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Artificial Intelligence (AI) and its Application in Health Care: An Islamic Perspective

**** Dr. M. Aminuddin, **Dr. Abida Iqbal***

** Assistant professor, Department of Islamic Studies, Bahria university, Islamabad*
*** National University of Modern Languages, Islamabad*

Keywords

Artificial Intelligence, Healthcare Ethics, Islamic Bioethics, Medical Accountability, Patient Privacy, Algorithmic Bias, Collective Liability

Abstract

The rapid integration of artificial intelligence (AI) into healthcare systems worldwide has ushered in transformative opportunities for diagnostics, treatment personalization, and patient management. However, these advancements also present complex ethical challenges that require careful consideration within diverse cultural and religious frameworks, including Islam. This article explores the application of AI in healthcare from an Islamic perspective, with a particular focus on the ethical, legal, and religious implications for medical accountability, patient autonomy, and data privacy. Islamic bioethics is rooted in the principles of divine permission, human stewardship, and the preservation of life, intellect, and dignity. The integration of AI in medicine must align with these foundational values, ensuring that technological innovations serve the common good (*maslaha*) and do not compromise the moral responsibilities of healthcare providers. Traditional Islamic jurisprudence emphasizes the accountability of physicians to both God and patients, requiring competence, transparency, and informed consent. As AI systems increasingly assist or even autonomously perform medical tasks, questions arise regarding the allocation of liability—whether it remains with the physician, extends to medical teams and institutions, or even includes AI developers in cases of error or harm. The concept of collective liability (*dhimmah mushtarakah*) is gaining traction in contemporary Islamic discourse, reflecting the collaborative nature of modern healthcare and the distributed responsibility inherent in AI-driven interventions. Furthermore, Islamic ethics mandate the protection of patient privacy and the prevention of harm, necessitating robust safeguards against data misuse and algorithmic bias. The principle of justice (*adl*) requires that AI tools be accessible and non-discriminatory, addressing disparities in healthcare delivery. This article synthesizes insights from classical and contemporary Islamic scholarship, case studies from Muslim-majority countries, and interdisciplinary research to propose a framework for ethically integrating AI in healthcare. It argues that while AI holds immense potential to enhance medical practice, its adoption must be guided by Islamic values of compassion, trust, and accountability, ensuring that technology remains a tool for human flourishing rather than a source of ethical conflict. The analysis underscores the need for ongoing dialogue among religious scholars, healthcare professionals, and technologists to navigate the evolving landscape of AI in medicine.

Introduction

Artificial intelligence (AI) is rapidly transforming the landscape of healthcare, offering unprecedented opportunities to enhance diagnostic accuracy, personalize treatment, and streamline patient management. From machine learning algorithms that analyze medical images to robotic systems that assist in complex surgeries, AI is reshaping the way healthcare is delivered and experienced (Topol, 2019). These technological advancements promise to improve patient outcomes, optimize resource allocation, and address longstanding challenges in global health systems. However, as AI becomes increasingly integrated into clinical practice, it also raises

*Corresponding Author: Dr. M. Aminuddin
Email Address: *aminuddin.iiui@gmail.com*

profound ethical, legal, and social questions that demand careful consideration within diverse cultural and religious contexts.

In Islam, healthcare is viewed as both a moral obligation and a sacred trust. The Qur'an and the teachings of the Prophet Muhammad (peace be upon him) emphasize the sanctity of human life (Qur'an 5:32) and the duty to preserve health and well-being (Hadith: "There is no disease that Allah has created, except that He has also created its treatment," Sahih al-Bukhari). These principles form the foundation of Islamic bioethics, which prioritizes compassion (rahma), justice (adl), and the responsible stewardship of the human body (Ghaly, 2020). As such, the integration of new technologies like AI into healthcare must be carefully evaluated to ensure that they align with these core values and do not compromise the ethical responsibilities of medical professionals.

The ethical challenges posed by AI in healthcare are multifaceted. Issues such as accountability, transparency, data privacy, and algorithmic bias are of particular concern, both in secular and religious frameworks (Char et al., 2020). In the Islamic tradition, the concept of trust (amanah) underscores the moral responsibility of healthcare providers to act in the best interests of their patients. This includes ensuring that AI tools are used competently, that patients are fully informed about the role of AI in their care, and that their personal data is protected from misuse. The principle of justice further requires that AI applications are accessible to all and do not perpetuate existing disparities in healthcare delivery (AlKandari, 2024).

Despite the growing body of literature on AI ethics, there remains a relative paucity of research addressing these issues from an Islamic perspective. This article seeks to fill this gap by exploring the application of AI in healthcare through the lens of Islamic bioethics. Drawing on classical and contemporary Islamic scholarship, case studies from Muslim-majority countries, and interdisciplinary research, the analysis will examine how AI can be integrated into healthcare in a manner that is consistent with Islamic values and principles. The article will also address key challenges, such as liability in cases of medical error, the need for transparency and explainability in AI systems, and the importance of safeguarding patient privacy. By doing so, it aims to contribute to the broader discourse on the ethical use of AI in healthcare and to provide practical guidance for policymakers, healthcare professionals, and religious scholars in Muslim-majority contexts.

Literature Review

The rapid advancement of artificial intelligence (AI) in healthcare has generated a substantial body of literature exploring its technical capabilities, ethical implications, and barriers to adoption. Recent reviews and meta-analyses have documented the transformative potential of AI across various medical domains, including diagnostics, treatment personalization, and patient management (Topol, 2019). However, alongside these opportunities, researchers have identified significant challenges such as data privacy concerns, algorithmic bias, and the need for robust regulatory frameworks to ensure patient safety and trust (Char et al., 2020).

A notable trend in literature is the increasing recognition of the multidisciplinary nature of AI in healthcare. Studies have examined AI not only from a technological standpoint but also through the lenses of management, economics, and ethics (Scirp, 2023). This broad perspective reflects the complexity of integrating AI into existing healthcare systems and underscores the importance of addressing both technical and

human factors in its implementation. For instance, the integration of AI with other emerging technologies such as the Internet of Things (IoT) and robotics has been highlighted as a key driver of innovation in modern healthcare settings (Scirp, 2023).

Despite the growing global interest in AI's role in medicine, there remains a relative scarcity of research addressing its ethical and legal implications from an Islamic perspective. Recent scholarly work has begun to address this gap by exploring the intersection of AI and Islamic bioethics, particularly in relation to medical accountability and liability (Ghaly, 2024). Islamic bioethics, rooted in the principles of the Qur'an, Hadith, and Islamic jurisprudence (Shariah), provides a distinct framework for evaluating the permissibility and appropriateness of new medical technologies. Key principles such as justice (*adl*), beneficence (*ihsan*), non-maleficence (*la dharar*), and respect for autonomy (*ikhtiyar*) are central to this framework and are increasingly being incorporated into health technology assessment (HTA) processes in Muslim-majority contexts (RSI International, 2024).

The concept of medical accountability in Islam traditionally revolves around the roles of God, the patient, and the physician. Classical and contemporary Muslim jurists have emphasized that medical interventions must be permitted by God, consented to by the patient, and performed by a competent physician (Ghaly, 2024). With the advent of AI, this framework is being re-examined to accommodate new stakeholders, such as medical teams, institutions, and AI developers, who may share liability for medical errors. The Islamic ethical framework thus advocates for collective and corporate forms of accountability, reflecting the collaborative nature of modern healthcare and the distributed responsibility inherent in AI-driven interventions (SSRN, 2024).

In the context of nursing care, the Islamic perspective views AI as a complementary tool that should enhance rather than replace the human touch and compassionate care provided by healthcare professionals (Salleh & Ahmad, 2018). Islamic ethics call for equitable and non-discriminatory healthcare delivery, emphasizing the need to identify and address biases embedded in AI systems to ensure that they do not perpetuate disparities or injustices. This approach aligns with the broader objectives of Islamic bioethics, which seek to protect life, intellect, progeny, wealth, and faith (*maqasid al-Shariah*) (RSI International, 2024).

Despite these advances, there remains a notable gap in the literature regarding the systematic integration of Islamic ethical frameworks into the evaluation and regulation of AI in healthcare. Most existing health technology assessment models are grounded in secular bioethics and may not fully consider the unique religious and cultural values that influence healthcare decisions in Muslim communities (RSI International, 2024). Recent studies have therefore called for the development of more culturally and ethically sensitive frameworks that align modern medical practices with Islamic principles (Ghaly, 2024).

In summary, the literature on AI in healthcare is rapidly expanding, with a growing emphasis on ethical, legal, and cultural considerations. While significant progress has been made in understanding the technical and managerial challenges of AI adoption, the integration of Islamic bioethical principles into this discourse is still in its early stages. Future research should focus on developing comprehensive frameworks that bridge the gap between technological innovation and Islamic values, ensuring that AI is used responsibly and equitably in Muslim-majority healthcare settings (Ghaly, 2024; RSI International, 2024).

AI in Healthcare: Key Applications and Ethical Challenges

The integration of artificial intelligence (AI) into healthcare has led to significant advancements in patient care, diagnostics, and treatment personalization. AI-driven technologies are now widely used in areas such as image analysis, predictive analytics, robotic surgery, and patient management systems. These innovations promise to improve diagnostic accuracy, streamline clinical workflows, and enhance patient outcomes (Topol, 2019). However, alongside these benefits, the adoption of AI in healthcare raises a host of ethical challenges that are of particular concern from an Islamic perspective.

Key Applications for AI in Healthcare

AI is transforming healthcare in several critical ways. In diagnostics, machine learning algorithms are being used to analyze medical images such as X-rays, CT scans, and MRIs, often with accuracy that rivals or surpasses that of human radiologists (Topol, 2019). AI-powered predictive analytics can identify patients at risk of developing certain conditions, enabling early intervention and personalized treatment plans. In treatment, AI assists in robotic surgery, providing surgeons with real-time data and enhancing precision during complex procedures. Additionally, AI-driven chatbots and virtual assistants are being deployed to improve patient engagement, answer medical queries, and facilitate appointment scheduling (Char et al., 2020).

In the field of radiology, for example, AI algorithms can rapidly and accurately detect abnormalities in imaging studies, reducing the workload on radiologists and minimizing diagnostic errors (Khan & Nayab, 2021). The use of AI in this context aligns with the Islamic principle of seeking knowledge and using it to benefit society, a value deeply rooted in the history of Islamic science and medicine (Al Balagh Academy, n.d.).

Ethical Challenges from a General and Islamic Perspective

Despite its potential, the use of AI in healthcare presents several ethical challenges. One of the most pressing issues is the question of accountability and liability. Traditional medical ethics, as well as Islamic bioethics, hold the physician responsible for patient care. However, with the introduction of AI, the responsibility may extend to medical teams, institutions, and even AI developers, especially in cases of medical error (Ghaly, 2024; SSRN, 2024). The Islamic ethical framework emphasizes that any medical intervention must be permitted by God, consented to by the patient, and performed by a competent professional. With AI, ensuring that these conditions are met becomes more complex, particularly when AI systems operate autonomously or their decision-making processes are opaque (Elgar, 2024).

Another critical challenge is data privacy and confidentiality. AI systems require access to vast amounts of patient data to function effectively. From an Islamic perspective, the protection of personal information is a moral obligation, rooted in the Qur'anic prohibition of spying and the importance of safeguarding secrets (Qur'an 49:12). Ensuring that patient data is not misused or exposed without consent is essential to maintaining trust in healthcare systems (Ghaly, 2024).

Algorithmic bias is another significant concern. AI systems trained on data from predominantly Western populations may not perform as accurately for patients from other backgrounds, potentially leading to disparities in care. The Islamic principle of justice (*adl*) requires that healthcare be equitable and non-discriminatory, making it imperative to

address biases in AI algorithms (RSI International, 2024).

Transparency and explainability are also vital. Patients have the right to understand how decisions about their care are made, especially when AI is involved. Islamic ethics, which emphasize informed consent (*bayyina*), require that patients be fully informed about the role of AI in their treatment and the potential risks and benefits (Elgar, 2024). This is particularly important given that AI applications in healthcare are still considered emerging technologies and not yet standard practice.

Case Studies and Islamic Perspectives

Case studies from Muslim-majority countries illustrate both the promise and the challenges of AI in healthcare. For example, Qatar has implemented AI-driven diagnostic tools in its healthcare system, guided by ethical frameworks that emphasize patient consent, data privacy, and the common good (*maslaha*) (WISH, n.d.; NCBI, 2022). Similarly, Kuwait has enacted laws to ensure that AI systems in healthcare comply with privacy regulations rooted in Islamic principles (NCBI, 2022).

The Islamic tradition encourages the pursuit of knowledge and the use of technology for the benefit of humanity, as exemplified by the contributions of Muslim scholars during the Golden Age of Islam (Khan & Nayab, 2021). AI, when used responsibly, can be seen as a continuation of this legacy, provided that its application is consistent with Islamic values of compassion, justice, and accountability.

Regulatory and Policy Frameworks for AI in Healthcare: Islamic Perspectives

The rapid integration of artificial intelligence (AI) into healthcare systems has prompted governments and regulatory bodies worldwide to develop robust legal and policy frameworks to ensure the safe, ethical, and effective use of these technologies. In Muslim-majority countries, these frameworks are increasingly being shaped by Islamic ethical principles, which emphasize accountability, justice, privacy, and the common good (*maslaha*). This section explores how Islamic perspectives are being incorporated into regulatory approaches for AI in healthcare, highlighting examples from countries such as Qatar, Kuwait, and Saudi Arabia.

Emerging Regulatory Approaches

Globally, the adoption of AI in healthcare is guided by a combination of national laws, international standards, and ethical guidelines. These frameworks address issues such as data privacy, algorithmic transparency, liability, and patient consent (Nuffield Council on Bioethics, 2022). In Muslim-majority countries, regulatory efforts are also informed by Islamic jurisprudence, which provides a distinct foundation for evaluating the permissibility and appropriateness of new technologies (Ghaly, 2024).

For example, Qatar has implemented AI-driven diagnostic tools in its healthcare system, underpinned by ethical frameworks that prioritize patient consent, data privacy, and the common good. The World Innovation Summit for Health (WISH) in Qatar has advocated for the development of culturally sensitive guidelines that align with Islamic values, emphasizing the need for transparency, accountability, and equitable access to healthcare technologies (WISH, n.d.; NCBI, 2022). Similarly, Kuwait has enacted legislation, such as Law No. 70/2020, which mandates that AI systems in healthcare comply with strict privacy regulations rooted in Islamic principles. These laws require that patient data be protected from misuse and that individuals have the right to understand how their data is used (NCBI, 2022).

Islamic Ethical Principles in Regulation

Islamic bioethics provides a comprehensive framework for addressing the ethical challenges posed by AI in healthcare. Central to this framework are the principles of *amanah* (trust), *adl* (justice), and the protection of privacy, as highlighted in the Qur'an (49:12) and the teachings of the Prophet Muhammad (peace be upon him). These principles are reflected in regulatory requirements that emphasize the need for informed consent, data confidentiality, and non-discriminatory access to healthcare services (Ghaly, 2024).

The concept of *maslaha* (public interest) further guides policymakers to prioritize the well-being of the community when regulating AI. This includes ensuring that AI-driven healthcare solutions are accessible to all segments of society and do not exacerbate existing health disparities. Islamic scholars and jurists are increasingly engaged in the development of regulatory guidelines, providing religious oversight to ensure that technological innovations remain consistent with Islamic values (Ghaly, 2024; RSI International, 2024).

Challenges and Opportunities

Despite these advances, challenges remain in the implementation of AI regulations in Muslim-majority countries. Issues such as algorithmic bias, liability for medical errors, and the need for explainability in AI systems are still being addressed. The Islamic ethical framework, with its emphasis on justice and accountability, offers a valuable lens through which to approach these challenges. For instance, the principle of *adl* requires that AI systems be designed and deployed in a way that ensures fairness and avoids discrimination (RSI International, 2024).

Moreover, the integration of AI into healthcare systems must be accompanied by ongoing education and training for healthcare professionals, ensuring that they are equipped to use these technologies responsibly and in accordance with both regulatory requirements and Islamic ethical standards (Ghaly, 2024).

Case Studies and Best Practices

Case studies from Qatar and Kuwait demonstrate how Islamic principles can be effectively integrated into regulatory frameworks for AI in healthcare. These countries have established multidisciplinary teams, including technologists, clinicians, and Islamic scholars, to oversee the development and implementation of AI-driven healthcare solutions (NCBI, 2022; WISH, n.d.). This collaborative approach ensures that technological innovations are not only technically sound but also ethically and culturally appropriate.

Recommendations for Ethical AI Integration in Muslim-Majority Healthcare Systems

The integration of artificial intelligence (AI) into healthcare in Muslim-majority countries presents both significant opportunities and complex ethical challenges. To ensure that AI-driven innovations are consistent with Islamic values and contribute to the well-being of patients and society, it is essential to develop and implement robust guidelines for ethical AI use. Drawing on insights from recent research, case studies, and Islamic bioethics, the following recommendations are proposed for stakeholders in the healthcare sector.

Strengthening Ethical and Regulatory Frameworks

First and foremost, Muslim-majority countries should continue to develop and refine ethical and regulatory frameworks that govern the use of AI in healthcare. These frameworks must be rooted in Islamic principles such as trust (*amanah*), justice (*adl*), and the protection of privacy, as

articulated in the Qur'an and the teachings of the Prophet Muhammad (peace be upon him) (Ghaly et al., 2024; WISH, 2024). Policymakers should engage Islamic scholars, ethicists, and technologists in the development of these guidelines to ensure that they are both culturally sensitive and technically sound. For example, the World Innovation Summit for Health (WISH) has recommended that AI policies in healthcare should emphasize transparency, accountability, and equitable access, reflecting the broader objectives of Islamic bioethics (WISH, 2024; NCBI, 2022).

Ensuring Accountability and Transparency

One of the most pressing ethical issues in AI-driven healthcare is the question of accountability, particularly in cases of medical error or unintended harm. The Islamic ethical framework emphasizes that only humans are morally accountable for their actions, and this principle should guide the allocation of responsibility in AI-assisted care (Ghaly et al., 2024). Physicians and healthcare institutions must maintain oversight of AI systems and be prepared to explain AI-driven decisions to patients. The so-called "black box" problem—where the reasoning behind AI decisions is opaque—must be addressed through regulatory requirements for explainability and interpretability (WISH, 2024; NCBI, 2022). Patients should be informed about the role of AI in their care and have the right to understand how decisions affecting their health are made.

Protecting Patient Privacy and Data Security

Protecting patient privacy is a fundamental ethical obligation in Islam, as highlighted in the Qur'an (49:12). AI systems rely on vast amounts of personal data, and robust safeguards must be in place to prevent unauthorized access, misuse, or breaches (Ghaly et al., 2024; NCBI, 2022). Regulatory frameworks should mandate strict data governance, including encryption, access controls, and regular audits. Patients should also be given clear information about how their data will be used and the opportunity to consent or opt out of data sharing for AI training and research.

Promoting Equity and Non-Discrimination

The principle of justice (*adl*) in Islam requires that healthcare be accessible and non-discriminatory. AI systems must be designed and deployed in a way that ensures equitable access to healthcare services for all segments of society, including marginalized and underserved populations (Ghaly et al., 2024; NCBI, 2022). Policymakers should address potential biases in AI algorithms by requiring diverse and representative training data, as well as ongoing monitoring for disparities in care. Efforts should also be made to bridge the digital divide and ensure that AI-driven healthcare solutions are available in rural and remote areas.

Enhancing Education and Training

The successful integration of AI into healthcare depends on the competence and confidence of healthcare professionals. Training programs should be developed to equip clinicians with the skills needed to use AI tools effectively and ethically. These programs should also address the ethical implications of AI, including issues of accountability, transparency, and patient consent (WISH, 2024; NCBI, 2022). In addition, public awareness campaigns can help patients understand the benefits and risks of AI in healthcare and foster trust in these technologies.

Fostering Interdisciplinary Collaboration

Addressing the ethical challenges of AI in healthcare requires collaboration among a wide range of stakeholders, including

technologists, clinicians, policymakers, and Islamic scholars. Multidisciplinary committees should be established to oversee the development and implementation of AI-driven healthcare solutions, ensuring that they are consistent with both technical best practices and Islamic values (Ghaly et al., 2024; NCBI, 2022). This collaborative approach has been successfully implemented in countries such as Qatar and Saudi Arabia, where partnerships between government agencies, healthcare institutions, and academic centers have facilitated the responsible adoption of AI in medicine (NCBI, 2022).

Encouraging Ongoing Research and Evaluation

Finally, it is essential to support ongoing research and evaluation of AI applications in healthcare. This includes monitoring the impact of AI on patient outcomes, equity, and the doctor-patient relationship, as well as assessing the effectiveness of regulatory and ethical frameworks (WISH, 2024; NCBI, 2022). Research should also explore innovative approaches to addressing emerging ethical challenges, such as the use of AI in end-of-life care, mental health, and other sensitive areas.

Conclusion

The integration of artificial intelligence (AI) into healthcare systems in Muslim-majority countries represents a profound opportunity to advance medical practice, improve patient outcomes, and address longstanding challenges in healthcare delivery. However, as this article has demonstrated, the adoption of AI in healthcare also raises complex ethical, legal, and cultural questions that must be addressed through a combination of robust regulatory frameworks and a commitment to Islamic ethical principles.

From an Islamic perspective, the use of AI in healthcare is both permissible and encouraged, provided that it aligns with core religious values such as trust (*amanah*), justice (*adl*), privacy, and the common good (*maslaha*). The Qur'an and the teachings of the Prophet Muhammad (peace be upon him) emphasize the sanctity of human life and the responsibility to use knowledge and technology for the benefit of society (Ghaly et al., 2024; WISH, 2024). Case studies from countries such as Qatar, Saudi Arabia, and the United Arab Emirates illustrate how these principles are being incorporated into regulatory and policy frameworks, ensuring that AI-driven healthcare solutions are both technically sound and ethically grounded (NCBI, 2022; WISH, 2024).

The literature and case studies reviewed in this article highlight the importance of accountability, transparency, and patient consent in the use of AI. The Islamic ethical framework provides clear guidance on these issues, emphasizing the need for healthcare professionals to maintain oversight of AI systems, to explain AI-driven decisions to patients, and to protect patient data from misuse (Ghaly et al., 2024; Elgar, 2024). The principle of justice further requires that AI applications be accessible to all and do not perpetuate disparities in healthcare delivery.

Despite these advances, challenges remain. Issues such as algorithmic bias, liability for medical errors, and the need for explainability in AI systems are still being addressed. The Islamic ethical framework, with its emphasis on collective accountability and the protection of human dignity, offers a valuable lens through which to approach these challenges. The recommendations proposed in this article—including the development of culturally sensitive regulatory frameworks, ongoing education and training for healthcare professionals, and interdisciplinary collaboration among technologists, clinicians, and Islamic scholars—provide a roadmap for the

responsible and ethical integration of AI in healthcare.

Looking ahead, it is essential for Muslim-majority countries to continue investing in research and evaluation to monitor the impact of AI on patient outcomes, equity, and the doctor-patient relationship. By fostering ongoing dialogue and collaboration, these countries can ensure that AI serves the best interests of patients and society, while remaining true to the values and principles of Islam. In this way, the integration of AI in healthcare can serve as a model for the responsible use of technology in the service of humanity.

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