

The Medicolegal Application of Artificial Intelligence as Doctors' Medical Assistants in Medical Services in Indonesia

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Abstract

This study examines the implementation of AI in medical services in Indonesia from a medicolegal perspective, highlighting the urgent need for the development of a robust legal and ethical framework to ensure responsible and safe use of AI while protecting patients' rights and privacy. The problem of the research is to analyze how medical ethics and the positive law in Indonesia regulate the application of Artificial Intelligence (AI) as medical assistance for doctors in medical services. This research employed a combination of the normative juridical approach method and the conceptual analysis approach. Results found that AI regulations in Indonesia are still in the developmental stages and lack specificity. Thus, in cases of errors in AI usage, the legal responsibility remains with the doctors who employed this technology as a tool. This underscores the importance of stringent oversight and the development of more detailed regulations as AI adoption in the medical sector in Indonesia continues to grow.

I. Introduction

Research on science and technology has had significant impacts on society, resulting in great transformations in daily life.¹ The increase in human life quality becomes the main focus, which is reflected in advancements in the health and education sectors as well as in infrastructure. The most recently emerging innovation is artificial intelligence (AI) technology, which has varied forms in technological development.² Artificial intelligence technologies have experienced rapid development and have started to be adopted in various sectors, including the health sector.

AI brings great potential to change the health service paradigm by increasing diagnosis accuracy, extending access to medical treatment, and holistically increasing the efficiency of medical practices.³ In Indonesia, the application of AI in medical services has great potential to increase the quality and efficiency of health services.⁴ However, these advancements also resulted in several issues in the medicolegal aspect that require serious consideration.⁵ Therefore, it is crucial to conduct medicolegal research that focuses on the application of AI in medical services in Indonesia.⁶

With a profound understanding of the involved legal and ethical aspects, we can make sure that the application of AI is carried out in a responsible and secure manner.⁷ This research will help determine a strong legal basis, identify frameworks that are suitable for regulations, and determine the best practices to maintain the balance between technological innovation and medicolegal needs. Therefore, research on the application of AI in the medicolegal sector of medical services in Indonesia is crucial to make sure that the application of AI technologies can be securely and responsibly carried out.⁸ AI is able to give

¹ Danang Sugihardana et al., "Tinjauan Yuridis Perlindungan Data Pribadi Dalam Menghadapi Tantangan Era Digital," *Prosiding University Research Colloquium* 19, no. SE-Articles (March 2024).

² Mutia Atika and Retno Sayekti, "Studi Literatur Review Sistem Informasi Perpustakaan Berbasis Artificial Intelligence (AI) Library Information System Based on Artificial Intelligence (AI): Literatur Review," *Journal of Information and Library Science* 14, no. 1 (2023): 39–52.

³ Ganis Sanhaji and Amirul Irsyaad Hizbullah, "Pemanfaatan Artificial Intelligence Dalam Bidang Kesehatan," *EDUSAINTEK: Jurnal Pendidikan, Sains Dan Teknologi* 11, no. 1 (2024): 234–42.

⁴ Md Ashrafur Rahman et al., "Impact of Artificial Intelligence (AI) Technology in Healthcare Sector: A Critical Evaluation of Both Sides of the Coin," *Clinical Pathology* 17 (2024): 2632010X241226887.

⁵ Patriot Haryo Trenggono and Adang Bachtar, "Peran Artificial Intelligence Dalam Pelayanan Kesehatan: A Systematic Review," *Jurnal Ners* 7, no. 1 (2023): 444–51.

⁶ Sehan Rifky et al., *Artificial Intelligence: Teori Dan Penerapan AI Di Berbagai Bidang* (PT. Sonpedia Publishing Indonesia, 2024).

⁷ Fitri Andri Astuti, "Pemanfaatan Teknologi Artificial Intelligence Untuk Penguatan Kesehatan Dan Pemulihan Ekonomi Nasional," *Jurnal Sistem Cerdas* 4, no. 1 (2021): 25–34.

⁸ Rita Komalasari, "Pemanfaatan Kecerdasan Buatan (Ai) Dalam Telemedicine: Dari Perspektif Profesional Kesehatan," *Jurnal Kedokteran Mulawarman* 9, no. 2 (2022): 72–81.

significant aid to doctors in various aspects, starting from disease diagnosis to the monitoring of patients and medical research.⁹ However, in the context of Indonesian law, there are yet any regulations that specifically regulate the usage of AI in medical services. Even so, some existing regulations may become a guideline for making such laws.¹⁰

The Law on Medical Practices state doctors' obligation to provide the best services for patients and become responsible for their actions. Then, Regulation of the Minister of Health No. 26 of 2018 regulates the management and confidentiality of patients' medical records. Next, Law No. 27 of 2022 on Personal Data Protection becomes an important reference that regulates the rights of data owners, including patient data that are used in AI.¹¹ Apart from that, principles of medical ethics such as patient autonomy, non-maleficence, beneficence, and justice also become guidelines for the use of AI in medical services.¹² Therefore, even though no specific regulations have been enacted, the existing legal framework may be used as a basis to make sure that the use of AI in medical services may still be carried out within the ethical corridors and suitable legal compliance.¹³

Several previous research were used as references for this research. The first article that became a reference was entitled "Organizational Readiness for Artificial Intelligence in Health Care: Insights for Decision-Making and Practice", which studied the preparedness of health organizations to integrate AI, emphasizing the importance of infrastructure, policies, and human resources in maximizing the benefits of AI in patient services.¹⁴ The second study was entitled "How Clinicians Perceive Artificial Intelligence-Assisted Technologies in Diagnostic Decision Making", which explored doctors' perspectives on the roles of AI in diagnostic decision-making, by focusing on the formation of a human-AI team that is optimal for effective clinical practices.¹⁵ Meanwhile, the third

⁹ Rony Sandra Yofa Zebua et al., *Fenomena Artificial Intelligence (Ai)* (PT. Sonpedia Publishing Indonesia, 2023).

¹⁰ Tegar Raffi Putra Jumantoro, "Menilik Pro Dan Kontra Pemanfaatan Dan Penetapan Status Hukum Artificial Intelligence (AI) Dalam Hukum Positif Indonesia," *Journal of Analytical Research, Statistics and Computation* 3, no. 1 (2024).

¹¹ Sugihardana et al., "Tinjauan Yuridis Perlindungan Data Pribadi Dalam Menghadapi Tantangan Era Digital."

¹² Ade Supriatini and Uli Wildan Nuryanto, "Dinamika Implementasi Good Hospital Governance Dan Prinsip Etika Autonomi, Beneficence, Non-Maleficene & Justice Pada Keputusan Pelayanan Pasien Rumah Sakit," in *National Conference on Applied Business, Education, & Technology (NCABET)*, vol. 2, 2022, 346–60.

¹³ Astuti, "Pemanfaatan Teknologi Artificial Intelligence Untuk Penguatan Kesehatan Dan Pemulihan Ekonomi Nasional."

¹⁴ Hassane Alami et al., "Organizational Readiness for Artificial Intelligence in Health Care: Insights for Decision-Making and Practice.," *Journal of Health Organization and Management* ahead-of-p, no. ahead-of-print (December 2020), <https://doi.org/10.1108/JHOM-03-2020-0074>.

¹⁵ Hyeyoung Hah and Deana Shevit Goldin, "How Clinicians Perceive Artificial Intelligence-Assisted Technologies in Diagnostic Decision Making: Mixed Methods Approach.," *Journal of Medical Internet Research* 23, no. 12 (December 2021): e33540, <https://doi.org/10.2196/33540>.

research was entitled “Artificial Intelligence and Personalized Medicine” which studied the importance of treatment personalization in facing varied diseases and patients’ pathophysiological processes. It focused on the role of AI in identifying suitable intervention targets as well as in developing effective personal medicine.¹⁶ As a whole, these journals studied the importance of integrating AI in medical practices to increase the efficiency, effectiveness, and quality of health services amid the AI technological era.

Most available research and literature have not specifically explored the medicolegal aspect of AI usage in the context of health services in Indonesia. Therefore, this research presents a significant novelty due to its in-depth focus on medicolegal issues that arise from the application of AI in medical services in Indonesia. By combining a literature review and updated research that aims to fill this scientific gap, it is hoped that this research may give a valuable contribution towards the understanding and handling of medicolegal issues related to the application of AI in medical services in Indonesia. Apart from that, it is hoped to develop a relevant recommendation for sustainable medical policies and practices that are according to applicable ethical and legal principles.

Thus, referring to the above explanation, this paper aims to answer the following research problem: “How do medical ethics and the positive law in Indonesia regulate the application of Artificial Intelligence (AI) as doctors’ medical assistants in medical services?”

2. Research Method

In this research, the authors employed a combination of the normative juridical approach method and the conceptual analysis approach.¹⁷ Through the normative juridical approach, the authors systematically analyzed the regulations and policies related to the use of AI in medical services in Indonesia. This aims to provide an understanding of the present legal bases as well as identify potential disadvantages or gaps in regulations that need to be fixed.

Then, the conceptual analysis approach was used to identify and understand the key concepts in the medicolegal field as well as the application of AI in medical services. This is to provide better insight into how to resolve medicolegal challenges that arise in the application of AI in medical services.¹⁸

¹⁶ Nicholas J Schork, “Artificial Intelligence and Personalized Medicine.,” *Cancer Treatment and Research* 178 (2019): 265–83, https://doi.org/10.1007/978-3-030-16391-4_11.

¹⁷ Depri Liber Sonata, “Metode Penelitian Hukum Normatif Dan Empiris: Karakteristik Khas Dari Metode Meneliti Hukum,” *Fiat Justisia Jurnal* 8, no. 1 (2014): 15–35.

¹⁸ I Made Pasek Diantha and M S Sh, *Metodologi Penelitian Hukum Normatif Dalam Justifikasi Teori Hukum* (Prenada Media, 2016).

As for the data analysis technique, the authors employed the descriptive method, where the authors described and interpreted primary and secondary legal regulations that are related to the application of AI in medical services in Indonesia in detail. Through literary studies, the authors collected and analyzed primary legal materials, such as laws and governmental regulations. The authors also analyzed secondary legal materials in the forms of related legal literature, articles, and research papers.

By applying the descriptive method, the authors described relevant legal content, interpreted arising legal issues, and explained perspectives or views that developed within the legal literature.¹⁹ It is hoped that this research may provide an in-depth understanding of the medicolegal complexity of AI in medical services.

3. Results and Discussion

Artificial intelligence is not a technology. Rather, it is a combination of technologies with high sophistication that allows the processing of big data that may ease the lives of human beings. Most of these technologies have a direct relevance to the health sector. AI supports varied processes and specific tasks. Simply put, AI refers to science and manipulation on the creation of an intelligent machine through algorithms or a series of regulations that are followed by these machines to copy humans' cognitive capabilities, such as learning and problem-solving.²⁰ The AI system has the potential to anticipate or handle occurring issues. Therefore, they operate purposely, intelligently, and adaptively. The strength of AI is placed on its capability to learn and identify patterns and relationships between a series of multidimensional and greatly multi-capital data. For instance, the AI system may translate all patients' medical records into a number that may represent diagnosis possibilities. Apart from that, the AI system is dynamic and autonomous. It can learn and adapt in line with the increasing abundance of available data.²¹

The use of an AI mechanism that has the capability to mine data and identify patterns has successfully been utilized to analyze "disease symbolic models" as well as their relationships with patients' symptoms that help in diagnosing patients, treating patients, developing medical protocols, developing medicine, as well as monitoring patients. The speed in which technologies develop in the

¹⁹ S T Muhammad Syahrur, *Pengantar Metodologi Penelitian Hukum: Kajian Penelitian Normatif, Empiris, Penulisan Proposal, Laporan Skripsi Dan Tesis* (CV. Dotplus Publisher, 2022).

²⁰ Thomas Davenport and Ravi Kalakota, "The Potential for Artificial Intelligence in Healthcare.," *Future Healthcare Journal* (England, June 2019), <https://doi.org/10.7861/futurehosp.6-2-94>.

²¹ Junaid Bajwa et al., "Artificial Intelligence in Healthcare: Transforming the Practice of Medicine.," *Future Healthcare Journal* 8, no. 2 (July 2021): e188–94, <https://doi.org/10.7861/fhj.2021-0095>.

health sector becomes even more clear with the presence of AI that offers various great potential, including its capabilities in supporting diagnosis processes and changing roles in the medical field, as AI may potentially substitute several tasks that were formerly only carried out by doctors.²²

The application of AI in the health sector is not only limited to its diagnosis. However, it has also provided ease in accessing and managing electronic medical records, giving more accurately targeted medicine recommendations, as well as becoming a warning system for patients' security, such as preventing patients' risks of falling. As a medical assistant, AI does not only ease the workload of doctors. It also allows them to focus on the handling of more complex cases, increasing the efficiency of health services, as well as speeding up the medical decision-making process. Apart from that, AI has the capability to process and analyze large amounts of data at high speed. It allows early identification of diseases that are difficult to detect during the initial stage, as well as provides a more personal recommendation of treatment. In its function as a medical-assisted diagnosis, AI strengthens the role of doctors in providing profound and comprehensive data analyses and helps the detection of possibly invisible risks and complications. AI also contributes to increasing patient safety protocol, such as by identifying the interactions of medicines that may potentially be dangerous or giving a warning on potential side effects before medical actions are carried out. In the end, it can make medical practices safer and more effective.²³

Even though AI has a high potential to increase the quality of health services, much concern occurs related to its application, which regards the security of AI, threats towards patient autonomy and choices, potential increase in treatment costs, the bias in data sources, as well as patient data security. These concerns are highly rational, considering that AI technologies are still relatively new and their applications are not yet truly comprehensive. Meanwhile, the medical decisions that doctors make involve various complex factors.²⁴ Therefore, it is crucial to develop an ethical innovation and a strong regulatory framework so that AI may support, and not substitute, doctors' professional judgement; maintain patients' rights; resolve biases in data; as well as protect the security of patient data. These careful and ethics-based approaches will guarantee that AI truly becomes a valuable tool in increasing the quality and efficiency of health facilities while minimizing related risks.

²² Sandeep Reddy, "Use of Artificial Intelligence in Healthcare Delivery," 2018.

²³ Hah and Goldin, "How Clinicians Perceive Artificial Intelligence-Assisted Technologies in Diagnostic Decision Making: Mixed Methods Approach."

²⁴ Jordan P Richardson et al., "Patient Apprehensions about the Use of Artificial Intelligence in Healthcare," *NPJ Digital Medicine* 4, no. 1 (2021): 140.

Medical Ethics

From the perspective of medical ethics, the use of AI in medical services must be centered on basic medical principles, such as beneficence, non-maleficence, autonomy (respecting patients' decisions), and justice.²⁵ AI may help doctors in giving more accurate diagnoses and treatment. However, it is crucial to make sure that AI is used as a tool of medical assistance, rather than as a substitute for doctors in making decisions. The final decision must still be in the hands of doctors who are responsible for the treatment of patients.

Medical ethics also emphasize the importance of maintaining the confidentiality of patients' data and privacy.²⁶ In the case of AI usage, this means that patients' data that are used to train the AI algorithm must strictly be protected and they cannot be misused. These ethics also oblige transparency in the use of AI, where patients must be informed if the AI is used in the process of diagnosing and treating them, as well as the potential impacts of AI's use.

To optimize the use of AI in the health sector, the World Health Organization (WHO) has issued a guideline called "Ethics and Governance of Artificial Intelligence for Health: WHO Guidance". It functions as a guideline for the use of AI technologies in health services. These guidelines were designed to make sure that AI technologies not only increase the efficiency and effectiveness of services but also do so in line with strict ethical principles. The WHO emphasizes that humans must still hold the main control over every clinical decision. This is so that the protection of autonomous rights as well as patients' personal data confidentiality becomes the main priority. Apart from that, the informed consent process must transparently be carried out to maintain patients' rights.

Apart from the aspect of autonomy, these guidelines also emphasize the importance of welfare, safety, and public interest. The security, accuracy, and effectiveness standards of service must be fulfilled with strict quality monitoring. The WHO also highlights the importance of transparency and openness in delivering information to patients, as well as the strengthening of responsibility and accountability in the use of AI. In the context of inclusivity and diversity, these guidelines invite AI technology developers to identify and respect the diverse characteristics of the population, such as gender, age, and ethnicity. All this is directed to make sure that the AI used in the health sector is responsive and sustainable; widely accessible; and beneficial for all of society.²⁷

²⁵ Taufik Suryadi and Tim Bioetika, "Prinsip-Prinsip Etika Dan Hukum Dalam Profesi Kedokteran," *Pertemuan Nasional V JBHKL* 13 (2009).

²⁶ Haikal Mubarak, Yeti Kurniati, and R A S Hernawati, "Application of Medical Professional Ethics in a Legal Context: Comparative Analysis of Ethical Cases and Legal Aspects," *Formosa Journal of Social Sciences (FJSS)* 2, no. 4 (2023): 563–76.

²⁷ W H O Guidance, "Ethics and Governance of Artificial Intelligence for Health," *World Health Organization*, 2021.

The Positive Law in Indonesia

Legally, the application of AI in medical services in Indonesia is currently in the development stage. Therefore, it can be sensed that Indonesia has not yet enacted a specific regulation that governs the use of AI in the medical and health fields. Law No. 29 of 2004 on Medical Practices regulate medical practices and emphasizes that the responsibility for patient diagnosis and treatment is in the hands of doctors who have medical practice licenses. This means that AI, however sophisticated it is, cannot substitute the role of doctors in making medical decisions.

However, the use of AI in health is stipulated in the Circulation Letter of the Republic of Indonesia's Minister of Communication and Informatics No. 9 of 2023 on the Ethics of Artificial Intelligence. It states that "The use of AI in the health sector adopts artificial intelligence for a more accurate medical diagnosis." However, its explanation is contained in a legal product in the form of a circulation letter whose contents materially bind the public even though it is not a legal regulation. According to the legal theory, a circulation letter is not a type of regulation (*regeling*) nor is it a decision (*beschikking*). On the contrary, a circulation letter is a policy (*beleidsregel*) and a pseudo-regulation (*pseudowetgeving*). A circulation letter is a direction, where a decision and action that is determined and carried out by a governmental official aims to resolve existing (concrete) issues so long as they are not regulated in the stipulations of legal regulations, or are regulated in an incomplete or unclear manner.²⁸ Thus, these bases are not strong enough to be used as legal bases in carrying out an action.

On the other hand, health service establishments have the obligation to guarantee patients' personal data protection so that they are not misused or leaked for interests that harm patients. Health facilities must reject the uncovering of information related to patients' confidential personal health data unless it is permitted by the law. A strong protection of patients' personal data is a key element in maintaining the integrity and security of health services in the digital era.

The Republic of Indonesia's Law No. 19 of 2016 on Electronic Information and Transaction (EIT Law) regulates the digital aspects that are relevant to the application of AI, such as data security and privacy.²⁹ In the case of AI usage in the

²⁸ Resita Lukitawati and Widodo Trisno Novianto, "Regulasi Layanan Kesehatan Digital Di Indonesia: Tantangan Etis Dan Hukum," *Ajudikasi: Jurnal Ilmu Hukum* 7, no. 2 (2023): 391–414.

²⁹ Irman Putra, "Pengujian Yuridis UU No. 11 Tahun 2008 Tentang Informasi Dan Transaksi Elektronik Ditinjau Dari UUD 1945: Menyeimbangkan Kebebasan Berekspresi Dan Keamanan Siber," *Jurnal Hukum Dan HAM Wara Sains* 3, no. 01 (2024): 167–74.

medical sector, this means that patients' data that are used by AI must be according to the applicable legal regulations. Then, each violation of data privacy may be imposed with legal sanctions.

Even though not all unwanted incidences in health service are malpractices, they often happen due to the presence of errors, such as errors in diagnosis, errors in treatment, the failure to carry out prevention, and other errors such as errors in communication. Malpractice usually involves actions that are not according to professional standards, bringing losses to patients.³⁰ In using AI technologies in the health sector, even though AI may provide significant support in the diagnosis and treatment processes, the role of AI is still under the control of human beings. AI may only operate based on the data and algorithms that were priorly programmed by human beings and its main function as a medical assistant is to give recommendations to doctors. Even so, the final decision in determining diagnoses and treatment is still in the hands of doctors.

Technical errors may occur in AI. For instance, this may happen in cases where the algorithms used are not in line with doctors' clinical rationing, which may lead to errors in diagnosis or in treatment administration. Even though AI provides valuable aid, it cannot fully substitute the medical decisions of human beings. Then, in cases of errors, AI cannot become legal subjects. This is caused by the fact that AI lacks legal awareness. It cannot understand the implications of its actions nor can it consciously determine desires in carrying out actions. Therefore, the legal responsibility is still in the hands of doctors or health professionals who use AI as a supporting instrument, rather than being attached to the AI itself. The use of AI requires the careful and accurate monitoring of human beings to minimize the risks of error and to make sure that patients obtain safe and effective treatment. This makes the legal protection of the use of AI as a supporting tool in the medical and health sectors become crucial. The required legal protection includes the protection of patients as well as guidelines for using AI in the medical sector.

Even though AI has great potential in the health sector, this technology's application in hospitals and other health services still requires much assessment and consideration. Before fully applying it, it is important to make sure that the AI can truly increase the operational effectiveness and efficiency without sacrificing service quality. Even though currently existing technologies are already advanced, they need further development so that they can optimally function. This is to minimize the possibility of technical errors. This advancement is crucial considering that in the health sector, small mistakes may bring great

³⁰ Ari Yunanto and S H Helmi, *Hukum Pidana Malpraktik Medik, Tinjauan Dan Perspektif Medikolegal* (Penerbit Andi, 2024).

impacts and risks to patient safety. With the help of AI, doctors may focus on tasks that require human expertise, while tasks that tend to be more routine and repetitive may be handled by technologies. Such situations are surely hoped to increase the quality of health services as a whole.

Even though AI offers many great benefits, its adoption in the health sector must be applied with great care. Security, privacy, and ethics in technological use must be well-maintained. The development of strict standards and regulations is also crucial to make sure that AI is responsibly used according to patients' interests. Therefore, even though AI has great potential to revolutionize the health sector, a wise and sustainable approach is still needed to make sure that this technology truly brings the desired benefits without leading to negative impacts.

With the right support, AI has a great chance to bring extensive impacts in the health sector. Starting from the increase in effectiveness and efficiency to providing doctors with ease in carrying out their tasks, AI may become a highly valuable tool in the effort to increase the quality of health services. Therefore, the integration of AI in the health sector needs to keep on being developed and perfected to bring maximum benefits for all involved parties.

4. Conclusion

The use of AI in the medical sector must be according to basic medical principles, such as beneficence, non-maleficence, autonomy (respecting patients' decisions), and justice that is also reflected in the guidelines entitled "Ethics and Governance of Artificial Intelligence for Health" that was issued by the WHO. In Indonesia, even though the law has not specifically regulated the use of AI in medical practices, there are legal guidelines with general characteristics, such as those which are stipulated in the Circulation Letter of the Republic of Indonesia's Minister of Communication and Informatics No. 9 of 2023 on the Ethics of Artificial Intelligence.

Even though this Circulation Letter provides guidelines, it does not yet have a legal power that is equivalent to the law. Therefore, the application of AI in the medical sector must still pay attention to stronger laws, such as the Law on Medical Practices and the Law on Health, so that they do not violate the existing legal framework. Apart from that, the Republic of Indonesia's Law No. 19 of 2016 on Electronic Information and Transaction is also relevant in the application of AI as it regulates important digital aspects, such as data security and patient privacy. In the case of responsibility, in cases of medical malpractice that involve AI, the legal responsibility is still burdened on doctors who utilize these technologies, considering that AI does not have legal awareness and that it cannot understand

the implications of its actions. Therefore, human supervision and control still become the key to its use.

The authors suggest that the government of the Republic of Indonesia must issue specific laws on the use of AI as it is certain that AI will keep on being developed in the present and future eras. These regulations must contain stipulations on the use of AI in the medical field to protect patient privacy and to determine responsibility in cases of medical malpractice. Future research may be conducted on the specific use of AI in other fields, such as education, environment, and economy, as well as how they relate to the legal aspect of their use.

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