

DISSERTATION TRAINING

At

Jivi.ai Gurgaon

Study/Project Title

Acceptance of Collaboration and Integration of AI in the Healthcare System by Healthcare Professionals

By

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UNDER THE GUIDANCE OF

Dr. Sukesh Bhardwaj

PGDM (Hospital and Health Management) 2022-2024



International Institute of Health Management Research New Delhi

ACKNOWLEDGEMENT

While we look back on the past three months, which have been incredibly busy and eventful, I would want to express our gratitude to everyone who has provided us with invaluable counsel and direction. This report would not have been possible without the support of those named below.

Firstly, we would like to thank IIHMR DELHI for giving us the chance to team up with Jivi.ai. I am extremely thankful to Dr. Gurukiran Tumma for believing in me and giving me the chance to work at Jivi.ai, as well as to my mentor, Ms. Divya Aggarwal, for all her hard work and diligent insights through these two years of IIHMR journey.

I want to sincerely thank everyone for their support, with a special thanks to Mr. Ankur Jain, the CEO, for his valuable insights and counseling. I want to thank our technical team members and lead, Ms. Ritu Saini, for providing me with the amazing chance to learn technical skills and be involved in the project itself. Both personally and professionally, this has been an amazing experience. The Clinical Team has worked hard to implement this new knowledge and information in the most efficient way possible and to enhance it even more to meet the career goals that have been set for us. Additionally, I want to express my gratitude to my clinical teammates for joining me on this wonderful trip.

ABBREVIATION

AI	Artificial Intelligence
Lab	Laboratory
Pharma	Pharmacy
LLM	Large Language Model
MedX	Medical Express
OpenAI	Open Artificial Intelligence

Figures, Tables, and Graphs

1. Medical/ healthcare professionals participating in the study
2. How long have they been practicing
3. Healthcare professionals' familiarity with the term AI
4. If they ever used AI in their practice
5. Benefits of AI in healthcare, according to practicing/working healthcare professionals.
6. Willingness to adopt AI in their practice
7. Accuracy of AI in healthcare
8. Factors influencing to adopt AI in their practice
9. Factors influencing not to adopt AI in their practice

About The Organization



Jivi.ai is a healthcare startup company founded by Mr. Ankur Jain, the former Chief Product Officer of Bharatpe. The main objective of the organization is to revolutionize primary healthcare through the utilization of artificial intelligence. Jivi AI uses massive language models, machine learning, generative AI, and digital health technologies to enhance healthcare accessibility and efficacy.

Since it was established in December 2023, the company has assembled an interdisciplinary team of experts and scholars from esteemed universities including Stanford, MIT, Harvard, and Yale. With intentions to expand its operations to the US, Jivi AI has already worked with more than 100 doctors, physicians, and hospitals, mostly in India.

The ultimate objective of Jivi AI is to enhance global healthcare outcomes for billions of people. To support its growth and development, the firm has acquired its first initial funding and is currently negotiating additional finance rounds.

Jivi's Large Language Model (LLM), Jivi MedX, achieves an average score of 91.65 across the nine benchmark categories on the leaderboard, surpassing well-known LLMs like OpenAI's GPT-4 and Google's Med-PaLM 2. Leading AI platform Hugging Face hosts the leaderboard, which rates LLMs with a focus on medicine based on how well they respond to questions about medicine from tests and studies.



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To whomsoever it may concern

This is to certify that **Dr. Amanpreet Kaur**, in partial fulfillment of the requirements for the award of the degree of MBA (Hospital and Health Management) from the IIMR, Delhi has completed her dissertation at **Jivi Health Private Limited** as an **Intern - Clinical Affairs** during **February 5, 2024** to **June 28, 2024**.

She has successfully carried out the study designed to her during internship training and her approach to the study has been sincere, scientific, and analytical.
We wish her all the best for future endeavors.

Sakshi Thapliyal
HR Manager
Jivi Health Private Limited

TO WHOMSOEVER IT MAY CONCERN

This is to certify that Dr. Amanpreet Kaur, student of PGDM (Hospital & Health Management) from International Institute of Health Management Research, New Delhi has undergone internship training at Jivi Healthcare from 05-02-24 to 28-06-24. The Candidate has successfully carried out the study designated to her during internship training and her approach to the study has been sincere, scientific and analytical.

I wish her all success in all her future endeavors.

Dr. Sumesh Kumar
Associate Dean, Academic and Student Affairs
IIHMR, New Delhi

Dr. Sukesh Bhardwaj
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Certificate of Approval

The following dissertation titled "Acceptance of Collaboration integration ^{in healthcare system}" at "Jivi Healthcare" is hereby approved as a certified study in management carried out and presented in a manner satisfactorily to warrant its acceptance as a prerequisite for the award of **PGDM (Hospital & Health Management)** for which it has been submitted. It is understood that by this approval the undersigned do not necessarily endorse or approve any statement made, opinion expressed, or conclusion drawn therein but approve the dissertation only for the purpose it is submitted.

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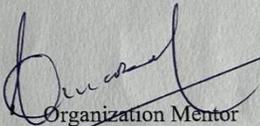
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CERTIFICATE BY SCHOLAR

This is to certify that the dissertation titled Acceptance of collaboration and integration of AI in health system by healthcare professionals, submitted by Dr. Amanpreet Kaur, PG/22/006 under the supervision of Dr. Sukesh Bhardwaj for award of PGDM (Hospital & Health Management) of the Institute carried out during the period from 05/02/2024 to 28/06/2024 embodies my original work and has not formed the basis for the award of any degree, diploma associate ship, fellowship, titles in this or any other Institute or other similar institution of higher learning.

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Abstract:

Artificial Intelligence (AI) in healthcare has the potential to transform clinical results, increase operational efficiencies, and revolutionize patient care.

However, the cooperation and acceptance of healthcare professionals are critical to the effective application of AI in healthcare. The factors impacting healthcare professionals' acceptance of AI, the possible advantages and difficulties of integrating AI, and the tactics to promote a cooperative environment for AI adoption in the healthcare system are all examined in this thesis.

The study uses a mixed-methods approach to get a thorough knowledge of healthcare professionals' opinions about AI by combining qualitative interviews with quantitative surveys. The results are intended to help technology developers, healthcare administrators, and legislators achieve a more seamless transition to a healthcare system enhanced by artificial intelligence.

Chapter 1: Introduction

1.1 Background

Artificial Intelligence (AI) is causing a rapid shift in the healthcare sector. AI technologies, such as robots, machine learning, and natural language processing, open up new avenues for the diagnosis, treatment, and management of medical disorders. It is widely used in
Nonetheless, the adoption and cooperation of medical professionals who are at the forefront of patient care are essential to the success of these technologies.

1.2 Research Problem

Even though AI has a lot to offer for the healthcare field, getting health personnel to accept it is still a major obstacle. The inclination of healthcare professionals to accept AI technologies can be influenced by a number of factors, including ethical issues, perceived threat to professional autonomy, faith in AI systems, and inadequate training. Comprehending these variables is crucial in formulating approaches that foster cooperation and acceptance of AI's integration into the healthcare system.

1.3 Research Objectives

- To observe the understanding of the term “Artificial Intelligence” among healthcare professionals.
- To explore healthcare professionals' attitudes towards AI technologies in healthcare setting.
- To explore potential benefits of AI in healthcare.
- To observe potential benefits and drawbacks of AI in healthcare.

1.4 Research Questions

- What are the main elements affecting the acceptance of AI by healthcare professionals?
- What are the advantages and difficulties that come with integrating AI in healthcare?
- What level of knowledge do healthcare workers now possess regarding AI?

1.5 Significance of the Study

For AI technologies to be successfully used in healthcare, it is essential to have a thorough understanding of the attitudes and opinions of healthcare professionals regarding AI, which is offered by this study. The results can help technology developers create an atmosphere that supports AI integration, which will ultimately improve patient care and healthcare outcomes.

Chapter 2: Literature Review

2.1 Role of AI in Healthcare

It focuses on six key areas: medical imaging and diagnostics, virtual patient care, medical research and drug discovery, patient engagement and compliance, rehabilitation, and administrative tasks. AI helps early diagnosis, keeps track of medical information, helps find new drugs, and lightens the labor of medical personnel. Given its advantages, integrating AI presents societal, ethical, and technical difficulties. Acceptance of AI in healthcare and patient safety depend on effective governance.

2.2 Trust in and Acceptance of Artificial Intelligence Applications in Medicine: Mixed Methods Study

It pinpoints elements impacting healthcare professionals' perceptions of and willingness to use AI. This study classifies 110 elements associated to trust and 77 factors related to acceptance into 19 umbrella factors across four categories: human-related, technology-related, ethical and legal, and extra considerations. It does this by quickly reviewing the literature and surveying stakeholders. According to stakeholders, the majority of criteria were extremely relevant. The research findings are meant to direct tactics for raising medical AI technology acceptability and confidence levels.

2.3 A Review of the Role of Artificial Intelligence in Healthcare

It is centered around six main areas: virtual patient care, medical research and drug discovery, medical imaging and diagnostics, patient engagement and compliance, rehabilitation, and administrative chores. AI facilitates medication research, streamlines medical records, improves early diagnosis, and lessens the workload of medical personnel. The integration of

AI is not without its hurdles, both ethically and socially, despite its benefits. Patient safety and acceptability of AI in healthcare depend on effective governance.

2.4 Artificial Intelligence in Medicine: Current Trends and Future Possibilities

It discusses how artificial intelligence is being used in healthcare, emphasizing developments in patient monitoring, treatment planning, and diagnosis. It talks about how AI can help with precision medicine, lower medical expenses, and improve patient outcomes. But there are obstacles like algorithmic bias, data privacy, and the requirement for regulations.

2.5 Ethical and Regulatory Challenges of AI Technologies in Healthcare

It highlights how important it is to have legal and ethical frameworks when AI is included into healthcare. In addition to addressing issues like patient permission, privacy, and bias in AI algorithms, it explores how AI may improve clinical outcomes, patient safety, and personalized treatment. To ensure the appropriate development and deployment of artificial intelligence (AI) in healthcare, the authors suggest a governance system that involves several stakeholders.

2.6 Exploring Perceptions of Healthcare Technologies Enabled by Artificial Intelligence

It is about people's opinion about AI in healthcare technology. The results indicate a somewhat receptive attitude towards artificial intelligence in healthcare, which is heavily impacted by technological and systemic trust. The loss of human connection, privacy, and transparency were major worries. The study highlights how receptivity to AI technology is influenced by demographic variables like age and work position and stresses the significance of fostering trust and addressing transparency in order to promote AI adoption.

2.7 The Role of AI in Hospitals and Clinics: Transforming Healthcare in the 21st Century

It gives an overview of how artificial intelligence (AI) is being incorporated into different areas of healthcare, including clinical decision-making, diagnostic accuracy, hospital operations, and patient monitoring through wearable devices and tele-medicine. The text delves into the ethical dilemmas around data privacy and algorithmic prejudice, emphasizing the need for interdisciplinary cooperation.

Chapter 3: Methodology

Research Design:

A cross-sectional mixed method study(Qualitative and Quantitative) was conducted among healthcare professionals.

Sample Selection:

Convenience sampling of healthcare professionals across diverse healthcare settings.

Data Collection:

Survey via google form (Annexture 1).

Sample size:

87 healthcare professionals

Chapter 4 : Results

The study was conducted on healthcare professionals including:

1. MBBS/MD- 14 professionals
2. Dentist- 22 professionals
3. Physiotherapists-6 professionals
4. AYUSH doctors-8 professionals
5. Other healthcare professionals (including: Radiology, lab, nursing, etc.)-37 professionals

Count of What medical field are you practicing in?

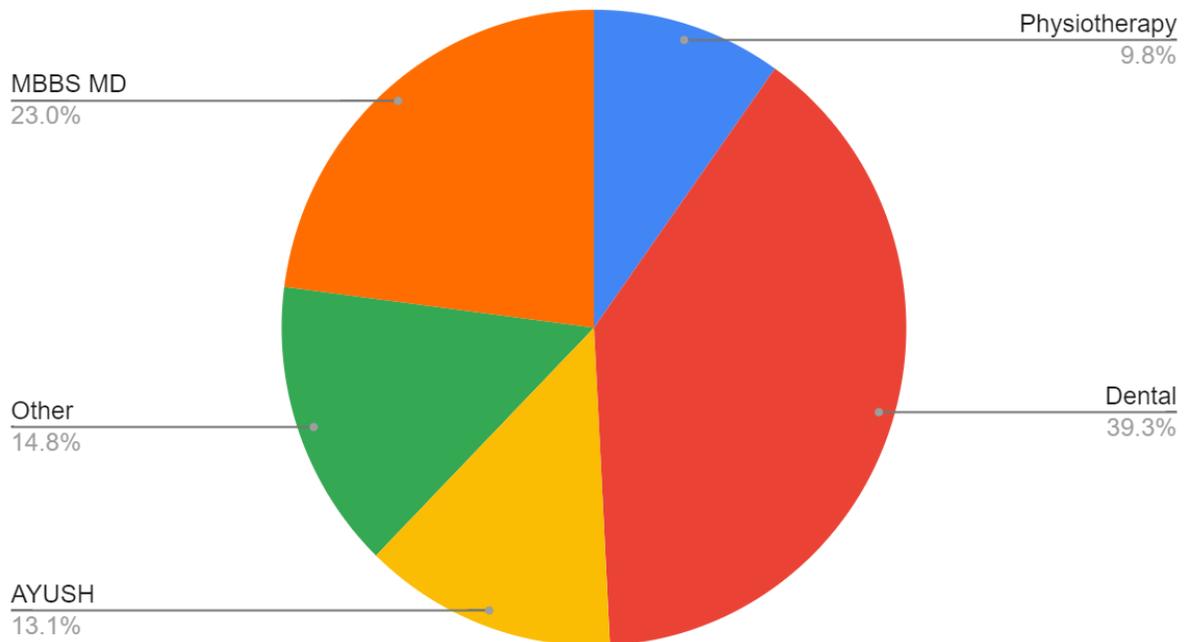


Fig.1

The participants of this study have practicing for:

- 0-2 years(40.6% of the participants)- 50 Healthcare professionals
- 2-5 years(37.5% of the participants)- 23 Healthcare professionals
- >5 years(21.9% of the participants)- 14 Healthcare professionals

Count of How long have you been practicing?

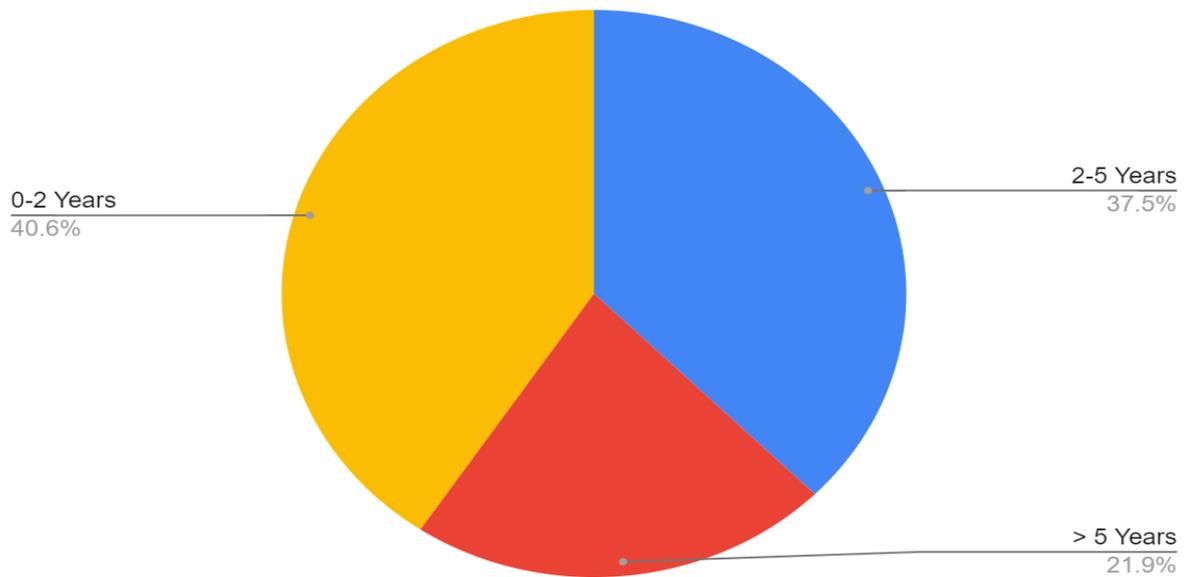


Fig.2

The results about healthcare professionals' familiarity with the term “Artificial Intelligence” shows that:

- 69.4% (43 professionals) of healthcare professionals are very familiar with the term.
- 30.6% (19 professionals) of healthcare professionals are somewhat familiar with the term.
- NO HEALTHCARE PROFESSIONAL WAS COMPLETELY UNAWARE OF THE TERM.

Count of Are you familiar with the term “Artificial Intelligence”?

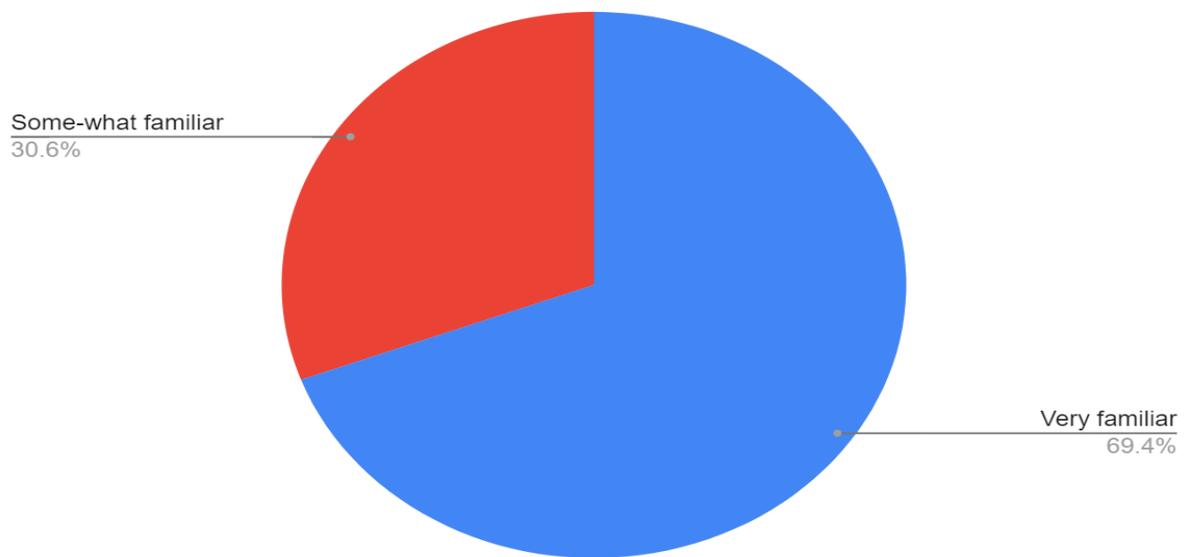


Fig.3

Using AI in their work/practice:

- 62.9% (21 professionals) Professionals never used AI in their practice
- 37.1% (37 professionals) have used AI in their practice.

Count of Have you ever used/do you use AI in your practice/work?

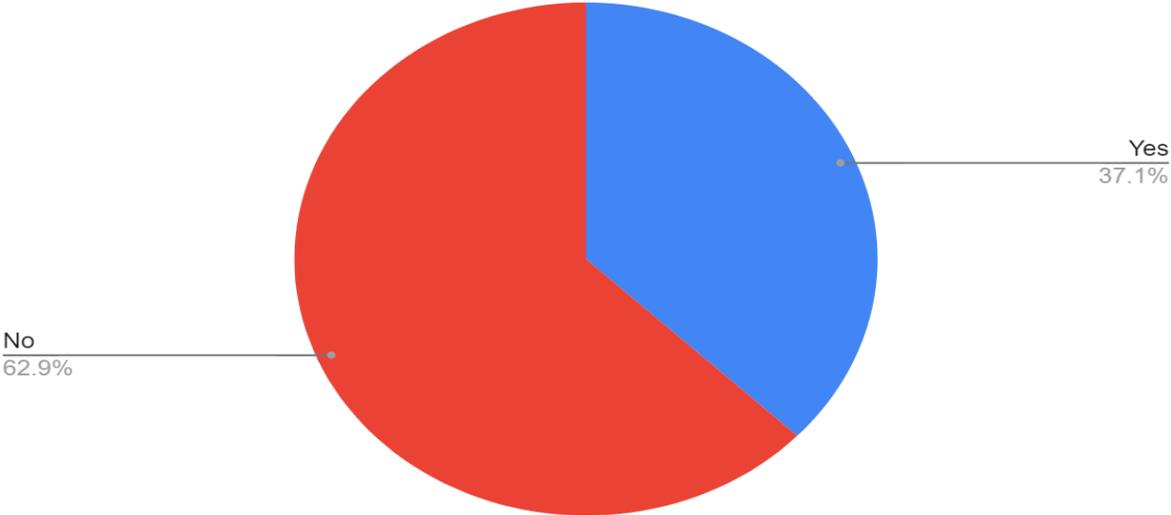


Fig.4

Benefits of Artificial intelligence in healthcare according to healthcare professionals

are:

- 38.7% professionals think it increases efficiency in administration related work.
- 37.1% professionals think it improves diagnostic accuracy.
- 3.2% professionals think it leads to better patient outcome.

Count of In your opinion, what are the potential benefits of AI in healthcare system?

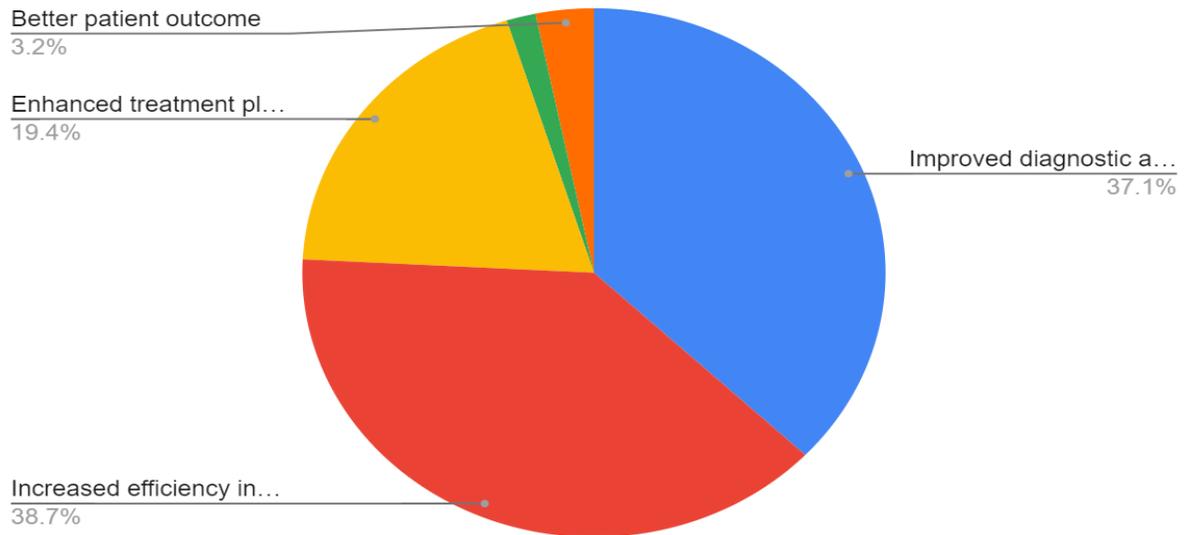


Fig.5

Willingness to adopt AI in their practice:

- 54.8% (21 professionals) healthcare professionals are somewhat willing to adopt AI in their practice.
- 43.5% (26 professionals) healthcare professionals are very willing to adopt AI in their practice.
- 1.6% (1 professional) healthcare professionals are not willing to adopt AI in their practice.
- This professional was from the field of AAYUSH

Count of Are you willing to adopt AI technology in your practice/work?

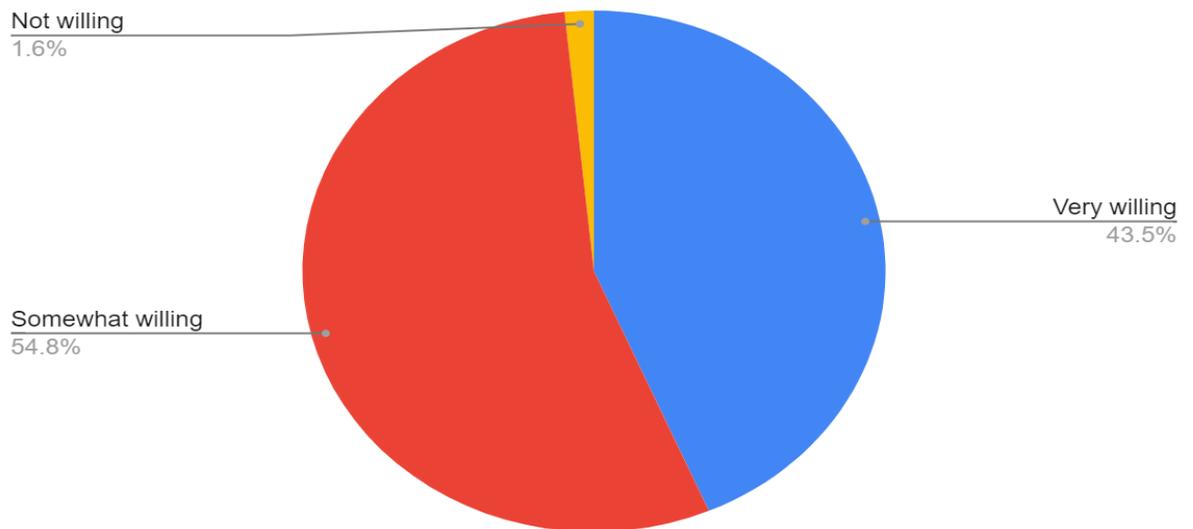


Fig.6

Accuracy of AI in healthcare:

- 66.1% professionals think that it is close to human intelligence but not good enough.
- 19.4% professionals think that it is as good as a human.
- 14.5% professionals think that it not even close to human intelligence.

Count of What do you think about the accuracy of AI in healthcare or with health-related concerns?

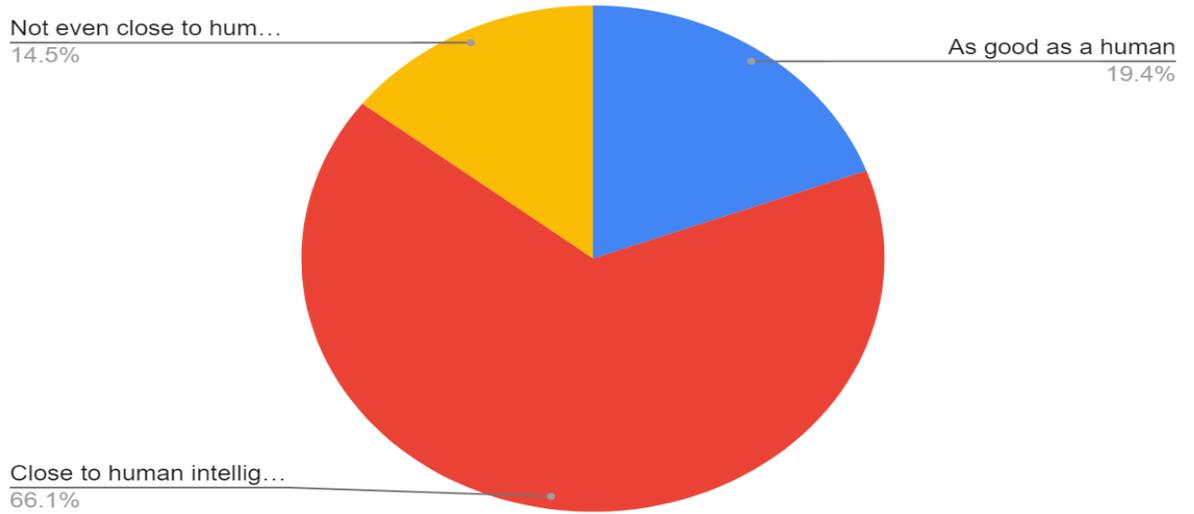


Fig.7

What influence their decision to adopt AI:

- 30.6% professionals are influence by its reliability and accuracy.
- 62.9% professionals are influence by ease that it provides in work flow.

Count of What factors influence your decision to adopt AI in your practice/work?

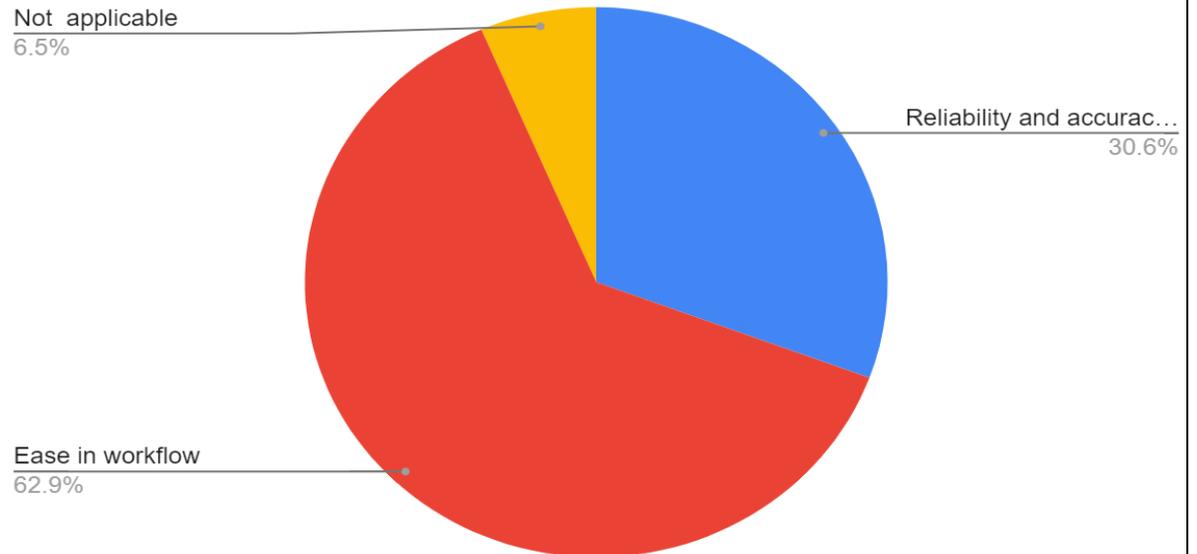


Fig.8

What influence their decision to not to adopt AI in healthcare:

- 32.3% professionals think that the human contact will be reduced.
- 30.6% professionals have doubts about its reliability and accuracy.
- 24.2% are concerned about legal and ethical considerations.

Count of What factors influence your decision to not adopt AI in your practice/work?

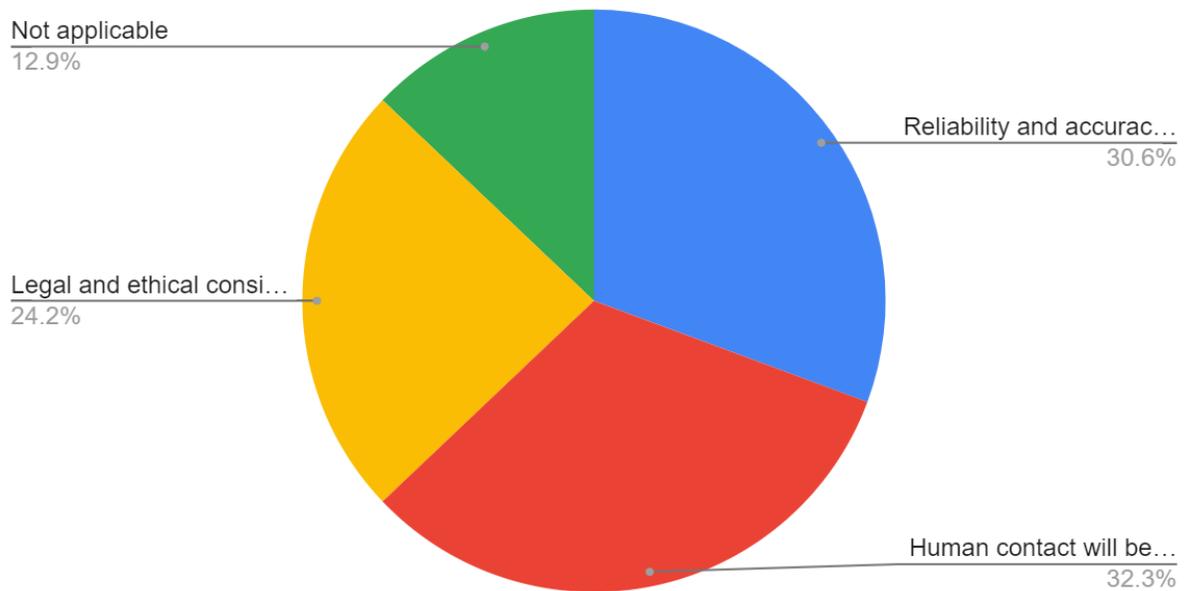


Fig.9

Chapter 5: Discussion

1. Awareness of healthcare professionals and its integration in healthcare system:

The word "Artificial Intelligence" is highly recognizable to the majority of healthcare workers surveyed, suggesting a high level of familiarity.

The fact that so many respondents are aware that AI is being utilized in healthcare highlights how AI technologies are becoming more and more integrated into medical procedures.

2. Willingness to Use Artificial Intelligence:

The responses of healthcare professionals ranged from "very willing" to "somewhat willing," indicating a high readiness to implement AI technology in their practice.

The decision to deploy AI is mostly influenced by the accuracy and dependability of AI systems as well as their potential to streamline operations.

Perceived Accuracy of AI: While some respondents think AI can match human professionals' accuracy, others think it can only come close to matching human intellect. This suggests a combination of cautious optimism and faith in AI's diagnostic abilities.

3. Issues and Obstacles to Adoption:

Dependability and Accuracy: Many respondents expressed concerns over the accuracy and dependability of AI systems, which may hinder their uptake.

Effect on Human Interaction: Concerned professionals believe that implementing AI could lead to a decrease in human interaction, a crucial component of patient care.

Chapter 6: Conclusion

1. AI's Role and Effects:

Healthcare is starting to recognize and use AI, which has a great deal of promise to increase the efficiency and accuracy of diagnosis.

According to the survey, healthcare professionals are generally open to implementing AI and have a high degree of awareness about it.

2. Positive Reaction but Exercise Caution:

Healthcare workers have valid concerns regarding the trustworthiness of AI and its potential to reduce human contact, despite the enthusiastic acceptance of the technology.

It is critical to address these issues by validating AI systems and making ongoing improvements to them.

3. Collaboration is Required:

AI developers and healthcare experts must continue to collaborate for the successful integration of AI in healthcare.

to guarantee that artificial intelligence (AI) technologies are created with high ethical standards and therapeutic demands in mind.

4. Future of AI:

AI is predicted to play an increasingly important role in healthcare as it develops, providing more advanced tools for patient care, diagnosis, and treatment planning.

For AI to be implemented successfully, healthcare personnel must get ongoing education and training on the technology.

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Annexture:

Questionnaire

- 1- Are you a practicing healthcare professional?
 - a. Yes
 - b. no
- 2- how long have you been practicing?
 - a. 0-2 years
 - b. 2-5 years
 - c. >5years
- 3- Are you familiar with the term “Artificial Intelligence”?
 - a. Very familiar
 - b. Some-what familiar
 - c. Not familiar at all
- 4- Are you aware of the fact that Artificial Intelligence is being used by healthcare professionals?
 - a. Yes
 - b. No
- 5- Have you ever used/do you use AI in your practice?
 - a. Yes
 - b. No
- 6- In your opinion, what are the potential benefits of AI in healthcare system?
 - a. Improved diagnostic accuracy
 - b. Enhanced treatment planning
 - c. Increased efficiency in administrative work
 - d. Better patient outcome
 - e. Others__
- 7- Are you willing to adopt AI technology in your practice?
 - a. Very willing
 - b. Somewhat willing
 - c. Not willing
- 8- What do you think about the accuracy of AI in healthcare or with health-related concerns?
 - a. As good as a human
 - b. Close to human intelligence but not enough
 - c. Not even close to human intelligence
- 9- What factors influence your decision to adopt AI in your practice?
 - a. Reliability and accuracy of AI
 - b. Ease in workflow
 - c. Supportive agent
 - d. Not applicable

10- What factors influence your decision to not adopt AI in your practice?

- a. Reliability and accuracy of AI
- b. Legal and ethical considerations
- c. Human contact will be reduced
- d. Not applicable

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