabu	To identify the factors affecting the prescribing decision of physicians.	A comprehensive search was conducted across various electronic databases such as Scopus, PubMed/MEDLINE CENTRAL, Cochrane Libraries, and Google Scholar to systematically explore literature published between 2000 and 2016 concerning the factors that influence physicians' prescribing decisions.	Prescribing decisions of physicians were found to be influenced primarily by factors related to physician characteristics, medication costs, and the marketing and promotional tactics employed by pharmaceutical industries.
5	Quality of medical prescriptions in diabetes and hypertension management in Kerala and its associated factors	Vijayakumar Krishnapillai, Sanjeev Nair, Anand T. N, Sreelal T. P & Biju Soman	to pinpoint how good prescriptions have a part in the secondary prevention of diabetes and hypertension and recommend remedies.	Cross-sectional research was carried out in 7 randomly chosen districts out of Kerala's 14 districts. Additionally, a sample size of 333 physicians was determined on the supposition that 30% of physicians provided "quality prescriptions.	two key conclusions from this research. First off, over half of the doctors provided high-quality prescriptions to their patients who had NCDs like diabetes, hypertension, or both. Over one-third of the prescriptions for NCD treatment were of good quality. Second, the level of training of doctors, their adherence to NCD

					recommendations, institutional quality assurance, and the contribution of prescribing software to the reduction of prescription mistake rates have all had a significant influence on prescription quality.
6	Prescribing patterns of antidiabetics in type 2 diabetes and factors affecting them	Moayad Allyhiani, Ahmad Kurdi, Akrm Abdulaziz, Sultan Faqeh, Abdulrahman Alhajjaji, Safwan Alansari, Abdulrhman Althaqafi, Naweed Alzaman, Majid Ali	to investigate the factors influencing the first- and second-line agent prescribing trends for the treatment of type 2 diabetes.	Prescribers in the Makkah Region of Saudi Arabia were asked to respond to a cross-sectional self-administered survey from 16 February through 16 June 2021.	The most popular first-line medication was metformin (95%), which was followed by sulfonylureas (5%). Sulfonylureas (30%) were regarded as the treatment of choice when the first line was contraindicated.

CHAPTER-3

RESEARCH OBJECTIVES AND QUESTIONS

3.1 RESEARCH OBJECTIVES:

Primary objective: To investigate the prescription habits of doctors treating diabetes in India.

Secondary objectives:

1. To assess the usefulness of technology and telemedicine in diabetes treatment.
2. To investigate the Factors influencing the prescription decisions of doctors in India.

Scope of Study: This study focuses on assessing the prescription habits of doctors treating diabetes in India. The scope of the study can be summarized as follows:

- **Prescription Patterns:** The study identifies the most prescribed medications for diabetes treatment in India and explores variations based on patient characteristics.
- **Role of Technology and Telemedicine:** The study investigates the use of technology, such as mobile applications and software, as well as the adoption of telemedicine for diabetes treatment and its impact on prescription decisions.
- **Factors Influencing Prescription Habits:** The study examines the influence of clinical guidelines, patient preferences, and medication availability on doctors' prescription habits.
- **Areas for Improvement:** The study aims to identify potential areas for improvement in diabetes management and education for doctors in India based on the assessment of current prescription habits and knowledge.

The study's scope is limited to assessing prescription habits and related factors among doctors treating diabetes in India and does not cover aspects such as patient adherence, long-term outcomes, or economic implications.

3.2 RESEARCH QUESTIONS:

1. What are the most prescribed medications and treatment modalities for diabetes by doctors in India?
2. What are the potential barriers that doctors treating diabetes in India's face when it comes to prescribing medications and managing diabetes?

CHAPTER-4

STUDY DESIGN AND METHODOLOGY

4.1 STUDY DESIGN:

Study type: Descriptive Study and Analytical

Data source: Primary and Secondary research

Data collection Technique/ Tools:

Primary research: Structured Questionnaire

Secondary Research: Data from different articles and journals

Data Analysis Tool: Research Data Analysis Using Excel, Tableau, PowerBI

Study Area: Bangalore, Hyderabad, Mumbai, Indore, New Delhi, Thane.

Sample size: 70

Sample selection: The Sample is Collected from different cities in India.

Data Collection: Quantitative data collection.

Study Duration: 3 Months

4.2 METHODS AND MATERIALS:

A Cross-Sectional study was conducted for a period of three months (March 2023- May 2023) for a study on the prescription habit of doctors treating diabetes in India. Data was collected from a random selection of doctors using a cross-sectional survey methodology. who treat diabetes in India. The sample size of the study is 70. After collecting the data, the data will be analyzed using descriptive statistics.

INCLUSION CRITERIA: Doctors from various specialties related to diabetes treatment, such as endocrinology, internal medicine, family medicine, and general practice, and gynecologists were included for different approaches to diabetes management.

EXCLUSION CRITERIA: Patients and other health professionals were excluded from the study.

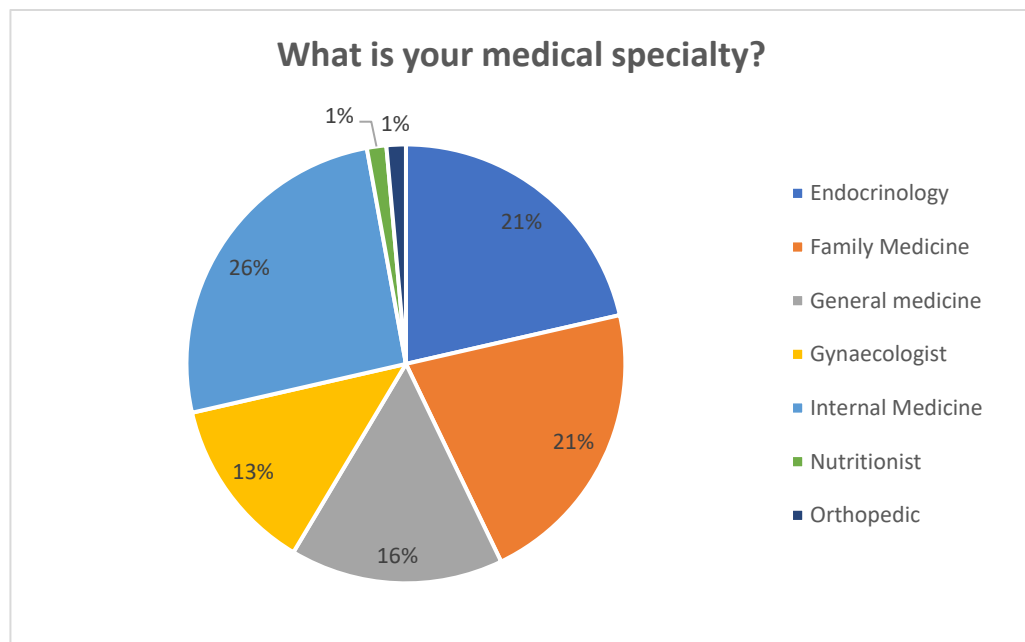
4.3 ETHICAL CONSIDERATIONS: The research was done with appropriate guidelines, and respondents were provided enough time for responses. Before research, consent, and permission were taken. The identity of the respondents was not disclosed. Secondary research was done with reliable and appropriate references.

CHAPTER-5

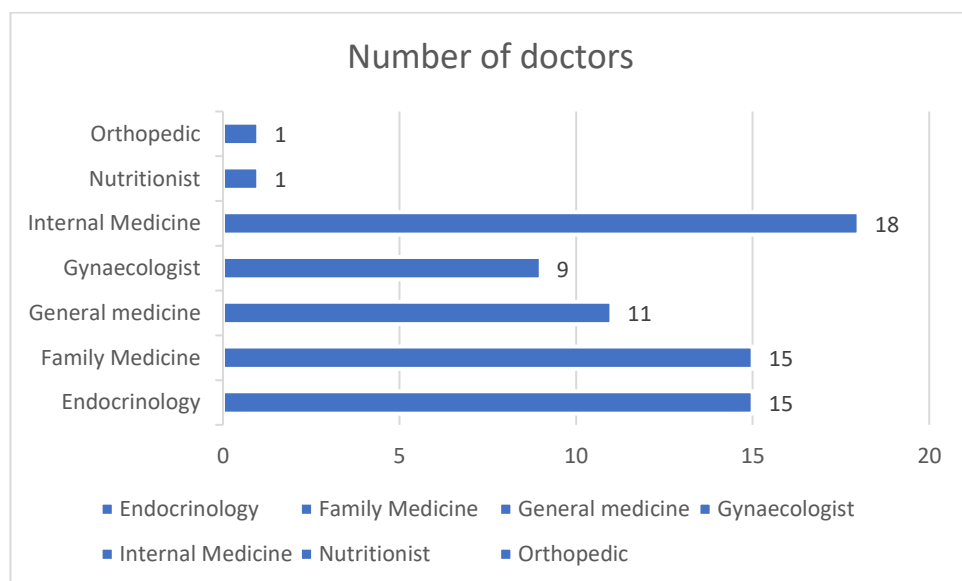
RESULTS

NOTE: The sample size of each graph is 70 (n=70)

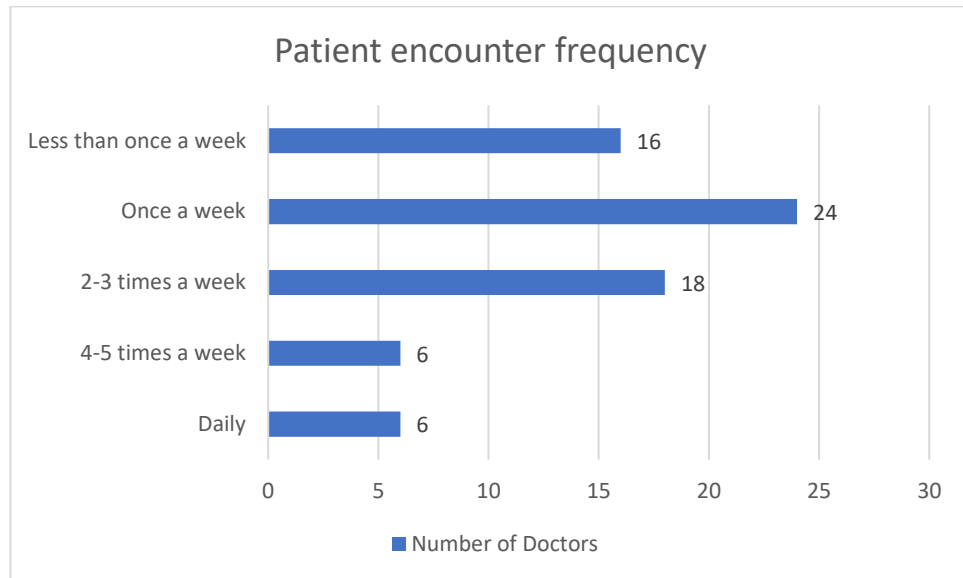
Out of the 70 participating doctors, the majority belonged to the following specialties: Endocrinology (21%), Internal Medicine (26%), and Family Medicine (21%). Additionally, General Medicine accounted for 16% of the participants, while Gynaecologists made up 13%. The remaining 1% each consisted of a Nutritionist and an Orthopedic doctor.



Graph 5.1: Medical specialty (Sample Size 70)

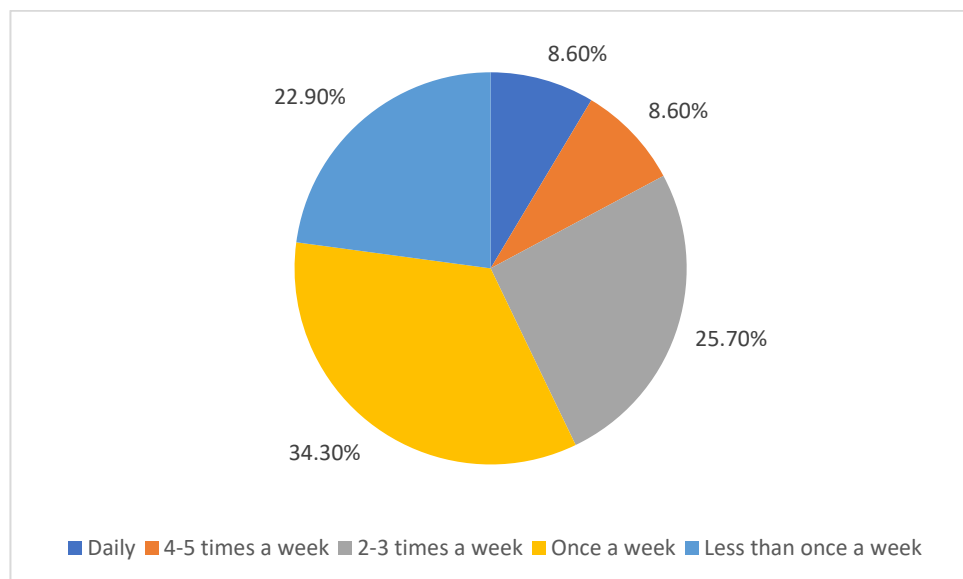


Graph 5.2: Number of Doctors



Graph 5.3: Patient encounter frequency. (Total number of doctors=70)

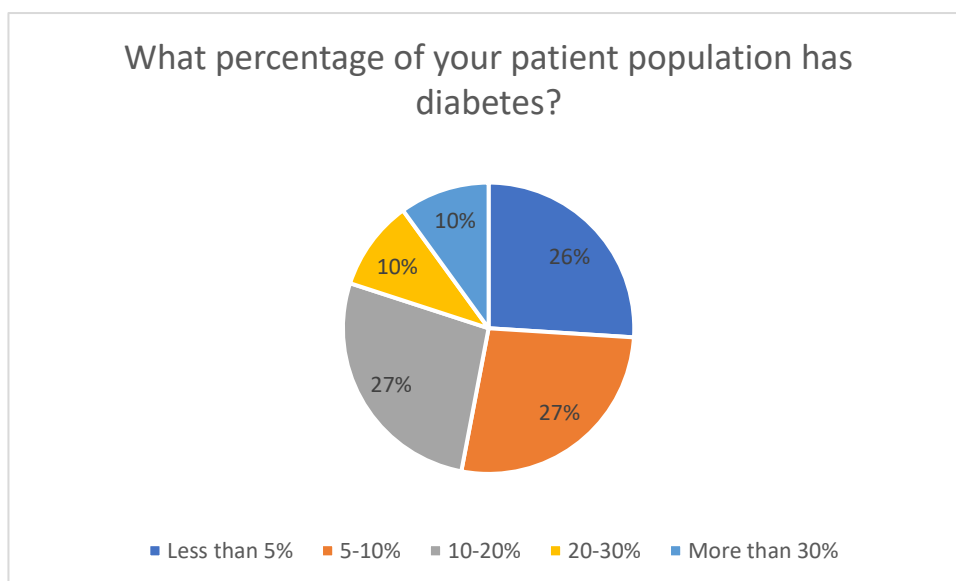
Approximately 34.3% of doctors encounter patients with diabetes on a weekly basis, while 25.7% of doctors encounter such patients 2-3 times per week. Patients who visit less than once a week account for 22.9%. Doctors encounter patients with a footfall of 4-5 times a week in 8.6% of cases, and the same percentage applies to doctors who see diabetic patients daily.



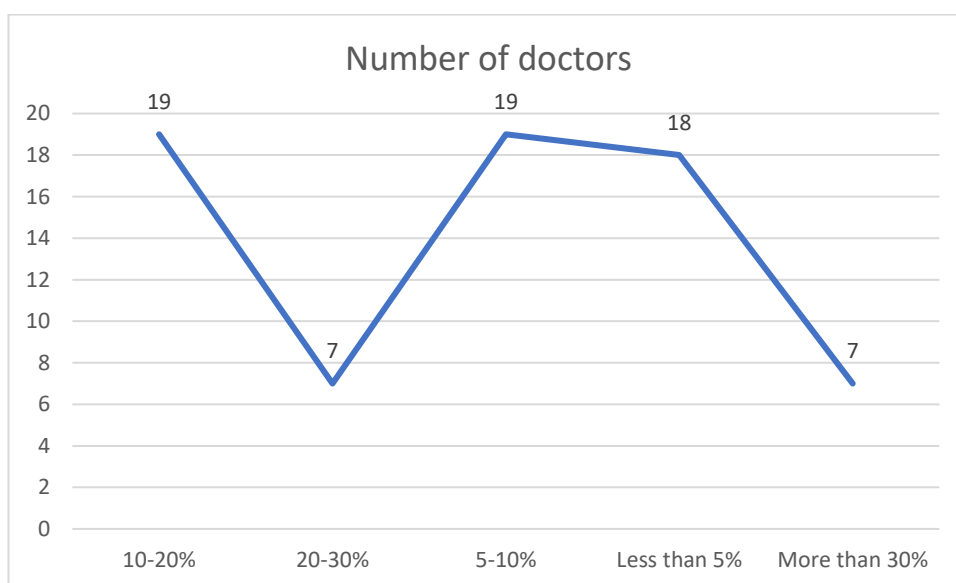
Graph 5.4: Percentage of patients

Out of the 70 doctors who participated in the survey, an average of 20% of their patient population is diabetic. Among them, 19 doctors (27%) have a patient population with a diabetes rate of 5-10%. Another 19 doctors (27%) have a patient population with a diabetes rate of 10-20%. Additionally, 7 doctors (10%) have a patient population with a diabetes rate of 20-30%, while another 7 doctors (10%) have a patient population with a

diabetes rate higher than 30%. Furthermore, 18 doctors (26%) have a patient population with a diabetes rate of less than 5%.

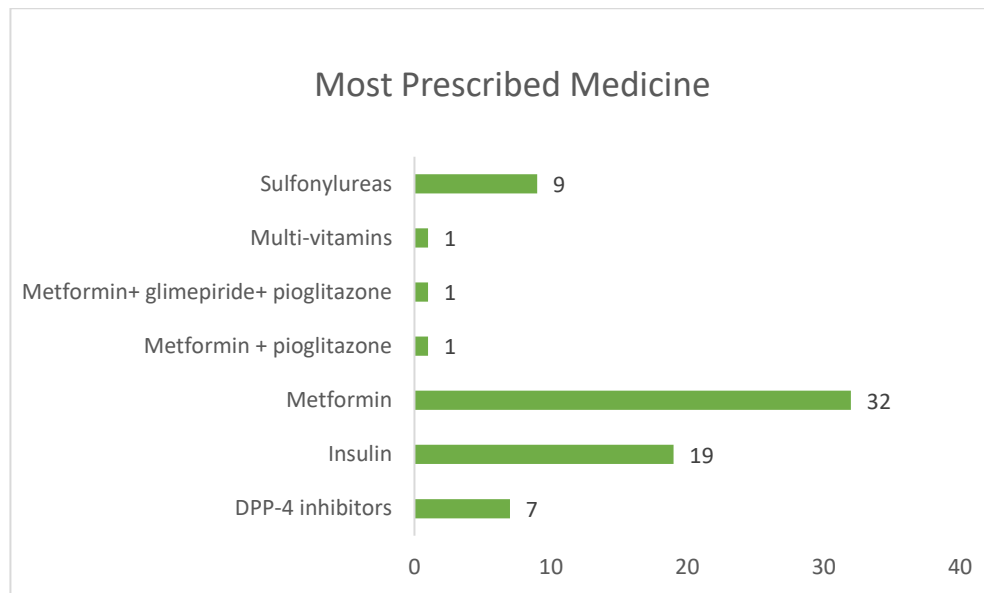


Graph 5.5: Diabetes percentage population

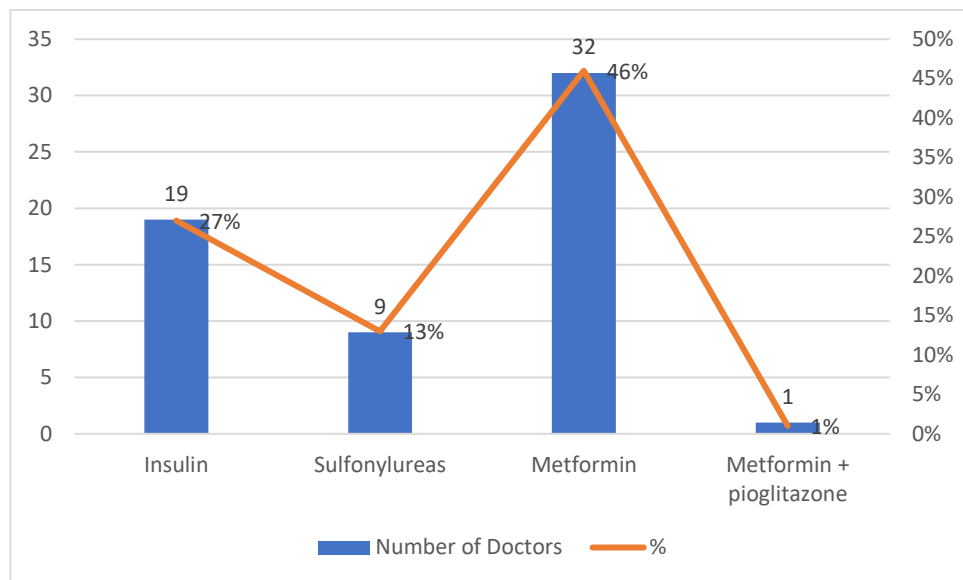


Graph 5.6: Number of doctors

Metformin (45.7%), sulfonylureas (12.9%), insulin (27.4%), and dipeptidyl peptidase-4 inhibitors (10%) were the most prescribed medications for diabetes treatment. Moreover, combination medications, including a two-drug combination (metformin + pioglitazone) and a three-drug combination (metformin + pioglitazone + glimepiride), were also prescribed, accounting for 1% of total prescriptions each.

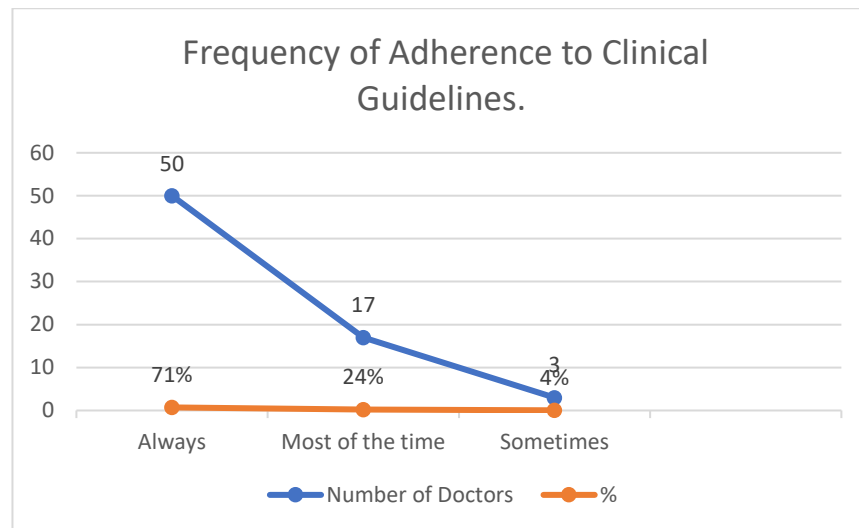


Graph 5.7: Most Prescribed Medicine



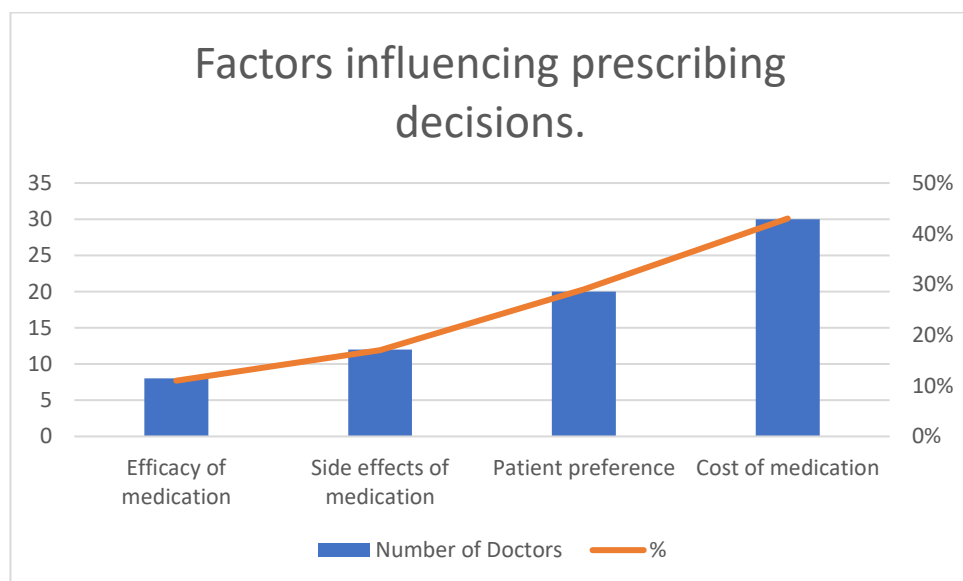
Graph 5.8: Frequently prescribed medication

Clinical guidelines are always followed by 71.4% of doctors, while 24.3% of doctors adhere to the guidelines most of the time, and 7.3% of doctors follow the guidelines occasionally.

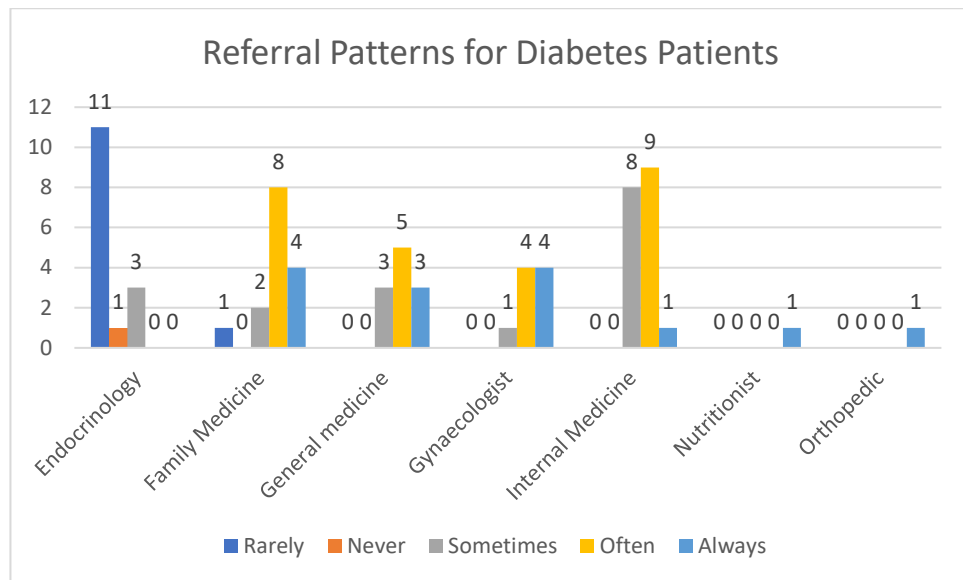


Graph 5.9: Frequency of Adherence to Clinical Guidelines.

Various factors influence the decisions made by healthcare professionals when prescribing medications. Patient preference (28.6%) emerges as a crucial determinant, highlighting the significance of involving patients in decision-making. The cost of medicine (42.9%) also plays a pivotal role, as the affordability of treatment impacts its accessibility and adherence. Furthermore, healthcare providers carefully consider the potential side effects of medications (17.1%) to ensure patient safety and well-being. Additionally, the overall efficacy of the prescribed treatment (11.4%) is a vital aspect that doctors consider in optimizing the management of diabetes. These multifaceted factors collectively guide healthcare professionals in making informed prescription decisions, contributing to the effective management of diabetes in clinical practice.



Graph 5.10: Factors influencing prescribing decisions.



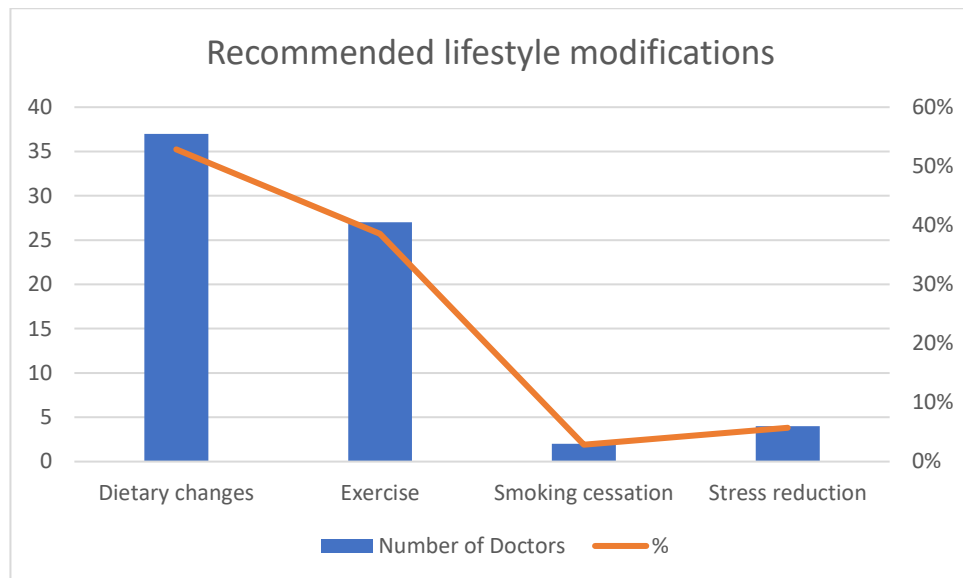
Graph 5.11: Referral Patterns for Diabetes Patients

The referral practices for patients with diabetes vary among different specialties. Endocrinologists rarely refer patients, while family medicine doctors frequently do so. General medicine, gynaecologists, and internal medicine doctors sometimes refer patients, with a mix of occasional and frequent referrals. Nutritionists and orthopedic specialists always refer patients to other healthcare professionals.

How often do you refer patients with diabetes to other healthcare professionals, such as endocrinologists or diabetes educators?	Number of Doctors	%
Rarely	12	17%
Never	1	1%
Sometimes	17	24%
Often	26	37%
Always	14	20%

Table

24.3% of doctors sometimes refer patients to other healthcare professionals, while 37.1% of doctors often prefer to refer patients to other healthcare professionals. 20% of doctors always refer patients to healthcare professionals. Additionally, 17.1% of doctors rarely refer patients to any healthcare professionals, and only 1 doctor, comprising 1%, never refers patients to any other healthcare professional.



Graph 5.12: Recommended lifestyle modifications.

52.9% of doctors recommend dietary changes as a lifestyle modification for patients suffering from diabetes, while 38.6% of doctors suggest exercise as an important modification. Additionally, smoking cessation is recommended by 2.9% of doctors, and stress reduction is recommended by 5.7% of doctors.

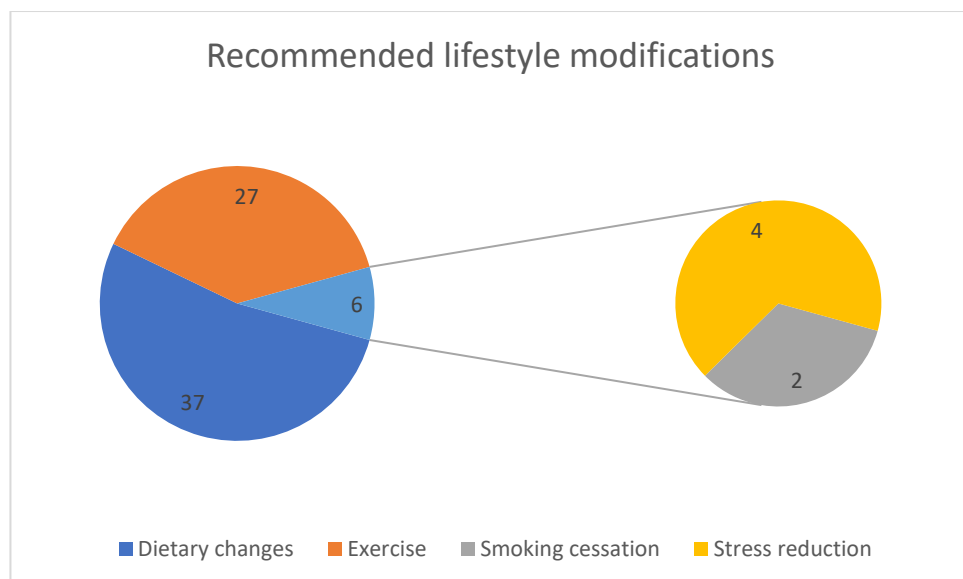
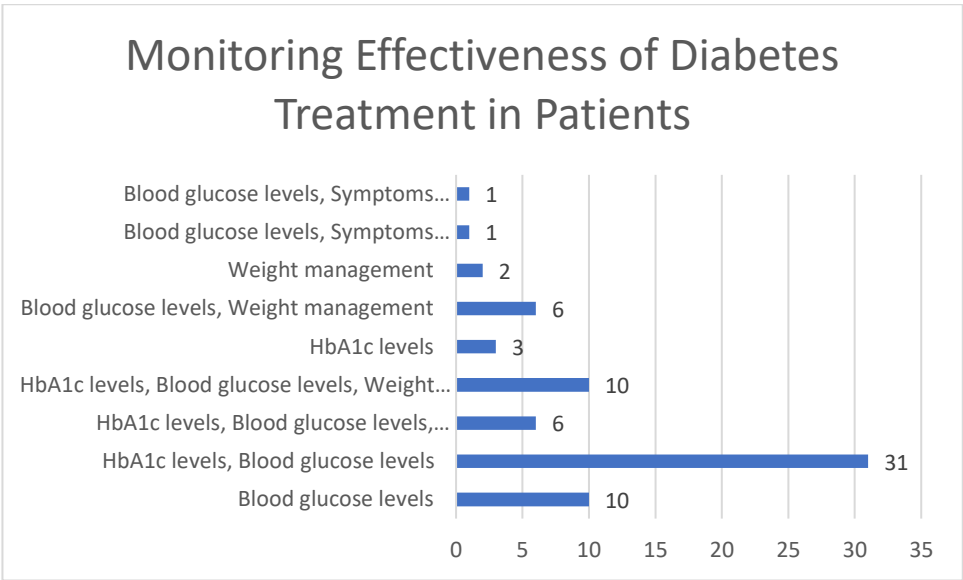
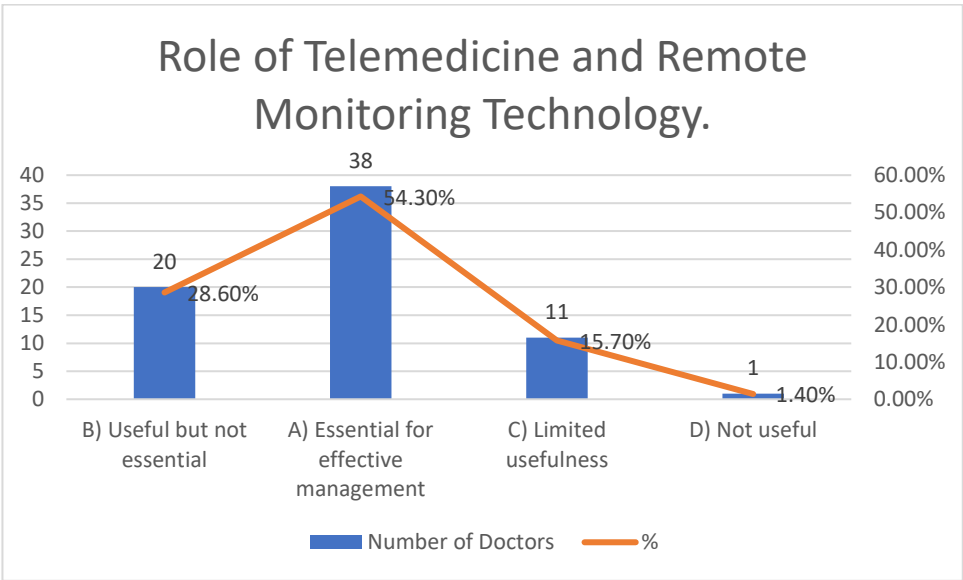


Table 5.13: suggested lifestyle changes.



Graph 5.14: Monitoring Effectiveness of Diabetes Treatment in Patients

Out of 70 doctors, 65 doctors, which comprises 92.9%, find measuring blood glucose levels to be the best way to assess the effectiveness of diabetes treatment. Of those 70 doctors, 50 also check HbA1c levels to monitor effective diabetes treatment. Furthermore, 25 doctors, accounting for 35.7%, also consider weight statistics as an indicator of treatment effectiveness. Among the 70 doctors, 8 of them specifically check for improvements in symptoms to evaluate the effectiveness of treatment.

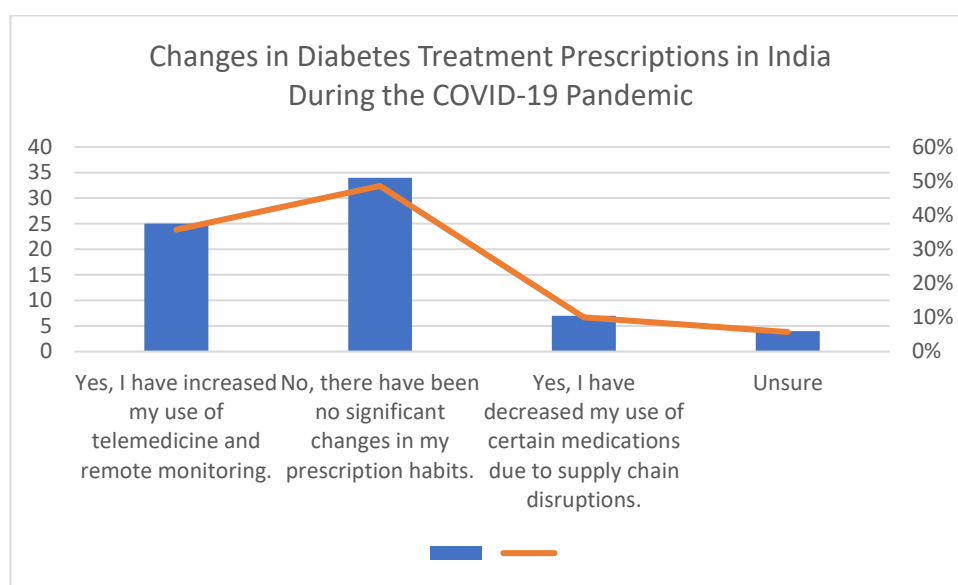


Graph 5.15: Role of Telemedicine and Remote Monitoring Technology.

Telemedicine and remote monitoring play a crucial role in the management of diabetes in India. Most doctors (38) perceive technology as essential for effective diabetes management, emphasizing its importance in improving patient care and outcomes. An additional group of doctors (20) considers technology to be useful but not essential,

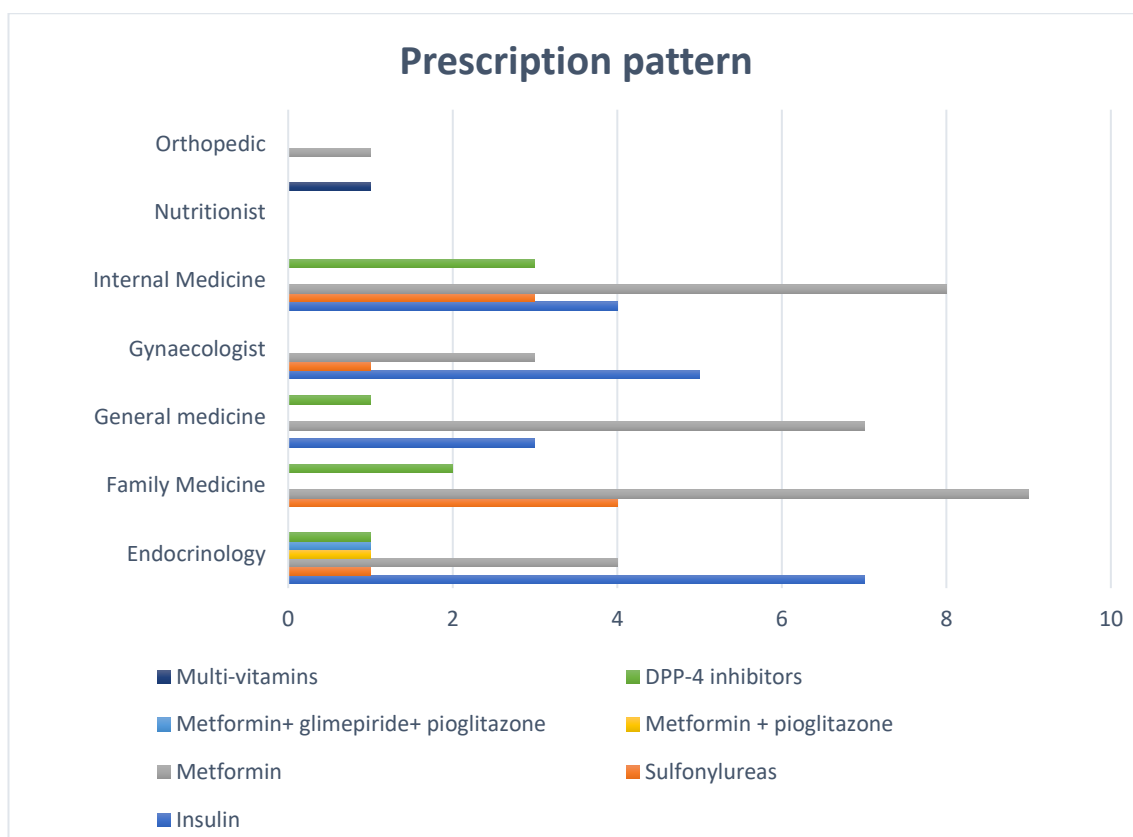
highlighting its potential benefits. While a smaller number of doctors (11) find limited usefulness in technology, only one doctor perceives it as not useful. This overall positive attitude towards technology underscores its significance in diabetes management, enabling remote access to healthcare services, regular patient monitoring, timely interventions, personalized treatment adjustments, and patient education for better self-management. By leveraging telemedicine and remote monitoring, healthcare providers can enhance accessibility, engagement, and overall quality of care for individuals with diabetes in India.

Based on the survey, 48.6% of doctors reported no significant change in their prescription habits. On the other hand, 35.7% of doctors have increased the use of telemedicine and remote monitoring. Additionally, 10% of doctors have decreased the use of certain medicines due to supply chain disruptions. The remaining doctors are unsure about their stance on this matter.



Graph 5.16: Changes in Diabetes Treatment Prescriptions in India During the COVID-19 Pandemic

Endocrinology had the highest prescription count for Insulin, Gynaecologist had the highest prescription count for Insulin, Family Medicine had the highest prescription count for Metformin, and Internal Medicine had the highest prescription count for Metformin, while General Medicine also had a significant prescription count for Metformin. Nutritionist was the only specialty with a prescription for multivitamins. Additionally, Endocrinology had the highest prescription count for combination medicines, specifically Metformin + pioglitazone, and Metformin + glimepiride + pioglitazone. Orthopedic had the lowest prescription count overall.



Graph 5.17: Prescription pattern

Doctor Speciality	Insulin	Sulfonyl ureas	Metformin	Metformin + pioglitazone	Metformin + glimepiride+ pioglitazone	DPP-4 inhibitors	Multi - vitamins
Endocrinologist	7	1	4	1	1	1	0
Family Medicine	0	4	9	0	0	2	0
General medicine	3	0	7	0	0	1	0
Gynaecologist	5	1	3	0	0	0	0
Internal Medicine	4	3	8	0	0	3	0
Nutritionist	0	0	0	0	0	0	1
Orthopedic	0	0	1	0	0	0	0

Table 5.1: Prescription pattern

CHAPTER-6

DISCUSSION

The prescription habits of diabetes doctors in India play an important role in managing and controlling this chronic condition, and this study aimed to investigate these habits, providing valuable insights into medication preferences, and adherence to clinical guidelines. The impact of different factors on prescription decisions was examined.

The distribution of participating doctors across medical disciplines found that endocrinologists, internal medicine practitioners, and family medicine physicians made up most of the sample. This conclusion implies that doctors in these specializations oversee diabetes care in India. Their knowledge and training in chronic illness management are likely to influence their prescribing patterns and treatment techniques.

Understanding the number of diabetic patient interactions is critical for gauging clinicians' workloads and demands. According to the study results, many doctors saw diabetes patients once or twice a week. This underlines the significant patient load and emphasizes the necessity for effective management techniques to handle India's expanding diabetes burden. Furthermore, clinicians' variable patient encounter frequency reveals disparities in patient demographics and diabetes incidence across various healthcare settings. These differences may alter prescription patterns and treatment methods, emphasizing the significance of taking geographical and contextual aspects into account in diabetes care.

Diabetes prevalence in the patient group seen by participating providers offers insight into the total disease burden. According to the report, 20% of patients had diabetes on average. However, there was significant variation, with clinicians reporting rates ranging from less than 5% to more than 30%. These variances might be related to disparities in patient groups, geographic areas, and healthcare environments. Understanding these prevalence rates gives critical information in finalizing prescription behaviors and customizing treatment techniques to the patient population's requirements.

These findings are consistent with recognized clinical standards and reflect the extensive usage of these drugs in the treatment of diabetes. Metformin, as the first-line treatment, was the most recommended medicine. Although combination drugs are prescribed in a tiny number of cases, they reflect an individualized approach to therapy that takes into consideration the needs of individuals. It is crucial to emphasize, however, that this study only looked at prescription trends and did not evaluate the appropriateness or usefulness of these drugs in individual individuals.

Clinical guidelines must be followed to provide evidence-based care and ensure standardized treatment practices. Most doctors said they followed clinical recommendations, whereas a smaller minority acknowledged just occasionally or partially following them. This conclusion emphasizes the importance of ongoing physician education and treatments targeted at improving guideline adherence. Further study should look at the variables that contribute to partial adherence as well as measures to promote compliance with guidelines, resulting in better patient outcomes.

Several factors were shown to impact prescription judgments. The patient choice was revealed as an important driver, emphasizing the need to include patients in decision-making. The cost of medication was also important, with affordability influencing treatment accessibility and adherence. To guarantee patient safety and well-being, healthcare practitioners carefully assessed the possible adverse effects of drugs. Furthermore, doctors considered the overall effectiveness of the given medication. These complex criteria jointly assisted healthcare practitioners in making educated prescription decisions, resulting in excellent diabetes control in clinical practice.

Referral practices differed among participating clinicians, with some sending patients to other healthcare providers only seldom or never, while others did so regularly. More research is needed to understand the causes of these referral patterns and their influence on patient outcomes. Multidisciplinary teams and specialized diabetes educators working together may give chances to improve patient care and results.

CHAPTER-7

CONCLUSION

Several crucial insights into the practices and variables influencing prescription choices among healthcare practitioners were provided by the research. To begin, most participating doctors were from disciplines such as Endocrinology, Internal Medicine, and Family Medicine, suggesting their competence and participation in diabetic patient management. This specialized allocation emphasizes the collaborative approach necessary to handle the varied aspects of diabetes care.

The survey discovered that doctors saw diabetes patients regularly, with a major fraction seeing them every week. This highlights the significant incidence of diabetes in India, as well as the importance of a thorough and consistent strategy for its care.

In terms of prescription trends, metformin was the most prescribed medication, according to worldwide recommendations. The vast variety of treatment options, including insulin and sulfonylureas, were also often advised. Combination medications were used in a modest number of cases, demonstrating that patient needs, and treatment objectives were taken into consideration.

Doctors reported mostly adhering to clinical recommendations, highlighting the requirement for evidence-based practices. Patient preferences, drug costs, likely side effects, and treatment effectiveness were shown to be the main factors influencing prescription choices. These results highlight the need for a patient-centered approach to therapy, as well as the necessity to deal with budgetary restraints and make sure that drugs are chosen and monitored properly.

The study also shed light on how technology aids in the control of diabetes. A substantial majority of professionals rated telemedicine and remote monitoring as important or advantageous, highlighting their potential to increase access to treatment and enhance illness management. But to fully profit from these technological advancements, issues like infrastructure and training must be resolved.

In addition, practitioners recognized the need for lifestyle modifications in diabetes management, such as dietary changes and exercise. For the best treatment outcomes, our findings emphasize the significance of comprehensive therapy that combines medication and lifestyle adjustments.

Overall, this study gives useful insights into prescription patterns and variables impacting diabetes management in India. The findings highlight the relevance of evidence-based practice, patient-centered care, and technological integration in diabetes treatment. These findings may be used to impact healthcare legislation, medical education, and clinical practice standards, resulting in better patient outcomes and diabetes treatment in India.

CHAPTER-8

LIMITATIONS

Sample Size: The study's sample size was quite small, with just 70 physicians participating. This small sample may not adequately represent the varied range of clinicians treating diabetes in India, thus influencing the generalizability of the findings.

Geographic Representation: The study did not consider geographical differences in diabetes care practices within India. As a result, the findings may not represent the entire spectrum of prescription behaviors across different geographic locations, which may differ in terms of healthcare infrastructure, access to resources, and cultural variables.

Self-Reported Data: The information gathered was based only on the participating doctors' self-reports, which might be subject to social desirability or recollection bias. The presented statistics may not be accurate since doctors may not have remembered their prescription patterns or may have supplied answers, they thought were favorable.

Selection Bias: The study included volunteer participants, which might lead to bias in the results. In comparison to doctors who did not participate, those who did may have differing prescribing practices or degrees of adherence to recommendations. This prejudice may have an impact on how most doctors in India who treat diabetes are represented.

Cross-Sectional Design: The study used a cross-sectional approach, which offers a moment-in-time picture of prescription behavior. This design cannot analyze changes in prescribing patterns over time or establish causality. To record temporal trends and gauge the effectiveness of interventions on prescription patterns, longitudinal studies would be beneficial.

Limited Patient Perspective: The study only focused on doctors' opinions, and disregarded patients' preferences, and experiences. If patient perspectives are considered, the variables influencing prescription decisions and treatment outcomes may be better understood.

Generalizability: The results of this study might not immediately apply to doctors working in other nations or healthcare facilities. The availability of resources, the cultural settings in which they are used, and the healthcare systems can all affect prescription practices.

CHAPTER-9

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CHAPTER-10

QUESTIONNAIRE USED

1. What is your medical specialty?
 - Endocrinology
 - Internal Medicine
 - Family Medicine
 - Other (please specify)

2. How frequently do you see patients with diabetes in your practice?
 - Less than once a week
 - Once a week
 - 2-3 times a week
 - 4-5 times a week
 - Daily

3. What percentage of your patient population has diabetes?
 - Less than 5%
 - 5-10%
 - 10-20%
 - 20-30%
 - More than 30%

4. What are the most prescribed medications for diabetes in your practice?
 - Metformin
 - Sulfonylureas
 - DPP-4 inhibitors
 - GLP-1 receptor agonists
 - Insulin
 - Other (please specify)

5. How often do you follow established clinical guidelines for the treatment of diabetes?
 - Always
 - Most of the time
 - Sometimes
 - Rarely
 - Never

6. What factors influence your prescribing decisions for diabetes medications?

- Patient preference
 - Cost of medication
 - Side effects of medication
 - Efficacy of medication
 - Other (please specify)
7. How often do you refer patients with diabetes to other healthcare professionals, such as endocrinologists or diabetes educators?
- Always
 - Often
 - Sometimes
 - Rarely
 - Never
8. What are your recommendations for lifestyle modifications for patients with diabetes?
- Dietary changes
 - Exercise
 - Smoking cessation
 - Stress reduction
 - Other (please specify)
9. How do you monitor the effectiveness of diabetes treatments in your patients?
(Choose more than one if any)
- HbA1c levels
 - Blood glucose levels
 - Symptoms improvement
 - Weight management
 - Other (please specify)
10. How do you see the role of technology, such as telemedicine and remote monitoring, in the management of diabetes in India?
- Essential for effective management
 - Useful but not essential
 - Limited usefulness
 - Not useful
11. Have you observed any changes in your prescription habits for diabetes treatment in India since the onset of the COVID-19 pandemic?
- Yes, I have increased my use of telemedicine and remote monitoring.

- Yes, I have decreased my use of certain medications due to supply chain disruptions.
- No, there have been no significant changes in my prescription habits.
- Unsure