# EXPLORING THE ROLE OF ARTIFICIAL INTELLIGENCE IN ADDRESSING HEALTHCARE CHALLENGES: A DOCTOR-CENTRIC APPROACH

Dissertation Submitted to


**The IIHMR University, Jaipur**

for the partial fulfillment 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

**Dr. Saurabh Kumar**

**2025**

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**06th June 2025**

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**Ms. Ruchila Fating,**
**Nagpur Maharashtra - 440034**

**To Whomsoever It May Concern**

This is to certify that **Ms. Ruchila Fating** has successfully completed her project **""EXPLORING THE ROLE OF ARTIFICIAL INTELLIGENCE IN ADDRESSING HEALTHCARE CHALLENGES: A DOCTOR-CENTRIC APPROACH"** in our **"Marketing _ Diacar Division"** with **Mankind Pharma Ltd. (Mumbai Corporate Office),** from **17th March to 06th June 2025.**

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We wish you all the best for future endeavors.

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# CERTIFICATE

This is to certify that the dissertation title **'Exploring the role of AI in addressing Healthcare Challenges : A Doctor Centric Approach'** is a record of the research work undertaken by **Ruchila Fating** 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 her approach to the research study has been sincere, scientific, and analytical.

Faculty Guide
IIHMR University, Jaipur
Date: 17.06.2025

School Dean
IIHMR University, Jaipur
Date: 17.06.2025

## DECLARATION BY STUDENT

I hereby declare that this dissertation titled **"Exploring The Role Of Artificial Intelligence In Addressing Healthcare Challenges: A Doctor-Centric Approach"** 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 Information derived from the published or unpublished work of others has been duly acknowledged in the text.

Ruchila

Signature

Ruchila Fating

Date 16/06/25

**ABSTRACT:**

Introduction

The use of artificial intelligence (AI) in healthcare has the potential to transform patient care, improve hospital efficiency, and reduce costs. AI can help doctors make quicker, better decisions, enhance diagnostic accuracy, and simplify routine tasks. While some hospitals are already using AI for patient management, diagnosis support, and personalized treatments, its overall adoption is still in the early stages.

Objective

The primary goal of the study was to understand the real-world challenges that healthcare professionals face in their daily practice and explore how emerging AI tools could provide practical solutions and support.

Methodology

A detailed survey was conducted with 74 doctors from various specialties and hospital settings.

- 33 doctors were personally interviewed.
- 41 doctors responded via a structured Google Form.

Doctors were mainly selected based on their MD and DM qualifications to ensure clinical expertise. The survey included doctors from specialties like internal medicine, cardiology, orthopedics, and general medicine. A carefully designed questionnaire and follow-up discussions were used to gather insights on topics such as decision-making, diagnostics, patient management, treatment planning, and administrative workload.

Results

The survey revealed several key challenges faced by doctors, including:
Over-investigation leading to unnecessary tests, Difficulty in differential diagnosis, Complexities in interpreting X-rays, ECHO, and angiography reports. Additionally, some doctors expressed a strong need for AI tools that could support like Detailed patient history analysis, Monitoring medication adherence, Providing follow-up reminders and patient engagement alerts

Conclusion

This study explored the common challenges doctors face in clinical practice and examined how Artificial Intelligence (AI) tools can help overcome them. Using a mixed-method approach involving 74 doctors, the research identified key issues such as administrative burden, medication non-adherence, delayed diagnosis, and poor patient follow-up. To address these, tools like DeepScribe, Augmedix, and Nabla assist in reducing documentation time, while AiCure and smartphone apps support medication adherence. In diabetes care,

machine learning models like Random Forest, SVM, and deep neural networks, along with devices like Dexcom and FreeStyle Libre, help in glucose monitoring and insulin adjustments. Diagnostic tools such as Enlitic and Butterfly Network aid in interpreting scans, and platforms like ChatGPT, Perplexity, and Google Gemini assist doctors with literature reviews and content creation. The study concludes that AI tools, when supported by proper training and hospital integration, can improve clinical workflows and patient care.

**KEYWORDS:**

AI (Artificial Intelligence), Algorithms, Random Forest, Healthcare, Cardiology, Radiology, Dermatology, Opthalmology.

**ACKNOWLEDGMENT**

I express my heartfelt gratitude to everyone who supported, guided, and encouraged me throughout the journey of completing my dissertation, undertaken as a part of my MBA in Pharmaceutical Management.

First and foremost, I would like to extend my sincere appreciation to the administration of **Mankind Specialities, Mumbai** for granting me the opportunity to undergo my dissertation in their esteemed organization.

These invaluable experiences have significantly contributed to my professional and personal development.

A special note of thanks to my industry mentors —**Mr. Balaji Ambesange sir and Mr. Kunal Deshmukh Sir** (Mankind Specialities)— for their continuous support, insightful guidance, and for providing me with golden opportunities to learn in a real-time industry setting. Their encouragement and mentorship played a vital role in shaping my understanding of the pharmaceutical sector.

I express my deepest gratitude to **Dr. Saurabh Kumar Banerjee Sir**, my Faculty Mentor and Dean, for his invaluable support, expert advice, and continuous encouragement throughout the course of my dissertation.

His guidance has been instrumental in both my academic and professional growth.

My sincere thanks to **Mr. Vinod Tejwani Sir** and the Placement Committee Team for their efforts in coordinating the dissertation process and providing us with all possible assistance.

Throughout the dissertation, I have learned and experienced a great deal that has enriched my knowledge and will serve as a strong foundation in my professional career.

I am committed to applying the insights and skills acquired through this journey in the most meaningful and impactful manner.

Thank you all for being an integral part of my learning journey

Yours Sincerely,

**Ruchila Fating**

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**LIST OF ABBREVIATIONS**

| Sr. No | Abbreviations | Full Form |
|---|---|---|
| 1. | AI | Artificial Intelligence |
| 2. | CT | Computed Tomography |
| 3. | MRI | Magnetic Resonance Imaging |
| 4. | PACS | Picture Archiving and Communication Systems |
| 5. | PET | Positron Emission Tomography |
| 6. | DR | Diabetic Retinopathy |
| 7. | AMD | Age-related Macular Degeneration |
| 8. | EHRs | Electronic Health Records |
| 9. | SVM | Support Vector Machine |
| 10. | RF | Random Forest |
| 11. | CNN | Convolutional Neural Network |

## CHAPTER 1: INTRODUCTION

Artificial Intelligence (AI) is becoming a bigger part of healthcare as hospitals and clinics look for smarter ways to improve processes and patient care. Still, doctors and other healthcare professionals face many challenges. These include problems like time-consuming hospital processes, difficulty in making fast and accurate diagnoses, and managing patient care efficiently. This research aims to understand the everyday problems that doctors face and how AI tools can help solve them. The goal is to find ways AI can make the lives of doctors easier and improve overall healthcare services.

AI in healthcare means using smart computer systems to understand complex medical data and help in diagnosing, treating, or preventing diseases. Sometimes, these AI tools can even perform better than humans in specific tasks, like analyzing X-rays or recommending treatments. Although this technology is still new and being studied in many fields of medicine, it is already being used in areas such as personalized medicine, drug development, making treatment plans, monitoring patients, and improving care. For example, AI can quickly read radiographs (X-rays), which are one of the most common tests in hospitals, and help doctors spot problems faster and more accurately.

However, there are also some serious concerns with using AI in healthcare. Ethical issues like patient data privacy, the risk of replacing human jobs, and possible biases in AI systems are important to consider. Sometimes, hospital leaders are slow to accept new technology like AI because of fear, lack of knowledge, or uncertainty about its results. In some cases, AI has been introduced without enough testing, which can lead to mistakes. Also, many people—whether doctors, patients, or the public—worry that AI cannot provide truly compassionate care like a human. Research has also shown that many AI studies in healthcare are not always easy to repeat or trust because of weak evidence. So, while AI has great potential, more careful testing and planning are needed before it can be fully trusted in hospitals.

## CHAPTER 2: LITERATURE REVIEW:

The healthcare sector is developing quickly. Knowing which treatment approaches are most likely to work with patients depending on their characteristics and treatment plan is a major concern for many healthcare organisations. Healthcare professionals could benefit from artificial intelligence in a number of ways, including patient care and administrative duties. With its many benefits over conventional analytics and other clinical decision-making tools, the technology seeks to replicate human cognitive processes. As data gets more reliable and precise, the healthcare sector can gain a better understanding of patient outcomes and diagnostic procedures. [2]

### 2.1 Applications of AI in healthcare

#### Image-Based Diagnosis with AI

One of the most successful uses of artificial intelligence (AI) in medicine today is in diagnosing diseases through medical images. Several specialties—such as radiology, ophthalmology, dermatology, and pathology—depend heavily on images to detect and understand health problems.

Let's look at how AI is helping in these fields.

#### Radiology

Radiologists diagnose diseases using different imaging techniques, including:

- X-rays
- CT (Computed Tomography) scans
- MRI (Magnetic Resonance Imaging)
- PET (Positron Emission Tomography)

These images help doctors find out what's causing a patient's symptoms, check for diseases, and track how a condition is changing over time. Radiology is especially suitable for AI because images often carry most of the information needed for diagnosis. Hospitals usually store a large number of medical images in systems called *Picture Archiving and Communication Systems* (PACS). These image collections give researchers the data they need to train AI models. In fact, using computers to help with radiology diagnoses dates back to the 1960s. But with today's powerful AI methods, the results have become far more accurate. For example, AI is now used to:

- Detect small growths in the lungs using CT scans
- Diagnose lung diseases, including tuberculosis, using chest X-rays
- Identify possible breast cancer using mammograms [3]

## Cardiology

AI in cardiology helps doctors identify changes in heart function and supports them in making better clinical decisions. One important use of AI is in analyzing ECG data to detect irregular heart rhythms. Many smart devices now use AI and deep learning algorithms to monitor heart rate, blood pressure, stroke risk, and conditions like tachycardia, bradycardia, and atrial fibrillation. These tools are easy to use and alert the person if something unusual is detected. Wearable devices that track body signals also work using similar AI-based technology.[2]

## AI in Heart Failure Prediction

In recent years, the use of Artificial Intelligence (AI) in cardiology has shown great promise, particularly in predicting heart-related conditions. A study titled *"Heart Failure Prediction Based on Random Forest Algorithm Using Genetic Algorithm for Feature Selection"* demonstrated the effective use of machine learning for early heart failure detection.

In this study, the Random Forest algorithm, supported by a Genetic Algorithm for selecting the most relevant features from patient data, achieved a high prediction accuracy of 93.36%. This approach outperformed other models and methods, making it highly efficient for identifying patients at risk of heart failure. Such AI-based systems can help healthcare professionals intervene early, plan treatments more effectively, and potentially save lives. The findings support the integration of AI in clinical practice to enhance diagnosis and risk assessment in cardiology. [8]

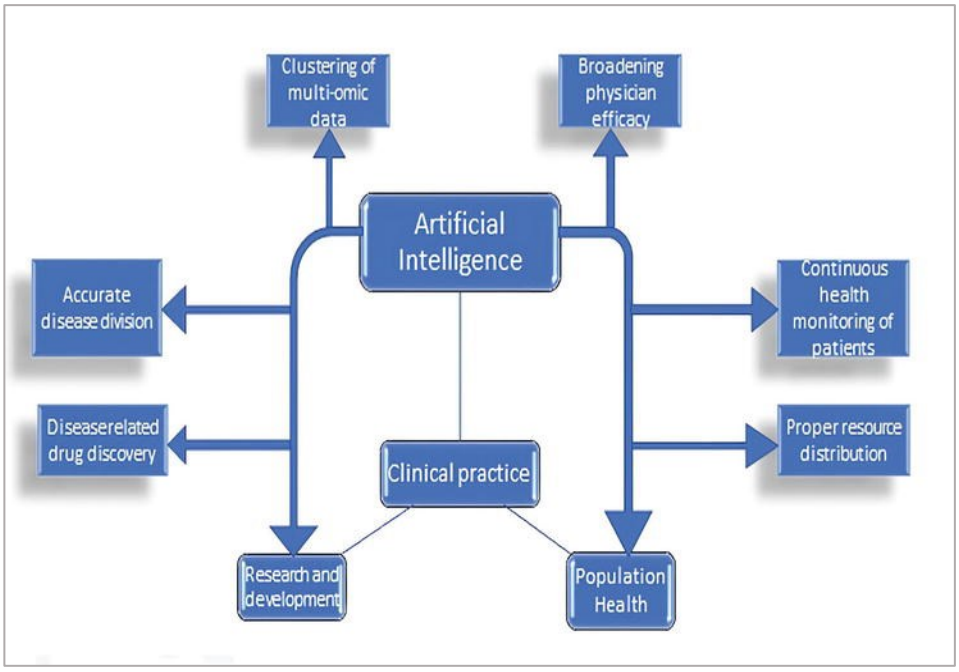


**Fig 1.1 AI in Cardiology**

**Dermatology**

In dermatology, looking carefully at the skin is key to diagnosing many conditions. For example, skin cancer like melanoma often looks different from harmless moles, and these differences can be spotted by trained eyes.

To help with early diagnosis, dermatologists created the **ABCDE rule**, which checks for:

- **A** — Asymmetry: one half of the spot doesn't match the other
- **B** — Border: edges are irregular or blurred
- **C** — Color: the spot has multiple colors
- **D** — Diameter: it’s larger than 6 millimeters
- **E** — Evolution: the spot changes size, shape, or color over time

Except for the "E" (Evolution) part, all these signs can usually be checked just by looking at a single photo of the skin lesion.

For years, scientists have tried to build AI tools that can automatically tell whether a skin spot is harmless or dangerous by analyzing pictures. Recently, convolutional neural networks (a special type of AI good at recognizing images) were trained using over 129,000 clinical images. These AI models reached the same level of accuracy as expert dermatologists when diagnosing skin cancer. In fact, in a direct comparison, the AI system even performed better than the average dermatologist when tested on photos and dermoscopy images.

While training such AI models takes a lot of computer power, once they are ready, the final versions can be run easily even on **mobile phones**. This could make expert-level skin cancer screening much more accessible to people around the world. [3]

**Ophthalmology**

In ophthalmology, doctors use a method called fundus photography to take detailed pictures of the inside of the eye — especially the retina, optic disc, and macula. This is a non-invasive process, meaning it doesn't hurt or require surgery.

These images help doctors detect and keep track of many eye diseases, such as:

- Diabetic Retinopathy (DR)
- Glaucoma
- Retinal tumors (neoplasms)
- Age-related Macular Degeneration (AMD)

Fundus photography is especially important because it helps catch problems that can lead to preventable blindness if not treated early.

For diabetic patients, the American Diabetes Association recommends annual screening for diabetic retinopathy — even if the patient has little or no signs of the disease. If the disease is progressing, more frequent checks are advised.

Traditionally, ophthalmologists would personally examine and interpret these fundus images. However, with millions of diabetic patients at risk for vision loss, it's very hard for specialists to keep up with the growing demand. This is where AI comes in — helping to make screening faster, easier, and more scalable.[3]

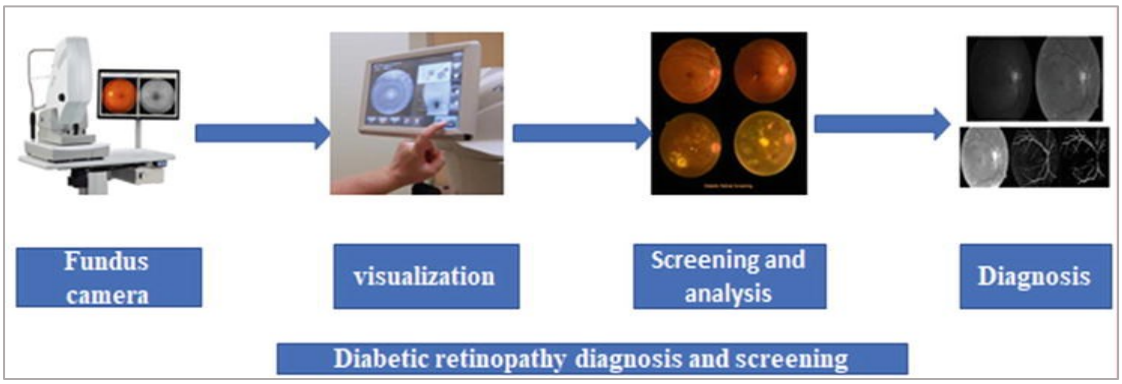


**Fig 1.2 Use of AI in diabetic retinopathy, diagnosis and treatment**

**AI in Diabetes Management**

Diabetes is becoming a major global health challenge, especially in countries like India. Traditional healthcare systems often fail to detect or manage diabetes early enough. This is where Artificial Intelligence (AI) is stepping in to revolutionize diabetes care.

1. **Early Detection and Screening**- AI models like SVM, RF, and CNN can accurately classify diabetic and non-diabetic individuals. AI detects diabetes before symptoms appear, allowing early intervention.
2. **Predicting Disease Onset and Complications** - AI predicts risk of type 1 and type 2 diabetes, heart failure, and kidney issues using EHR, glucose levels, age, etc. Helps personalize care plans and prevent complications.
3. **Personalized Treatment Plans**- AI-driven Clinical Decision Support Systems (CDSS) offer treatment suggestions based on a person's health data. Smart systems adjust insulin doses automatically and reduce chances of low/high blood sugar.
4. **Glucose Monitoring and Insulin Delivery**- AI powers continuous glucose monitors (CGM) and automated insulin delivery systems (artificial pancreas). Devices like FreeStyle Libre, Dexcom G6, and Medtronic 780G help maintain better glucose control.

5. **Diet and Lifestyle Management-** Apps like mySugr and NutriAIDE use AI to guide diet, exercise, and meal planning. These tools offer real-time suggestions based on individual data.
6. **Telemedicine and Remote Monitoring**- AI helps doctors monitor patients remotely. Patients get virtual consultations, glucose tracking, and lifestyle tips through mobile apps and chatbots.
7. **Patient Education and Engagement-** AI chatbots and virtual assistants answer queries, remind about medications, and track diet or physical activity. Education apps using AI show improvements in awareness and glucose levels.
8. **Advancing Research**- AI processes huge datasets from genomics, sensors, and medical records to discover new treatments and understand risks better. Helps in faster drug discovery and non-invasive diagnosis.[4]

**AI IN 4Ps**

AI presents transformative opportunities in the clinical management of diabetes through its ability to enhance precision, prediction, personalization, and healthcare penetration.

1. By supporting **precision medicine**, AI can analyze individual variations in genetics, environment, and lifestyle to tailor treatments and predict complications specific to each patient.
2. In terms of **prediction**, AI systems use logical and probabilistic reasoning to detect patterns and risks that may be invisible to the human eye, enabling early interventions and reducing the burden of diabetes-related complications.
3. AI also promotes **personalized care** by analyzing large volumes of patient data to deliver individualized recommendations for diet, medication, physical activity, and glucose monitoring—allowing healthcare providers to focus more on patient interaction rather than repetitive tasks.
4. Additionally, AI-driven digital health tools have expanded the **penetration** of quality diabetes care to remote and underserved communities by lowering costs and improving access, especially in areas where conventional care is limited. Together, these capabilities position AI as a powerful tool to revolutionize how diabetes is predicted, managed, and treated across diverse populations.[6]

**Clinical Outcome Prediction and Patient Monitoring**

AI is showing a lot of promise not just in diagnosing diseases but also in predicting how a patient's health might change over time by using data from their medical records (EHRs — Electronic Health Records).

For example:

- Bayesian networks (a type of AI model) can predict important outcomes like a patient's risk of dying, chances of being readmitted to the hospital, or how long they might need to stay — just by analyzing their emergency department records.
- Health insurance claims data have been used to predict mortality in elderly patients.
- Information from doctor's notes can help classify cancer patients based on how well they might respond to chemotherapy.
- AI can also help find important clinical indicators that predict outcomes for patients undergoing organ transplants.

All these AI studies are helping doctors better guide patients and create more personalized treatment plans based on likely outcomes.[3]

**Healthcare Administration**

Running a hospital or healthcare center is becoming more and more complicated. Many hospitals around the world are facing resource shortages and too much paperwork, which takes time away from doctors and nurses who should be focusing on patients.

- AI and IT tools can handle routine tasks like entering patient data or reviewing lab results.
- This gives clinicians more time to focus on patient care.
- When AI is connected to Electronic Health Records (EHRs), it becomes easier and faster to find important patient information.[5]

**AI in Precision Medicine and Clinical Decision Support**

Artificial Intelligence (AI) helps doctors provide personalized treatments by analyzing a patient's genes, lifestyle, and health data. It can predict how well a person might respond to certain medicines and suggest the best treatment plan. For example, studies have shown that AI can successfully predict who will benefit from chemotherapy or antidepressants, helping doctors make better and faster decisions.

**AI in Dose Optimization and Drug Monitoring**

AI can improve patient safety by helping doctors choose the right medication dose for each individual. It can also predict harmful drug reactions and help avoid them. AI systems like CURATE.AI adjust chemotherapy doses based on how a patient responds, leading to better results with fewer side effects. This shows how AI can make treatments safer and more effective.

### AI in Therapeutic Drug Monitoring (TDM)

In TDM, AI uses patient data—like medical history and genetics—to make sure the right amount of a drug is given at the right time. It can detect risky drug interactions and alert doctors early. AI also helps identify patients who might react badly to a drug, improving safety and reducing hospital visits.

### AI in Population Health Management

AI supports public health by identifying people at high risk for diseases like diabetes or heart problems. Using past health records and lifestyle data, AI can predict who might need extra care and help prevent hospital readmissions. It also automates tasks like patient follow-up and care coordination, saving time and money.

### AI in Predictive Analytics and Risk Assessment

AI-driven predictive analytics helps healthcare systems spot disease trends, forecast supply needs like vaccines, and respond to public health threats. For example, tools in Saudi Arabia used social media data to detect disease patterns and guide health awareness efforts. These tools can improve disease prevention and healthcare planning when combined with strong data and technology systems.[7]

## 2.2 Artificial Intelligence in Indian Healthcare: Challenges

India’s large and diverse population presents many challenges to its healthcare system — from a shortage of skilled professionals and limited infrastructure to a high burden of disease. Artificial Intelligence (AI) has the potential to solve some of these issues. However, its implementation comes with its own set of difficulties.

To successfully use AI in Indian healthcare, we must deal with concerns like data privacy, poor infrastructure, algorithmic bias, and a lack of trained experts. The good news is that India's growing tech industry provides a strong base to tackle these problems through research, investments in data systems, and ethical guidelines.

### Legal and Ethical Responsibility

One of the biggest concerns is determining who is legally responsible if something goes wrong with an AI-based decision in a healthcare setting. For example, if an AI tool makes a wrong diagnosis, it is unclear whether the responsibility lies with the doctor, the hospital, or the developers of the AI system. Current medical laws do not clearly define accountability in such cases. Therefore, there is an urgent need for clear legal frameworks and ethical guidelines that involve input from doctors, legal experts, developers, and patients.

### Government Support and Strategy

Different governments have taken different approaches to AI in healthcare. While some have actively supported the development and use of AI, others rely more on private companies. As AI becomes more widely used, governments must develop clear strategies that answer key

questions: How should AI be used? Who should fund its development and implementation? And how can it be made safe and accessible for all?

**Understanding the 'Black Box' Problem**

Many AI systems, especially those based on deep learning, operate like a "black box" — meaning it is difficult to understand how they make decisions. This lack of transparency can reduce trust among healthcare professionals. Doctors need to know why an AI system made a particular recommendation. To solve this issue, clinicians must be directly involved in developing AI tools so they can help validate the data and understand how the system works.

**Bias in AI**

AI systems can produce biased results if they are trained on data that is not diverse or representative of all population groups. This can lead to unfair treatment outcomes, particularly for minority or rural populations. To avoid this, AI models should be trained on data from a wide variety of people, ensuring that the results are fair and accurate for everyone.

**Resistance from Healthcare Professionals**

Some doctors and nurses may be hesitant to use AI tools due to lack of familiarity or trust. Their concern may also stem from valid questions like: Will this tool increase my workload? Will it actually help in real clinical settings? To gain their support, healthcare professionals should be involved early in the design, testing, and implementation of AI systems. Their insights can help make the tools more practical and user-friendly.

**Data Sharing and Privacy Concerns**

AI systems need large amounts of patient data to work effectively. However, sharing sensitive health data with AI companies raises serious privacy and security concerns. Recent cases have shown that public trust can be damaged when data is shared without consent. Therefore, clear protocols, strong data protection systems, and transparency about how data is used are essential. Patients should be involved in decisions about their data.

**Integration with Existing Technology**

For AI tools to be accepted and used regularly in hospitals, they must work smoothly with existing hospital software and systems. The tools must have user-friendly interfaces and should simplify tasks, not make them more complicated. If the system is too complex or doesn’t integrate well, doctors and staff may avoid using it — even if the tool is highly accurate.[5]

### 2.3 Mitigating the Risks and Misuse of AI in Healthcare

While Artificial Intelligence (AI) offers transformative potential in healthcare, it's important to recognize the risks that come with it. If not carefully developed and monitored, AI can unintentionally worsen healthcare inequalities — especially when trained on biased or poor-quality data. These biases can result in unfair treatment outcomes, especially for underrepresented groups.

In addition, AI systems deal with sensitive patient information, making them vulnerable to data breaches and ethical concerns. If this data is misused, it can lead to serious legal and privacy issues.

**Key Safeguards to Prevent Misuse**

- Strong Governance:
  AI systems in healthcare must be built under clear and ethical governance frameworks that focus on transparency, fairness, and accountability.
- Regular Monitoring and Audits:
  Continuous checks are necessary to ensure AI tools remain unbiased, deliver accurate outcomes, and adjust to changing conditions in healthcare.
- Ethical AI Development:
  Developers must ensure that AI is designed and tested using diverse and high-quality datasets to avoid skewed results.

By taking these steps, we can maximize the benefits of AI in healthcare while reducing risks, making sure that AI tools are safe, fair, and responsible. [1]

## CHAPTER 3: METHODOLOGY

This research used a mixed-method research methodology, and thus both quantitative as well as qualitative methods were used. This was used to provide a more holistic and balanced understanding of actual issues confronted by physicians in their day-to-day clinical practice and how Artificial Intelligence (AI) might be applied to address them. The aim was to gather quantitative data and qualitative for better insight.

**Research Tools Employed**

There were two primary tools used for data collection:

1. Structured Questionnaire – A Google Form was designed and distributed among doctors. It consisted of multiple-choice questions and open ended questions about challenges, application of technology, and recommendations on AI. This technique facilitated the collection of numerical data that could be quantified and compared.

2.\tIn-Depth Interviews – Personal interviews were carried out with some of the chosen doctors. They were either face-to-face or telephone interviews. They were semi-structured, in the sense that some important questions were asked in advance, but doctors also had the liberty to discuss their experiences and views in depth. These interviews assisted in collecting detailed and meaningful information that could not have been achieved by just a form.

**Sample Size and Selection Criteria**

Total of 74 doctors took part in this study. Among them:

•41 doctors completed the Google Form (quantitative data)

•33 doctors were personally interviewed (qualitative data)

Physicians were chosen on the basis of their clinical credentials, particularly those possessing MD (Doctor of Medicine) and DM (Doctorate in Medicine) degrees. This was done to ensure that the answers were provided by seasoned experts dealing with critical and complex cases on a daily basis. Physicians belonging to various specialties were sampled to obtain a more comprehensive picture.

Compositon of the 33 interviewed physicians:

• 5 MD Physicians

• 15 MD/DNB in General Medicine

• 5 Cardiologists (MD and DM)

•7 from other specializations (such as MBBS, FCGP, FIAMS)

This choice allowed to incorporate a variety of experiences from internal medicine, cardiology, and other specialties, making the research more valid and representative.

**Time Period of Study**

The collection of data was carried out within two months, March to April. This brief and fixed time period ensured uniformity in the responses and minimized the seasonal or practice-related fluctuations that might influence the answers.

**Data Collection and Analysis Process**

After the responses were gathered, the analysis was conducted in two manners:

•For the Google Form responses, every response was read carefully, and the answers were analyzed to identify recurring issues. Charts and graphs were also generated to display the data.

• For the interview information, answers were hand-written down during the interviews. Afterwards, these were coded into categories or themes, e.g., delays in diagnosis, issues with record-keeping, or awareness regarding AI.

Both the types of data were then compared and related. For instance, if a problem was seen in both the form and interviews (such as follow-up issues with the patients), it was given greater weight. This mixed-method analysis provided a robust and reliable result, as it was not based on mere numbers but also on actual experiences of physicians.

**Type of Study**

It was a cross-sectional study, meaning it was done at one point in time (March–April) to have a snapshot of where things stood now. It was also descriptive, so the primary objective was to describe what issues doctors are experiencing and how AI can assist, rather than to try out some drug or treatment.

## CHAPTER 4: RESULTS

### Question 1: The speciality of Doctors

The observations are as follows,

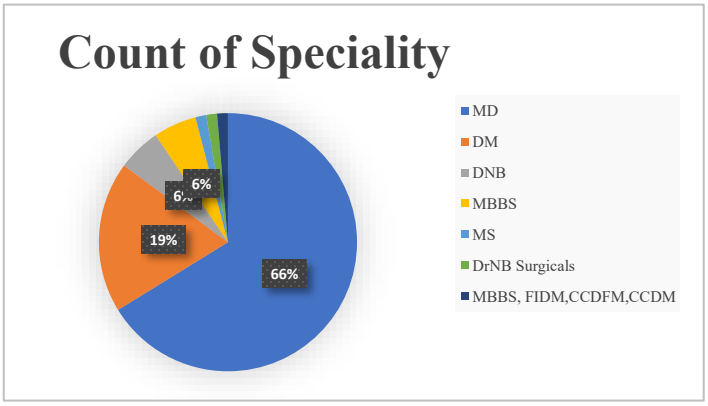


**Fig 4.1**

**Inferences:**

- Most respondents (49) were MD specialists, making them the dominant group in the study.
- DM-qualified doctors (14) formed the second-largest group, indicating strong input from super-specialists.
- The chart shows a diverse mix of specializations, adding depth and variety to the study.

### Question 2: Years of Experience

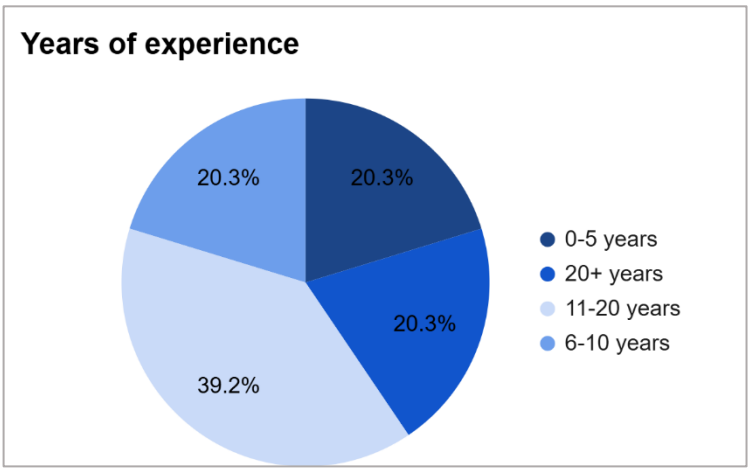


**Fig 4.2**

**Inferences:**

The majority of doctors (39.2%) have 11–20 years of experience, indicating strong mid-career representation. Other experience groups are evenly distributed at 20.3% each.

**QUESTION 3: How familiar are you with AI applications in healthcare?**

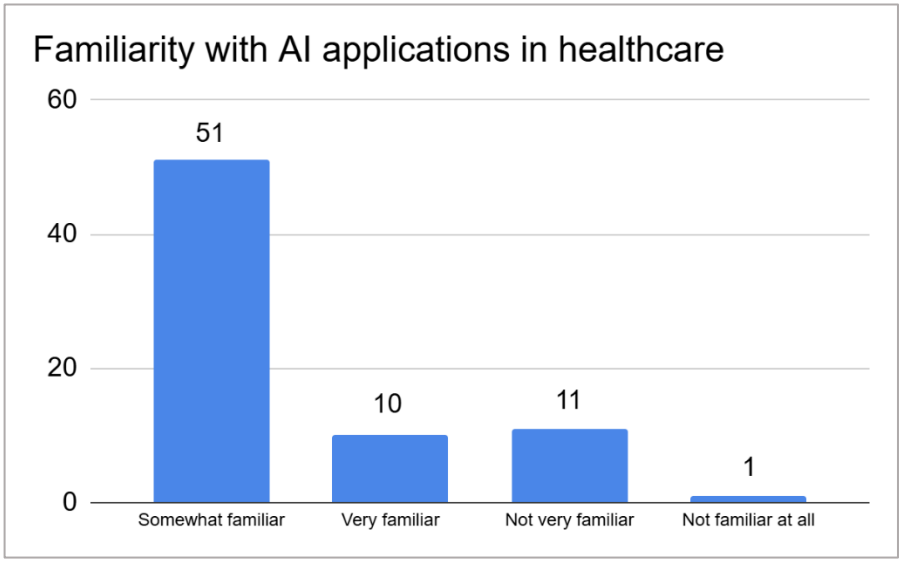


**Fig 4.3**

**Inferences:**

- Most doctors (51 out of 74) ie,73.3% are somewhat familiar with AI in healthcare, showing moderate awareness but room for deeper understanding.
- Only 10 (13.5%) doctors are very familiar, while 11(14.9%) doctors are not familiar with AI suggesting that knowledge of AI is still limited among the respondents.
- A small number 1 doctor (1.4%) is not familiar at all.

**Question 4: What are the biggest challenges you face in your daily medical practice?**

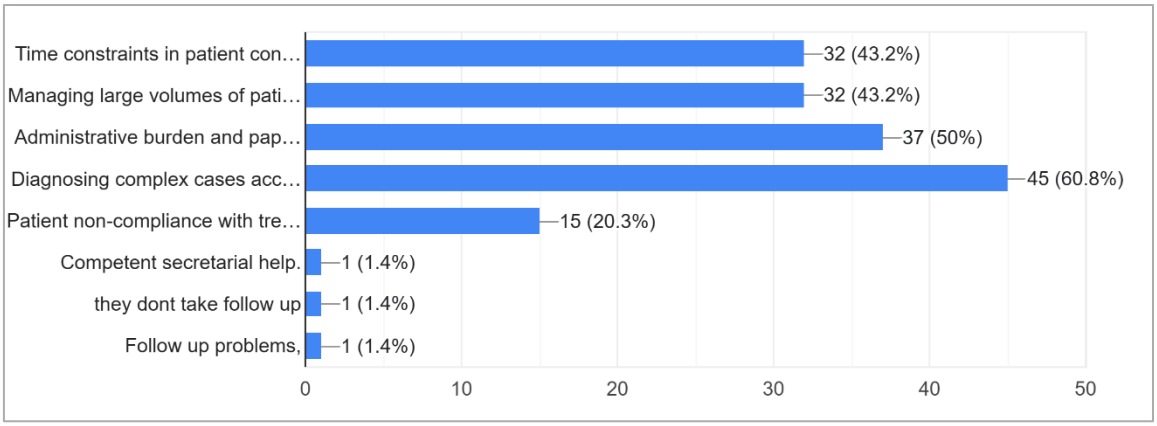


**Fig 4.4**

**Inferences:**

- Diagnosing complex cases accurately is the biggest challenge, reported by 60.8% of doctors.
- Administrative workload and paperwork is a major issue for 50% of respondents.
- Time constraints and handling large patient volumes are equally challenging, both reported by 43.2% of doctors.
- Patient non-compliance with treatment was noted by 20.3%, showing it's a significant but less common concern.
- A few doctors also mentioned minor issues like lack of follow-up, secretarial help, and follow-up problems, but these were rare (1.4% each).

**Question 5: Have you used any AI-based tools in your medical practice?**

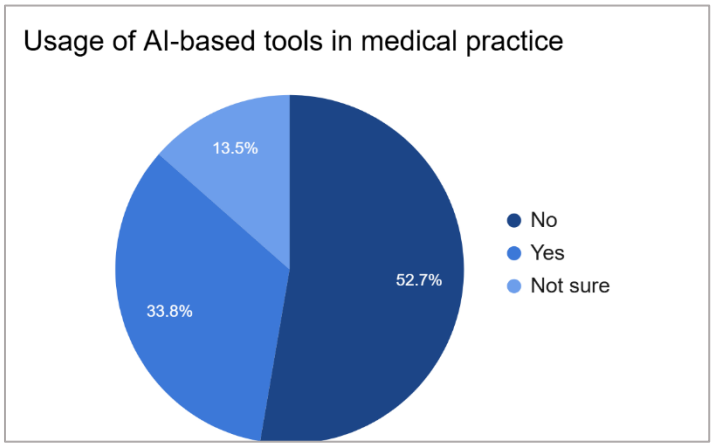


**Fig 4.5**

**Inferences:**

- More than half of the doctors (52.7%) have not used AI tools in their medical practice.
- Only 33.8% of doctors reported using AI tools
- 13.5% are unsure about whether they've used AI, which suggests a lack of awareness or clarity about AI-based technologies in clinical settings.

**Question 6: If yes, which AI applications have you used? (OPEN ENDED QUESTION)**

- Among the respondents who reported using AI-based tools in their medical practice, several mentioned a range of applications that assist in clinical tasks and information retrieval.
- Tools like **ChatGPT**, **Perplexity**, **Notebook LM**, **Google Gemini, DeepSeek** and **Grok** were commonly used.

**Question 7: For what purpose have you used AI based applications?**

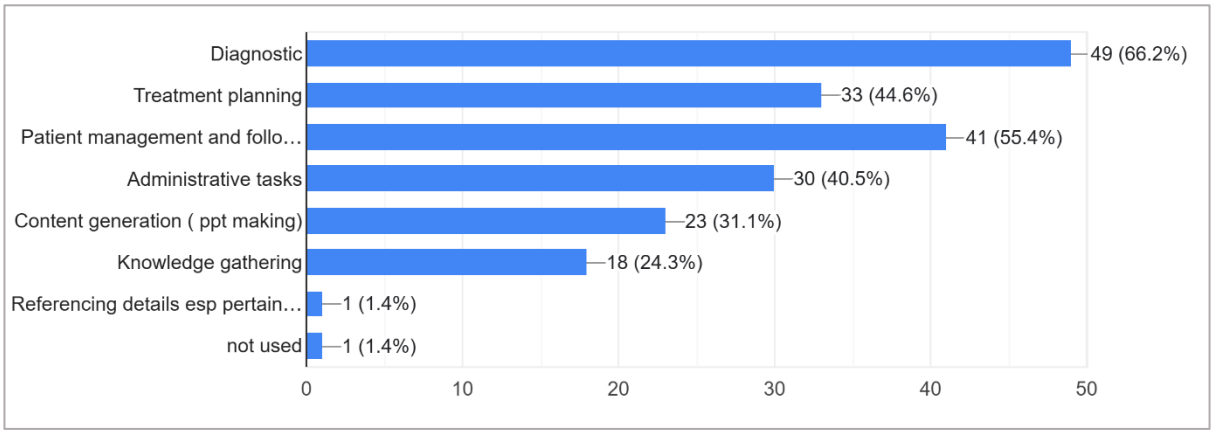


**Fig 4.6**

**Inferences:**

- Diagnostic support is the most common use of AI, with 66.2% of doctors using it for this purpose.
- Patient management and follow-up (55.4%) and treatment planning (44.6%) are also major areas where AI is applied.
- 40.5% of respondents use AI for administrative tasks, showing its role in reducing paperwork and routine burdens.
- 31.1% use AI for content generation such as making presentations or reports.
- 24.3% of doctors rely on AI for knowledge gathering, like staying updated on medical trends.
- Very few use AI for referencing (1.4%) or reported not using AI at all (1.4%), indicating widespread adoption in some form

**Question 8**: What type of AI training or support would you find most beneficial?

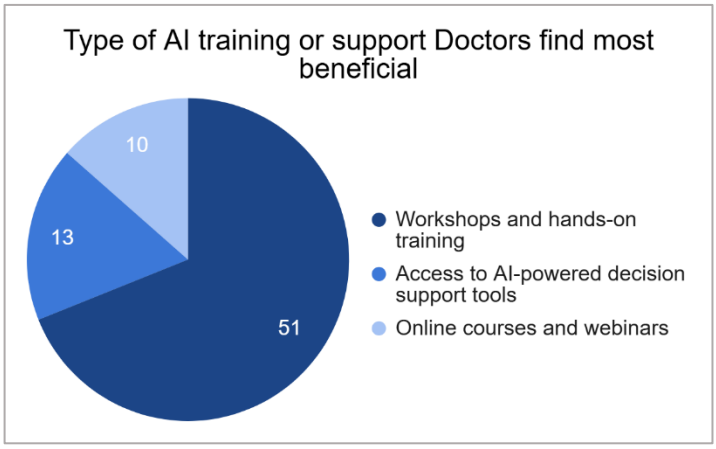


**Fig 4.7**

**Inferences:**

- The majority of doctors (51 respondents) prefer workshops and hands-on training, indicating a strong need for practical, real-time learning.
- 13 doctors find access to AI-powered decision support tools most useful, showing interest in tools that assist in clinical practice.
- 10 doctors selected online courses and webinars as beneficial, reflecting a preference for flexible, self-paced learning formats.

**Question 9: What recommendations do you have for improving AI adoption in healthcare? (OPEN ENDED QUESTION)**

- AI should support differential diagnosis and interpretation of ECG, ECHO, angiography, and X-rays.
- It should provide disease-specific information when symptoms or data are entered.
- AI can help reduce unnecessary tests and assist with clinical calculations.
- Doctors emphasized the need for hands-on training and increased awareness about AI tools.
- AI systems should be simple to use, thoroughly tested, and have a user-friendly interface.

## CHAPTER 5: DISCUSSIONS AND RECOMMENDATIONS

This study explored doctors' awareness, usage, and expectations of Artificial Intelligence (AI) in clinical practice. The results suggest that while many doctors are still in the early stages of using AI tools, there is a clear interest in adopting them. Most respondents were somewhat familiar with AI, and only a few were very familiar, showing a gap in deep knowledge and experience with such technologies.

Although over half of the doctors surveyed had not yet used AI tools in practice, a considerable number had begun exploring them. The most commonly used tools included ChatGPT, Grok, Perplexity, DeepSeek, Notebook LM, Google Gemini, and Dacon software. These were mainly used for quick access to medical information, content generation, clinical references, and support in decision-making. This early use shows that doctors are open to using AI, particularly for improving knowledge and efficiency.

The data also highlighted the main challenges faced by doctors, such as diagnosing complex cases, administrative workload, time limitations, and managing large patient volumes. These are areas where AI could provide significant support. Doctors also reported using AI in diagnosis, patient management, treatment planning, and administrative tasks, showing its wide-ranging potential in both clinical and non-clinical roles.

Doctors with 11–20 years of experience and those holding MD or DM degrees formed the majority of respondents. Their practical experience adds credibility to the feedback received. When asked about preferred training formats, most doctors favored hands-on workshops, along with access to user-friendly, well-tested tools and online courses. They also recommended that AI tools should assist in interpreting diagnostic reports like ECGs, ECHOs, angiographies, and X-rays, while also helping reduce unnecessary investigations and perform medical calculations.

Overall, the study reflects a growing interest in AI among clinicians, a willingness to adopt it, and a clear need for training, awareness, and better integration into routine clinical workflows. With proper support, AI can play a key role in improving healthcare delivery, decision-making, and patient outcomes.

## RECOMMENDATIONS

Based on the findings from the survey and the AI tools explored during this study, several recommendations can be made to improve healthcare delivery and address common challenges faced by doctors. The integration of selected AI tools into everyday clinical practice has the potential to significantly enhance diagnosis, treatment planning, and patient management.

Common challenges identified in the study included delayed diagnosis, poor patient follow-up, difficulties in managing medical records, and issues with medication adherence. To address these problems, AI-powered medical administration tools such as **DeepScribe**, **DeepMind**, **Augmedix**, and **Nabla** are suggested. These tools assist in converting voice conversations into clinical documentation, thereby reducing paperwork and allowing doctors to spend more time with their patients. For instance, DeepScribe automatically records and organizes doctor-patient conversations into structured medical notes, easing the administrative load.

For improving **patient medication adherence**, tools like **AiCure** and **SAED (Smartphone-Assisted Electronic Devices)** can be highly useful. AiCure uses facial recognition through a mobile app to confirm whether a patient has taken their medication, while SAED allows patients to log their meals, blood sugar levels, and insulin doses, along with sending reminders to take medications—particularly beneficial for chronic conditions like diabetes.

In the field of **diabetes management**, various AI models such as **Support Vector Machines (SVM)**, **Random Forest (RF)**, **Logistic Regression**, and **Deep Neural Networks (DNN)** can be implemented to predict the onset and progression of the disease. These models can identify high-risk patients and support early medical intervention.

To support **personalized treatment**, tools like **DreaMed Advisor Pro** and **camAPS FX** provide insulin dosage recommendations based on real-time glucose levels and meal inputs. These tools help patients and healthcare professionals maintain better control over blood sugar levels, reducing the risk of complications like hypoglycemia or hyperglycemia.

**Smart devices** such as **Dexcom**, **MiniMed**, and **FreeStyle Libre** are already widely used for continuous glucose monitoring. These devices collect real-time data and alert users when blood sugar levels approach dangerous thresholds. Their AI-driven features allow them to learn patterns and predict potential risks, supporting preventive care.

For **medical imaging**, AI can play a critical role in interpreting diagnostic tests such as ECGs, ECHOs, X-rays, and angiographies. Tools like those developed by **Tempus**, **Enlitic**, and **Butterfly Network** can assist radiologists and physicians by identifying subtle findings, reducing delays, and improving diagnostic accuracy—especially in complex or high-volume settings.

When it comes to **content creation and medical education**, Literature search tools like **Elicit, Perplexity and consensus**. Visual content generator like **Canva, beautiful.ai, Flourish.** For PPT Generation tools like **Decktopus, Gamma**. For Visual things and animation tools like, **Napkin, beautiful.ai and Pika** can support doctors and students in summarizing research papers, preparing presentations, and generating clear and accurate content. These tools are also valuable for patient education, making it easier to explain medical conditions using simplified visuals and summaries.

To ensure the successful adoption of these AI tools in clinical settings, it is strongly recommended that **hospitals and healthcare institutions conduct hands-on training sessions and workshops**. As highlighted throughout the report, tools must be **simple to use, thoroughly tested, and seamlessly integrated** into existing healthcare systems without adding to the clinician's workload. Proper awareness and capacity-building efforts are essential to build trust and confidence in using AI solutions effectively.

## CHAPTER 6: CONCLUSION

Artificial Intelligence is already making a meaningful impact in healthcare by supporting diagnosis, patient monitoring, treatment planning, and reducing the workload on medical professionals. Tools like ChatGPT, AiCure, FreeStyle Libre, and DeepScribe are actively being used for tasks such as drafting medical notes, tracking medications, and managing chronic conditions like diabetes. While some doctors have adopted these tools, many remain unfamiliar or hesitant about integrating them into daily practice.

As a suggestion to the company, we can consider developing an,

Integrated digital platform that brings all essential AI tools under one roof. Doctors have also expressed a clear need for AI tools that assist with diagnosis, generate PPTs, offer a user-friendly interface, analyze X-rays, maintain patient records, and help in predicting diseases This unified platform can offer AI-driven solutions for diagnosis support, patient engagement, medical documentation, and marketing intelligence. Partnering with established AI companies could accelerate this innovation and ensure quality outcomes.

Moreover, Company can invest in creating an AI tool based on Random Forest (RF) algorithms, which could serve multiple purposes:

- Analyze prescription patterns to identify key trends and optimize marketing efforts.
- Interpret ECG data to distinguish between normal and abnormal heartbeats, helping in early diagnosis of cardiac issues.
- Provide actionable insights to healthcare professionals to support decision-making and personalized treatment plans.

Moreover Organizing training and awareness programs for doctors and staff so they can learn how to use these AI tools in real life.

This combination of advanced technology and strategic innovation can position Mankind as a future-ready leader in digital healthcare transformation. By providing useful AI tools, Mankind can build **stronger relationships with doctors**, which often results in **higher prescription rates** and long-term brand loyalty. At the same time, the company can gain access to **real-time data**, helping marketing teams run **smarter, more focused campaigns** that improve efficiency and boost return on investment.

## CHAPTER 7: REFERENCES


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# ANNEXURE

**Section 1: General Information**

1. **Name _____**
2. **Specialty:**
    - MBBS
    - MD
    - DM
    - DNB
    - MS
    - MCH
    - OTHER
3. **Years of experience:**
    - 0-5 years
    - 6-10 years
    - 11-20 years
    - 20+ years
4. **How familiar are you with AI applications in healthcare?**
    - Very familiar – I use AI tools regularly
    - Somewhat familiar – I have basic knowledge
    - Not very familiar – I have heard about it but don't use it
    - Not familiar at all
5. **What are the biggest challenges you face in your daily medical practice? (Select all that apply)**
    - Time constraints in patient consultations.
    - Managing large volumes of patient data
    - Administrative burden and paperwork
    - Diagnosing complex cases accurately
    - Patient non-compliance with treatment
    - Other (please specify) _____

6. **Have you used any AI-based tools in your medical practice?**
    - Yes
    - No
    - Not sure

7. **If yes, which AI applications have you used? (OPEN ENDED QUESTION)**

8. **For what purpose have you used AI based applications?**
    - Diagnostic
    - Treatement planning
    - Patient management and follow up
    - Administrative tasks
    - Content generation ( ppt making)
    - Knowledge gathering
    - Other

9. **What type of AI training or support would you find most beneficial?**
    - Workshops and hands-on training
    - Online courses and webinars
    - Access to AI-powered decision support tools
    - Other (please specify) _____

10. **What recommendations do you have for improving AI adoption in healthcare? (OPEN ENDED QUESTION)**