DISSERTATION TRAINING REPORT

At

Wadhwani AI

"Exploring Healthcare Professionals Perception and Acceptance of Artificial Intelligence in Healthcare: A Cross sectional Study."

By

Dr. Shivam Kalia
Enroll No. - PG/21/096

Under the guidance of
Dr. Sumant Swain

Post Graduate Diploma in Hospital and Health Management
2021-23

International Institute of Health Management Research
New Delhi

The certificate is awarded to

Dr. Shivam Kalia

in recognition of having successfully completed his
Internship at
eHealth -Wadhwani AI
and has successfully completed his Project on

"Exploring Healthcare Professionals Perception and Acceptance of Artificial Intelligence in Healthcare: A Cross sectional Study."
on
5th May 2023

from
Wadhwani AI

He comes across as a committed, sincere & diligent person who has a strong drive & zeal for learning.
We wish him all the best for future endeavors.

(Training & Development)

(Human Resources)

TO WHOMSOEVER IT MAY CONCERN

This is to certify that **Dr. Shivam Kalia** student of PGDM (Hospital & Health Management) from International Institute of Health Management Research, New Delhi has undergone internship training at **Wadhwani AI** from 6th February 2023 to 5th May 2023.

The Candidate has successfully carried out the study designated to him during internship.
training and his/her approach to the study has been sincere, scientific, and analytical.
The Internship is in fulfillment of the course requirements.
I wish him all success in all his/her future endeavors.

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

Dr. Suman Swain
Associate Professor
IIHMR, Delhi

Certificate of Approval

The following dissertation titled **"Exploring Healthcare Professionals Perception and Acceptance of Artificial Intelligence in Healthcare: A Cross-sectional Study"** at **"Wadhwani AI"** is hereby approved as a certified study in management carried out and presented in a manner satisfactory 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.

Dissertation Examination Committee for evaluation of the dissertation.

Name	Signature
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CERTIFICATE FROM DISSERTATION ADVISORY COMMITTEE

This is to certify that **Dr. Shivam Kalia**, a graduate student of the PGDM (Hospital & Health Management) has worked under our guidance and supervision. He is submitting this dissertation titled "**Exploring Healthcare Professionals Perception and Acceptance of Artificial Intelligence in Healthcare: A Cross sectional Study.**" at "**Wadhwani AI**" in partial fulfillment of the requirements for the award of the PGDM (Hospital & Health Management). This dissertation has the requisite standard and to the best of our knowledge no part of it has been reproduced from any other dissertation, monograph, report, or book.

Mentor
Dr. Sumant Swain
Assistant Professor
IIHMR, Delhi

CERTIFICATE BY SCHOLAR

This is to certify that the dissertation titled "*Exploring Healthcare Professionals Perception and Acceptance of Artificial Intelligence in Healthcare: A Cross sectional Study*.." and submitted by **Dr. Shivam Kalia** Enrollment No. **PG/21/096** under the supervision of **Dr Sumant Swain** for award of PGDM (Hospital & Health Management) of the Institute carried out during the period from **February 2023** to **May 2023** 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.

Signature
Dr. Shivam Kalia

FEEDBACK FORM

5-May-2023

To Whomsoever It May Concern

This is to certify that Shivam Kalia was associated with Artificial Intelligence Unit of National Entrepreneurship Network (hereon referred to as NEN-AI), Mumbai office from 6-February-2023 to 5-May-2023.

He was designated as a Business Analyst Intern, during his relieving. We wish him all the best in his future endeavors.

Best Regards,

Shekar Sivasubramanian
Chief Executive Officer

Dr Shivam Kalia

Dr Shivam Kalia

Date: 5th May 2023
Place: New Delhi

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Signature
Dr. Shivam Kalia

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ORGANIZATION PROFILE

Introduction:

Wadhwani AI is a pioneering organization at the forefront of artificial intelligence (AI) research and application, dedicated to harnessing the power of AI for social good. Founded in 2018 by Dr. Romesh Wadhwani, a prominent entrepreneur and philanthropist, Wadhwani AI strives to create AI-driven solutions to address some of the world's most pressing challenges.

Mission:

Wadhwani AI's mission is to develop and deploy AI technologies to transform and improve the lives of millions of people globally. By leveraging AI's potential, the organization aims to drive innovation, accelerate economic growth, and enhance human welfare across various domains, including healthcare, agriculture, education, and more.

Research and Innovation:

Wadhwani AI is committed to advancing the frontiers of AI research and development. Their team of world-class researchers, engineers, and data scientists collaboratively work on cutting-edge projects, exploring novel approaches and methodologies to tackle complex problems. Through interdisciplinary research and a strong focus on applied AI, Wadhwani AI aims to deliver practical and scalable solutions with real-world impact.

Areas of Focus:

Healthcare: Wadhwani AI envisions a future where AI revolutionizes healthcare delivery, making it more accessible, affordable, and effective. The organization works on projects such as AI-based disease diagnosis, drug discovery, personalized medicine, and healthcare analytics to improve patient outcomes and empower healthcare providers

Agriculture: Recognizing the crucial role of agriculture in global food security, Wadhwani AI focuses on developing AI-driven solutions to enhance agricultural productivity, optimize resource utilization, and mitigate risks. Their projects include crop yield prediction, pest and disease detection, precision farming, and supply chain optimization.

Education: Wadhwani AI believes in leveraging AI to revolutionize education, making it inclusive, personalized, and adaptive. Through initiatives like intelligent tutoring systems, educational content generation, and data-driven insights, the organization aims to improve learning outcomes, increase access to quality education, and bridge educational disparities.

Social Impact: Wadhwani AI actively engages in projects that address societal challenges, such as disaster response, poverty alleviation, and sustainable development. By harnessing the power of AI, they seek to create scalable solutions that empower communities, enable data-driven decision-making, and drive positive social change.

Partnerships and Collaborations:

Wadhwani AI understands the importance of collaboration in driving AI innovation. They actively foster partnerships with leading academic institutions, research organizations, government agencies, and industry stakeholders. By leveraging a global network of experts, Wadhwani AI promotes knowledge sharing, interdisciplinary collaborations, and the development of AI ecosystems worldwide.

"Exploring Healthcare Professionals Perception and Acceptance of Artificial Intelligence in Healthcare: A Cross sectional Study."

INTRODUCTION

Background:

Artificial intelligence (AI) has emerged as a transformative technology with the potential to revolutionize various industries, including healthcare. AI encompasses a range of technologies and algorithms that enable machines to simulate human intelligence, learn from data, and perform tasks traditionally requiring human intelligence. In the healthcare sector, AI holds tremendous promise in improving patient outcomes, enhancing efficiency, and transforming healthcare delivery.

The Indian healthcare system faces several challenges, including a large and diverse population, limited healthcare resources, and the need for cost-effective and accessible healthcare services. The integration of AI in Indian healthcare has the potential to address these challenges and improve healthcare delivery across the country. AI in healthcare can be applied in various areas, including medical imaging analysis, predictive analytics, electronic health records management, drug discovery, and virtual patient care. These applications have the potential to enhance diagnostic accuracy, enable personalized treatment plans, facilitate remote patient monitoring, and support healthcare decision-making processes. Despite the potential benefits, the adoption and acceptance of AI in Indian healthcare face several barriers and challenges. These include concerns about privacy and security, lack of trust in AI algorithms, ethical considerations, potential job displacement, regulatory and legal challenges, and the need for clear guidelines and frameworks for implementation. Understanding healthcare professionals' perceptions and acceptance of AI in Indian healthcare is crucial for successful integration and implementation. Healthcare professionals play a vital role in healthcare delivery and are key stakeholders in the adoption and use of AI technologies. Assessing their attitudes, beliefs, and barriers towards AI can provide valuable insights into the readiness and acceptance of AI in the Indian healthcare context. Moreover, by exploring the perspectives of healthcare professionals, we can identify the specific areas where AI can have the most significant impact and address the concerns and challenges, they may face. This understanding can inform the development of targeted strategies, policies, and interventions to facilitate the adoption and implementation of AI in Indian healthcare.

Therefore, the objective of this research study is twofold: to assess healthcare professionals' perceptions and acceptance of AI in Indian healthcare and to explore the barriers and challenges perceived by healthcare professionals in adopting AI technologies. By gaining insights into these aspects, we aim to contribute to the

knowledge base and provide recommendations for effective integration and utilization of AI in Indian healthcare.

In summary, the integration of AI in Indian healthcare holds immense potential to overcome challenges, improve healthcare delivery, and enhance patient outcomes. However, addressing the barriers and challenges perceived by healthcare professionals and understanding their perceptions and acceptance are crucial steps in realizing this potential. This research study aims to bridge this gap in knowledge and contribute to the successful implementation of AI in Indian healthcare, ultimately benefiting patients and healthcare providers across the country.

Aim:

The aim of this research study is to assess healthcare professionals' perceptions and acceptance of artificial intelligence (AI) in Indian healthcare, and to explore the barriers and challenges perceived by these professionals in adopting AI technologies.

Objective:

Primary objective

- To Assess healthcare professionals' perceptions and acceptance of artificial intelligence (AI) in Indian healthcare.

Secondary objective

- To explore barriers and challenges perceived by healthcare professionals in adopting AI technologies.

- Assessing Attitudes, Beliefs, and Barriers of healthcare professionals regarding AI in Healthcare.

Literature Review

Over the past few years, there has been a proliferation of academic research on the utilization of artificial intelligence (AI) in healthcare. While AI and its subsets have been extensively explored in fields such as marketing, social media, and finance, their application in the daily practice of clinical care remains insufficiently explored. Several literature reviews have shed light on different aspects of AI in the clinical domain, providing valuable insights into its potential, challenges, and implications.

Fritsch et al. (2021) conducted a study focusing on the attitudes and perceptions of German patients and their companions towards the use of AI in healthcare. Despite having limited knowledge about AI, the majority of participants expressed a positive outlook on its potential in healthcare. They emphasized the importance of physician supervision and ultimate responsibility when integrating AI technologies, highlighting the need to consider patient perspectives and concerns in the implementation process.

Chen et al. (2022) conducted a literature review and questionnaire-based study to assess the acceptance of clinical AI among physicians and medical students. The findings revealed that while awareness of clinical AI was relatively high, actual usage and knowledge of AI were limited among healthcare professionals. Approximately 38% of respondents were aware of clinical AI, but only 20% reported utility in their practice. Positive attitudes towards clinical AI were observed, but concerns about potential unpredictable and incorrect results were noted. The study highlighted the importance of collaboration between AI and healthcare professionals, emphasizing that AI should assist in clinical decision-making rather than replacing physicians.

Kansal et al. (2022) conducted a cross-sectional study to evaluate the knowledge and perspectives on the usage of AI among doctors and medical students in a developing country. The research involved hosting webinars to create awareness about AI in healthcare and surveying participants using a Likert scale to assess their knowledge and interest in AI. The results revealed that while the majority recognized the potential importance of AI in delivering healthcare services, they reported limited knowledge about its applications and limitations. Notably, medical students expressed greater interest in learning about AI compared to doctors, although they had less knowledge about its principles and applications. The study highlighted the need for formal training courses on AI in medical schools and hospitals to promote the dissemination of knowledge and called for further research to understand the perception and attitude of healthcare professionals towards AI.

Alia et al. (2023) conducted a systematic review of academic articles to examine the benefits, challenges, methodologies, and functionalities of AI in the healthcare sector.

The review initially considered a substantial sample of 1,988 academic articles, which were carefully reviewed and filtered down to 180 articles for full analysis. The findings demonstrated the significant potential of AI systems to improve the quality of healthcare services, particularly in areas such as early detection and diagnosis. AI was shown to outperform humans in terms of accuracy, efficiency, and timely execution of medical and administrative processes. The review also identified the benefits of AI-enabled healthcare for patients, including diagnosis, treatment, consultation, and self-management of chronic conditions. Additionally, the study identified several areas for future research, such as value-added healthcare services, security and privacy of patient data, health monitoring features, and innovative IT service delivery models utilizing AI.

Sabharwal, Miah, and Fosso Wamba (2022) conducted a systematic review that specifically focused on the application of AI in the clinical domain. Their unique approach utilized Latent Dirichlet Allocation topic modeling to gain insights into the existing literature on AI technologies in clinical care. The review encompassed 305 unique articles, of which 115 met the inclusion criteria based on the topic modeling approach. The review highlighted the potential of AI technologies to improve patient care in various areas, with a particular emphasis on disease management in clinics. The research also provided a proposal for future research directions, capabilities, and the impact of AI technologies in the clinical

METHODOLOGY

Research Design:
This study adopts a cross-sectional research design to explore healthcare professionals' perception and acceptance of artificial intelligence (AI) in healthcare. The cross-sectional approach allows for the collection of data at a specific point in time, providing insights into attitudes, beliefs, and barriers related to AI adoption in the healthcare sector.

Sampling:
The target population for this study consists of healthcare professionals in India. In this study, purposive sampling was employed to select participants who met specific criteria relevant to the research objectives, to recruit participants from various healthcare settings, including hospitals, clinics, and healthcare institutions.

Sample Size Estimation:
The sample size estimation was conducted using the estimated proportion formula:
n = (Z^2 * p * (1-p)) / E^2
To calculate a proportion with a 95% level of confidence and a margin of error of 7% we obtain

n = (1.96)2 / 4(0.07)2 = **196**
where:
n = required sample size
Z = Z-value (corresponding to the desired confidence level)
p = estimated proportion of healthcare professionals accepting AI in healthcare
E = desired margin of error

Given the practical constraints and resource limitations, the sample size for this study will be 137 participants. Although the estimated sample size based on the formula was calculated to be 196 participants, the decision to have a smaller sample size is justified by the following reasons:

Resource Constraints: Limited availability of time and financial resources for data collection and analysis.
Feasibility: Logistical challenges in reaching out to a larger number of healthcare professionals for participation.
Practical Considerations: Working within the limitations of the available population size in the target area.

Data Collection:

In this research study, data collection was conducted using a structured questionnaire consisting of 11 multiple-choice questions. The questionnaire was designed to gather specific information on healthcare professionals' perceptions and acceptance of artificial intelligence (AI) in Indian healthcare. The questionnaire was created using Google Forms, a user-friendly online survey platform that allowed for easy distribution and data collection.

Prior to data collection, ethical considerations were taken into account, and proper consent was obtained from all participants. The purpose of the study, the voluntary nature of participation, and the confidentiality of responses were clearly communicated to ensure informed consent.

The questionnaire was then circulated among the target population of healthcare professionals, including doctors, nurses, allied health professionals, hospital administrators, and public health professionals. The online format of the questionnaire facilitated easy accessibility and convenience for participants, allowing them to respond at their own pace and convenience.

The questionnaire comprised multiple-choice questions, which offered predefined response options for participants to choose from. This format enabled efficient data collection and streamlined the analysis process.

Data Analysis:

The collected data from the questionnaire were analyzed using a combination of descriptive analysis, frequency analysis, chi-square test, and regression analysis. Descriptive analysis was employed to summarize and describe the characteristics of the collected data. This included calculating measures such as means, standard deviations, and percentages to provide an overview of the respondents' demographics, perceptions, and familiarity with AI in healthcare.

Frequency analysis was conducted to examine the distribution and frequency of responses to the multiple-choice questions. This analysis helped identify the most common and prevalent perceptions, barriers, and attitudes towards AI in healthcare among the participants.

To explore the relationship between variables, chi-square tests were performed. This statistical test was used to assess the association between categorical variables, such as the relationship between healthcare roles and the perceived necessary factors for AI implementation.

Furthermore, regression analysis was employed to identify any significant predictors or factors influencing the willingness to incorporate AI in healthcare. This analysis allowed for the examination of the relationship between variables and provided insights into the factors that contribute to the acceptance and adoption of AI technologies.

The MS Excel software was utilized as the primary tool for data analysis. Its various functions, formulas, and statistical capabilities were leveraged to process and analyze the collected data. The utilization of these analytical approaches aimed to derive meaningful insights from the data, uncover patterns and relationships, and address the research objectives effectively.

Ethical Considerations:

The study will adhere to ethical guidelines and ensure the confidentiality and anonymity of participants. Informed consent will be obtained from each participant prior to their participation in the study. The data collected will be stored securely and used solely for research purposes.

Limitations:

The study's limitations include the smaller sample size of 137 participants, which may affect the generalizability of the findings to the larger population of healthcare

professionals in India. Additionally, the use of a convenience sampling method may introduce selection bias. These limitations will be acknowledged and discussed in the research findings.

RESULTS

Healthcare Role	Mean Age	AI familiarity level	Perceived necessary factor for AI Implementation	Positive perception towards AI	Willingness to incorporate AI	Common AI Application Encountered
Nurse	32 years	6.15	Clear guidelines	38%	76%	Computer vision for medical imaging analysis
Physician/Doctor	40 years	6.446	Lack of trust in AI algorithms	20%	30%	Machine learning algorithms for decision support
Allied health professional	34 years	5.86	Ethical considerations	40%.	65%	Chatbots or virtual assistants for patient interactions
Hospital administrator	32 years	6.125	Potential job displacement	85.71%	45%	Computer vision for medical imaging analysis
Public health professional	30 years	3.125	Privacy and security concerns	40%	35%	Predictive analytics for disease management

Table 1: Characteristics and Perceptions of Healthcare Professionals Towards AI Adoption

The results of the study showed variations in perceptions and willingness to incorporate AI among different healthcare roles. Nurses, with a mean age of 32 years, exhibited a positive perception towards AI in healthcare, with 76% expressing willingness to incorporate AI. Their familiarity with AI was moderate (AI familiarity level: 6.15), and they identified clear guidelines as a necessary factor for AI implementation. The common AI application encountered by nurses was computer vision for medical imaging analysis.

Physicians/doctors, with a mean age of 40 years, had a lower positive perception (20%) towards AI and a moderate level of willingness to incorporate AI (30%). Lack of trust in AI algorithms was identified as a significant barrier, and machine learning algorithms for decision support were the common AI applications encountered by physicians/doctors.

Allied health professionals, with a mean age of 34 years, expressed a positive perception towards AI in healthcare (40%) and a high level of willingness to incorporate AI (65%). Ethical considerations were identified as a necessary factor for AI implementation, and chatbots or virtual assistants for patient interactions were the common AI applications encountered by allied health professionals.

Hospital administrators, with a mean age of 32 years, showed a high level of willingness to incorporate AI (45%) but also expressed concerns about potential job displacement (85.71%). Computer vision for medical imaging analysis was the common AI application encountered by hospital administrators.

Public health professionals, with a mean age of 30 years, had a relatively lower positive perception towards AI (40%) and a moderate level of willingness to incorporate AI (35%). Privacy and security concerns were identified as a significant barrier, and predictive analytics for disease management were the common AI applications encountered by public health professionals.

These findings highlight the varying perceptions, concerns, and experiences of different healthcare roles regarding AI in healthcare. Understanding these differences can inform the development of targeted strategies and interventions to enhance the integration and acceptance of AI technologies in Indian healthcare.

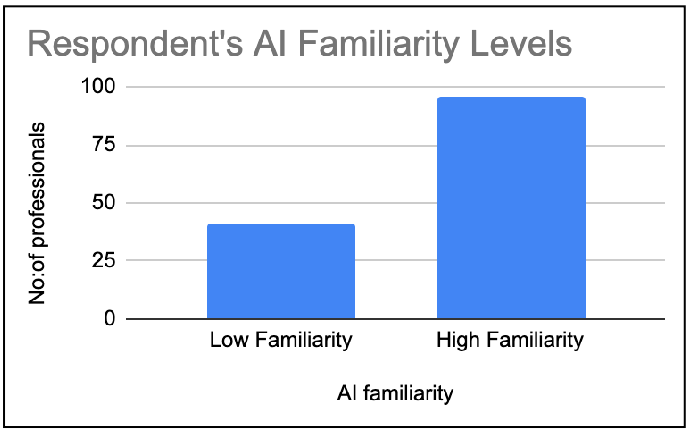

Figure 1: The data provided represents the familiarity levels of individuals with AI ranging between 1-10 out of 10.

The results indicate that among the healthcare professionals surveyed, a majority of 96 respondents (70.1%) reported a high level of familiarity with artificial intelligence (AI) in healthcare, rating their familiarity between 6 and 10 on a scale of 1 to 10. On the other hand, 41 respondents (29.9%) indicated a lower level of familiarity, ranging from 1 to 5 on the same scale.

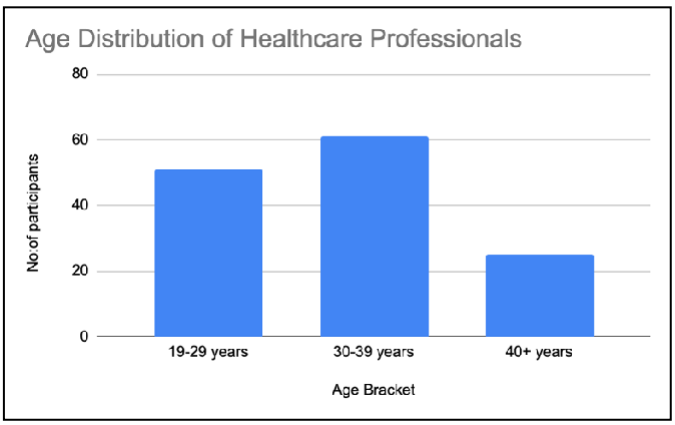

Figure 2: Graph shows the age distribution of healthcare professionals

The age distribution analysis of healthcare professionals participating in the study revealed that the majority of respondents were in the age range of 30-39 years, accounting for 61 individuals (44.5%). This was followed by 51 respondents (37.2%) in the age range of 19-29 years. The remaining 25 individuals (18.2%) were aged 40 years or above.

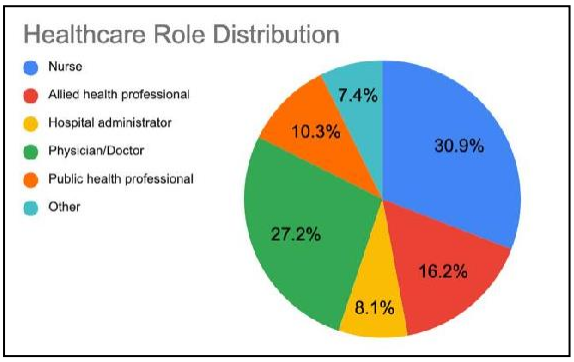

Figure 3: The Pie chart shows the %age distribution of healthcare roles of respondents.

The analysis of healthcare roles among the participants revealed a diverse representation of professionals in the study. Nurses constituted the largest proportion, accounting for 30.88% of the respondents. They were followed by physicians/doctors at 27.21% and allied health professionals at 16.18%. Public health professionals represented 10.29% of the participants, while hospital administrators accounted for 8.09%. The remaining 7.35% comprised professionals from other healthcare roles.

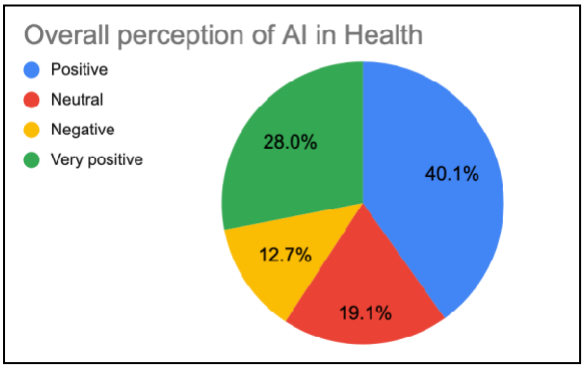

Figure 4: Pie chart shows frequency distribution of perceptions regarding AI in the healthcare domain among the surveyed individuals.

The analysis of perceptions regarding AI in healthcare revealed a range of responses among the participants. A total of 63 respondents (45.99%) expressed a positive perception of AI, indicating an optimistic outlook towards the integration of AI technologies in healthcare. Another 44 participants (32.12%) reported a very positive perception, highlighting a strong belief in the potential benefits of AI. However, a notable proportion of professionals held a neutral perception (21.90%) or a negative perception (14.60%) towards AI in healthcare.

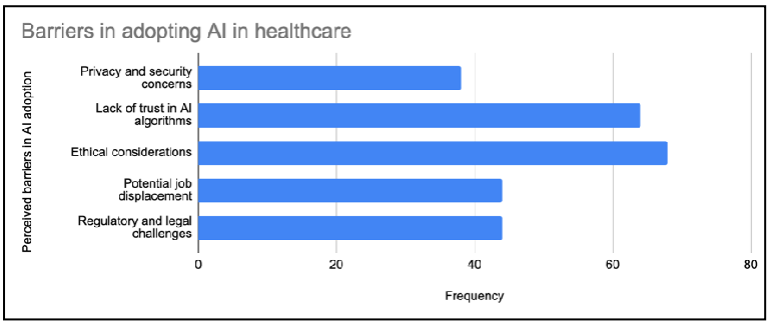

Figure 5: Bar graph shows the frequency of Perceived barriers to AI as per Healthcare professionals

The analysis of barriers to the adoption of AI in healthcare highlighted several key factors that were perceived as obstacles by healthcare professionals. Among the identified barriers, ethical considerations were reported by the highest number of respondents (68), emphasizing the importance of addressing ethical implications associated with AI implementation. Privacy and security concerns were also significant, with 38 participants expressing apprehensions regarding the protection of patient data. Lack of trust in AI algorithms (64), potential job displacement (44), and regulatory and legal challenges (44) were additional barriers identified.

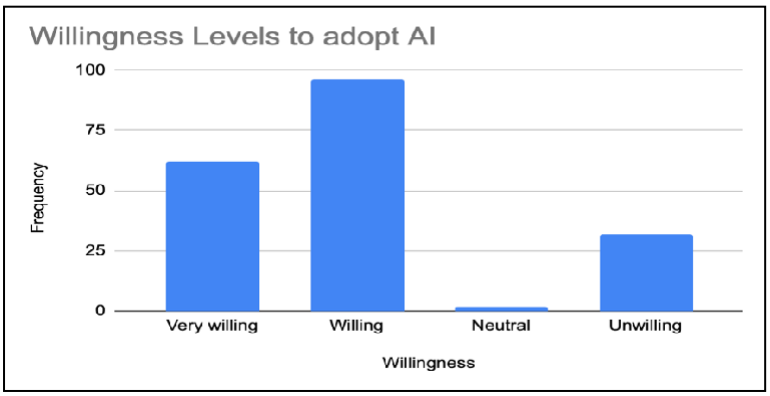

Figure 6: Bar graph shows the willingness level of healthcare professionals to adopt AI

The analysis of adoption willingness among healthcare professionals showed a predominantly positive attitude towards incorporating AI technologies. A majority of respondents (62) expressed being "very willing" to adopt AI, while 96 respondents indicated their willingness to adopt AI. A small number of participants reported a neutral stance (2), and 32 respondents expressed an unwillingness to adopt AI.

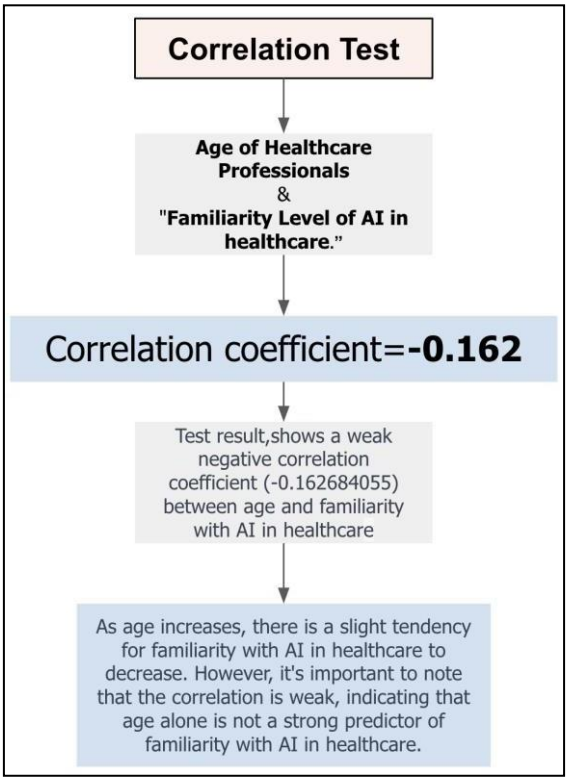

Figure 7: Correlation Test

The correlation analysis revealed a weak negative correlation (-0.16) between age and familiarity with AI in healthcare among the surveyed healthcare professionals. This suggests that as age increases, there is a slight tendency for familiarity with AI to decrease. However, the strength of this correlation is relatively weak, indicating that age alone is not a strong predictor of familiarity with AI in healthcare.

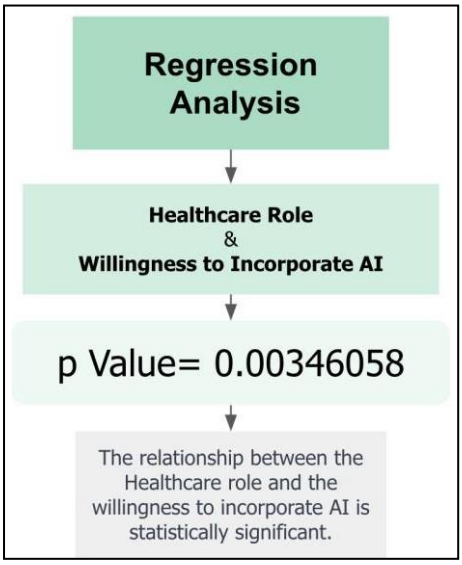

Figure 8: Regression Analysis

The regression analysis examined the relationship between healthcare roles and willingness to incorporate AI technologies. The results indicated a statistically significant relationship ($p < 0.05$) between the primary healthcare role and the willingness to incorporate AI.

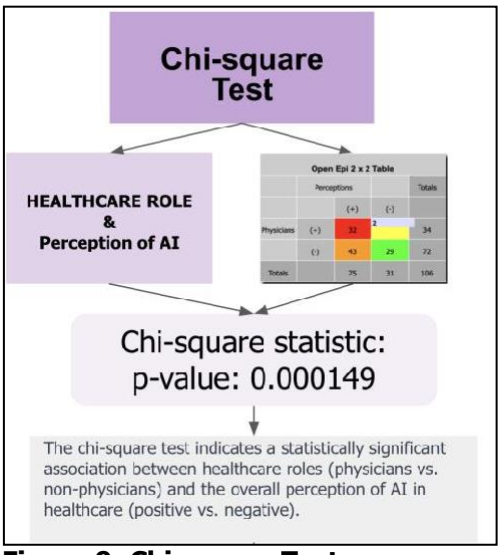

Figure 9: Chi-square Test

The chi-square test revealed a significant association ($p < 0.001$) between healthcare roles (physicians vs. non-physicians) and the overall perception of AI in healthcare. The test results indicate that healthcare roles and the perception of AI are not independent variables. This suggests that healthcare professionals' roles have an influence on their overall perception of AI in healthcare.

Discussion

Our study aimed to assess the perceptions and acceptance of artificial intelligence (AI) in Indian healthcare among healthcare professionals and explore the barriers and challenges perceived by these professionals in adopting AI technologies. The quantitative results provide valuable insights into these objectives.

The descriptive test results provide valuable insights into the perceptions, attitudes, and characteristics of healthcare professionals regarding artificial intelligence (AI) in Indian healthcare.

The distribution of healthcare professionals by role indicates that nurses represent the largest proportion (30.88%), followed by physicians/doctors (27.21%), allied health professionals (16.18%), public health professionals (10.29%), hospital administrators (8.09%), and others (7.35%). This diversity in roles highlights the importance of considering the perspectives and needs of various healthcare professionals when implementing AI technologies.

The age distribution of healthcare professionals shows that the majority fall within the age ranges of 19-29 years and 30-39 years, accounting for 74.45% of the respondents. This indicates that younger professionals may have greater exposure to and familiarity with AI technologies, which can potentially influence their perceptions and acceptance.

Regarding familiarity with AI, the results indicate that a significant proportion of respondents (41 out of 137) reported low familiarity levels (1-5 out of 10), while the majority (96 out of 137) expressed high familiarity levels (6-10 out of 10). This suggests a reasonable understanding of AI among the participants, although there is room for improvement in enhancing familiarity among those with lower scores.

The perception of AI in healthcare shows a positive trend, with 63 respondents expressing a positive perception, 30 having a neutral perception, and 20 holding a negative perception. Additionally, 44 respondents reported a very positive perception. These findings indicate an overall favorable view of AI technologies in the Indian healthcare sector, although there is a need to address the concerns and reservations of those with neutral or negative perceptions.

When examining the barriers to AI adoption, privacy and security concerns were reported by 38 respondents, followed by lack of trust in AI algorithms (64 respondents), ethical considerations (68 respondents), potential job displacement (44 respondents), and regulatory and legal challenges (44 respondents). These barriers highlight the need for comprehensive strategies that address privacy, trust, ethics, workforce implications, and regulatory frameworks to facilitate the smooth integration of AI in healthcare.

The adoption willingness of healthcare professionals reveals a positive inclination, with 62 respondents indicating being very willing to incorporate AI and 96 respondents expressing willingness. Only two respondents had a neutral stance, while 32 respondents reported being unwilling. These findings suggest a general openness and willingness among the healthcare professionals to embrace AI technologies, albeit with some variations in the degree of willingness.

Overall, the descriptive test results provide valuable insights into the perceptions, attitudes, and characteristics of healthcare professionals regarding AI in Indian healthcare. These findings contribute to the understanding of the current landscape and can guide the development of targeted interventions and strategies to address barriers, enhance familiarity, promote positive perceptions, and facilitate the successful adoption and integration of AI technologies in healthcare settings.

The analysis of our data revealed several interesting findings that can contribute to the discussion of our research study. Firstly, there was a weak negative correlation (-0.16) between age and familiarity with AI in healthcare. This suggests that as age increases, there tends to be a slight decrease in familiarity with AI, although the relationship is not strong.

Additionally, our regression analysis showed a statistically significant relationship between primary healthcare role and willingness to incorporate AI. The coefficient of -0.199 indicates that as the healthcare role moves from being a physician to a non-physician, the willingness to incorporate AI decreases. This finding highlights the importance of considering the specific roles and perspectives of healthcare professionals when implementing AI technologies in healthcare settings.

Furthermore, the chi-square test revealed a statistically significant association between healthcare roles (physicians vs. non-physicians) and the overall perception of AI in healthcare. This indicates that there are notable differences in the perception of AI between physicians and non-physicians. Understanding and addressing these differences can help in developing targeted strategies to enhance the acceptance and integration of AI in healthcare.

These results provide valuable insights into the factors influencing familiarity, willingness, and perception of AI among healthcare professionals. The weak negative correlation with age suggests the need for targeted educational initiatives to increase familiarity with AI technologies, particularly among older healthcare professionals. The significant relationship between healthcare role and willingness to incorporate AI emphasizes the importance of tailoring implementation strategies based on the specific roles and perspectives within the healthcare workforce.

It is crucial to recognize the potential implications of these findings for the successful integration of AI in Indian healthcare. Strategies should be devised to address the concerns and reservations of healthcare professionals, particularly in terms of trust, ethical considerations, privacy, and clear guidelines. Education and awareness programs should be developed to promote the benefits and potential applications of AI in healthcare and to bridge the gap between positive and negative perceptions.

Overall, the results of our analysis highlight the complexity of adopting AI technologies in healthcare and the need for a comprehensive approach that considers the diverse perspectives and concerns of healthcare professionals. By addressing these factors and tailoring strategies accordingly, we can foster a favorable environment for the successful implementation and utilization of AI in Indian healthcare, ultimately leading to improved patient care and healthcare outcomes.

Conclusion

In conclusion, our meticulous study delved into the multifaceted perspectives of healthcare professionals on the integration of artificial intelligence (AI) in Indian healthcare. The participants, including nurses, physicians, allied health professionals, hospital administrators, and public health experts, provided valuable insights into their perceptions and acceptance of AI technologies.

The findings revealed a generally positive perception among healthcare professionals regarding the potential of AI to revolutionize patient care. The majority of professionals exhibited a positive outlook, recognizing the transformative capabilities of AI in improving healthcare outcomes. This optimistic view highlights the growing acceptance and openness towards incorporating AI in the Indian healthcare sector.

However, it is important to acknowledge the existence of reservations and concerns expressed by a notable portion of professionals. These reservations emphasize the need for ongoing education and awareness-building initiatives to promote a better understanding of AI technologies and their potential benefits in healthcare. Addressing the knowledge gaps and misconceptions surrounding AI can help build trust and confidence among professionals, fostering a more conducive environment for AI adoption.

Our analysis also identified several barriers and challenges perceived by healthcare professionals in adopting AI. Lack of trust in AI algorithms emerged as a significant barrier, with professionals expressing concerns regarding the reliability and accuracy of AI systems. Ethical considerations, privacy and security apprehensions, potential job displacement, and regulatory challenges were also highlighted as substantial hurdles. Overcoming these barriers is crucial to create an environment that fosters trust, safeguards patient data, and ensures ethical AI practices.

Despite these challenges, the willingness to incorporate AI technologies among healthcare professionals is promising. Professionals from different roles, such as nurses, allied health professionals, and hospital administrators, expressed varying levels of willingness to embrace AI. This willingness demonstrates the potential for successful integration of AI in healthcare, provided that the identified barriers are effectively addressed.

Furthermore, our study identified the specific AI applications encountered by healthcare professionals. Computer vision for medical imaging analysis, machine learning algorithms for decision support, and chatbots or virtual assistants for patient interactions were among the common AI applications mentioned. These insights can guide future implementation strategies and highlight areas where AI can have the most significant impact in healthcare settings.

In conclusion, our study aimed to assess healthcare professionals' perceptions and acceptance of AI in Indian healthcare. The findings highlight the overall positive outlook towards AI technologies, the need for ongoing education and awareness, the identified barriers and challenges, and the specific AI applications encountered in

healthcare. By acknowledging and addressing these findings, healthcare organizations and policymakers can effectively harness the potential of AI to improve patient care, enhance healthcare outcomes, and drive advancements in the Indian healthcare system.

Instrumentation

Data collection was conducted using this structured questionnaire consisting of 11 multiple-choice questions. The questionnaire was designed to gather specific information on healthcare professionals' perceptions and acceptance of artificial intelligence (AI) in Indian healthcare

1. What is your primary healthcare role?
a) Physician/Doctor
b) Nurse
c) Allied health professional
d) Public health professional
e) Hospital administrator
f) Other (specify)

2. How familiar are you with artificial intelligence (AI) in healthcare? (Scale of 1-10)

3. Rate your overall perception of AI in healthcare:
a) Very positive
b) Positive
c) Neutral
d) Negative
e) Very negative

4. Benefits of AI in healthcare: (Select all that apply)
a) Improved diagnostic accuracy
b) Enhanced treatment planning
c) Streamlined administrative tasks
d) Increased efficiency in healthcare delivery
e) Personalized patient care
f) Other (specify)

5. Barriers in adopting AI in healthcare: (Select all that apply)
a) Privacy and security concerns
b) Ethical considerations
c) Potential job displacement
d) Lack of trust in AI algorithms
e) Regulatory and legal challenges
f) Other (specify)

6. Willingness to incorporate AI tools/technologies in daily healthcare practice:
a) Very willing
b) Willing
c) Neutral

d) Unwilling
e) Very unwilling

7. Level of training/education received regarding AI in healthcare:
a) Extensive training
b) Some training
c) Limited training
d) No training

8. Have you witnessed or experienced positive impacts of AI on patient outcomes?
a) Yes
b) No

9. Influence of external factors (e.g., media, professional networks) on perception of AI in healthcare:
a) Very influential
b) Influential
c) Somewhat influential
d) Not influential

10. Factors necessary for successful implementation of AI in healthcare: (Select all that apply)
a) Availability of quality data for AI analysis
b) Clear guidelines and regulations
c) Trust and confidence in AI algorithms
d) Sufficient training and education for healthcare professionals
e) Collaborative networks and partnerships

11. Specific AI applications/technologies encountered or used in healthcare practice: (Select all that apply)
a) Natural language processing for data analysis
b) Machine learning algorithms for clinical decision support
c) Computer vision for medical imaging analysis
d) Chatbots or virtual assistants for patient interactions
e) Predictive analytics for disease management
f) Other (specify)

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Annexure

Consent Form

Title: Exploring Healthcare Professionals' Perception and Acceptance of Artificial Intelligence in Healthcare: Assessing Attitudes, Beliefs, and Barriers.

Principal Investigator: Dr. Shivam Kalia
Affiliation: IIHMR and Wadhwani AI

Dear Participant,

You are invited to participate in a research study conducted by Dr. Shivam Kalia from IIHMR and Wadhwani AI. The purpose of this study is to explore healthcare professionals' perception and acceptance of artificial intelligence (AI) in healthcare. By participating in this study, you will contribute to the understanding of how healthcare professionals perceive and accept AI, as well as the potential barriers and benefits associated with its implementation.

Please read the following information carefully before deciding whether or not to participate in this study:

Study Procedures:
You will be asked to complete a questionnaire consisting of multiple-choice questions related to your healthcare role, familiarity with AI, perceptions of AI in healthcare, benefits, barriers, willingness to adopt AI, training, witnessed impact, influence of external factors, and key factors for successful AI implementation. Your responses will be anonymous, and no personally identifiable information will be collected.

Voluntary Participation:
Participation in this study is entirely voluntary.
You have the right to refuse to participate or withdraw from the study at any time without penalty or loss of benefits.
Confidentiality:

Your participation and responses will be kept strictly confidential.
Data collected will be securely stored and accessible only to the research team.
Data will be reported in aggregate form, ensuring participant anonymity.
Data Use and Publication:

The information collected may be used for research purposes, including publication in academic journals or presentation at conferences.
Any information published will be presented in a way that ensures participant anonymity.

By proceeding to the questionnaire, you indicate your voluntary agreement to participate in this study.

If you have any questions or concerns about this study, please contact Dr. Shivam Kalia at drshivamkalia@gmail.com

Thank you for your participation.

Sincerely,
Dr. Shivam Kalia
Principal Investigator
By clicking "Proceed" below, you indicate that you have read and understood the information provided and voluntarily agree to participate in this study.

[Proceed] [Decline]

Shivam kalia D

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