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Ethical Issues of Artificial Intelligence (AI) in the Healthcare

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Abstract

The idea of integrating ethics into artificial intelligence (AI) increased globally, and it became an important policy objective in many countries. The ethics of AI has seen significant press coverage in recent years, which supports related research, but also may end up undermining it. The issues under discussion were just predictions of what future technology will bring, and we already know what would be most ethical and how to achieve that. This paper is a literature review in nature; it analyzes previous studies related to implementation of ethics in AI. The literature results indicate that between 2010 and 2021, there were 150 AI ethical incidents; including data privacy and security risks, safety concerns, bias diagnosis, the possibility of hostile entities taking control of AI, a lack of interpersonal communication or a humanistic perspective, wealth concentration around an AI business and job losses. The findings obtained from this literature review can help to propose method for AI; it's, indeed, an avenue for researchers to understand ethics needed in AI. Thus, this is crucial to provide suitable suggestions on planning the next course of action on how to integrate ethics in AI in the future.

Keywords: Ethical Issues; AI; Healthcare; AI Issue

■ 1.0 INTRODUCTION

The term "AI" (AI) refers to a broad field that encompasses several academic fields, including computer science, business, engineering, biology, psychology, mathematics, statistics, logic, philosophy, and linguistics. AI is rapidly infiltrating the healthcare sector and playing crucial roles in everything from patient management and resource allocation to the automation of time-consuming and standard tasks in medical practice. AI in healthcare is characterized as machines imitating human cognitive processes (Jha & Topol, 2016). According to Artificial Intelligence Incident Database (AIID), between 2010 and 2021, there were 150 AI ethics incidents. Figure 1 shows that from 2010 to 2016, the number of AI ethics issues continuously rose, peaking in 2016. The rapid growth of AI during that period could be connected to the trend of AI advancement technology (Wei & Zhou, 2022).

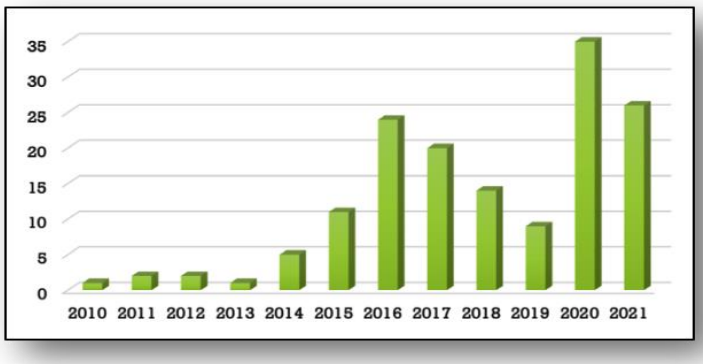

Figure 1: Statistic of AI ethical incidents from 2010 to 2016 (Wei & Zhou, 2022)

AI incorporates the fundamentals of sensing, recognizing, and object identification to enable machines to perform as well as or even better than humans. As developers create AI systems to carry out these tasks, several risks and challenges appear, including data privacy and security risks, safety concerns, bias diagnosis, the possibility of hostile entities taking control of AI, a lack of interpersonal communication or a humanistic perspective, wealth concentration around an AI business and job losses (Statista, 2022)

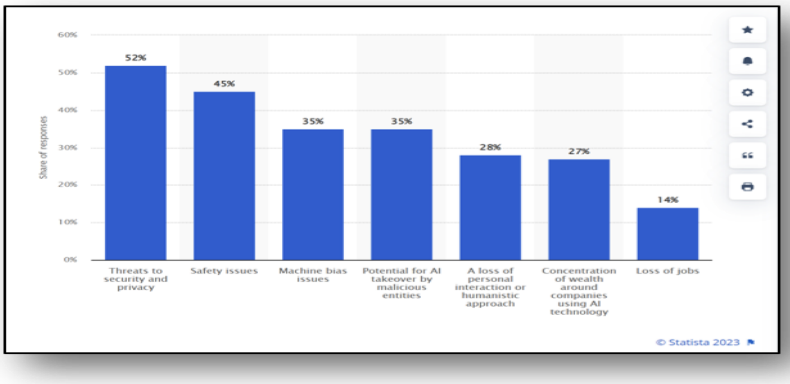

Figure 2: Statistic of AI ethical issues in healthcare in the United States as of 2021(Statista, 2022)

A poll of corporate executives in the healthcare sector in the United States in 2021 revealed that 52% of respondents were concerned that the use of AI in healthcare could pose risks to data security and privacy. While 35 percent were concerned about machine bias, and 45 percent were concerned that AI might have safety hazards. The potential risks of ethical problems are particularly substantial when it comes to healthcare because they are directly tied to the safety of human life. For instance, if human doctors and robots collaborated during an operation, which should be held accountable? Hence, in this study, we will emphasize ethical issues caused by AI in healthcare-related, specifically the bias of diagnosis, data privacy and security, trust of AI related to safety issues, and how to solve and mitigate it. Therefore, AI ethical issues related to bias, data privacy, and trust need to be regulated by policy and law.

■ 2.0 AI IN HEALTH CARE, RISKS OR REMEDIES

2.1 Unconsciously Biased Results

AI is a branch of computer science and substantial datasets combined in the field of AI facilitate problem-solving. It also includes the topics of machine learning and deep learning, which are frequently mentioned when talking about AI. According to the input, these fields employ AI approaches to create expert systems that make predictions or categorize data (What Is AI (AI) ? | IBM, n.d.). Any machine learning system or human-trained algorithm will only be as reliable, efficient, and equitable as the data it is taught on. AI also carries the danger of biases and, consequently prejudice. The dataset that AI is trained on will determine whether it becomes aimed at one community or, by default, discriminates against other populations. There are some instances related to AI bias in healthcare, such as the case of IBM AI technology. IBM created Watson in 2011, and Memorial Sloan Kettering Cancer Centre employed it for the first time in 2013. The study revealed that Watson had received training particular to a population and on American-style cancer treatment methods. As a result, Watson isn't considered by Dutch physicians to be a helpful tool for their approach to cancer treatment. (Brian, 2021). On the other hand, another instance related to this ethical issue is the invention blood pulse oximeter, which functions to determine oxygen levels. By passing infrared light through the skin, the pulse oximeter determines the amount of oxygen in the blood. The pulse oximeter routinely overestimates oxygen saturation levels in patients who are not white. Hence measurements are known to be influenced by the patient's skin tone. Due to this, Black patients are three times more likely than White patients to experience an occult hypoxemia that goes unnoticed by pulse oximeters (Norori et al., 2021). The consequence of false reading of this health device will lead to the misinterpretation of the individual's health condition, which can somehow contribute to the harmfulness of the people because the correct measurement cannot be taken precisely whether to seek immediate treatment or not.

Besides that, AI technology plays a role in facilitating researchers in analyzing the viability of a particular disease based on the clinical data collected. However, due to its reliance on historical data derived through biased data creation or clinical procedures, AI can introduce or maintain biases that could negatively impact patient outcomes (Parikh et al., 2019). For instance, this study found that the risk factors from the Framingham Study have been utilized for years to forecast the likelihood of developing cardiovascular disease. The original Framingham Study drew its sample from a largely non-Hispanic white community. The projected risk of a cardiovascular event was 20% lower for black people than for white people when the Framingham Risk Score was applied to populations with similar clinical features,

showing that the score may not sufficiently capture risk factors for some minority groups. Having said that, the limited and biased data provided by the respective entity will produce a wrong analysis and affect the healthcare system's decision in the particular situation. On the other hand, One fundamental problem is that machine learning systems might unintentionally or intentionally perpetuate biases. There are several prominent accounts of such instances, such as the replication of gender or racial stereotypes in hiring decisions or probationary processes, using machine learning (Raso et al., 2018). So, those responsible for the development of AI must be aware of this risk and take measures to minimize the impact of any possible biases at each level of the product development process. Regarding this, to reduce the possibility of AI bias and its contribution to unethical situations, the developer should think about the machine learning technologies and procedures they want to employ to train the algorithms and what datasets they want to use for the programming.

2.2 Your Data Is Everyone Data

Data has replaced oil as the most valuable resource in the world. Data is infinitely renewable, unlike oil, which cannot be "used up." The value of the same data can be increased by using it in different ways, including via algorithms and programs. On the contrary, repeated usage and application will frequently make data more valuable. The most crucial component in AI and machine learning is data. It describes the information transformed into a format that is easier to process and transport. Data is frequently gathered to be measured, reported, displayed, and analyzed. It can be structured or unstructured. Large data sets must be gathered for AI to learn. When you take that into account, you see there are issues with data privacy, cybersecurity, ethics, and safety (McKeon, 2021). Huge amounts of data, particularly private and personal data, are crucial for the development of AI systems. To guard against abuse and malicious usage, those data must be appropriately handled (Timmermans et al., 2010). One example related can be quote related to healthcare in a ruling issued in July 2017, the UK Information Commissioner's Office found that The Royal Free NHS Foundation Trust had violated the UK Data Protection Act 1998 by giving Google DeepMind access to the personal data of roughly 1.6 million patients. As part of its clinical safety evaluation, the data exchange was conducted for "Streams," an app that aims to help with identifying and diagnosing acute kidney injury. (Gerke et al., 2020). When the patient data was leaked and spread, it violated the privacy of the people, which is considered irresponsible. This situation can raise the feeling of unsecured among the community in providing data to the government in the future and somehow disadvantage the government when the data is in need.

On the other hand, patient data's position and privacy are argued. The creation and use of AI deep learning algorithms across numerous data domains and applications are increasingly characterized by opacity (Faraj et al., 2018). The lack of transparency in the healthcare industry makes it difficult to monitor how Personal Health Information (PHI) data are used and to comprehend the goals and effects of data use, such as the potential for discriminatory profiling. The exploitation of medicolegal algorithms by hackers for creating autonomous procedures may jeopardize the security and safety of sensitive information. AI research must adhere to ethical standards to avoid these problems (Keskinbora, 2019). Growing worry about the possibility of a violation of patient confidentiality and privacy is more than unsettling. For instance, the use of facial recognition technology may pose a major risk to data security, incidental finds, and fully informed consent. Additionally, the development of AI may be linked to some risks that require justification and clarification through updating policies and consent. Patients' right to privacy is considered one of the most significant ethical problems (Verma et al., 2020). Therefore, a precise mechanism should be applied to regulate the patient's data being taken by unethical and irresponsible entities. The tracking mechanism needs to be implemented for each data goes and used in the future to ensure it does not violate the right of the people.

2.3 Should We Trust Robots?

Trust is a psychological process that helps people deal with the uncertainty that comes from the gap between what they know and what they don't know (Asan et al., 2020). Our civilization relies heavily on trust to operate. There are several of our systems that demand reliability. Engineers can offer assurance in the case of AI by using mathematical arguments. For instance, it might be possible to establish mathematically that a drone's AI landing guidance system will produce a stable landing. For a device like a self-driving car, it is challenging to provide this kind of assurance because roadways are crowded with drivers and other barriers whose behavior is unpredictable. It is difficult to make sure an AI system's "decisions" and responses are secure in any situation. The same goes for AI practice in the medical, especially when the machine learning algorithms that deliver results or make decisions without providing any explanation or evidence of their reasoning or known as a black box. These inquiries are complicated to respond to when the AI uses "black-box" algorithms, which may be the consequence of opaque machine learning methods that are exceedingly complex for clinicians to comprehend completely. As an illustration, Corti's algorithms are "black boxes" because not even the program's developer is aware of how the system chooses when to alert emergency dispatchers when someone is experiencing a cardiac arrest. Medical practitioners might be concerned about this lack of understanding (Gerke et al., 2020)

Furthermore, safety is one of the most challenging concerns facing AI in healthcare. To cite one well-known illustration, IBM Watson for oncology engages AI algorithms to analyze data from patient medical records and assist doctors in researching cancer therapy alternatives for their patients. Meanwhile, it has recently drawn criticism for allegedly making "unsafe and erroneous" suggestions for cancer therapies (Brown, 2018). In addition, the study found that the possibility of autonomous functions in AI applications as well as their potential for deliberate or inadvertent

manipulation to produce unsafe results may be a significant barrier to doctors using AI in their clinical settings in terms of trust.

AI is incapable of using "medical sensibility" or "rational thinking" unlike the human physician. It is because the most common form of AI is machine learning, where its functions are similar to a signal translator in that the interpretation rule is directly learned from the input. Patients are not merely biological beings but rather distinct individuals with unique wants, desires, weaknesses, and attitudes. The human aspect of healthcare involves a special relationship between a physician and a patient that is infused with special values and obligations (Quinn et al., 2020). It is widely believed that this relationship necessitates a patient-centered strategy that recognizes patient autonomy and encourages informed decisions in line with patient values. Additional values have included the promotion of advantage (beneficence), prevention of damage, and the obligations of privacy, secrecy, justice, and responsibility. Therefore, this capability embedded in the human soul is challenging to develop in the machine at present. The decision proposed by the machine is based only on deep learning from the data it acquired and learned, which has potentially raised the machine's trust issues when it deals with a human patient with heart and feelings.

■ 3.0 BUILDING BETTER TRUST BETWEEN HUMANS AND MACHINES

According to Steve Jobs, the founder of Apple Inc., "Computers are like a bicycle for our minds". This quote means that computers or machines represented an advancement in tool design that significantly increased human potential. However, many moral questions are raised by the prospect of a building thinking machine. We don't yet have adequate policies and laws or recommendations for handling problems like these that can arise in ongoing research. These challenges concern the moral standing of the robots themselves as well as ensuring that such devices do not harm humans and other morally significant beings.

In addition, the researcher concluded that to prevent any potential ethical problems, the potential risks and damages related to AI applications also need to be transparent. We must now study and evaluate the organizational and legal developments brought on by the rise of AI in the healthcare industry (Kooli & Al Muftah, 2022). Therefore, it becomes crucial to ensure that these emerging technologies are used responsibly to prevent any ethical quandaries in the deployment of AI. Additionally, we must make sure that medical professionals are adequately covered and safeguarded against the various unintended consequences of this manufactured medical advancement. Additionally, it is critical to ensure patients' security and safety and protect their rights, even if this means preparing for the day when patients will interact with systems rather than doctors. Ethics on technology has influenced both a professional and societal level. For instance, the "code of professional ethics" has altered the practices in various branches of science, engineering, and technology and has provided a specific framework for the types of projects undertaken, as well as their nature, extent, and execution. Numerous technologies have changed course as a result of consumer awareness of and preference for moral values. The legal framework and public participation in science and technology are two more elements that determine how ethics affects technology. Therefore, the development of an ethical framework to identify which scientific pursuits should be viewed as morally dubious is the goal of normative ethics of science.

On the other hand, four essential AI success factors for the healthcare industry may help mitigate the observed ethical issues (Wolff et al., 2021). The success factor identified was first, to properly use of AI by forming cooperation between computer scientists and physicians should be considered. Adopting proper rules, regulations, and policies that govern and regulate the use of AI in healthcare must be the main focus in this situation. These measures will also safeguard patient and user rights and lay out their obligations. Secondly, a thorough introduction to AI will result from training healthcare workers, including nurses and doctors. Thirdly, all technologist and clinical personnel training programs should make it a requirement to teach ethics and ethics in AI. Fourthly, it's important to note that AI should be used to decrease rather than exacerbate health disparity on all fronts.

Even though, according to the finding, there are still fewer establishments in the AI regulatory. However, numerous standalone entity such as professional body and industry in Europe has started to build their ethical guideline and policies related to AI. This action somehow has influenced the European Commission to make a good start by drafting a law related to AI that aims to abide by all the relevant rules and regulations, moral standards and values, and take into account its social surroundings (Leimanis & Palkova, 2021). Having a systematic regulation of AI will somehow control the failure and unethical circumstances by AI in the future. This strategy needs to be imposed now due to the rapid development of technology.

While in China, an AI policy has been developed since 2017 and has a comprehensive action plan comprising economic, defense, and social welfare and to focuses on the requirement to provide rules and moral guidelines for AI use. This policy aimed to aspires China to take the lead globally in establishing AI ethics and standards. Therefore, China published eight AI governance guidelines in June 2019 as a strategy. The core principles emphasized that improving human welfare should come first and foremost when developing AI. The principles also stressed the importance of justice, privacy, and the protection of human rights. Finally, they emphasized the significance of openness, accountability, cooperation, and flexibility to deal with new and developing dangers (Laskai & Webster,

2019). According to the eight principles outlined in Artificial Intelligence Development Plan (AIDP), its constitute that the development of AI in China should start with the goal of improving humankind's overall well-being; it should adhere to human morals, ethics, and values; it should foster harmony between humans and machines; and it should advance human civilization. Its foundation should be the protection of human rights and societal safety; it should forbid misuse and abuse. While in terms of bias, the AIDP principle emphasized that the development of AI should support justice and fairness, safeguard stakeholders' rights and interests, and advance opportunity equality. Eliminate prejudice and discrimination from the data collection, algorithm design, technology development, product R&D, and application processes by continuously raising the level of technology and improving management techniques. In addition, related to data privacy this policy addressed that a person's right to know and make choices should be fully protected, and AI development should respect and defend personal privacy. There should be limits and guidelines established for collecting, storing, processing, and other uses of personal information. To prevent theft, falsification, disclosure, or other unauthorized gathering or use of personal information, improve the processes for authorization and revocation. Moreover, related to the trust of the safety of AI the policy has expressed that to gradually achieve auditability, supervision, traceability, and trustworthiness, AI systems need continuously increase their transparency, explainability, reliability, and controllability. Pay strict attention to the safety and security of AI systems, enhance the robustness and tamper-resistance of AI, and develop AI security assessment and management skills.

From another perspective, regulating AI only through the wording of legal action can be very challenging, if not impossible, to undertake through the conventional process of enacting laws. It is conceivable, and even necessary, to govern the activities related to the development and use of AI, but what about future advances and issues that will require direct intervention from AI/autonomous systems rather than humans? Therefore, another tool besides legal tools needs to be explored, such as manipulating the programming code. As we know, cyberspace is a man-made construct using computer software. Since AI is an algorithmic code that makes up a component of cyberspace, it might be governed using the same method, i.e., through codes that have legal restrictions included in them. Cyberspace is dynamic and always evolving. Because AI is dynamic and constantly changing, the regulating process should likewise be dynamic to adapt to shifting social dynamics and take into consideration various spatial contexts and legal systems (Szostek & Prabucki, 2022). This option can be concurrently applied with legal tools in regulating AI to minimize the issues in the future. But the proper study needs to be undertaken to ensure it will not hinder the advancement of AI technology for the benefit of socioeconomic and human living.

On the other hand, from the Islamic perspective, Kuntowijoyo provides a framework for the scientific nation of Islam, a method for fusing science and religion. This scientificization of Islam diverges from the scripture and emphasises context (Kuntowijoyo, 2006) The process of scientificizing Islam entails developing Muslim normative-subjective conceptions into open and inclusive empirical-objective formulations. Islam's scientification uses knowledge from other fields to comprehend its normative contents rather than making normative judgments (Priyono, 2008). From both Islamic points of view, we can observe the connections between Islam and science and technology. Islam, science, and technology all contribute in different ways to one another. Therefore, efforts to promote science and technology should be made within the framework of Islamic philosophy, which is based on Islamic principles and the ethical and moral code expressed in Shariah.

■ 4.0 CONCLUSION

Technology advancement is undoubtedly good for our environment and society, but it's crucial to keep in mind that if it's used improperly, it could bring about the end of civilization. Today, we are becoming increasingly conscious of the significance and promise of AI in revolutionizing the provision of healthcare services. As of right now, we have seen several breakthroughs based on AI technology that has radically changed how healthcare services are organized and delivered. The clinical and operational efficiency of healthcare will improve with the ongoing and successful usage of AI. Additionally, by consistently funding research and development for AI algorithms and machine learning, levels of data privacy use and protection, as well as network security, will be optimized in this context. To maximize the benefits of these developments, it is crucial to manage its growth by enacting laws and regulations that control and restrict the boundaries of development. Governments and policymakers can better manage this growth. Researchers need to be made more aware of the value of both the advancement of technology and the observance of moral principles via advocacy. Therefore, the organizations that support technology development must focus on quality assurance. They will be able to build safe and healthy technology for the environment, people, and the earth if they maintain control over their systems and marinate them. We must know that whatever it is, there will always be a human element in medicine, and doctors will still treat patients in the end, regardless of how much AI alters healthcare delivery and quality. Though, AI will continue to be a technological tool that should improve healthcare, but with a stronger ethical foundation. Nobody can eliminate the ethical considerations linked with the use of AI in healthcare because every technology has advantages and disadvantages as well as safety and security risks. However, ongoing oversight can reduce these moral dilemmas. Therefore, the protection of science and technology requires consideration of ethics, morals, and policy because we cannot simply avoid technology. After all, it has a lot of contributions to our economy, society, and living. The matter is how we manage it accordingly.

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