

ETHICAL CONSIDERATIONS AND CHALLENGES ASSOCIATED WITH IMPLEMENTATION OF ARTIFICIAL INTELLIGENCE IN INDIAN HEALTHCARE SECTOR

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By

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Under the Supervision and Guidance of

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3. Date of Joining the Internship/Dissertation: *22/4/24*
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DECLARATION BY STUDENT

I hereby declare that this dissertation titled is the “**Ethical considerations and Challenges associated with Implementation of Artificial Intelligence in Indian Healthcare Sector**” Bonafede record of my original research work. I declare that it has not been submitted to any other university or institution for the award of any degree or diploma. Information derived from the published or unpublished work of others has been duly acknowledged in the text.



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CERTIFICATE

This is to certify that dissertation titled **“Ethical Considerations and Challenges Associated with Implementation of Artificial Intelligence in Indian Healthcare Sector”** is a record of the research work undertaken by **Dr. Sanya Kawatra**, in partial fulfilment of the requirements for the award of the degree of MBA (Hospital and Health Management) from the IIHMR University, Jaipur, under my guidance and supervision and ~~his~~her approach to the research study has been sincere, scientific, and analytical.

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Sincerely,

Dr. Sanya Kawatra

ABSTRACT

The use of Artificial Intelligence and Machine Learning in our daily lives have shown a rapid increase in the past recent years, and without a doubt, it is increasing still. AI has impacted so many sectors globally, including one of the most important sectors, Healthcare.

AI is revolutionizing the Healthcare Industry on a global level. From enhancing diagnostic techniques to streamlining healthcare operations and robotic surgeries, AI has been implemented in all. Similar is the case for the Indian Healthcare Sector.

The increasing use of AI has raised concerns about the Ethical issues which has led to multiple obstructions in the implementation of AI in the Indian Healthcare Sector.

This thesis is a Literature Review of such published articles which have assessed the effects of introducing AI in Healthcare sector of India and talks about the various hurdles that stand in the implementation of the same.

Objective:

The study objective is to identify the ethical issues, challenges and recommend solutions, in relevance to the implementation of AI in Indian Healthcare sector.

Review of Literature:

A review of existing literature (Published articles, guidelines and laws) was conducted to understand implications of AI in healthcare, exclusively for India.

Methodology:

This research has been conducted as a desk study and it relies on secondary data obtained from various sources such as published articles and papers collected from Search engines, guidelines established by governing bodies etc, it was also made sure that all sources have a good credibility. An inclusion and exclusion criteria was also followed for the selection of relevant data. The data was then categorized in points in relevance to the issues and challenges and analyzed aligning with the objectives of the study.

Results:

The key results of this research highlight several critical challenges and ethical concerns in implementing AI technologies in the Indian healthcare sector including data privacy and security risks, algorithmic biases, and the need for transparency in AI decision-

making processes. Practical challenges such as regulatory constraints, resistance from healthcare professionals, and a lack of digital literacy were also prominent. Despite these barriers, the findings suggest that robust regulatory frameworks like DISHA and the Personal Data Protection Bill can address many ethical concerns. Strategies such as diverse training datasets and regular algorithm audits can mitigate biases, while transparency in AI operations can build trust among stakeholders. Moreover, fostering collaboration between AI developers, healthcare providers, and policymakers, coupled with targeted educational initiatives, can facilitate the ethical and effective integration of AI in Indian healthcare. These measures collectively aim to create a more accessible, efficient, and patient-centric healthcare system in India.

KEYWORDS: Artificial Intelligence, Machine Learning, Ethical issues, Challenges, Indian Healthcare, Regulations

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Abbreviations

Sr. No.	Abbreviation	Full-form
1	AI	Artificial Intelligence
2	ML	Machine Learning
3	ICMR	Indian Council of Medical Research
4	NABH	National Accreditation Board for Hospitals
5	DISHA	Digital Information Security in Healthcare Act
6	MeitY	Ministry of Electronics and Information Technology

Chapter 1: Introduction

Artificial Intelligence: To put in a very simple manner, AI, is technology that enables computers and machines to simulate human intelligence and problem-solving capabilities.

Machine Learning: Gives computers "the ability to learn without being explicitly programmed".

Artificial Intelligence (AI) has revolutionized various sectors globally, healthcare being one of them. Integration of AI in healthcare is changing and bringing significant advancements in areas like Diagnostics, Treatment planning, patient care, and AI technology like Machine Learning, Language processing, and robotics have been (/are) important in enhancing the healthcare delivery. This is also enhanced by AI chatbots and virtual assistants that work 24/7 to support patients who are sick as well as provide predictive analytics for real-time monitoring of patient health. Furthermore, AI facilitates medical research through the identification of possible drug candidates and optimizing hospitals to enable efficiency while minimizing costs. On the other hand, use of AI in healthcare has ethical considerations such as data privacy, algorithmic bias, transparency in decision-making among others which require careful thinking and cooperation to implement them effectively and fairly.

The Evolution of AI in Indian Healthcare system

AI in Indian healthcare has experienced innovations, improvements, and hinderances at remarkably considerable rates. In the past one decade, the role of AI has emerged from being an innovation to being a vital part of several operations in Indian healthcare sector. This part looks at the evolution of AI in Indian healthcare with an evaluation of events, existing uses of AI, and potential uses in the future.

Early Stages of AI Adoption:

Research and Pilot Projects:

- In pilot studies, early work using AI in disease diagnosis was conducted with academic institutions and large international technology companies to explore AI as a diagnostic tool for tuberculosis, diabetic retinopathy, cervical cancer, among others.
- Small pilot studies for the use of AI in the chosen hospitals included automated record keeping, appointment management, and basic triage based on patient's data.

Advancements in the 2010s:

Major developments occurred in the middle to the latter half of the 2010s mainly due to the subsequent availability of voluminous data, better computational resources and a heightened know-how in the field of AI. This period was characterized by new and complex utilization possibilities of the AI technologies in healthcare.

1. Diagnostic and Predictive Analytics:

- Molecular imaging techniques
- Health care measures could be predicted and initiated in advance, for instance, simulating disease outbreaks, and patients' readmissions, thus improving health care resource management.

2. Telemedicine and Remote Monitoring:

- Telemedicine was also improved and enabled regular consultation and constant supervision of patients. Intelligent and automated communication through chatbots and virtual assistants were efficient in supporting the needs of the patients throughout their processes.
- Smart watches and similar wearables that incorporated AI kept track of the patients' vital signs and informed the concerned health professionals when the figures were outside certain parameters.

3. Personalized Medicine:

- AI's ability to process large data sets helped in the arrival of a concept of Precision Medicine that involved making personal treatment plans on genetic make-up and other factors like lifestyles and environments.
- Individual care approaches were most effective in the treatment of chronic diseases and in oncology, when taking into account the features of the patient's body.

4. Operational Efficiency:

- AI enhanced reservation for patients and the automation of specific processes such as supply chain management, employees' rostering, resulting in minimized delays in admission.

Evolution post-2010s:

Since the early 2020's the use of AI in the Indian healthcare sector has steadily become more integrated, legislative, and accepted.

1. Integration into Mainstream Healthcare: .

- The incorporation of AI-driven platforms played an enormous role in handling the COVID-19 situation; tracing the virus spread, predicting epicenters, and overcoming the healthcare system's challenges.

2. Regulatory Advancements:

- This means that regulatory frameworks changed and emerged to have provisions and accommodate the use of AI technologies. Owing to the introduction of DISHA and the Personal Data Protection Bill, there were better policies to regulate data privacy and security.

- Thus, these regulations should help to grant that uses of AI in healthcare will be correct, protect patients' privacy, and be as successful as possible.

3. AI-Driven Research and Development:

- AI helped to advance knowledge and discovery channels regarding clinical trials, predictors of candidates for the compounds, and drug discovery routes.

- Tech giants, healthcare facilities and educational institutions also came up with specific solutions that were fitted to the Indian system.

Guidelines that are being implemented regarding the use of AI in Indian Healthcare sector:

The ICMR Guidelines

The Indian Council of Medical Research (ICMR) has come up with detailed guidelines on the use of Artificial Intelligence (AI) in the field of healthcare. The concept of AI, understood as an assessment of a system's potential to process input information from the surrounding environment and accomplish certain objectives while adapting to it, has the great potential for the development of healthcare that may contribute to its increased accessibility, reduced cost, and higher effectiveness. For instance, AI can self-interpret pictures of the chest through CT scans for tuberculosis and mammograms for breast cancer. But the use of AI in healthcare has its merits and demerits as it has some ethical legal and social issues, making it vital to have good policies drawn.

The ICMR's guidelines for developing and implementing those tools and models, which centers on ethics so that everyone involved is accountable and responsible for their actions at all times. The pertinent ethical issues to contemplate encompass data security, confidentiality/privacy, and information dissemination. Thus, AI has the potential to

democratize healthcare by allowing early diagnosis and access but that comes with the downside of the risks when it is used without proper regulation and ethical consideration.

The guidelines are general and refer to any AI system in biomedical and health research concerning humans and their biological information. They are aimed for healthcare experts, technology creators, scientists, businesspeople, analysis for medical facilities, and institutions using health data for studies and providing medical services. Following ethical principles mentioned in the 2017 National Ethical Guidelines for Biomedical and Health Research and the 2019 Central Drugs Standard Control Organization (CDSCO) of new drugs and clinical trials.

The guidelines are also aware of the fast-growing interconnection between healthcare and AI and are thus intended to be evolved periodically to consider new ethical aspects. It is to advocate safe, efficient, and substantiated use of AI solutions in healthcare, while avoiding the limitation of innovation and endorsing certain diagnoses or treatments.

Other guidelines include NITI Aayog's AI for all but is not included in this section as it was implemented in 2018, since then, the technological advancements have increased.

Chapter-3: Study Objectives and Methodology

3.1 Study Objectives

1. To identify the challenges faced by healthcare sector in adopting AI technologies.
2. To identify the ethical issues of AI implementation in Indian healthcare sector.
3. To provide recommendations addressing ethical concerns and overcoming implementation challenges.

3.2 Study Design:

The research design for the study is a “Desk Study”. It is a Literature Review on the ethical factors and issues emerging from the application of Artificial Intelligence (AI) in the context of Indian health care industry.

6 Articles and various guidelines in relevance to the title were studied.

3.3 Data Collection:

3.3.1 Source of Data

Secondary data has been collected from the following sources:

1. Google Scholar: Literature review in the form of scholarly articles and research papers on AI in health care, its ethical implication, and possible hurdles.
2. BirlaSoft: Official publication by Lifesciences, BirlaSoft by CK Birla.
3. ICMR Guidelines for AI use in Indian Healthcare: Ethical standards and procedures regarding; the utilization of artificial intelligence in healthcare investigations or treatments set every so often by the Indian Council of Medical Research.
4. NITI Aayog Guidelines: Official documents like National Policy on AI; AI policies prepared by NITI Aayog, related with the regulation of artificial intelligence in healthcare sector.

3.3.2 Selection criteria

The articles were selected on the basis of their relevance to the topic of research that is “The Ethical considerations and Challenges associated with implementation of AI in Indian Healthcare”. The Inclusion and Exclusion criteria was also kept in mind while selecting the Articles.

Inclusion Criteria:

1. Relevance to AI in Healthcare:

- Papers, articles, guidelines, and other sources that are solely concerned with the use, emergence, and effects of AI in the issue of Indian healthcare.

2. Geographical Focus on India:

- Literature reviews that are specific to India's healthcare system, data on the current use of AI in the Indian healthcare system, examples of AI solutions in action and the laws and legislation regarding AI in India.

3. Publication Date:

- Sources that have been published in the recent past (preferably within the last 5 years and if not, it must not be older than 10 years).

4. Credible Sources:

- Secondary research data collected from scientific journals, government publications, scholarly institutions and information from other authorized organizations like the Indian Council of Medical research (ICMR), Ministry of Electronics and Information technology (MeitY) etc.

5. Ethical and Regulatory Discussions:

- Articles and research papers concerning ethical issues, data privacy and security as well as regulations regarding the use of AI in the delivery of health care services.

Exclusion Criteria:

1. Irrelevant to Healthcare:

- Scholarly publications and articles that are based on AI implementations in fields other than health care or related fields unless those papers shed some light on health care fields.

2. Non-Indian Context:

- Journal articles that have not mentioned Indian context except were used for the purpose of comparison with data available in India.

3. Outdated Publications:

- Original papers that were published more than ten years ago.

4. Non-Credible Sources:

- Any data that is new, unpublished, or is present in the non-refereed sources like newspapers, magazines, or blogs, or any other unverified websites that do not belong to the field of AI and healthcare.

5. Overly Technical Content:

- Includes articles that are too technical and do not clearly provide tangible implementation processes or relate well to ethical, legal, and practical use of AI in the healthcare field.

6. Non-English Publications:

- Articles and papers not in English language, unless the publication is translated into English for easy understanding for the research process.

3.3.3 Search Strategy

The search was conducted focusing on keywords like: Challenges of AI, Indian Healthcare, Ethical issues, Hurdles of AI, Implementation of AI in Healthcare, Problems of AI etc. on search engines.

3.4 Data Extraction

Data extraction was conducted thoroughly and in several stages.

First, each article that was selected was reviewed for identification of the information relevant to the title/topic of the thesis and key points were also highlighted according to the objectives of the research. The following steps were taken:

1. Initial review: Each article was read and reviewed with respect to the content as well as relevance with the topic of the research.
2. Key information highlight: The Key information of each article was highlighted which mainly contained the ethical issues and challenges of AI implementation in the Indian Healthcare sector.

3.5 Data Analysis:

The section on the analysis of collected data focuses on the systematic examination and interpretation of secondary data available in the literature, guidelines and articles. The emphasis is made on the main themes and findings connected with ethical concerns and challenges of using artificial intelligence in Indian healthcare.

Chapter 3: Review of Literature

Sr. No.	Author	Title	Study Location
1	Shantanu Jindal <i>IndusLaw, Gurgaon</i> Shweta Gupta, Partner <i>IndusLaw, Gurgaon</i>	AI in healthcare: trends and challenges in India	India
This describes the following: • AI in Healthcare Integrated into the global health care system AI has evolved the frontier of medical imaging, diagnosis, treatment planning and prognosis. It suggests possible enhancements of the patients' well-being and financial savings. Thus, AI can boost healthcare services' productivity in India, where the population's need for health services is increasing. • Challenges and Risks AI learns with data, and prejudice in this data results in prejudice and discriminating consequences. The large population and diverse demographics of India may impact the integrity of datasets, hence AI's efficacy. Furthermore, due to its independent operation, AI has concerns for patient safety, as well as inconsistency in critical situations, such as an experimental medical chatbot with OpenAI's GPT-3. Regulatory and Ethical Considerations AI's integration within the healthcare sector raises questions on legal responsibility for AI decisions, indefinite programming biases, and patients' privacy. India passed its Digital Data Protection Act, 2023 to protect digital personal data but remains to be seen in Health Sector. Legal frameworks must be put in place as a way of managing several risks that are linked with AI such as cyber security dangers. AI and its role in Health Care Systems of the Future However, there is evidence that AI tools are useful to doctors in such fields as IVF or drugs search. However, for AI to be incorporated into patients' care completely, enhancement of its accuracy, bias, and work on the regulation's transparency is			

required. Thus, the delicate line between over-regulation and the full unlocking of AI's potential must be struck.

2	Keerti Pradhan Preethi John Namrata Sandhu	Use of artificial intelligence in healthcare delivery in India	India
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The 4th Industrial Revolution and technology especially the Artificial intelligence (AI) holds the promise of revolutionizing the healthcare in India not only in decision support but also in research, public health surveillance and many more. Struggles of acquiring healthcare in rural areas can be solved by AI, and there is backing by different entities such as key tech firms and government frameworks such as NITI Aayog's 'AI for All'. However, there are barriers that AI integration will encounter most of which include: Data privacy, ethical questions, and skilled human resource. Challenges such as infrastructural deprivations, data accessibility challenges and integrational issues also affect AI deployment. The legal framework is equally disorganized for implementing AI and insufficiency of rules for data acquisition, clinical trials and responsibilities for AI decisions. Solving these problems entails developing the proper legislation to protect data, guarantee cybersecurity, and engage the public and private sectors. Such programmes include the National Artificial Intelligence Marketplace and collaborative projects, and they are instrumental in the development of such ideas. Legal guidelines must adapt to document AI's development specifically through the safety, confidentiality of data, cybersecurity, along with the cultivation of a qualified personnel to provide apt AI implementation in healthcare. However, it is vital to realize that presently, AI's usage in diagnostic tools, treatment plans, and patient engagement is increasing, proving that it can revolutionize Indian healthcare.

3.	LIFE SCIENCES, BIRLASOFT By CK Birla Group	Artificial Intelligence in Healthcare: Addressing Ethical and Regulatory Hurdles	India
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This paper reveals that applying of artificial intelligence in the field of healthcare has many ethical implications and concerns. The first is opacity where most AI models are ‘black boxes,’ or systems that no one can really understand how they came to the decisions they made; this causes mistrust between patients and healthcare workers.

Algorithmic bias: is a major problem since some AI engineered models may end up being inherently prejudicial if trained using non-robust datasets. This requires proper policies and processes of managing data, and validating the data, to get different and accurate training data so that AI systems could be fair and inclusive for all.

Privacy protection is also a major issue considering that much of the contemporary society is a creation of the social media. This kind of application of AI in healthcare presupposes the presence of detailed personal data and raises the questions of data protection and patient’s permission. Ensuring that data is available to improve and develop AI while maintaining patients’ rights is a dilemma that requires effective laws and strict data management rules.

The very structure of regulation is not without its problems. Today’s legal requirements, like GDPR, focus on the principles of transparency and data protection but do not necessarily provide proper recommendations regarding the usage of AI in healthcare. Sweeping and less ambiguous rules are required in relation to the accountability measures for the AI employment within the sphere of medicine.

AI also poses the danger for substituting human discretion, which is another ethical issue. AI integration might reduce the importance of the healthcare professional and decrease over-sight thus de-skilling of the profession. This is especially the case in tightly and/or unpredictably controlled areas best decided by human judgment: safety.

There are barriers that relate to the practical aspect of its implementation which include interoperability and infrastructural deficits that slow down the AI implementation in the healthcare system. The IT environments in many healthcare

systems continue to be ill-prepared for the support of advanced AI technologies, and the organization of the health data systems remains challenging in terms of integrating consistent and smooth AI interventions, which results in dissimilar patterns of AI application and clinical practice.

4.	NITI Aayog	National Strategy for Artificial Intelligence	India
The use of AI across different industries such as the healthcare industry in India come with issues with ethical consideration. Some of the challenges that have limited the integration of AI in healthcare include lack of multi-stakeholder convergence, no access to large quality clinical data for open data, and the issues of privacy and security of data. Broadly, the challenges span several common themes across various sectors: Broadly, the challenges span several common themes across various sectors: 1. Lack of Enabling Data Ecosystems: The public lacks high-quality data advertisers and publishers; and focused on capturing consumer attention and converting browser to buyers. 2. Low Intensity of AI Research: Fundamental research of AI technologies is scarce, and the turn of this research into market solutions is even more crotched. 3. Inadequate AI Expertise and Skilling Opportunities: There is lack of skilled workers and courses or to train people in AI or related field. 4. High Resource Costs and Low Awareness: One of the reasons is the high costs directly linked to mechanisms of AI technology, low information and knowledge about AI among businesses. 5. Unclear Privacy, Security, and Ethical Regulations: There is a lack of regulation in the protection of data and the ethical use of AI, hence the current regulations are very weak. 6. Unattractive Intellectual Property Regime: It is currently revealed that the current or existing IP regime is not suitably inspiring the research and development in AI technology.			

This is why ethics play such important roles in the determination of the extent to which AI can be adopted. AI systems bear the necessity of being explainable and absence of biased to pave the way for non-discriminated approach. This entails data bible check and confirmation to ensure that it does not produce bias's results. Privacy protection is important because the data which healthcare deals with is usually highly sensitive. There is a desire for strong and effective regulation to allow the use of data while at the same time protecting patients' information.

Unfortunately, while several years have passed since the first laws were enacted in India, the regulatory situation is still insufficient, and it is changing constantly. Hence, there is a requirement for a set of rules pertinent to manage the risks that AI presents which include legal responsibility of decisions made by AI and principles of a proper application of AI systems in the society. The shortage of AI integration also requires coverage of interoperability and infrastructure by the regulatory frameworks.

5	Shweta Jaiswal DVR Seshadri Raj Krishnan Shankar	Challenges in Adopting AI in Healthcare in India	India
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Even though the planned benefits of AI utilization in healthcare include the lack of medical specialists, improvement of prevention, care, and the increase of patients' overall well-being, there are still restrictions for AI implementation in the sector. The future development of AI and its widespread adoption in healthcare especially in India, is challenged with a number of major barriers. First of all, AI systems enhance autonomously as a result of modifying from their mistakes, yet, in the sphere of healthcare, a single faux pas can lead to tremendous repercussions; therefore, doctors and patients avoid using new AI systems. This reluctance is illustrated by the case of IBM Watson Health, where hypothetical patients' data resulted in unsafe advice. Second, there is a violation of data privacy, and Indian massive and dispersed health data hinder the advancements of AI. Patients are afraid of abuse of their information by certain authorities or insurance providers, and the fragmented data available and often unvalidated just presents an urban picture, and the AI outlay could be a false one. Thirdly, there are questions of ethics and morality when artificial intelligence is used in decisions over patients'

medical treatment and care. These cases confuse trust in AI systems where recently AIIMS Delhi faced a cyberattack that led to poor data security. Fourthly, legal limitations from the ancient laws do not capture the development of such technologies despite the up-and-coming legislations such as the DISHA and the Personal Data Protection Bill. Finally, the health-care community seems to resist AI-based systems due to a threat of loss of jobs and the lack of knowledge of what constitutes as advantages of system-based AI. Introducing AI as part of the clinical practice and as a feature in EHR remains a difficult process, while many clinicians have no experience with computers. To deal with these challenges, it is possible to create an AI ecosystem with the help of partnerships, solve the problems of AI skills as well as data quality and representativeness, and to stimulate the use of AI and entrepreneurial thinking in healthcare organizations.

6.	Global Legal Insights	AI, Machine Learning, and Big Data Laws and Regulations	India
It is still worthy to note that presently India does not possess legal measures and provisions that exclusively address the deployment and evolution of Artificial Intelligence (AI) and Machine Learning (ML) solutions and devices. Although, it is expected that the upcoming Digital India Act for which government is expected to issue a draft for public debate by July 2024, may fill this gap. It is to support the AI progress since this legislation encourages innovation in AI, ML as well as other related technologies. Ministers in the Government of India have declared their willingness to support monetization of AI/ML technologies and, yet, to regulate those processes in cases when the risks are high. This regulation is likely to feature human action and supervision besides the promotion of the ethical uptake of AI/ML tools. Meanwhile, the MeitY (Ministry of Electronics and Information Technology) has also sent out to advisories to the intermediaries and the platforms which host and provide AI tools to the user base in India. These advisories seek to enforce the compliance with the specific guidelines pertaining to the use of AI tool that are part of the due diligence requirements under the Information Technology (Intermediary Guidelines and Digital Media Ethics Code) Rules, 2021 which has been framed under the Information Technology Act, 2000. Despite the fact that these advisories are still not backed up by legal provisions, there is an indication of some			

convergence of the business community and the government in order to have efficient ways of dealing with these regulatory pointers.

Chapter 4: Results

The Results of this study are presented aligning with the Objectives of the study.

Objective 1. Identifying the challenges faced by healthcare sector in adopting AI technologies.

The main challenges that have been common in most of the articles studies are:

1. Data Privacy and Security:

The first and arguably the biggest moral dilemma with the broad usage of AI is patients' information privacy.

2. Algorithmic Bias:

Some AI systems used in healthcare may reinforce the bias that exists in the data used for teaching the algorithms which in turn affect the provision of care for different patients. This bias is linked to the bias exhibited in clinical diagnosis and treatment proposed for patients belonging to underrepresented groups.

3. Transparency and Accountability:

The decision-making procedures among AI must be transparent so that the public has trust in them. Despite the beneficial impact of AI, there is concern on how recommendations or diagnoses are produced by such systems since both care providers and patients could benefit from understanding the process.

Objective 2. Identifying the ethical issues of AI implementation in Indian healthcare sector.

1. Regulatory and Ethical Frameworks:

The existing legal regulation in India fails to respond to innovative risks related to the use of AI technologies in healthcare. Today's laws still do not capture all the ethical and legal issues that should surround the use of artificial intelligence.

2. Reluctance to Adoption:

Patients' willingness along with the overall willingness of the health care providers to embrace AI-based systems seems to be relatively low as mentioned in the studied articles. This resistance stems from job losses, ignorance, and AI formats that do not fit the clinical processes.

Objective 3. Recommendations for addressing ethical concerns and overcoming implementation challenges.

1. Increase Transparency:

Encourage necessity and clarity because, for example, creating self-explaining AI models that are capable of describing why an AI has made a particular action. Other measures regarding increasing transparency include an identification of how decisions made by an AI system can be audited and validated.

2. Strengthen Regulatory Frameworks:

Enhance and include new regulation concerning ethical and feasible issues of AI in the healthcare sector. Recruit various stakeholders who will develop elaborate sets of rules that will relate to the constantly evolving AI systems.

3. Foster AI Literacy and Adoption:

Develop educational programs and training activities focused on raising the level of digital competence and increasing the knowledge about AI. Thus, it is sensible to demonstrate the advantages of using AI tools and offer practical recommendations on their training to enhance healthcare providers' awareness of the technologies.

Chapter 5: Discussion

5.1 Ethical Considerations of the study

Since this study will rely on secondary sources of data, the following issues of ethics shall be considered in endeavoring to do this research:

While employing data in this study, it is pointed out that the data is also available in the public domain, which raises concern of plagiarism of data. To avoid that, all the sources are cited carefully in the Literature review and the references section has also been added. Another issue arises where there are certain articles which need permission to be used or if their data can be shared or not. To avoid this, it was made sure that all the selected articles are available on the public domains to be used.

5.2 Limitations

As the study is based and dependent on the secondary data available, it possesses some limitations which can be explained in detail as below:

A significant limitation is that, the secondary data obtained is mainly derived from articles and guidelines which might not reflect the most recent state of technological innovation or continuing projects that are yet to be published or recorded in the literature.

Furthermore, the quality and the amount of information are always dependent on the amount of data available, and recommendations provided. The lack of publications for some aspects of AI implementation can be less covered by the sources.

Finally, the source of data used in this study includes the data being deficient of context-specific analysis that primary data gathering methods like interviews/Surveys could offer. However, the study seeks to offer a general understanding of ethics and issues arise with AI integration in health systems of India.

References

1. ICMR: Ethical Guidelines for application of Artificial Intelligence in Biomedical Research and Healthcare
2. NITI Aayog: National Strategies for Artificial Intelligence #AIFORALL
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