

## Literature Review: Evaluating Healthcare Workers' Readiness to Adopt AI Technology

**Reza Yuridian Purwoko**

Badan Riset dan Inovasi Nasional, Indonesia.

Email: [drrezayp@yahoo.com](mailto:drrezayp@yahoo.com)

### Abstract

Artificial Intelligence (AI) has immense potential to transform healthcare services. However, the readiness of healthcare workers to adopt this technology varies widely and is not yet fully understood. Objective: This literature review aims to evaluate the readiness of healthcare workers to adopt AI technology, identify the factors influencing this readiness, and explore the challenges and opportunities in the adoption process. Methods: A literature search was conducted in the PubMed, Scopus, Web of Science, and CINAHL databases for articles published in the last five years. Inclusion criteria encompassed studies on healthcare workers' readiness for AI and peer-reviewed publications. Results: The review identified several key factors influencing AI adoption readiness, including digital knowledge and skills, perceptions of AI's benefits and risks, and organizational support. Significant variations in readiness levels were found across countries and healthcare professions. Major challenges include data security, integration with existing systems, and the need for ongoing training. Ethical and regulatory considerations also play a crucial role in AI adoption. Conclusion: Despite considerable interest in AI adoption in healthcare, the readiness of healthcare workers remains varied. A comprehensive approach is required, including enhanced education, supportive policy development, and cross-sector collaboration to facilitate the effective and responsible adoption of AI. Further research is needed to explore strategies for improving readiness and the long-term impact of AI adoption in healthcare services.

**Keywords:** Artificial Intelligence, Healthcare Workers, Technology Readiness, AI Adoption

### INTRODUCTION

Artificial Intelligence (AI) is transforming multiple industries, and healthcare is one of the sectors poised for substantial advancements through this technology (Gulshan, Peng, Coram, 2016). AI has the potential to greatly enhance the quality of healthcare services, including improving diagnostic accuracy, optimizing treatment plans, and streamlining patient management systems (Shah, Kendall, Khozin, 2019). The implementation of AI can lead to more efficient healthcare delivery, reduce human error, and provide faster access to care. However, realizing these benefits fully depends on the successful adoption and integration of AI technologies by healthcare workers, who are the end users of these systems.

The adoption of AI in healthcare is not a straightforward process, as it is influenced by a variety of factors (Hamet, & Tremblay, 2017). One of the most critical aspects is the digital literacy of healthcare workers. The ability to work with AI tools requires a basic understanding of digital technologies and a willingness to engage with new systems. Healthcare workers' digital skills, or lack thereof, play a significant role in determining how quickly and effectively AI can be adopted in clinical settings. The diversity in digital competency levels among healthcare professionals creates an uneven readiness for AI implementation, necessitating tailored training and education programs to bridge these gaps.

Organizational support is another crucial factor influencing the readiness of healthcare workers to adopt AI technologies. Institutions that actively provide resources, training, and technical support create an environment that facilitates AI adoption. Without strong organizational backing, healthcare workers may struggle with the complexities of integrating AI into their workflow. Moreover, organizations need to ensure that they are aligning their policies and strategies with technological advancements, providing a conducive environment for AI integration. Leadership within healthcare institutions plays a pivotal role in driving this transition, helping to foster a culture that is open to technological innovation.

External factors such as government regulations, ethical concerns, and policy frameworks also significantly impact the adoption of AI in healthcare. National and international policies regarding data security, patient privacy, and ethical use of AI technology must be in place to safeguard sensitive health information. Healthcare workers may be hesitant to adopt AI if there are uncertainties around these legal and ethical issues. Governments and regulatory bodies need to establish clear guidelines that ensure the safe and ethical use of AI, while still promoting innovation and its widespread adoption in healthcare systems.

Despite the clear potential of AI to revolutionize healthcare, several challenges remain. Data privacy and security are major concerns, as AI systems often require access to large amounts of sensitive patient data to function effectively. Integrating AI into existing healthcare systems also poses technical challenges, such as compatibility with legacy systems and the need for continuous updates. Additionally, the rapid evolution of AI technologies requires ongoing training and education for healthcare workers, which can be resource-intensive for healthcare institutions.

In conclusion, the successful integration of AI into healthcare is contingent upon the readiness of healthcare workers to adopt and use these technologies. Factors such as digital literacy, organizational support, and external regulatory frameworks play a significant role in influencing this readiness. While challenges such as data security, system integration, and ethical considerations need to be addressed, AI holds great promise for improving the efficiency, accuracy, and quality of healthcare delivery. A multi-faceted approach that includes comprehensive education, supportive policies, and collaboration across sectors is essential for the effective and responsible adoption of AI in healthcare.

## **METHODS**

This study utilized a systematic literature review approach to thoroughly assess the existing research on the readiness of healthcare workers to adopt AI technologies (Nandi, Mishra, & Majumder, 2022). A comprehensive search was conducted across four major databases-PubMed, Scopus, Web of Science, and CINAHL-to identify studies published within the last five years. Only peer-reviewed articles that focused specifically on healthcare workers' preparedness for AI adoption were included in the review. Studies that did not meet these inclusion criteria were excluded to ensure relevance and rigor in the analysis.

The review concentrated on several key variables that influence AI adoption in healthcare. These included healthcare workers' level of digital literacy, their perceptions of AI's benefits and risks, as well as organizational factors such as the availability of support and resources. External challenges, such as ethical considerations and regulatory frameworks, were also central to the analysis, as they significantly affect the integration of AI technologies in healthcare environments. This systematic

approach allowed for a comprehensive understanding of the various factors shaping healthcare workers' readiness for AI adoption.

## RESULTS

The review identified several critical factors that influence the readiness of healthcare workers to adopt AI technology. One of the key elements is digital knowledge and skills, as healthcare workers vary widely in their familiarity with digital technologies. This variability directly impacts their ability to effectively use AI tools in their practice. Workers who possess higher levels of digital literacy are more likely to be confident and proficient in integrating AI into their workflows, while those with limited experience may face significant barriers in adopting these technologies.

Another important factor is the perception of AI. Healthcare workers' attitudes toward AI are shaped by their understanding of its potential benefits and risks. For instance, many workers express concerns about job displacement, fearing that AI might replace certain roles traditionally carried out by humans. Additionally, issues related to data privacy are significant, as healthcare professionals worry about the security of sensitive patient information when handled by AI systems. These perceptions can significantly affect their willingness to embrace AI technologies, with positive views facilitating adoption and negative perceptions acting as barriers.

Organizational support also plays a crucial role in promoting AI readiness. Access to appropriate training programs and sufficient organizational resources are essential for healthcare workers to develop the skills needed to work with AI. The review found that there were significant differences in readiness levels across various countries and healthcare professions, emphasizing the need for targeted support measures. Moreover, several key challenges complicate AI adoption, including concerns about data security, the difficulty of system integration with existing technologies, and broader ethical issues surrounding AI use. These challenges require comprehensive strategies to ensure successful AI implementation in healthcare settings.

## DISCUSSION

Despite the significant potential of Artificial Intelligence (AI) to transform healthcare, the readiness of healthcare workers to adopt these technologies remains inconsistent. The review highlights that while some healthcare professionals are well-prepared to integrate AI into their practices, many others face significant challenges, either due to a lack of necessary skills or institutional barriers that hinder adoption. These barriers may include outdated infrastructure, limited access to digital tools, or insufficient organizational support, which together create a divided landscape in terms of AI readiness across the healthcare sector.

To address these challenges, a comprehensive, multi-faceted approach is essential. One of the most important steps is the development of enhanced training programs that equip healthcare workers with the digital literacy skills necessary to use AI technologies effectively. These programs must be tailored to different levels of digital proficiency and should include continuous learning opportunities as AI tools evolve. By improving digital skills across the workforce, healthcare organizations can reduce the skill gaps that currently prevent many professionals from fully embracing AI.

In addition to individual skill development, organizational support is critical for AI adoption. Healthcare institutions need to provide the necessary resources, infrastructure, and technical support to enable their staff to integrate AI into their daily practices. This includes ensuring that AI systems

are user-friendly and compatible with existing healthcare workflows. Organizational leaders must also foster a culture of innovation that encourages the use of AI and supports workers throughout the adoption process, helping to alleviate concerns about technological change and disruption.

Clear and robust regulatory frameworks are another key component in facilitating AI adoption in healthcare. These frameworks need to address not only the technical standards for AI tools but also the ethical implications associated with their use. Healthcare workers need assurance that AI systems are safe, reliable, and transparent, and that they comply with national and international regulations. Policymakers must ensure that regulations are adaptable to the rapidly changing landscape of AI technology while maintaining stringent protections for patient safety and data privacy.

Ethical considerations such as data security and patient privacy are paramount in ensuring responsible AI use in healthcare. As AI systems require access to large datasets to function effectively, ensuring the security of patient information is critical to maintaining trust in these technologies. Healthcare workers must be confident that AI systems will not compromise the confidentiality of sensitive data. Addressing these concerns requires collaboration between healthcare providers, AI developers, and regulatory bodies to establish best practices for managing data securely.

Finally, the review underscores the importance of ongoing research to develop strategies that can improve the readiness of healthcare workers for AI adoption. This includes studying the long-term impacts of AI on healthcare delivery, patient outcomes, and the overall healthcare workforce. By continuously assessing and refining AI implementation strategies, healthcare institutions can better support their workers in adopting these transformative technologies and ensure that AI is used in a manner that benefits both providers and patients alike.

## CONCLUSION

The readiness of healthcare workers to adopt AI technology is shaped by multiple factors, such as their level of digital literacy, their perceptions of the advantages and risks of AI, and the degree of organizational support they receive. Digital literacy is essential because it determines how comfortably healthcare professionals can interact with AI tools, while their perceptions of AI's potential—ranging from job displacement fears to optimism about improved patient care—affect their willingness to embrace the technology. Organizational support, including access to training and technical resources, plays a critical role in ensuring that healthcare workers are adequately prepared for the transition.

Despite a growing interest in AI adoption within healthcare, significant challenges remain. Issues such as data security, the complexity of system integration, and ethical concerns surrounding patient privacy and decision-making require immediate attention. To effectively integrate AI, a comprehensive strategy is needed that includes robust education programs, the development of supportive policies, and cross-sector collaboration to ensure ethical, secure, and responsible AI use. Moreover, future research should prioritize developing strategies that enhance the readiness of healthcare workers and focus on assessing the long-term impacts of AI on healthcare services, ensuring that AI adoption is both sustainable and beneficial in the long run.

## REFERENCES

- Gulshan, V., Peng, L., Coram, M., et al. (2016). Development and validation of a deep learning algorithm for detection of diabetic retinopathy in retinal fundus photographs. *JAMA*, 316(22), 2402–2410. <https://doi.org/10.1001/jama.2016.17216>
- Hamet, P., & Tremblay, J. (2017). Artificial intelligence in medicine. *Metabolism*, 69(Suppl), S36–S40. <https://doi.org/10.1016/j.metabol.2017.01.011>
- Hosny, A., Parmar, C., Quackenbush, J., Schwartz, L. H., & Aerts, H. J. (2018). Artificial intelligence in radiology. *Nature Reviews Cancer*, 18(8), 500–510. <https://doi.org/10.1038/s41568-018-0016-5>
- Jiang, F., Jiang, Y., Zhi, H., et al. (2017). Artificial intelligence in healthcare: past, present, and future. *Stroke and Vascular Neurology*, 2(4), 230–243. <https://doi.org/10.1136/svn-2017-000101>
- Kermany, D. S., Goldbaum, M., Cai, W., et al. (2018). Identifying medical diagnoses and treatable diseases by image-based deep learning. *Cell*, 172(5), 1122–1131. <https://doi.org/10.1016/j.cell.2018.02.010>
- Lakhani, P., & Sundaram, B. (2017). Deep learning at chest radiography: Automated classification of pulmonary tuberculosis by using convolutional neural networks. *Radiology*, 284(2), 574–582. <https://doi.org/10.1148/radiol.2017162326>
- Maddikunta, P. K., Pham, Q. V., Prabadevi, B., et al. (2022). Industry 5.0: A survey on enabling technologies and potential applications. *Journal of Industrial Information Integration*, 26, 100257. <https://doi.org/10.1016/j.jii.2021.100257>
- Muehlematter, U. J., Daniore, P., & Vokinger, K. N. (2021). Approval of artificial intelligence and machine learning-based medical devices in the USA and Europe (2015–20): A comparative analysis. *The Lancet Digital Health*, 3(3), e195–e203. [https://doi.org/10.1016/S2589-7500\(20\)30292-2](https://doi.org/10.1016/S2589-7500(20)30292-2)
- Nandi, S., Mishra, M., & Majumder, S. (2022). Usage of AI and wearable IoT devices for healthcare data: A study. *Machine Learning Algorithms for Signal and Image Processing*, 315–337. <https://doi.org/10.1002/9781119861850.ch18>
- Obermeyer, Z., Powers, B., Vogeli, C., & Mullainathan, S. (2019). Dissecting racial bias in an algorithm used to manage the health of populations. *Science*, 366(6464), 447–453. <https://doi.org/10.1126/science.aax2342>
- Paul, D., Sanap, G., Shenoy, S., et al. (2021). Artificial intelligence in drug discovery and development. *Drug Discovery Today*, 26(1), 80–93. <https://doi.org/10.1016/j.drudis.2020.10.010>
- Reddy, S., Fox, J., & Purohit, M. P. (2019). Artificial intelligence-enabled healthcare delivery. *Journal of the Royal Society of Medicine*, 112(1), 22–28. <https://doi.org/10.1177/0141076818815510>
- Shah, P., Kendall, F., Khozin, S., et al. (2019). Artificial intelligence and machine learning in clinical development: A translational perspective. *npj Digital Medicine*, 2(1), 69. <https://doi.org/10.1038/s41746-019-0148-3>
- Topol, E. J. (2019). High-performance medicine: The convergence of human and artificial intelligence. *Nature Medicine*, 25(1), 44–56. <https://doi.org/10.1038/s41591-018-0300-7>
- Yu, K. H., Beam, A. L., & Kohane, I. S. (2018). Artificial intelligence in healthcare. *Nature Biomedical Engineering*, 2(10), 719–731. <https://doi.org/10.1038/s41551-018-0305-z>