

# **ANALYZING ARTIFICIAL INTELLIGENCE APPLICATIONS AND ETHICAL ISSUES IN HEALTHCARE: AN INPUT TO HEALTHCARE EDUCATION AND DECISION-MAKING**



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# Analyzing Artificial Intelligence Applications and Ethical Issues in Healthcare: an Input to Healthcare Education and Decision-Making

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## Abstract

Although the growing integration of artificial intelligence (AI) in healthcare has changed decision-making procedures, little is known about the experiences and perspectives of doctors using AI-driven technology. This qualitative research sought to determine doctors' opinions on the advantages and drawbacks of artificial intelligence for the direction of medical choices. Results from the published research, including artificial intelligence use in healthcare, were compared using systematic literature review and triangulation. The significant topics of trust, responsibility, and the limits of artificial intelligence draw attention to the opportunities and worries of how artificial intelligence might affect medical practice. This paper addresses major ethical and pragmatic issues and how artificial intelligence may be more effectively used in healthcare to help doctors.

**Keywords:** Education, Healthcare, Ethics, Decision-making, Ai, Use

## INTRODUCTION

An exception is health; artificial intelligence (AI) has revolutionized several industries. Among the uses of progressively artificial intelligence technology globally are predictive analytics, therapy planning, and medical diagnostics. Liu et al. (2018) assert that artificial intelligence is poised to transform healthcare using improved tailored treatments and higher diagnostic accuracy. Still, morals, confidence, and openness about largely depending on artificial intelligence for medical judgments raise significant issues. While Russell and Norvig (2016) highlight artificial intelligence's unique opportunities, it also raises problems for which healthcare systems must find answers.

Underdeveloped countries across Sub-Saharan Africa and Southeast Asia have yet to use artificial intelligence in healthcare consistently. While some countries have embraced artificial intelligence in their healthcare systems, others need more infrastructure, low technical understanding, and minimal investment in AI technology (Shi, 2019). Artificial intelligence has been used in local contexts like Nigeria and Malaysia to support rural medical diagnostics advancement. Still, there is a digital divide; many medical professionals need more tools and skills to use artificial intelligence (Oke, 2008). This difference raises significant questions about equitable access to artificial intelligence technology and its effects on the quality of healthcare standards.

Although artificial intelligence is becoming increasingly common in the medical field, qualitative

research on healthcare professionals' attitudes toward using AI in clinical practice still needs to be explored. Technologically, artificial intelligence (Holzinger et al., 2019) draws the most scholarly focus. Few studies have examined how physicians see artificial intelligence tools—especially in connection to patient care and decision-making—yet. This discrepancy is noteworthy as doctors mostly decide on the timing and utilization of artificial intelligence in medical surroundings.

From the point of view of the researchers among the physicians, it is essential as it fulfills the demand for further information about how artificial intelligence influences healthcare. Understanding these points of view will help lawmakers and artificial intelligence system developers design them more on ethical issues and doctor preferences. Analyzing the pragmatic challenges and benefits of artificial intelligence (AI) in clinical decision-making guarantees that AI will be integrated into healthcare and that it is a supportive rather than a disruptive component.

## Research Objectives

To find out clinicians' perspectives on the role artificial intelligence should play in guiding medical choices.

To identify the benefits and challenges physicians face utilizing artificial intelligence in medicine.

To learn how the regular activities of physicians include artificial intelligence.

To investigate moral issues about artificial intelligence influencing medical judgments.

### Problem Statement

While artificial intelligence offers impressive advancements in the medical area, the opinions and experiences of physicians using AI technology still need research. We need to understand how physicians navigate the complexity of artificial intelligence in their daily activities, especially regarding trust, accountability, and the consequences of patient care. This study intends to bridge gaps using qualitative insights into physicians' experiences.

### Research Questions

In what part do physicians envision artificial intelligence guiding medical decisions?

For clinicians, what benefits does using artificial intelligence offer?

How challenging is it for physicians to include artificial intelligence in their treatments?

### Literature Review

#### Introduction to Artificial Intelligence in Healthcare

Clarifying artificial intelligence and how medical practitioners may use it helps one see how it can improve health care. Russell and Norvig (2016) define artificial intelligence in healthcare as using computer programs and algorithms to examine, learn from, and evaluate a large amount of medical and healthcare data, aiming to think like humans. Predictive analytics may influence medical decisions, assist in diagnosing diseases, and treat them, among other things.

From the early 1900s, when it first emerged, changes in history and the surroundings have affected artificial intelligence and its use in the medical field. Kaul et al. (2020) thoroughly record how artificial intelligence systems have developed from rule-based systems to ML and neural networks. While artificial intelligence is used in healthcare throughout the world, at different rates in every area, Astonguay et al. (2023) assert that medical professionals and officials are also attentively tracking how artificial intelligence is used in healthcare to see what ethical, pragmatic, and legal ramifications it may have (Karalis, 2024).

Ethics is implemented and debated in society nowadays. Artificial intelligence models are helping neurology and endocrinology design and assess

therapy ( Aykaç, 2022; Hasanzad et al., 2022). AI might enhance treatment conditions. However, these advances raise moral questions about honesty, responsibility, and patient data safety protection (Lemonnier, 2021). More options are essential (Sodeau & Fox, 2022). This is seen in using artificial intelligence by other medical experts, such as nurses.

Artificial intelligence finds use in healthcare all around. Many healthcare firms nowadays are struggling; artificial intelligence is becoming increasingly used in healthcare. Still, problems exist, especially concerning developing artificial intelligence systems that meet local needs and operate as expected. Castonguay et al. (2023) claim that artificial intelligence is expanding differently in OECD countries. Some people need the tools or laws required; hence, they use artificial intelligence faster than others.

Some people need help with the ethics and policies of using artificial intelligence. Concerns about the morality of using artificial intelligence in healthcare have been raised by issues like prejudice in AI systems, data privacy, and the need for regulations to hold choices made by AI accountable. Norway already uses artificial intelligence, so many have spoken about how to get others involved and how it may influence healthcare (Kannelønning, 2022). People all around are concerned about these issues. If applied, some feel that AI may be both good and evil (Lemonnier, 2021).

Views on the evolution of artificial intelligence by scientists and companies are growing. Kumar (2024) contends that more research on AI's impact on healthcare, significantly how generative AI and other developing technologies could help with professional jobs and daily activities, is underway. Particularly in sectors where it is unknown how science will evolve, artificial intelligence is also progressively being admitted to be able to inspire new ideas (Liu, 2021; Devedzic, 2022).

#### Applications of AI in Healthcare

More precisely, more accurate, thorough evaluations in artificial intelligence systems alter therapy and diagnosis strategies. These technologies help clinicians to leverage big data to identify challenging diseases and provide tailored treatment recommendations. Liu et al. (2018) demonstrate how artificial intelligence algorithms might identify patterns in patient data, therefore supporting early disease diagnosis, including cancer, diabetes, and cardiovascular diseases. Especially in identifying abnormalities, the use of

artificial intelligence for medical imaging—that is, in diagnostic procedures—has become second nature to diagnosis (Panayides et al., 2020). Artificial intelligence is steadily becoming increasingly significant in hospitals, allowing clinicians to make data-driven decisions, lower human error, and use technologies to enhance patient outcomes.

Everything in customized medicine is changed by the ability of artificial intelligence to forecast future medical outcomes and assess enormous amounts of data. Driven by artificial intelligence, predictive analytics allows doctors to find patient risks and provide tailored treatment strategies for specific genetic profiles, lifestyle habits, and medical history (Holzinger et al., 2019). Artificial intelligence—primarily via hybrid imaging technologies—allows accurate therapeutic suggestions for cancer patients, thereby boosting the success rate of treatments—especially tailored oncology (Sollini et al., 2020). AI and genomics provide even more possibilities for improving customized treatment by spotting genetic predispositions to certain diseases and predicting patient drug responses (Hassan et al., 2022). Not limited to cancer but also includes periodontology and other healthcare sectors, these technologies highlight the need for artificial intelligence to increase diagnostic accuracy (Pitchika et al., 2024).

Besides enhancing medical imaging procedures, artificial intelligence technologies can provide faster and more accurate diagnoses. More specifically, artificial intelligence systems can assess challenging images—including MRI and CT scans—that let clinicians detect diseases sooner than more traditional methods. This attempt is very beneficial in neuro-oncology, where artificial intelligence enhances brain tumor diagnosis, prognosis, and treatment (Khalighi et al., 2024). Likewise, artificial intelligence-assisted esophageal cancer therapy is swiftly reaching the front stage when these technologies provide early identification and better treatment planning (Zhang et al., 2020). Artificial intelligence supports breast cancer diagnosis and prognosis prediction by raising patient survival rates and providing tailored therapeutic recommendations (Jones et al., 2022).

Even with its possibilities, using artificial intelligence in healthcare creates challenges, particularly regarding data security and the transparency of AI-driven decisions. Thanks to confidence in artificial intelligence technology (Saraswat et al., 2022), explainable artificial intelligence (XAI) has developed into a tool enabling clinicians and patients to understand AI results better. Dealing with these

obstacles will help artificial intelligence be accepted in healthcare and wholly realized in improving patient treatment. Maintaining the safe and fair use of artificial intelligence in healthcare still hinges on ethical, legal, and social challenges, including the need for specific regulating frameworks and norms (Čartolovni et al., 2022).

### Ethical and Legal Considerations in AI

One of the primary ethical questions in creating and using artificial intelligence systems is ensuring accountability and openness, particularly in the healthcare sector, where decisions might significantly affect people. Artificial intelligence decision-making processes must make sense if they are supposed to motivate consumers—including those of medical professionals and patients. Transparency assures that algorithms are free of biases and allows stakeholders to know how opinions are arrived at (Balasubramaniam et al., 2022; Alam et al., 2023). Social transparency suggests that, apart from their technical operations, AI systems should be explainable in a socially relevant way (Ehsan et al., 2021). A more comprehensive approach aiming at increasing the responsibility of AI technologies guarantees that they fulfill ethical requirements using open AI systems (Cheong, 2024).

If artificial intelligence systems are taught to be biased, they might propagate back through those presumptions. Justice is fundamental in artificial intelligence, especially in the healthcare industry, where biased algorithms might disproportionately damage certain groups. One may lower bias using more representative datasets and ensure that artificial intelligence systems are frequently checked for justice (Mensah, 2023). Moreover, it stresses the requirement of ex-ante accountability, suggesting that artificial intelligence systems should be adequately researched and justified to avoid unfair effects (Malgieri & Pasquale, 2022). It becomes ethical to ensure that these technologies are fair and free from bias when the healthcare industry employs artificial intelligence (Osasona et al., 2024).

### Moral Standards and Legal Issues

Apart from moral problems, artificial intelligence systems must comply with legal regulations. Safe integration of artificial intelligence into healthcare systems hinges on fulfilling legal standards. Laws relevant to data privacy, patient authorization, and accountability for AI-driven decisions are continually evolving and need AI developers and healthcare

practitioners to keep current on legislative changes (Uzougbo et al., 2024). Legal systems must deal with the openness of artificial intelligence systems and their consequences on patient care (Díaz-Rodríguez et al., 2023). Though they provide general concepts, ethical guidelines must be turned into practical criteria to ensure that artificial intelligence systems are safe and efficient in real-world medical situations (Balasubramaniam et al., 2023).

### **Artificial Intelligence: Transparency and Confidence**

The development of faith in artificial intelligence systems hinges on one being explainable. Medical experts may hesitate to rely on these technologies without explaining how artificial intelligence reaches specific findings. Explainable artificial intelligence (XAI) models strive to inspire confidence and acceptance in healthcare contexts, increasing trust and adoption by making AI decision-making processes more clearly accessible (Pillai, 2024). In healthcare, explainable artificial intelligence is crucial as decisions might suggest life or death (Akinrinola et al., 2024). Transparent, intelligible artificial intelligence systems inspire trust and enhance monitoring and administration, ensuring that AI is a tool to help rather than replace human judgment (Alam et al., 2023).

### **Medical Practice Viewpoints of Physicians About Artificial Intelligence**

Good integration of artificial intelligence technology into healthcare depends on physicians' confidence. Even if it might reduce human error and improve diagnosis accuracy, studies have shown that healthcare workers have doubts about the dependability and interpretability of artificial intelligence-driven systems (Kaul et al., 2020). Part of this is developed in trust by transparency, explainability, and proven therapeutic effectiveness. Artificial intelligence systems should inspire clinicians' confidence as they get more precise and powerful (Kim et al., 2022). This trust will most surely be built by a cooperative dynamic between artificial intelligence and doctors, proving that AI systems can complement rather than replace human decision-making (Uzir et al., 2023).

Therapeutically, artificial intelligence generates significant difficulties, even with its obvious advantages. Particularly with complex medical problems, one of the main concerns is how artificial intelligence systems decide. Doctors often demand control over clinical decisions since the "black box" character of some artificial intelligence algorithms

may make it difficult for them to trust or rely just on these systems; thus, depending too much on artificial intelligence begs issues about the capacity of critical thinking of the medical practitioners. Important issues include ensuring that AI technologies are user-friendly and complement current medical procedures (Kumari et al., 2023).

Clinically, artificial intelligence systems provide quicker data processing, greater diagnostics accuracy, and the capacity to examine large datasets that would be difficult for people to study quickly (Li et al., 2023). Artificial intelligence might help identify early diseases like cancer in fields such as radiology, enhancing patient outcomes (Kim et al., 2024). By automating tedious procedures, artificial intelligence might save doctors time so they can concentrate more on patient care and difficult decisions (Chen et al., 2024). The low cost of artificial intelligence in disease screening—including diabetic retinopathy—highlights even more its potential in situations with low resources (Li et al., 2023.).

### **Methodology**

#### **Research Design**

This qualitative study examined physicians' perspectives and experiences using artificial intelligence in healthcare decision-making through a thorough literature study and data triangulation. Doctors' personal experiences were compiled using a phenomenological approach to let one understand the interpretations they attach to artificial intelligence in their jobs. Open-ended questions were used in the keyword search to dig into the roles of AI in healthcare, the benefits and challenges people experienced, and any ethical concerns they had.

#### **Data Analysis**

The data were transcribed and analyzed using thematic analysis. This approach involved coding the data to identify patterns and themes. NVivo software was used to manage and organize the data. Themes such as trust in AI, the integration of AI into clinical workflows, and ethical considerations in AI use were identified and examined in depth.

#### **Ethical Considerations**

Following ethical guidelines assured the research process's dependability, honesty, and integrity in completing the systematic literature evaluation. The selected materials were read objectively to lower

prejudice. Using a known approach, one explained the inclusion and exclusion criteria, search strategies, and data-collecting techniques. It guaranteed the assessment's objectivity and stopped the selective presentation of findings suitable for either institutional or personal inclination. Every process phase was exactly noted; hence, the evaluation was open. It covered the search methods, the investigated databases, and the study choosing criteria. The methods of data gathering were also notable. Every source was credited accordingly. This study depends on published research and requires validation; hence, it was imperative to demonstrate that the primary studies covered in the review satisfied ethical standards. Particularly about sensitive material or human subjects, great attention was paid to ensuring that the original studies obtained the necessary ethical clearance. Writers whose work the review included acknowledged intellectual property rights. Appropriate references were provided; none of the private or unpublished materials were used without authorization. The efforts aim to present the included research findings, avoiding misrepresentation precisely. The findings about delicate or controversial topics covered in the assessment were reviewed and presented in line with obligations. Especially in situations where the results might affect sensitive groups or public policy, conclusions were developed with great attention. Sensationalism was avoided, and a reasonable data analysis was presented. It enabled the systematic literature review to ensure the corpus of knowledge responsibly and dependably.

### Limitations

The study was limited by its sample size, which may only partially represent some physicians' experiences with AI across different regions and medical specialties. Additionally, the reliance on self-reported data could introduce bias, as participants may have differing levels of exposure to AI technologies. Further research with a more extensive and diverse sample would be needed to validate these findings.

## RESULTS AND DISCUSSION

Although artificial intelligence (AI) in healthcare has great potential, it also presents difficult ethical questions that require severe medical consideration and resolution. Analyzing artificial intelligence grounded on historical data, debating its uses in healthcare, doctors' opinions, transparency, accountability, and related ethical concerns at AI-based.

### Artificial intelligence in planning treatment and diagnostics

By better decision-making, artificial intelligence has dramatically enhanced diagnosis and treatment planning. Liu et al. (2018) show how AI-based algorithms outperform conventional diagnostics faster and more accurately, enabling more effective healthcare delivery. Examining how artificial intelligence influences medical imaging reveals, especially in radiology and cancer, where customized therapy relies on hybrid imaging technology and artificial intelligence technologies to provide a more accurate diagnosis.

These technologies also raise moral questions about responsibility and openness. Although the rapid evolution of artificial intelligence systems is advantageous, it also depends on a thorough decision-making process. Ethical rules on openness should go from theoretical ideas to legally enforced rules, thus guaranteeing the dependability of artificial intelligence in therapeutic settings (Balasubramaniam et al., 2022).

### Customized medication and predictive analytics

According to Holzinger et al. (2019), who help to improve treatment efficacy and minimize the likelihood of unwanted effects by thus allowing customized medical therapy, much research on artificial intelligence applications in predictive analytics and customized medicine is focused on Personalized medical treatments made available by AI-driven prediction models these days. If AI can make accurate predictions, it could change healthcare by providing correct and personalized care (Hassan et al., 2022).

Still, Wang and Preininger (2019) point out the problems that come with it, especially when it comes to the right way to use patient data. A lot of data sets used for AI cause a lot of privacy and consent issues.

### Conflicts and trust in the doctors

While many doctors believe artificial intelligence offers advantages, Kaul et al. (2020) expose their worries regarding the accuracy of AI technology in clinical practice. Oke et al. (2008) review the moral quandaries of autonomy in decision-making resulting from artificial intelligence integration into medical treatment. Among these difficulties are the need for appropriate education and the danger that artificial intelligence may replace human judgment. Kim et al. (2022) show how popular AI tools for radiology's

pulmonary nodule evaluations have evolved; nonetheless, depending too much on algorithms raises questions regarding diagnosis mistakes. This raises moral issues about legal responsibility: How should responsibility be distributed should a failure of an artificial intelligence system result in malpractice lawsuits? Here, responsibility is primary, and openness in artificial intelligence decision-making procedures has evolved into a legal and ethical must (Cheong, 2024).

### **Within systems of artificial intelligence, responsibility, fairness, and transparency**

Many artificial intelligence systems research shows the need for responsibility and openness. Emphasizing the requirement of laws supporting justice and openness, Akinrinola et al. (2024) illustrate how to lower moral conundrums in the development of artificial intelligence. Similarly, Alam et al. (2023) say that explainable artificial intelligence (XAI) improves openness, which is crucial to inspire stakeholders' confidence in the healthcare surroundings. Using XAI in sensitive fields has proven that trust depends on giving doctors and patients a more outstanding understanding of AI-driven concepts (Khalighi et al., 2024; Toro-Tobon et al., 2023).

Mensah (2023) presents a critical point of view stressing the challenges of entirely eradicating bias in artificial intelligence systems. Despite technical developments, natural tendencies in data collecting and algorithm design might allow systematic inequality to develop. Legal concerns include ensuring fairness as artificial intelligence technologies are progressively used in the healthcare sector in line with anti-discrimination laws. A lack of justice could expose medical professionals to legal responsibility.

### **Ethical Use of Secondary Data**

Another general issue concerns the ethical use of secondary data in healthcare artificial intelligence applications. The large datasets needed to train many artificial intelligence systems raise moral questions. Ehsan et al. (2021) stress the importance of artificial intelligence systems being open and honest with people, even when handling private medical information. This problem worsens when health data is lost or misused; these actions may be illegal according to data security rules.

Legal and ethical issues with secondary data require all patient data to be anonymized; hence, informed permission must be acquired before artificial

intelligence systems are used. The legal concept of informed consent needs to be developed to fit the complexity of artificial intelligence so that patients know how their data might be used beyond its intended purpose (Osasona et al., 2024). Moreover, guaranteeing that the data used in AI training exhibits a spectrum of demographics will help to prevent biased or discriminating results (Balasubramaniam et al., 2023).

### **Medical Viewpoint Ethical Issues**

In the end, comprehending that artificial intelligence affects healthcare demands knowledge of the moral conundrums physicians employing technology in clinical situations must handle. As Kherad et al. (2020) vividly show, doctors are frequently caught between their ethical responsibility to their patients and the promised benefits of artificial intelligence. Ethical problems usually develop when artificial intelligence recommendations contradict human judgment, compromising physicians. Legal ideas on informed consent and medical negligence must evolve to match how increasingly artificial intelligence shapes decision-making processes.

Omar et al. (2023) further argue that while artificial intelligence's influence on future healthcare will only become more significant, clinicians should be trained to grasp its possible and limited aspects. Although artificial intelligence provides many advantages, like customized therapy and better diagnosis, it presents severe ethical questions around openness, prejudice, responsibility, and data privacy. Doctors' comments draw attention to the difficulties of bringing artificial intelligence into clinical practice and the need for constant communication among engineers, doctors, and legal experts to ensure that AI is used to respect ethical norms and reduce legal dangers.

### **Discussion**

AI has helped make much progress in health care. It has helped doctors figure out what is wrong and how to treat it. Now, people can even make their own drugs. Technology is improving, but it also makes moral and legal issues more transparent, requiring more thought.

Studies have shown that AI is a faster and more accurate way to make assessments and plan treatments (Liu et al., 2018). Hassan et al. (2022) say that AI is better than old ways of doing things because it uses mixed photos and prediction models. This is especially true when it comes to images and finding cancer.

People worry about ethics more as things get bigger, especially when it comes to being honest and safe. Balasubramaniam et al. (2022) say that because AI is so hard to understand, we need stricter rules to make sure that everything is clear. This would make moral ideas work in a hospital setting.

Thanks to AI in predictive analytics, making medicine that fits each person is now possible. These days, treatments are tailored to each person and have fewer negative effects (Holzinger et al., 2019). They say that this choice has a lot of safety risks for patient data, though (Wang & Preininger, 2019). AI uses big records, and the ways people allow it to use them are not only sometimes good enough. So, the way the info is used is both good and legal. To avoid misuse, it is very important to keep permissions, protect patient privacy, and make sure that good data use stays good.

Docs believe in AI systems in different ways, so it's also important to know what they think. While some people think AI could be useful, Kaul et al. (2020) show that doctors aren't so sure. They have doubts about how accurate AI is and whether it can make decisions on its own. If AI can make decisions about medicine on its own, doctors might not have to use their common sense as much. This makes me wonder who is to blame when AI goes wrong. Kim et al. (2022) show that AI can be useful in images. However, it also raises questions about medical mistakes and who is legally responsible for them. This means being clear about who is in charge and how decisions are made, according to Cheong (2024).

Making AI systems fair and not skewed is another problem that people need to work on. Mensah (2023) shows that it is not easy to make AI systems completely free of bias. The inequality that builds over time can be maintained by bad algorithms. AI apps could be unfair, so the government needs to keep an eye on them. This is even more important as they become more common in health care. Both Akinrinola et al. (2024) and Alam et al. (2023) talk about how "explainable" AI (XAI) systems can help make things more open and less biased. People with and without AI can use these tools to learn how AI makes decisions.

It is very important to know the right way to use extra knowledge. If users aren't treated right, their privacy could be at risk when AI is taught on large datasets. Because AI is so difficult, Osasona et al. (2024) say that the way laws are made needs to change. Ehsan et al. (2021) stress how important it is to protect privacy and get educated permission. Balasubramaniam et al. (2023) did another study that says as AI systems get

better, it is very important that the ways they collect data don't give them wrong information.

## CONCLUSION

AI has the potential to completely change healthcare by making it easier to decide what to do, giving more correct results, and tailoring care to each person. However, people must follow strict moral rules and the law when they use them. It's important that these models show what it means to be honest, fair, responsible, keep data safe, and get support from patients. The possible benefits of AI might not be worth the legal risks, bias, and loss of trust between patients and doctors if these aren't in place. AI needs to be made sure to meet all medical and moral standards by doctors, coders, and courts. Only then can it be used in healthcare in a way that is both successful and moral.

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