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Managing the ethical implications of artificial intelligence in healthcare: An analysis from Islamic perspectives

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Abstract

As AI and machine learning (ML) transform healthcare, it is essential to examine these changes through an ethical and religious lens. This review explores AI, ML, and healthcare from an Islamic perspective, focusing on Islamic bioethics. This study uses a qualitative research methodology through a literature review approach, examining classical Islamic texts on akhlak al-Islamiyyah (Islamic ethics) alongside scholarly works on artificial intelligence in healthcare. Relevant journal articles, books, and reports on robotics and AI technology are also reviewed to explore their legal and ethical implications. Ethical concerns such as privacy, fairness, and bias are identified and mapped onto core Islamic values, including the sanctity of life, autonomy, beneficence, and justice. The review highlights challenges and opportunities in integrating AI and ML in healthcare, offering recommendations for ethically responsible implementation aligned with Islamic principles.

Keywords: Artificial Intelligence, Islamic Ethics, Healthcare, Management

1.0 Introduction

Artificial intelligence covers several large areas starting from the most general things to specific things. Technology has proven to develop poetry writing, autonomous driving and even diagnose diseases in an accurate way (Vinothkumar, J., et al 2023). The emergence of artificial intelligence technology in the field of medicine symbolizes rapid progress in this industry. This technology has also led to more universal and efficient healthcare and more convenient and accurate medical treatment. Therefore, this study aims to critically examine the integration of artificial intelligence (AI) in the healthcare sector with special emphasis on Islamic and bioethical perspectives. The researcher will consider the ethical challenges associated with the use of AI and in healthcare and ensure alignment with Islamic bioethical principles.

2.0 Literature Review

Ethical Considerations in AI for healthcare

Although AI technology offers new opportunities to improve people's daily lives, this technology also brings some challenges that should be managed effectively with wisdom.

First and foremost, data privacy. Since artificial intelligence technology needs to be trained with a large amount of personal health data information, several patient data sets are collected and used to build this technology (Alowais, S. A., et al 2023). This indirectly raises privacy issues arising in terms of data collection and sharing (Safavi et al 2019), (Rigby et al 2019). Patients may believe that their data is used for one purpose

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only, but it is difficult to predict the subsequent use (Yoon, M., Park, et al 2024). For example, surveillance systems used by AI systems through personal devices or robotics will raise concerns because personal health data and information can be hacked and shared for profit (Pauwels E, et al 2018). There are also privacy and security concerns if personal data is leaked to employers and companies (Allahrakha, N. (2023). Patients should be given the trust that personal data is stored safely, secured and used ethically and effectively (Gerke, S., et al 2020). One of the cases that occurred related to the sharing of data between Google DeepMind with an AI research company and the Royal Free London NHS Foundation Trust (NHS) when a total of 1.6 million patient data has been shared with the company DeepMind for the purpose of improving the management of kidney disease (Mc William et al 2022). The question arises if the data used does not get the consent of the patient, thereby threatening the patient's privacy and ultimately destroying public trust (Denton S., et al 2018).

Bias in the data used to train the algorithm is also one of the ethical risks (Tsamados, A., et al 2021, Ntoutsi, et al 2020, Leavy, S., et al 2020). The main concern with algorithms is that if they are developed by humans, they can naturally create errors. This indirectly produces output that gives advantages to certain populations over others. Bias is due to inaccurate data used to train AI algorithms. Complete and not representative of a population thus making the results of AI cannot be generalized to the population in which it is used (Celi, L.A., et al. 2022). Not only is the data set biased, even AI has the potential to maintain systemic inequality based on race, gender and other demographic characteristics (Straw, I. et al 2020).

The lack of transparency in certain AI algorithms raises concerns about accountability and the ability to explain their decision-making processes. In healthcare, where choices can significantly impact lives, this lack of explainability presents an ethical dilemma (Yoon et al., 2021). Ethical AI practices call for the creation of algorithms that are not only precise but also offer clear explanations for their recommendations, enabling healthcare professionals to make well-informed decisions (Khanna et al, 2020).

Medical staff have also shown mistrust of AI and as a result they hesitate to use this technology. For example, physicians in various countries have stopped using IBM's Watson Oncology and AI-powered diagnostic support systems (Nufield Council 2018). Mistrust among medical staff was also raised regarding machine learning programs that are difficult to understand and explain (Verghese et al 2018)

Among the ethical questions that are often discussed among researchers is who should be responsible for errors in the application of AI technology in clinical care (Naik, N., et al 2022; Upadhyay, U., et al 2023). This question often arises because AI processes are too complex for most individuals to understand and explain. This causes them to face difficulties in examining the output of this technology system (Cadario, R., et al 2021). Likewise, questions arise about compensation for harm suffered because of the use of artificial intelligence technology (Holm, S., et al 2021). Some views among researchers state that health sector personnel who need to be responsible for decision-making assisted by AI technology (Khullar, D., et al 2021, Molnár-Gábor, F. 2020).

3.0 Methodology

This study uses qualitative research methodology. The researchers take a literature review approach by studying classic islamic texts that discuss the concept of akhlak al-islamiyyah (Islamic ethics) and literature on artificificial intelligence in healthcare then analyzed to understand the definition, category, and application of this concept. The researchers also examined journal articles, books, and reports on developments in robotics and AI technology, as well as their legal and ethical implications. The researchers Identify ethical concerns specific to AI such as privacy, fairness, bias and map them onto Islamic ethical principles such as sanctity of life, autonomy, beneficence, and justice.

4.0 Findings

Islamic ethics based on the artificial intelligence ethical considerations

Based on the islamic principles, the concept of the sanctity of life is the belief that all human beings in every stage of life regardless of race, skin color, ethnicity, intelligence level, religion, language, gender, character, behavior, physical ability/disability, potential, class, social status should be considered human. Islam elevates the value of life and prioritizes self-protection in maintaining life. Taking care of life is included in one of al-daruriyyat al khams in the discussion of maqasid al-shariah which is obligatory for everyone who is affected by

the burden of obligation (mukallaf) to take care of it (Al-Ghazali, 1994). This is related to medicine to preserve life, take care of public health and prevent factors that contribute to the well-being of individuals and communities (Rosman, A.S et al 2019, Zamri, M.F.N. et al 2023). In addition, Islamic bioethics also emphasizes the importance of respecting individual dignity because it is considered as a noble creation.In the earliest book of Islamic medical ethics, 'Adab al tabaib' or 'Doctoral Ethics' written by Al-Ruhawi (1967), he suggested that doctors should preserve their five senses and not use them except for beneficial purposes and reject harmful things. Therefore, in Islamic bioethics, the concept of bringing goodness (beneficence) is closely related to the concept of "Ihsan" which means doing good or excelling. One of the general methods in Islamic jurisprudence is that the law comes to achieve good (maslahat) and reject damage (mafasid) (Al-Shatibi, I.I 2012). Therefore, Muslims are encouraged to show kindness and compassion to all creation. This principle emphasizes the importance of avoiding actions that can harm individuals and communities that prioritize well-being. When a doctor performs a treatment, there are side effects and risks of harm. Therefore, this principle aims to balance benefits and harms, thus acting in the best interest of the patient. In Islam, the concept of avoiding harm is very important as mentioned in the fiqh method "every dharar (damage) must be eliminated" (Al-Din'Abd al-Rahman, J. 1999).

In Islam, autonomy is often associated with the principle of al-taskhir, that is, the Lord of the universe subjugates all creatures to humans so that they perform governance (tadbir), developing this world as desired by Allah SWT. Islam also emphasizes individual responsibility and the protection of human rights. With the creation of humans as His caliphs on earth, God endowed humans with reason and responsibility for their actions and respected their status: " 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." (Al-Quran, 17: 70). Al-Asyqar, M.S (2007) mentions that Allah created them with a beautiful form and gave them privileges with the ability to speak and think, and specialized them with various types of food, drink, and clothing that animals do not have. Respecting karamah al-insan (human dignity) is an ethical principle that is very important to the application of artificial intelligence in healthcare.

Muslims are also instructed to act with justice (al-a'adalah) in every aspecys of life, whether in terms of spirituality, law, politics or finance. Al-A'dl has been narrated many times in the Qur'an and in the |words of the Prophet. In the Qur'an, Allah SWT said "when you judge between people, judge with fairness (Al-Nisa: 58). Furthermore, every human being should be treated equally, and no differentiation should be made based on culture or ethnicity. Prophet Muhammad, in his last sermon said: "All human beings are from Adam and Eve, an Arab does not have an advantage over a non-Arab and a non-Arab has an advantage over an Arab; also a White has no advantage over a Black nor does a Black have an advantage over a White except by piety and goodness of action" (Hanbal A., Musnad). Therefore, according to Islamic scholars, justice is ultimately sourced and revolves around piety to Allah SWT by doing what is commanded and avoiding what Allah forbids.

Islam strongly protects (hifz) and respects human privacy. Allah SWT said : "O you who have believed, do not enter houses other than your own houses until you ascertain welcome and greet their inhabitants."This verse states that a person is prohibited from entering another person's house if he does not get permission from the owner which is the duty of a Muslim to ask for permission. Al-Tabari (1999) states when explaining this verse, it is important to greet (give salam) before entering someone's house. Ibnu Katsir (2000) also explained the same meaning of knocking on the door three times with a greeting as a respectable approach to ask permission from the owner. Permission from the owner is the only way to verify and authorize visitors to enter the home. In this verse too, the host has full right to allow a person to enter or not. Al-Tabari (1999) also stated that Muslims need to ask for permission if they want to enter or access a place. Similarly, Muslims should be encouraged not to disturb during breaks in the three times of privacy. Ibn Kathir, I. (2000) explains what is meant by three times, namely, before the Fajr prayer, during Qailullah (daytime sleep) and after the Isha prayer. Therefore, individual privacy rights must be respected in the sense that time is a very valuable and important time to relax or be alone without being disturbed.

Informed consent should be made with the patient's understanding and consent (Isti'zan). The Quran emphasizes the importance of a person's willingness, consent and mutual consultation (Shura) in making decisions (Al-Quran, 42:38). Activities involving contemporary medicine between doctors and patients also require informed consent to uphold the rights of each individual. In other words, there must be an element of offer and acceptance - which means agreement between the two parties before they sign the contract. A Muslim cannot enter a contract with another Muslim against his will and likewise one cannot be said to have accepted an offer if he does not agree to the terms of the contract. In Islam, no contract can be legally made if it conflicts

with the principles of Sharia. Therefore, even if both parties have agreed to the contract, it is still considered void and illegal in Islam because it is against the principles of Sharia. (Noor, N. S. M., et al (2019).

5.0 Discussion

Application of Islamic ethics in healthcare artificial intelligence

The sanctity of life is used as a principle and guide in making more ethical decisions by emphasizing the benefits and harm of each decision. The results produced must be in line with this principle to ensure that this technology contributes positively to patients. Artificial intelligence technology benefits individuals and society through ethical clinical decision-making by providing reliable information, such as offering evidence of the patient's preferences (Howard, D., et al 2022). This will benefit the general quality of clinical treatment and the overall decision-making process (Biller-Andorno N et al 2019). In applying this technology, developers and medical practitioners should be mindful of healthcare by prioritizing the safety of AI technologies and ensuring that they do not introduce new risks or compromise patient safety. Continuous testing, validation and monitoring of AI algorithms is essential to identify and address potential biases, errors or unintended consequences that could negatively impact patient outcomes (Benzinger, L., et al 2023). Transparency in the AI decision-making process is also important to build trust among healthcare professionals and patients to help minimize the risk of harm associated with the use of AI.

Among the applications of the principle of Al-Taskhir is towards the patient. This involves patients in the process of developing and evaluating AI systems to ensure that this technology is in line with human needs and values. Patients need to be involved from the beginning in the AI system development process which involves interviews, mass meetings or surveys to understand their needs and expectations for this technology. Patients should also be concerned about decisions related to the design and implementation of AI systems by providing their insight and perspective so that the technology produced will be more relevant and acceptable to other patients (Bjerring, J. C., et al 2021). Patients should also be explained about the principles of AI, how algorithms work and how they are applied in a health context. This helps patients understand how this technology can help in treating their health. Among other applications of the principle of autonomy are related to their rights to obtain informed consent, their right to data access and privacy security (Bitterman, D. S., Aerts, et al 2020). as described in other subtopics. Furthermore, human supervision and responsibility brings a human-centered approach. This principle encourages a human-centered approach with AI systems that are developed and implemented with human supervision (Saheb, T., et al 2023). Health care among professionals should maintain the responsibility to interpret the recommendations of this technology in making decisions

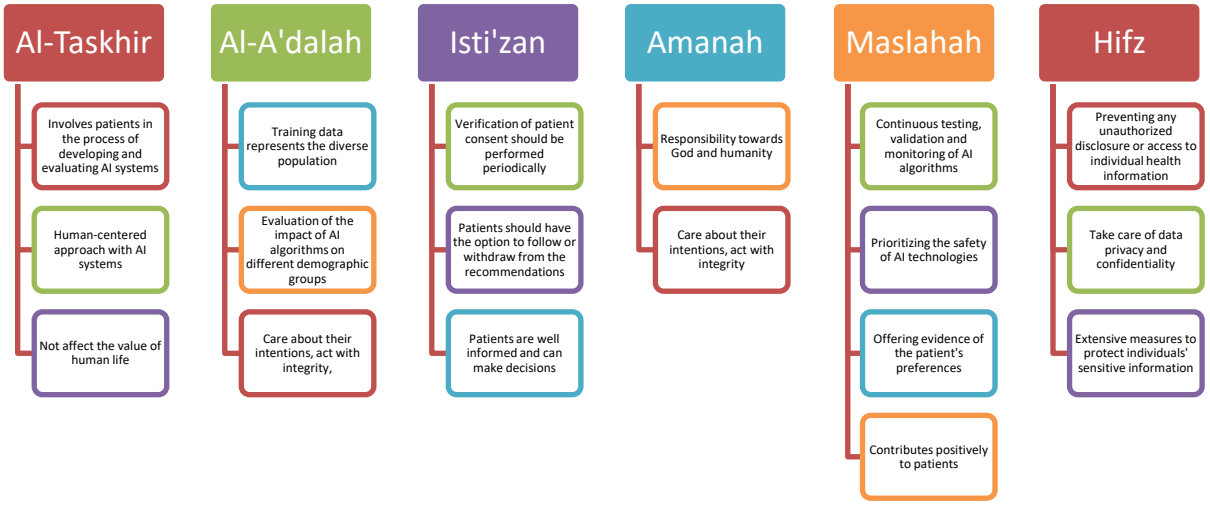
Al-A'dalah can be seen from several angles, namely through the design and training of AI algorithms and selection bias and data representation. Bias in data means biases present in healthcare data may show up in AI algorithms if not addressed. This is very important to select and process data by revealing bias (Juhn, Y. J., Malik, et al 2024). For example, if certain demographic groups are underrepresented, efforts should be made to balance the data set. This is to ensure that the training data represents the diverse population that will be provided by the AI algorithm. This includes considering factors such as age, gender, ethnicity, socioeconomic status and geographic location (Orwat, C. (2020). In addition, it is about the fairness of the algorithm. What needs to be considered is determining the metric measurement during this technological development phase. This involves evaluation of the impact of AI algorithms on different demographic groups (Pandey, A. et al 2021, July).

A major concern in implementing healthcare AI applications is to protect (Hifz) patient data privacy (Murdoch et al 2021). This is related to the care of medical data, data security and individual control of data. In addition, maintaining the confidentiality of patient data is also emphasized by preventing any unauthorized disclosure or access to individual health information. What needs to be emphasized is that only authorized personnel or systems are entitled to access this data (Bak, M., et al 2022). AI systems or algorithms implemented in the healthcare domain should take extensive measures to protect individuals' sensitive information. The design of AI algorithms should also specifically take care of data privacy and confidentiality. This means that algorithms should incorporate mechanisms to limit the risk of unauthorized access or use of sensitive health information. This can involve encryption, access control and other security measures to protect data throughout the AI/ML process (Milossi, M., et al 2021).

By emphasizing the concept of Al-Amanah, Islamic ethics encourages individuals involved in the field of AI in healthcare to care about their intentions, act with integrity, and consider the broader ethical implications of their work. This perspective reinforces the idea that technological progress should be aligned with moral and spiritual values, fostering a sense of responsibility towards God and humanity. Clinical systems require strict control and supervision (transparency and efficiency). Research is underway on black-box models to address the need for greater transparency by clinicians and consumers. Current descriptive techniques have their limitations (eg high-dimensional non-linear approximation of models by linear models), which cardiologists and cardiovascular researchers need to be aware of to make informed decisions about when and how to use them (Petch, J., et al 2022). Transforming healthcare systems supported by the enormous potential of AI requires a multidisciplinary approach involving AI developers/users, clinicians, workforce ethicists, and humanities scholars.

Isti'zan mechanisms should also be established, and patients should have the option to follow or withdraw from the recommendations presented by AI technology (Pickering, B. 2021) through clear and understandable consent specifically addressing the use of AI/ML in healthcare (Mudgal, K. S. et al 2020). These forms should outline the purpose of the artificial intelligence application, the types of data involved, and the potential impact on patient care as well as information regarding the risks and benefits of treatment associated with the use of AI/ML (Ursin, F. et al 2021). This ensures that patients are well informed and can make decisions based on a comprehensive understanding of the implications of technology for their health. This is to ensure the emphasis on the importance of transparency, communication and respect for patient autonomy in the context of AI/ML (Artificial Intelligence/Machine Learning) integration. into healthcare (Amann, J., et al 2020). Furthermore, verification of patient consent should be performed periodically, especially if there are significant updates or changes in the use of AI/ML in healthcare. This is to ensure patients remain informed and can adjust their options as needed.

The diagram illustrates the application of Islamic ethics in the use of artificial intelligence in healthcare



6.0 Conclusion & Recommendations

This study can conclude that artificial intelligence (AI) and machine learning (ML) technologies play an increasingly important role in healthcare. By integrating this technology, the provision of health services can be improved through improved diagnosis, reduced human error, and continuous patient monitoring. From an Islamic perspective, the use of artificial intelligence in the field of health should comply with Islamic ethical and moral values. The principles of justice, privacy, and responsibility should be held high in the development and use of this technology. In addition, emphasis should be placed on research and development that is innovative and in line with Islamic values. This is so because artificial intelligence technology and machine learning applied in health care should be a tool to improve the quality of human life and comply with Islamic moral and ethical principles. By combining this advanced technology with Islamic views that support the advancement of science and technology in accordance with moral values, researchers can expect that this technology will lead to

a more efficient, effective, and safe healthcare system. Therefore, it is important for stakeholders, including religious leaders, health experts, and policy makers, to work together to ensure that the use of artificial intelligence in healthcare is in line with Islamic principles and provides maximum benefit to society.

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