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Legal Analysis Regarding the Use of Artificial Intelligence (AI) in the Implementation of Medical Practice in Indonesia

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ABSTRACT

Background. Health is a fundamental human need, alongside clothing, food, and shelter. A healthy life is essential for individuals to carry out daily activities, and without health, life becomes meaningless. The integration of Artificial Intelligence (AI) in healthcare offers solutions and enhances modern medical services. However, the use of AI in healthcare also raises concerns and potential risks.

Purpose. This study aims to determine the legal protection available to patients in the use of AI and analyze the legal liability of doctors in employing AI technologies in medical practices.

Method. This research adopts a normative juridical method, focusing on secondary data, including primary, secondary, and tertiary legal materials. The study examines legal frameworks and regulations to explore the aspects of patient protection and the liability of healthcare professionals using AI.

Results. The study identifies two forms of legal protection for patients: preventive and repressive. Preventive protection includes ensuring the security of patient data before it is uploaded to AI systems, safeguarding privacy and data integrity. Repressive protection applies if a patient suffers harm due to AI usage; in such cases, patients can report the issue to authorities in accordance with relevant laws and regulations. The study also discusses the legal responsibility of both doctors and AI developers. Doctors using AI in treatment can be held liable if their use of AI results in harm to patients. Similarly, AI developers or creators can also be held legally accountable if their AI technology negatively impacts patient care. Legal liabilities could include criminal, civil, or administrative responsibility.

Conclusion. AI plays a significant role in modern healthcare but also presents challenges regarding patient protection and professional liability. Clear legal protections, including preventive measures to secure patient data and repressive actions for harm, are essential. Both healthcare providers using AI and AI developers must be held accountable for any adverse outcomes, ensuring patient safety and trust in the healthcare system.

KEYWORDS

Artificial Intelligence, Medical Practice, Legal Analysis

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INTRODUCTION

Humans are basically destined to have human rights which are basic human rights and remain with them throughout their lives from birth to death. Therefore, the state is present to ensure that the human rights of its citizens can be fulfilled properly (Pelau, 2021). This step was then outlined in Article 28 H paragraph (1) of the 1945 Constitution

which states that humans basically have several basic rights, for example getting a decent life, having a place to live, a healthy environment, and also maximum health services (Borges, 2021). One of the basic human rights that must be fulfilled is the best health service for citizens (Markus, 2021).

The rules for providing health services to the community contained in this article are an application of the Declaration of Human Rights Article 25 paragraph (1) which contains:

> *Everyone has the right to standard of living adequate for the health and well-being of himself and of his family, including food, clothing, housing and medical care and necessary social services and the right to security in the event of unemployment sickness, disability, widowhood, old age or rather lack of livelihood in circumstances beyond his control.*

The meaning of this declaration is that people throughout the world without exception have the human right to obtain health facilities and adequate health care for themselves, including their families and the environment around them (Secinaro, 2021). This also includes having the right to a home, access to clothing and nutritious food. When a person has a healthy body, of course it can support the activities and productivity of society in order to achieve prosperity in life and family (Ghassemi, 2021).

Health is one of the basic human needs besides clothing, food and shelter. Without a healthy life, human life becomes meaningless, because when sick, it is impossible for humans to carry out good daily activities (C. Zhang, 2021). According to Law of the Republic of Indonesia Number 17 of 2023 concerning Health, Article 1 number 1 states: "Health is a person's healthy condition, both physically, mentally and socially and not just being free from disease to enable him to live a productive life." People who suffer from a disease that cannot cure the disease themselves inevitably have to seek help from people who can cure the disease, namely health workers (Wang, 2023).

If a human being has a fresh, fit body and does not have disease, he or she will certainly have high productivity to meet the needs of himself and his family (Pan, 2021). Humans can seek income from work that can be used to achieve prosperity in life. In order to maintain this situation, the government is obliged to provide the best health services for its people with maximum resources, both human and equipment available in these health services (Bag, 2021).

The best health services can result from the suitability of medical personnel who provide services to the community, namely from doctors and other medical personnel in hospitals, clinics or private practices (Shi, 2021). To maximize the performance of doctors and to avoid unlawful acts, every action of doctors in providing health services must be based on several laws and regulations, including: Law Number 36 of 2009 concerning Health which has been amended by Law Number 17 of 2023 concerning Health and its implementing regulations; Civil Code (KUHPerdata); Criminal Code (KUHP); and other relevant regulations.

The development of human life has now entered the technological era. Where every line of activity carried out by society is always based on the existence of technology. The development of science and technology in every line of human life is running very quickly. In fact, several fields such as the education, health and economic sectors have been supported by the existence of technology (Collins, 2021).

Technology is starting to enter every area of community activity, indicating that Indonesia has entered the era of industrial revolution 5.0, where there is convenience and automation in getting all kinds of access to information and ease of connecting with fellow citizens (Shastri, 2021). The industrial revolution is a change that occurs very quickly in the implementation of production

processes which were previously generally carried out by humans, but are now starting to be replaced by machine (Misra, 2022).

The industrial revolution is currently happening all over the world, including in Indonesia, which has almost entered the 5.0 era. The process of entering the 5.0 revolution is marked by the role of humans starting to be replaced in doing work with machine technology or other information technology related to computer technology. This change has also changed human work patterns (Moor, 2023). If previously all work was done manually, now every work carried out can be based on digitalization (Angelov, 2021).

This change in work patterns does have a positive side, where humans doing the work will be much easier and lighter than when everything was still manual (Velden, 2022). However, if this change or technological progress becomes unstoppable, new innovations will continue to emerge which of course will also have a negative impact on human life (Cooper, 2023).

One example of this is the emergence of artificial intelligence technology or what is often called Artificial Intelligence (AI). The existence of AI is currently being discussed by all people in Indonesia. This is because there are so many things that can be done with AI technology (J. Zhang, 2021). The emergence of AI, which is likely to continue to increase, will of course eventually touch other fields, such as education, health, public services and economic sectors related to business or enterprise. For example, the Directorate General of Immigration in Indonesia has started using AI to support surveillance efforts in several border areas in Indonesia. This includes starting to be used at airports and ports which are frequently used (Letaief, 2022).

Today's use of AI can be utilized in various fields, one of which is health. The use of AI in the health sector is intended, among other things, to accommodate the shortage of doctors in Indonesia. Based on data provided by the Indonesian Doctors Association (IDI), in September 2023 there will be 169,708 registered doctors to serve 278,000,000 Indonesians spread across all regions and islands. Based on this data, it can be calculated that the ratio of doctors for every 1000 residents is only 0.6, which is still below the WHO recommendation, namely 1 doctor for 1000 residents. This value is far behind compared to other Asian countries which have reached 1.2 per 1000 people. Apart from that, problems related to medical practice, apart from the number of doctors, are also related to the unequal distribution of doctors. Data from the Indonesian Medical Council notes that Java Island has the largest number of doctors, and there are still a number of provinces that only have less than 10 thousand people.

Problems regarding medical practice are both related to the number of doctors and the distribution of doctors. If the best solution is not immediately found, it has the potential to hamper the health service process for the community (Zhu, 2021). Therefore, the presence of AI in the health sector could be one solution to help with the problem of a shortage of doctors in Indonesia. The existence of AI in the health sector can be used to diagnose disease, analyze medical imaging, predict risk and disease progression, monitor patient health data, manage hospital administration, and various other functions efficiently and quickly (Poliwoda, 2022).

The presence of AI in the health sector certainly not only provides assistance or solutions in the world of health and supports more modern and advanced health services, but the presence of AI also still has a negative side. WHO provides an identification regarding the use of AI in the health sector, where there is a risk of bias by the system and also cyber security threats such as those related to the security and use of patients' personal data. Risks like this result in harm to patients (Bartalena, 2021). Apart from that, the use of AI also results in system failure which can occur at any time, when this system failure occurs it can have an impact on patient handling performance. If

an error occurs in treating a patient due to a failed system, the responsibility will be imposed on the doctor who treats the patient (Botwe, 2021).

Based on this description, there is a legal gap, where the existence of AI can basically help treat patients in Indonesia amidst the increasing problems in the health sector, but on the other hand, the existence of AI also has negative impacts related to legal protection for patients and also accountability. law for doctors who make mistakes in treating patients due to inappropriate use of AI (Hwang, 2022).

RESEARCH METHODOLOGY

Research methods are the procedures for conducting research. Apart from that, research methods also discuss the procedures for carrying out research, as well as the research strategies used (Yilmaz, 2020). Methodology in research outlines the steps involved in the research process. The term research method consists of two words, namely method which comes from the Greek, namely methodos which means way or leading to a path and the word research which means the process of collecting and analyzing data carried out systematically to achieve certain goals (Barker, 2022).

In general, research is understood to follow a certain structural process, the aim of research is to produce new knowledge which consists of 3 main forms, namely:

Explanatory research, namely compiling and identifying new problems;

Constructive research, namely developing a solution to a problem;

Empirical research is to test the possibility of solving a problem using empirical evidence.

The main goal of research is to discover hidden and never-before-discovered truths. In connection with this research method, the researcher describes the research method used in this research:

In this case, the researcher uses a normative juridical approach, which means the research focuses on the use of library materials or secondary data which includes primary, secondary and tertiary legal materials. Normative legal research includes research on legal principles, legal systematics, levels of legal synchronization, legal history and legal comparison (Mueller, 2020). According to Sri Mamudji and Soerjono Soekanto, normative legal research is legal research carried out by examining library materials or secondary data as a data basis for conducting analysis.

The data used is secondary data, which is a type of data in which researchers will carry out learning related to library literature consisting of legal rules, theories, principles, and so on related to the problem formulation in this paper. Secondary data refers to information obtained from library sources (Ji, 2021).

Library study research (Library Research) is used in collecting this data, namely library research which bases research on reading sources of legal materials in the form of books, laws and regulations, theories, principles and so on that are related to discussing a problem.

Analysis will also be carried out using qualitative methods because data analysis is carried out from research results through literature studies and interviews, so the data analysis process does not use thematic and statistical models (Li, 2020).

RESULT AND DISCUSSION

Legal Protection for Patients Against the Use of AI in Medical Practice

Health is a human right for all Indonesian people which is protected by the state. Even in Indonesian laws and regulations, it is stated that the government has the responsibility to ensure

access to health for all Indonesian citizens. However, with a large population with a very wide area coverage, Indonesia is trying to deal with the problem of unequal distribution of doctors by calling on the public to support developing AI technology, thereby increasing access to health services and optimizing the use of health resources.

AI technology has been widely used in the health services sector, including for research and drug development; imaging analysis and medical diagnostics; physician decision support; forecasting patient risk & prognosis; monitoring and controlling lifestyle; information processing and analysis of patient vital data; condition monitoring and care of chronic patients; to the management of emergency care and surgical processes. The development of AI technology in the health sector is also being expanded to provide convenience in providing health services, for example analyzing access to electronic medical records, providing drug recommendations, as a warning in patient monitoring, and so on.

The use of AI technology is considered to be able to increase accuracy in making diagnoses, as well as help lighten the human workload. The integration of AI in patient diagnosis increases the opportunity to receive better health services, increases accuracy in diagnosis, and encourages health research beyond the field of medicine. It can be concluded that the use of AI can reduce accuracy in the health care system, including reducing human error and doctors' cognitive bias in determining the best treatment decisions.

To be able to optimize the use of AI in the world of health, the World Health Organization as the World Health Organization issued guidelines for Ethics and Governance of Artificial Intelligence for Health: WHO Guidance as a guide for the use of AI technology in the world of health. This guideline explains the six ethical principles recommended for the use of AI in the Health sector, namely protecting autonomy, improving human welfare and safety, ensuring transparency, responsibility and accountability, ensuring inclusivity and equality, and promoting responsive and sustainable AI. The guidelines also emphasize the need for data protection, patient autonomy to refuse AI technology in their care, and compensation that should be provided to patients in the event of the effects of AI errors. Through these guidelines, WHO appeals to all stakeholders including patients, service providers, doctors, and platform/application developers to commit to integrating ethical norms into every aspect of health services.

No	Principle	Scope & Explanation
1	Protecting Autonomous Rights	a. Humans must maintain control in every clinical decision. b. Protection and confidentiality of patient data. c. Informed consent (agreement).
2	Prioritizing well-being, safety, and public interest	a. Ensuring compliance with safety, accuracy, and service effectiveness standards. b. Continuous monitoring and evaluation (Quality control, quality improvement).
3	Ensuring transparency, ease of understanding, and clarity	a. Disclosure and easy access to information for patients.
4	Strengthening user responsibility and accountability	a. Ensuring user competence and qualifications. b. Setting mitigation in every process. c. Setting mitigation in specific cases.
5	Practicing inclusivity and diversity	a. Ensuring the system recognizes diversity of characters (gender, age, ethnicity, etc.).

		b. Setting mechanisms for evaluation and correction to avoid negative impacts on vulnerable groups.
6	Building responsive and sustainable AI	Developing AI technology that can be used sustainably for the welfare of society.

Tabel 1. Ethical Principles for the Use of AI in the Health Sector
Source: WHO

One form of utilizing AI in the field of health services which is currently being widely developed in Indonesia is telemedicine. Based on Law No. 17 of 2023 concerning Health, Telemedicine is described as the provision of clinical health services and facilities carried out by health professionals remotely using information and communication technology. Health services as intended include, among other things, the exchange of information regarding diagnosis, treatment and disease prevention. and injuries, research and evaluation, and the provision of health services education. These services can only be provided by health workers who have a license to practice at a Health Service Facility.

The use of health services based on digital technology and artificial intelligence has been very noticeable in Indonesia, especially during the Covid-19 pandemic. During this period, telemedicine services became the main alternative recommended by the Government through the Ministry of Health for the general public so that they could still use health facilities and services without having to visit health service facilities, thereby minimizing the risk of exposure to the virus.

AI's ability to process information is greatly influenced by the completeness of the data, the quality of the data and the accuracy of the algorithms entered into the system. Comprehensive clinical considerations will need to consider many sources of information, including theory and literature, clinical trial data, population data, including patient personal data, to be compared with observational data, medical examination results, laboratory examination results, in addition to many other relevant data.

Apart from choosing a reliable AI system, service providers also need to regularly evaluate AI technology, including getting input and recommendations from the medical professional association itself to develop AI in a sustainable manner. Doctors are required to be more careful and wiser in developing anamnesis techniques, as well as combining several pieces of information at once, because the final decision regarding treatment remains the authority of the doctor.

Several challenges related to personal data protection in providing AI-based health services include aspects of effectiveness and security, responsibility, data protection, personal data protection, cyber security and aspects of copyright law. Confidentiality of patient data is an important aspect that needs to be maintained in the relationship between doctors and patients. This is because to be able to provide data and AI-based health services will require a large and comprehensive amount and variety of data about patients that is personal and sensitive.

As a data owner, when a patient uses AI-based health services, the patient must give permission for the use of his personal data and medical records to be accessed by the information system, so that it can be processed further to obtain the most appropriate recommendations. Information regarding the purpose and area of use of the data needs to be conveyed, including who has access to the data, as well as what kind of data will be able to be opened. The organizer must be able to ensure that the patient's data is managed properly and will not be disseminated or used for other purposes without the patient's knowledge. Data management as intended includes the use, storage, access and dissemination of data, including for research, publication and other purposes.

In connection with data protection, it can be linked to the following legal protection theory, Philipus M. Hadjon has an opinion regarding legal protection which is a form of fulfillment of human dignity, which is the right of every legal subject. Meanwhile, CST Kansil, stated that legal efforts to protect the community are an effort that must be carried out by legal officials to ensure welfare for the community and provide a sense of security and security. There is another opinion expressed by Muktie A. Fadjar who believes that protection is narrowed in meaning to legal protection, which means that society as legal subjects has its own rights and obligations. As legal subjects, society has an important role in fulfilling activities in society.

In essence, legal protection can be divided into two types, namely:

Preventive legal protection, meaning that protection is carried out by the authorities before a problem occurs. So, this protection is sought to prevent violations in the legal sector.

Repressive legal protection, namely the type of legal protection that occurs after a legal problem occurs or after a legal violation occurs.

Regarding customer data protection as part of legal protection, it can also be linked to consumer protection theory, because patients in this case are included in the category of consumers who use the services of doctors or hospitals. So, all patient rights as consumers must be protected, including the protection of patient data from the use of AI in the health sector. According to Mochtar Kusumaatmadja, the protection provided to consumers is part of fulfilling legal regulations relating to problems that arise between conflicting parties in buying and selling activities.

Another opinion comes from AZ Nasution, who believes that consumers receive protection which is a legal basis regarding the existence of a regulation which contains principles related to efforts to protect the position of consumers who tend to be weak. Furthermore, the definition of consumer protection is also stated in Article 1 point 1 of Law Number 8 of 1999 concerning Consumer Protection, which reads, "Consumer protection is an effort made to guarantee legal certainty to provide protection for consumers." So based on several opinions on this matter, it can be interpreted that consumer protection is a legal event that provides legal certainty for consumers in using goods/services in order to avoid fraud by business actors and other losses.

In consumer protection there is a goal to achieve legal certainty, the way that can be done to achieve this goal is to provide knowledge education for consumers which is useful for increasing their dignity, and from the business actor's side can provide honesty regarding the situation and product information to user side. Apart from that, there is a need for the attitude of business actors to always be responsible for all products sold, and can be held responsible for compensation for losses to consumers. If these methods are implemented well, the parties are aware of their rights and obligations, then consumer-related problems can be minimized and consumer protection can be well maintained.

Patients can give informed consent to doctors and health facility providers to access and utilize medical record data, so that it can be used by service providers to determine the most appropriate action for the patient. This consent must be well documented to ensure the data cannot be misused for other purposes outside the agreed health service context. The right to give informed consent is completely autonomous from the patient. Patients must have the option to consent or not to the handling, processing and sharing of data. Patients have the right to have electronic medical records of their health. This is an effort to provide legal protection for patients, considering that data confidentiality is the patient's right.

Patients whose disease is treated through AI have the potential to experience disruption or malpractice both system-wise and in the treatment process, where this has the potential to harm the patient's position both physically and materially. In terms of personal data, often before carrying out

an examination via AI, patients are required to enter personal data in the system, including regarding the patient's health information recorded in AI. Legally, in Indonesia there is not yet a single legal regulation that specifically regulates all matters regarding AI, including the protection of patients whose rights are injured due to the use of AI. So one form of legal protection that can be provided is preventive, namely first ensuring the security of AI data before the patient uploads personal data. Then the repressive protection that can be carried out if a patient experiences harm due to the use of AI is to report it to the authorities based on the relevant laws and regulations.

Legal Responsibility for Doctors in the Use of Artificial Intelligence in Medical Practice

Legal responsibility is the obligation to bear all responsibility if an event occurs that could give rise to legal consequences. Based on Law Number 11 of 2008 jo. Law Number 19 of 2016 concerning Information and Electronic Transactions (UU ITE) states that this regulation was formed to deal with various technological and information system problems in Indonesia in order to create legal certainty in dealing with problems in the field of technology. However, the definition of AI is not specifically explained in the ITE Law. So there are several groups who provide interpretations of AI that are linked to the legal regulations in the ITE Law.

Based on the ITE Law, AI is classified as an electronic agent and electronic system. If we refer to the characteristics of AI which are related to the definition of electronic systems listed in the ITE Law, they have similarities in the performance of AI which can collect data, process data, analyze data, and transmit electronic information data in accordance with Article 1 Number 5 of the ITE Law. Apart from that, it is also in accordance with Article 1 Number 8 of the ITE Law which explains AI as an electronic agent that operates automatically on orders from people in carrying out actions through electronic systems.

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Van Hamel provides an explanation of the limits of liability for AI. In this case, the AI does not understand the implications of the consequences, and cannot determine its readiness to act, nor is it aware of taking legal action. Therefore, this is related to the awareness that the human person as an absolute legal subject in criminal law cannot be separated from negligence. on its behavior, while AI includes electronic devices created by humans. So the limitation of AI's liability in criminal law lies in its inability to become a legal subject.

Medical activities involving AI technology are not only subject to legal regulations, but also raise psychological, ethical and moral issues related to patient care. It is necessary to establish the grounds for recognizing medical practice as a source of regulation of medical legal relations. To achieve this goal, it is important to determine whether the work performed by AI can be considered a genuine part of emerging medical practice and legal customs, on par with the work of human doctors. It is also important to determine the limitations and capacities of AI in its operations.

Responsibility for activities related to the use of AI rests with those who use this intelligence as an object of increasing danger. At the same time, a source of increased danger is understood as any activity, the implementation of which creates an increased likelihood of danger due to the impossibility of full control by a person. The existing legal structure assumes that hospitals or AI

managers, whether doctors, operators or other parties, determine the parameters of their work or behavior.

Regarding the responsibility for doctors in using AI can be linked to the theory of legal responsibility, according to the legal dictionary, responsibility is a necessity for someone to carry out what is required of them. Titik Triwulan Tutik believes that accountability must have a basis, namely something that gives rise to a legal right for someone to sue another person as well as something that gives rise to another person's legal obligation to provide accountability.

Peter Salim also gave his opinion regarding the concept of responsibility, where the expert divided responsibility into 3 things, namely:

Responsibility in the sense of accountability is related to finance or bookkeeping related to payments. This type of responsibility can also be linked to trust;

Responsibility in the sense of responsibility, which means sharing the burden or consequences of an action that has been carried out. This type of responsibility can also be interpreted as an obligation to correct mistakes that have occurred previously. According to this responsibility, if an act that violates the law occurs, the party who violates it can be sued, blamed, or threatened by law enforcers before the court, including accepting the burden resulting from their own or other people's actions;

The third type of responsibility is liability, which means bearing the burden of all losses arising from one's actions or the actions of other people acting on their behalf. This type of responsibility can also be interpreted as an obligation to pay compensation for losses arising from an action.

The perspective of legal science also has a view regarding responsibility which has become known as legal responsibility, namely human awareness of behavior or actions whether intentional or not. Responsibility also means acting as a form of awareness of obligations. Ridwan Halim also gave his view regarding legal responsibility as a further consequence of the implementation of roles, whether roles of obligation, right or power. So in general, legal responsibility can be interpreted as an obligation to do something or behave in a certain way without deviating from existing provisions.

Purbacaraka explained that legal responsibility originates from the use of facilities in implementing each person's ability to exercise their rights and/or carry out their obligations. Every implementation of obligations and exercise of rights, whether inadequate or adequate, is basically still carried out with responsibility, including the exercise of power (Ahmed, 2022).

Hans Kelsen believes that legal responsibility is someone who is legally responsible for certain actions, that this party can be subject to sanctions for actions that are contrary to the values of the rule of law. Sanctions are known as deliquets, so that the person's own actions ultimately make the person responsible. The subject of responsibility and the subject of legal obligation are the same. Hans Kelsen also added that in the theory of responsibility there are two types, namely responsibility based on fault (base on fault) and absolute responsibility (absolute responsibility).

Responsibility based on the element of fault is a fairly general principle that applies in law, for example criminal and civil law. This principle states that a person can only be held accountable if there is an element of wrongdoing, such as an example of an unlawful act, where there is an act committed, an element of error, a loss suffered and a causal relationship between the fault and the loss (Swed, 2022).

Absolute responsibility means that an action causes consequences that are considered detrimental by the legislator and there is a relationship between the action and the consequences. This is often identified with the principle of absolute responsibility. In modern law, there are other

forms of errors committed without intention or planning, negligence or oversight. Negligence or error is an omitted offense and responsibility for the negligence is more of an absolute responsibility. However, there are exceptions that allow him to be released from responsibility, such as a force majeure event.

The theory of legal responsibility was also explained by Abdulakdir Muhammad who divided legal responsibility into several things, namely:

Responsibility due to unlawful acts carried out intentionally (intentional tort liability), where the perpetrator must have committed an act that is detrimental to another party, or the perpetrator knows that the action he is carrying out could cause harm to another party;

Liability resulting from unlawful acts committed due to negligence (negligence tort liability), is an act based on the concept of error related to morals and law which are mixed.

Responsibility occurs because of the principle of liability; this type of responsibility arises from the provisions of statutory regulations so that the theory of responsibility is interpreted as liability. This concept of responsibility is related to the legal obligations imposed on a person because of legal responsibility for certain actions that have been carried out.

This research places greater emphasis on responsibility due to fault (fault liability), namely a responsibility imposed on perpetrators whose mistakes cause the victim or other party to suffer losses. The party who feels aggrieved is obliged to prove the existence of the error or the burden of proof is on the party who feels aggrieved, not the perpetrator (Y. B. Zhang, 2021). The responsibility that can be imposed on a doctor if a medical error occurs as a result of the use of AI which is detrimental to the patient can be seen from two points of view, namely responsibility due to an administrative error, namely an error made by the perpetrator by not carrying out procedures in accordance with the applicable provisions in which the doctor using an AI system is not in accordance with applicable procedures resulting in patients experiencing losses such as wrong actions or leakage of patient data (Adli, 2022). Other errors can be related to professional errors, namely errors in carrying out the medical profession that are not in accordance with the standards of the medical profession, causing harm to patients where doctors do not treat patients in the right way so that patients suffer losses (Yaghobian, 2022).

The forms of legal responsibility that can be imposed on doctors are in the form of three types of responsibility, the first is civil responsibility. This type of responsibility requires the doctor to compensate the patient for losses. The compensation in question is not only related to money but also in other forms according to the agreement of both parties. Regarding civil liability, this is often related to a lawsuit filed by the patient and his family before the court (Tischkowitz, 2021).

The second form of responsibility is criminal responsibility (Busse, 2021). Often the actions taken by doctor's result in fatal losses for patients. For example, in the use of AI, doctors experience treatment failures that cause the patient to become permanently disabled or his personal data is spread, then the patient and his family have the right to bring this case to justice by reporting it to the police. When a doctor is charged with criminal responsibility, the form of sanction that can be imposed is a prison sentence which is usually accompanied by a fine (O'Bryant, 2023).

The final form of responsibility is administrative responsibility. This type of responsibility is usually accompanied by other responsibilities, for example administrative responsibility in the form of giving a warning to a doctor. If the action is still carried out, it is possible that the doctor's professional license will be revoked so that the doctor will no longer be able to practice medicine (Park, 2021).

The role of AI creators must be considered in terms of accountability. The main approach proposed is that AI producers are only liable if they intentionally created the intelligence to commit

an offense, evidence of the creator's direct fault in the event of legal consequences. So the responsibility for using AI in medical practice lies with the AI creators and AI users themselves, because AI is not categorized as a legal subject, but rather as a legal object (MacKinnon, 2021).

CONCLUSION

In the first problem, it can be concluded that patients whose disease is treated through AI have the potential to experience disruption or malpractice both system-wise and in the treatment process, where this has the potential to harm the patient's position both physically and materially. In terms of personal data, often before carrying out an examination via AI, patients are required to enter personal data in the system, including regarding the patient's health information recorded in AI. Legally, in Indonesia there is not yet a single legal regulation that specifically regulates all matters regarding AI, including the protection of patients whose rights are injured due to the use of AI. So, one form of legal protection that can be provided is preventive, namely first ensuring the security of AI data before the patient uploads personal data. Then the repressive protection that can be carried out if a patient experiences harm due to the use of AI is to report it to the authorities based on the relevant laws and regulations.

The second problem can be concluded that when using AI technology an error occurs that impacts the patient and harms the patient, then there is a party who is obliged to be responsible for his actions. Even though this action was caused by AI technology, AI here is not a legal subject, so it cannot be held responsible for its actions. The parties who can be subject to legal responsibility are the parties who use AI and those who create AI, namely the doctors who use AI technology to treat patients and the creators of AI programs because their creations fail and have an impact on patient treatment. Both parties can be held legally responsible in the form of criminal, civil or administrative responsibility.

AUTHORS' CONTRIBUTION

Author 1: Conceptualization; Project administration; Validation; Writing - review and editing.
Author 2: Conceptualization; Data curation; In-vestigation.

REFERENCES

Adli, I. (2022). Knowledge, attitude, and practice related to the COVID-19 pandemic among undergraduate medical students in Indonesia: A nationwide cross-sectional study. *PLoS ONE*, *17*(1). https://doi.org/10.1371/journal.pone.0262827

Ahmed, Z. (2022). Knowledge, attitude, and practice of artificial intelligence among doctors and medical students in Pakistan: A cross-sectional online survey. *Annals of Medicine and Surgery*, *76*(Query date: 2024-12-06 04:26:46). https://doi.org/10.1016/j.amsu.2022.103493

Angelov, P. P. (2021). Explainable artificial intelligence: An analytical review. *Wiley Interdisciplinary Reviews: Data Mining and Knowledge Discovery*, *11*(5). https://doi.org/10.1002/widm.1424

Bag, S. (2021). Role of institutional pressures and resources in the adoption of big data analytics powered artificial intelligence, sustainable manufacturing practices and circular economy capabilities. *Technological Forecasting and Social Change*, *163*(Query date: 2024-12-06 11:25:52). https://doi.org/10.1016/j.techfore.2020.120420

Barker, T. H. (2022). Revising the JBI quantitative critical appraisal tools to improve their applicability: An overview of methods and the development process. *JBI Evidence Synthesis*, *21*(3), 478–493. https://doi.org/10.11124/JBIES-22-00125

Bartalena, L. (2021). The 2021 European Group on Graves' orbitopathy (EUGOGO) clinical practice guidelines for the medical management of Graves' orbitopathy. *European Journal of Endocrinology*, *185*(4). https://doi.org/10.1530/EJE-21-0479

Borges, A. F. S. (2021). The strategic use of artificial intelligence in the digital era: Systematic literature review and future research directions. *International Journal of Information Management*, *57*(Query date: 2024-12-06 11:25:52). https://doi.org/10.1016/j.ijinfomgt.2020.102225

Botwe, B. O. (2021). The integration of artificial intelligence in medical imaging practice: Perspectives of African radiographers. *Radiography*, *27*(3), 861–866. https://doi.org/10.1016/j.radi.2021.01.008

Busse, J. W. (2021). Medical cannabis or cannabinoids for chronic pain: A clinical practice guideline. *The BMJ*, *374*(Query date: 2024-12-06 04:26:46). https://doi.org/10.1136/bmj.n2040

Collins, G. S. (2021). Protocol for development of a reporting guideline (TRIPOD-AI) and risk of bias tool (PROBAST-AI) for diagnostic and prognostic prediction model studies based on artificial intelligence. *BMJ Open*, *11*(7). https://doi.org/10.1136/bmjopen-2020-048008

Cooper, G. (2023). Examining Science Education in ChatGPT: An Exploratory Study of Generative Artificial Intelligence. *Journal of Science Education and Technology*, *32*(3), 444–452. https://doi.org/10.1007/s10956-023-10039-y

Ghassemi, M. (2021). The false hope of current approaches to explainable artificial intelligence in health care. *The Lancet Digital Health*, *3*(11). https://doi.org/10.1016/S2589-7500(21)00208-9

Hwang, G. J. (2022). Definition, roles, and potential research issues of the metaverse in education: An artificial intelligence perspective. *Computers and Education: Artificial Intelligence*, *3*(Query date: 2024-12-06 11:25:52). https://doi.org/10.1016/j.caeai.2022.100082

Ji, H. (2021). Qualitative and quantitative recognition method of drug-producing chemicals based on SnO2 gas sensor with dynamic measurement and PCA weak separation. *Sensors and Actuators B: Chemical*, *348*(Query date: 2024-12-01 09:57:11). https://doi.org/10.1016/j.snb.2021.130698

Letaief, K. B. (2022). Edge Artificial Intelligence for 6G: Vision, Enabling Technologies, and Applications. *IEEE Journal on Selected Areas in Communications*, *40*(1), 5–36. https://doi.org/10.1109/JSAC.2021.3126076

Li, Z. (2020). From community-acquired pneumonia to COVID-19: A deep learning–based method for quantitative analysis of COVID-19 on thick-section CT scans. *European Radiology*, *30*(12), 6828–6837. https://doi.org/10.1007/s00330-020-07042-x

MacKinnon, K. R. (2021). Preventing transition "regret": An institutional ethnography of gender-affirming medical care assessment practices in Canada. *Social Science and Medicine*, *291*(Query date: 2024-12-06 04:26:46). https://doi.org/10.1016/j.socscimed.2021.114477

Markus, A. F. (2021). The role of explainability in creating trustworthy artificial intelligence for health care: A comprehensive survey of the terminology, design choices, and evaluation strategies. *Journal of Biomedical Informatics*, *113*(Query date: 2024-12-06 11:25:52). https://doi.org/10.1016/j.jbi.2020.103655

Misra, N. N. (2022). IoT, Big Data, and Artificial Intelligence in Agriculture and Food Industry. *IEEE Internet of Things Journal*, *9*(9), 6305–6324. https://doi.org/10.1109/JIOT.2020.2998584

Moor, M. (2023). Foundation models for generalist medical artificial intelligence. *Nature*, *616*(7956), 259–265. https://doi.org/10.1038/s41586-023-05881-4

Mueller, A. V. (2020). Quantitative Method for Comparative Assessment of Particle Removal Efficiency of Fabric Masks as Alternatives to Standard Surgical Masks for PPE. *Matter*, *3*(3), 950–962. https://doi.org/10.1016/j.matt.2020.07.006

O'Bryant, S. E. (2023). Medical comorbidities and ethnicity impact plasma Alzheimer's disease biomarkers: Important considerations for clinical trials and practice. *Alzheimer's and Dementia*, *19*(1), 36–43. https://doi.org/10.1002/alz.12647

Pan, Y. (2021). Roles of artificial intelligence in construction engineering and management: A critical review and future trends. *Automation in Construction*, *122*(Query date: 2024-12-06 11:25:52). https://doi.org/10.1016/j.autcon.2020.103517

Park, C. J. (2021). Medical Student Perspectives on the Impact of Artificial Intelligence on the Practice of Medicine. *Current Problems in Diagnostic Radiology*, *50*(5), 614–619. https://doi.org/10.1067/j.cpradiol.2020.06.011

Pelau, C. (2021). What makes an AI device human-like? The role of interaction quality, empathy and perceived psychological anthropomorphic characteristics in the acceptance of artificial intelligence in the service industry. *Computers in Human Behavior*, *122*(Query date: 2024-12-06 11:25:52). https://doi.org/10.1016/j.chb.2021.106855

Poliwoda, S. (2022). Stem cells: A comprehensive review of origins and emerging clinical roles in medical practice. *Orthopedic Reviews*, *14*(3). https://doi.org/10.52965/001C.37498

Secinaro, S. (2021). The role of artificial intelligence in healthcare: A structured literature review. *BMC Medical Informatics and Decision Making*, *21*(1). https://doi.org/10.1186/s12911-021-01488-9

Shastri, B. J. (2021). Photonics for artificial intelligence and neuromorphic computing. *Nature Photonics*, *15*(2), 102–114. https://doi.org/10.1038/s41566-020-00754-y

Shi, F. (2021). Review of Artificial Intelligence Techniques in Imaging Data Acquisition, Segmentation, and Diagnosis for COVID-19. *IEEE Reviews in Biomedical Engineering*, *14*(Query date: 2024-12-06 11:25:52), 4–15. https://doi.org/10.1109/RBME.2020.2987975

Swed, S. (2022). Knowledge, attitude, and practice of artificial intelligence among doctors and medical students in Syria: A cross-sectional online survey. *Frontiers in Artificial Intelligence*, *5*(Query date: 2024-12-06 04:26:46). https://doi.org/10.3389/frai.2022.1011524

Tischkowitz, M. (2021). Management of individuals with germline variants in PALB2: A clinical practice resource of the American College of Medical Genetics and Genomics (ACMG). *Genetics in Medicine*, *23*(8), 1416–1423. https://doi.org/10.1038/s41436-021-01151-8

Velden, B. H. M. van der. (2022). Explainable artificial intelligence (XAI) in deep learning-based medical image analysis. *Medical Image Analysis*, *79*(Query date: 2024-12-06 11:25:52). https://doi.org/10.1016/j.media.2022.102470

Wang, H. (2023). Scientific discovery in the age of artificial intelligence. *Nature*, *620*(7972), 47–60. https://doi.org/10.1038/s41586-023-06221-2

Yaghobian, S. (2022). Knowledge, attitudes and practices of telemedicine education and training of French medical students and residents. *Journal of Telemedicine and Telecare*, *28*(4), 248–257. https://doi.org/10.1177/1357633X20926829

Yilmaz, M. A. (2020). Simultaneous quantitative screening of 53 phytochemicals in 33 species of medicinal and aromatic plants: A detailed, robust and comprehensive LC–MS/MS method validation. *Industrial Crops and Products*, *149*(Query date: 2024-12-01 09:57:11). https://doi.org/10.1016/j.indcrop.2020.112347

Zhang, C. (2021). Study on artificial intelligence: The state of the art and future prospects. *Journal of Industrial Information Integration*, *23*(Query date: 2024-12-06 11:25:52). https://doi.org/10.1016/j.jii.2021.100224

Zhang, J. (2021). Empowering Things with Intelligence: A Survey of the Progress, Challenges, and Opportunities in Artificial Intelligence of Things. *IEEE Internet of Things Journal*, *8*(10), 7789–7817. https://doi.org/10.1109/JIOT.2020.3039359

Zhang, Y. B. (2021). Knowledge, attitude, and practice of nurses in intensive care unit on preventing medical device–related pressure injury: A cross-sectional study in western China. *International Wound Journal*, *18*(6), 777–786. https://doi.org/10.1111/iwj.13581

Zhu, J. M. (2021). Private equity and physician medical practices—Navigating a changing ecosystem. *New England Journal of Medicine*, *384*(11), 981–983. https://doi.org/10.1056/NEJMp2032115