

Ethical Considerations of Artificial Intelligence in Healthcare: A Study in Islamic Bioethics

HABEEBULLAH, Abdulkabeer
Akinlabi
DEPARTMENT OF ARABIC AND
ISLAMIC STUDIES
FOUNTAIN UNIVERSITY, OSOGBO

08093921440

Abstract

Artificial intelligence (AI) is increasingly being integrated into healthcare systems, offering significant advancements in medical diagnosis, treatment, and patient care. However, the ethical implications of AI in healthcare, particularly within the framework of Islamic bioethics, remain understudied. This study explores the ethical considerations of AI in healthcare from an Islamic perspective, focusing on principles such as human dignity, compassion, justice, and accountability. Drawing on Islamic ethical principles and contemporary bioethical theories, this study examines the implications of AI in medical decision-making, patient privacy, genetic engineering, and access to healthcare. It argues that while AI has the potential to improve healthcare outcomes and increase efficiency, its implementation must be guided by Islamic values to ensure ethical practices and uphold patient rights. Through a comparative analysis of AI ethics frameworks and Islamic bioethical principles, this study proposes guidelines for the responsible development and use of AI in healthcare. It emphasizes the importance of integrating Islamic

values into its algorithms and decision-making processes to ensure that they align with Islamic teachings and respect human dignity. The study contributes to the growing discourse on AI ethics by providing a nuanced understanding of the ethical considerations of AI in healthcare from an Islamic perspective. It highlights the need for interdisciplinary collaboration between AI developers, healthcare professionals, and Islamic scholars to develop ethical guidelines that promote the well-being of patients while upholding Islamic principles.

Keywords: Artificial Intelligence, Islamic Bioethics, Islamic ethical studies, AI in healthcare

Background and Islamic Bioethics

The era of Artificial Intelligence (AI) walking into healthcare was a transition, transforming the traditional way how healthcare services are delivered and managed. AI technologies are transforming the medical landscape, from machine learning algorithms that assist in diagnostic decisions to robotic surgery; boosting the accuracy

of diagnostics and tailoring treatment plans as per patient requirements. These technologies offer the potential of improving outcomes for patients, reducing costs in healthcare while also ensuring that high-quality care is available to even some hard-to-reach populations. Yet, for all of its advantages, the application of AI within healthcare likewise creates significant ethical dilemmas. Patient privacy, data security, algorithmic bias and possible reduction of human empathy in patient care are among the key issues that underly much of the discourse surrounding AI's role in medicine. These concerns are not merely technical or regulatory in nature; they also touch on deeper moral and philosophical issues, making it essential to approach the discussion from an ethical standpoint.

Islamic bioethics, based on *Shari'ah* (Islamic laws), is a well-elaborated system that governs the ethical considerations related to mammalian procedures generally and AI for healthcare applications specifically. Islamic bioethics is based on central concepts including justice ('*Adl*), the inviolability of life, pursuit of knowledge and moral accountability (*Murāqabah*).

For example, Allah commands the believers to respect each other's privacy by taking permission before entering into any home. He says:

"O you who have believed, do not enter houses other than your own houses until you ascertain welcome and greet their inhabitants. That is best for you; perhaps you will be reminded." (Quran 24:27)

In another verse, He says:

"O you who have believed, avoid much [negative] assumption. Indeed, some assumption is sin. And do not spy or backbite each other..." (Quran 49:12)

The Prophet (peace be upon him) said:

"Whoever listens to the people's conversation when they do not want him to or they run away from him, molten lead will be poured into his ears on the Day of Resurrection." (Sahih al-Bukhari, Hadith 7042)

Islamic teaching views healthcare as less of a service and more of an imperative, which must be enacted with the highest morals and compassion. The *Maqāsid al-Shari'ah* (Objectives of Islamic law) principles adopted in this research intend to maintain and give life, *a'qīdah*/mind or intellect, *nafs*/soul or human dignity which directly related with the meaningful integration of AI in healthcare. The above principles from Islamic bioethics can be applied to help ensure the ethical use of AI that respects patient autonomy, justice and maintaining the therapeutic relationship between patients and healthcare providers.

In this scenario, one is tempted to know the extent Islam possess an answer in bioethics about all ethical problems that arise with AI: ranging from ethics of robotics surgery (Lahan et al. 2016) up to how we address disease through medicine and

crucially now healthcare-generated data. How then will Islamic Bio-Ethic approach these large-enough-scale problematics increasing as such emerged because of advancements autonomous AI system? In this regard, the present paper intends to explore these challenges from an Islamic bioethical perspective in order to exploit all merits of AI with respect for moral teachings of Islam.

Research Problem

The rapid adoption of artificial intelligence into the rapidly developing health sector holds promising opportunities and, in parallel, raises critical and important ethical dilemmas. Although AI can revolutionize health delivery fairly, through an increase in the precision of diagnoses and personal treatment and thereby increase efficiency, it again raises important concerns regarding patient privacy, discriminating algorithms, and data security that lay the ground for humane treatment. In this regard, the challenges are not essentially technical but also contain deep ethical dimensions, especially when viewed in the perspective of religious and moral traditions. An Islamic bioethical reaction to the advent of AI in healthcare necessitates sensitive reflection on principles such as *‘Adl* or justice, *Murāqabah* or moral accountability, and the preservation of human dignity. There is a desperate need to unfold how these principles can assist the ethical integration of AI into healthcare, ensuring that the technology is applied in a manner that conforms with the teachings of Islam, and in the end, contribute to the general well-being of the individuals and society at large. With the newness

of AI in health and the involution involved, there remains a great deficiency of research into the juncture of AI, health, and Islamic bioethics. It is on this edifice that this paper is based to contribute toward closing this research gap by analyzing the ethical challenges presented by AI in health care and how they can be evaluated alongside an Islamic bioethical framework.

Objectives of the study

1. To identify and analyze the key ethical challenges associated with the use of AI in healthcare, particularly concerning privacy, bias, accountability, and the patient-clinician relationship.
2. To explore how Islamic bioethical principles, such as justice (*Adl*), moral accountability (*Muraqabah*), and the preservation of human dignity, can be applied to these challenges to ensure the ethical use of AI in healthcare.
3. To Develop a comprehensive Islamic ethical framework for the integration of AI in healthcare, providing guidelines that align with Islamic teachings and support the ethical deployment of AI technologies.
4. To Offer Recommendations for healthcare practitioners, policymakers, and AI developers on how to incorporate Islamic bioethical considerations into the design, implementation, and regulation of AI systems in healthcare.

Methodology

This study employs a multidisciplinary approach, combining qualitative research methods with a

thorough analysis of Islamic bioethical principles to explore the ethical implications of Artificial Intelligence (AI) in healthcare. The methodology is structured to ensure a comprehensive understanding of both the technological and ethical dimensions involved, as well as the specific application of Islamic bioethics to these challenges.

Literature Review

Artificial intelligence is the duplication of human intelligence into machines that are programmed to perform tasks that would otherwise be performed by any human intelligence through acts such as learning, reasoning, solving, and decision-making. AI technologies in health have a broad scope of applications to enhance improvement in patient care, clinical outcomes, and efficient operations.

Artificial intelligence is one of those few developments that hold the potential to bring about paradigmatic changes in any sphere, of which healthcare is surely among the most auspicious. In its essence, AI entails developing machines and systems with capacities for performing tasks usually segregated as uniquely human—those demanding intelligence characterized by learning, reasoning, and decision-making. In health, these applications vary and are deep, interpolating into how medical services are offered and how patient care should be managed.

Diagnostic assistance is one of the essential applications of AI in healthcare. Indeed, AI algorithms have improved appreciably in their ability to analyze medical images like X-rays, CT

scans, and MRIs. Equipped with advanced technologies in image recognition, these systems now detect and diagnose conditions at capabilities that often match or even often surpass human expertise. Classically, AI-driven tools have the prowess to identify the first signs of diseases such as cancer, heart conditions, or even neurological disorders very early on, hence enabling effective and timely interventions. This not only serves to increase the accuracy of diagnosis but also accelerates this process of disease detection, which is important for the success of a treatment.

It has introduced major revamping in surgery with the invention of robotic systems. The AI-aided surgical tools are granted unprecedented precision and control over intricate surgeries. It is the real-time data provision and the putative optimal surgical pathways provided by the AI systems that allow surgeons to conduct minimally invasive surgeries with reduced risks and higher outcomes (Yang et al., 2020). The integration of AI in surgical practice is a step ahead in making surgical interventions efficient and reducing human error. Other major contributions of AI have been toward personalized medicine itself. Genetic profiling data coupled with lifestyle and routine medical history information will make it possible for AI algorithms to create person-specific treatment plans. This approach allows for tailored therapeutic strategies that align with the unique characteristics of each patient, optimizing treatment efficacy and minimizing adverse effects. Such personalized strategies are particularly valuable in managing

chronic conditions, where patient responses can vary significantly (Obermeyer et al., 2019).

Notably, predictive analytics, driven by AI in healthcare, draws clear lines of the impact. AI-driven predictive models, according to various authors, have been developed based on vast amounts of data extracted from patients' records and population health databases. Such models can predict the likelihood of recurrence of a certain disease, predetermine the distribution of patient response to administered treatments, and identify the necessity for readmissions. In a nutshell, such predictive analytics enhances general healthcare efficiency and effectiveness since it allows for advance interventions and better care management. Another important application of artificial intelligence in healthcare relates to natural language processing (NLP). NLP systems are designed to comprehend and parse relevant information from sources of data that are unstructured, comprising within this category medical records, research papers, and notes from patients. This system automatically summarizes the history of a patient; it underlines relevant clinical information and supports clinical decision-making through the synthesization of large textual volumes of data (Miotto et al., 2016). One of the key capabilities of NLP is handling and finding sense in unstructured information, which is very relevant to making medical information more accessible and useful.

AI-driven virtual health assistants can, in the same way, enthusiastically take part in a very important role in the care of the patient. They can provide

access to support that is tailor-made and more personalized. These AIs can monitor medicine intake schedules, provide basic medical information, and even do the preliminary assessment of symptoms. The AI acts as a very important part of better patient engagement and management of chronic conditions by ensuring patients get timely and relevant information about health decision-making processes (Kaplan and Haenlein, 2019).

Islamic Ethical Framework for AI Usage in Healthcare

Increased Artificial Intelligence involvement in health creates new transformative opportunities and challenges that require ethical frameworks to ensure technologies align with central values and principles. There is the existence of a general ethical framework within an Islamic bioethics that adequately guides the integration of AI into healthcare. Amongst others, it establishes tenets such as justice, moral accountability, and the inviolability of human dignity.

This review of literature gives an overview of the Islamic ethical framework for AI in healthcare, with insights into guidelines and recommendations and shots at the policy implications emanated from these ethical considerations. The Islamic bioethics, rooted overwhelmingly in Shariah, gives a sound framework for treading the ethical dimensions of AI in healthcare. Central to this framework is justice, which entails that the AI designs and development synchronize under auspices to guarantee fairness and equity. It addresses the potential biases of AI

algorithms, influencing unequal treatment across different demographic groups.

This, as Albar and Kahan, 2020 post in their research work, concerns how AI devices can be designed to reduce prevailing health disparities but not propagate or create new ones, maintaining high ethical standards in medical practice.

Murāqabah, which speaks of the responsibilities of people and entities engaged in development and fielding AI technologies. This principle enforces transparency in decision-making processes and creating oversight mechanisms that will ensure adherence to moral accountability. Developers, health providers, and policy makers should be liable for the ethical actions of AI systems and shall take measures for their responsible and ethical uses. Confirming that every action, no matter how small, is recorded, holding individuals morally accountable, Allah (swt) says in the glorious Qur'an:

"So, whoever does an atom's weight of good will see it, and whoever does an atom's weight of evil will see it." (Quran 99:7-8)

The Prophet Muhammad (peace be upon him) said:

"Every one of you is a shepherd, and every one of you will be asked about his flock..." (Sahih al-Bukhari, Hadith 893; Sahih Muslim, Hadith 1829)

Another essential value in the Islamic ethical framework is respect for human dignity, as this is a core value in Islam, reflecting the sacredness and inherent worth of every individual.

Allah says, highlighting the elevated status He has granted to all human beings, emphasizing universal dignity:

"And We have certainly honored the children of Adam and carried them on the land and sea and provided for them of the good things and preferred them over much of what We have created, with [definite] preference." (Quran 17:70)

Prophet Muhammad (peace be upon him) also said:

"Indeed, your blood, your wealth, and your honor are sacred to one another like the sanctity of this day of yours, in this month of yours, in this city of yours." (Sahih al-Bukhari, Hadith 67; Sahih Muslim, Hadith 1679)

AI systems would have to be such that they respect patient autonomy, ensuring that technology does not burden the human element of care. In line with Niazi and Ghaffar, 2022, the maintenance of confidentiality regarding patient information and the upkeep of empathetic elements of the consultations between patients and clinicians become critical factors toward upholding human dignity within healthcare settings. The guidelines

and recommendations that can be forwarded to align AI applications with the ethical principles laid down by Islam are many. It is of great importance to ensure that AI systems are ethically designed and implemented. This means algorithms will have safeguards against biases and guarantee equal treatment. AI has to be trained on diverse datasets, and their audit must be done regularly in order to find and reduce potential bias as much as possible.

It helps in ensuring that the technologies of AI will not be skewed towards one group over another, and are helpful in guaranteeing fairness in healthcare. Transparency and accountability of AI systems are also critical. Developers and healthcare providers need to ensure that the decision-making processes of AI systems are transparent and clearly documented. Regular ethical reviews with transparent communication about the inner workings of AI decisions, Hassan & Khan noted, would remain accountable to the stakeholders and build trust.

Such practices help to ensure, at a great number of different levels, that AI technologies are designed for use in a manner consistent with Islamic ethics and values, and that any potential problems will be dealt with at the forefront of the development process.

Another important guideline respects the autonomy of the patient. AI technologies had to be mainly used to complement human judgment in relation to the care of a patient. From the point of making sure patients are informed, involved, and consulted about decisions regarding their mode of treatment, its

suitability, and the involvement of AI in their care, their autonomy is respected and the human touch aspect of health matters is preserved, as Jabbar & Ahmed, 2024 puts it.

This is also confirmed in the Qur'an where Allah says:

"There shall be no compulsion in [acceptance of] the religion. The right course has become clear from the wrong..." (Quran 2:256)

That approach ensures some balance between technological advancement and basic features of attending to a patient.

Another important aspect is data privacy and security. AI systems have to be upgraded to the best standards of protection of personal data in regards to protecting patient information from unauthorized persons who would misuse the information. Standard confidentiality as prescribed in the Islamic doctrine comes first when it comes to preserving trust and maintaining personal data (Salman & Junaid, 2022).

The Prophet (peace be upon him) said:

"Whoever conceals the faults of a Muslim, Allah will conceal his faults on the Day of Resurrection." (Sahih Muslim, Hadith 2590)

Most importantly, ethical standards and regulations taking under consideration Islamic precepts in the development and application of AI technologies are required. The governments should set certain

measures regarding AI systems to be fair, accountable, transparent, and consequential, so that their use might stand in accord with Islamic values. As Karim maintains, it implies that now healthcare professionals and the developers of AI technologies must receive education and training with respect to Islamic bioethical precepts, so that these latter will be taken into consideration in their practices. Courses at the junction of artificial intelligence, health, and Islamic ethics could lead to good ethical practices that would help face some challenges presented by AI technologies.

Participation of stakeholders, therefore, is a basic ingredient in developing and implementing policies that are imbued with Islamic ethical principles. In this regard, appropriate steps can be taken by involving Islamic scholars, healthcare providers, and AI developers to ensure that the use of AI technologies does not get horribly wrong in violating some of the tenets espoused by Islam (Husain et al., 2022). In view of this, such collaboration could mean more effective and sound ethical practices when it comes to the integration of AI into health management.

Application of the principles from Islamic bioethics to AI in healthcare delivers a framework that insists on justice, accountability, and preservation of human dignity. It is with these guidelines, plus the implantation of ethical dimensions into policy development, that integration of artificial intelligence into healthcare can be managed and regulated according to Islamic values; this will enhance ethical and fair patient care.

Summary of Findings and Contribution to Knowledge

Artificial intelligence (AI) in health is such an enormous and intimidating development that can bring about enhanced accuracy of diagnosis, greater precision in surgery, and customized treatment for patients. Though the ethical issues involved in the implementations of AI are deep, these paradigmatic shifts into the deployment of artificial intelligence pose a much deeper dimension of policy issues when viewed from the prism of Islamic bioethics. This review considers the ethical framework provided by Islamic principles—justice, moral accountability, and the sanctity of human dignity—leading to increased use of AI in ethical modes within healthcare.

Literature review shows that Islamic bioethics provides a comprehensive framework for the review of AI technologies in healthcare. The principle of justice insists that designing and implementing AI systems would ensure fairness and prevent biases, redressing possible inequities in treatment. This includes using diverse data sets and regular auditing to reduce biases in AI algorithms. The principle of *Muraqabah* specifies moral accountability for the developer, healthcare professional, and policymaker by making AI systems open and transparent, with clearly documented decision processes, and overseeing mechanisms in place. What drives the preservation of human dignity has more to do with the preservation of patient autonomy and confidentiality by ensuring that AI technologies complement rather than replace human elements of

care. It is in a framework of this nature that guidelines and recommendations can be deduced, emphasizing the ethical design, transparency, respect for autonomy, and strict measures regarding data privacy in AI-assisted healthcare. These will also work toward aligning AI applications with Islamic values while contributing to the universal aspiration of delivering ethical healthcare. The review places emphasis on the achievement of translation policies, which encapsulate these ethical considerations at the level of rule-making, manpower development programs, and stakeholder engagement strategies.

This study, thus contributes to the literature in that it goes further than the usual techno-centered articles by discussing in detail, how AI usage in healthcare can be fomented through Islamic ethical precepts. It brings out the perspectives of Islamic bioethics, focusing on justice, accountability, human dignity, and juxtaposing these against more secular ethical frameworks underpinning AI development. By bringing in Islamic values into the debate on AI ethics, the review contributes to a richer understanding regarding the paths by which a diversity of ethical perspectives helps to guide responsible technological use in healthcare. Level-specific guidelines bring into focus how AI systems could be aligned with Islamic ethical principles, backed by concrete recommendations to developers, healthcare providers, and policymakers. These recommendations contribute to the development of AI technologies that are not only technically advanced but also ethically sound and respectful of patients' rights. The review underlines how these, in

fact, offer lessons that can be used for establishing policies and practices so that AI works in tandem with Islamic values for pushing forward the cause of Islamic bioethics in technology.

Ways in which future research could build on this review's finding would have to be explored. It especially requires studies based on empirical evidence of practical applications of Islamic ethical principles in AI systems. This could involve the examination of how these principles are implemented in their actual settings and assessing their impact on health outcomes and patient satisfaction. Research efforts should indeed be directed toward the development of frameworks and tools for the auditing of AI systems to comply with Islamic ethical guidelines, including metrics that can be used in the evaluation of fairness, accountability, and transparency in AI technologies. Future research may also delve into how Islamic bioethics intersects with other approaches to ethics by comparing them for common grounds and differences. It may be expected that such a comparative analysis would bring much more insight into how very different ethical perspectives could be integrated within global AI standards.

Finally, research is due on the problems or obstacles—the challenges, barriers, or outlooks—that have occurred in implementing Islamic ethical prescriptions within AI development and in comparable contexts of diversity/multiculturalism. Not until one understands what these challenges are can strategies be adopted regarding how best to

infuse Islamic values into the global discourse for ethics in AI.

In summary, principles of Islamic bioethics in the use of AI in healthcare serve with guidelines and recommendations informed by considerations of justice, accountability, and human dignity. Contributions to the field of Islamic bioethics and technology open up avenues for future research that can continue to further define and expand these ethical frameworks to ensure AI technologies are developed and utilized in a manner respectful and protective of basic values.

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