POTENTIAL OF ARTIFICIAL INTELLIGENCE IN NURSING CARE: A SCOPING REVIEW

Pham Van Hiep[1], Nguyen Bich Huong[2]
1.2. National Otorhinorarynology Hospital of Vietnam
https://doi.org/10.60137/tmhvn.v70i74.226

ABSTRACT

Objective: Overview of the potential of AI in nursing care. **Method:** A scoping review. **Results:** Of the 217 relevant articles, 10 articles that met the selection criteria were included in the study. Artificial Intelligence (AI) in nursing care demonstrates the great potential of AI to support and improve the activities of nurses. Studies have shown that AI can support clinical decision making, automate administrative tasks, improve care efficiency and improve patient outcomes. **Conclusion:** Artificial Intelligence (AI) offers a great potential to transform the field of nursing care, promising to improve work efficiency, enhance the quality of care and support patients.

Keywords: Artificial Intelligence, AI, nursing care

* First author Pham Van Hiep Phone number: 0986175299
Email: tranghiep92@gmail.com
Date of receipt: 29/4/2025 Date of receipt of feedback: 12/07/2025
Date of receipt of review: 24/12/2025 Date of approval for publication: 26/12/2025

1. INTRODUCTION

Artificial intelligence (AI) is increasingly being used in healthcare, offering the potential to assist nurses in clinical and administrative activities. AI can assist in complex clinical decision making, automate tasks such as documentation, and free up time for nurses [1]. Applications of AI in healthcare are diverse, including supporting behavior change, health monitoring, and disease screening and diagnosis [2]. In the nursing field, AI can be applied to improve work efficiency, enhance the quality of care, and support patients [1]. However, the implementation of AI technologies in nursing also raises many issues of concern such as data bias, ethical and legal issues, and user acceptance [3].

Despite the increase in research and development of AI applications for nursing [1], a comprehensive overview of the evidence supporting promising use cases is lacking [1]. Current studies focus mainly on the technology development and testing phase [2], while evidence on practical impact and implementation aspects in clinical practice is limited [3]. Furthermore, many studies lack the involvement of nurses in the AI development process [1], as well as the related ethical and legal issues [4]. This suggests that more high-quality studies involving nurses are needed to fully assess the potential and challenges of AI in nursing care.

To address the above research gaps, in particular the lack of a comprehensive overview of the potential of AI in nursing care. The results of this study are expected to provide a comprehensive overview of the potential of AI in nursing, thereby guiding future research and supporting the application of AI in nursing practice.

2. SUBJECTS AND METHODS

2.1. Research subjects

The research subjects are scientific articles and documents related to the application of AI in nursing care

Selection criteria: Publications and research articles related to the application of AI in nursing care; Location: Worldwide; Language: English; Publication: 2020-2025.

Exclusion criteria: Duplicate publications and articles; Publications and articles that do not provide original data; Publications and articles that do not have full-text articles.

2.2 Methods, search strategies and data sources

- This survey was conducted according to the PRISMA-ScR (PRISMA exension for Scoping Reviews) guidelines, which is a checklist for conducting review studies.

- Research design: A scoping review.

- We systematically searched PubMed, Ebsco and Embase databases with the search keywords: "**artificial intelligence applications, nursing care**".

2.3. Research selection

Two researchers performed independently in 2 steps:

- Step 1: Abstracts of found articles will be removed from duplication and entered into Endnote X7 document management software. Researchers will carefully read the title and abstract. Articles that meet the criteria will be selected, articles that do not meet the criteria will be excluded.

- Step 2: Studies with appropriate titles and abstracts will be read in full text, if determined to be suitable for the research objectives, they will be selected and information collected.

In these 2 steps, if there is a conflict between the two researchers, both will discuss and reach a consensus.

2.4. Data extraction

Author, year of publication, location, research design, research subjects, main results of the study.

3. RESEARCH RESULTS

A total of 217 articles were found in the database, after exclusion, 10 articles were selected for full text reading and found to meet the selection criteria, exclusion criteria and were included in the study (*diagram below*).

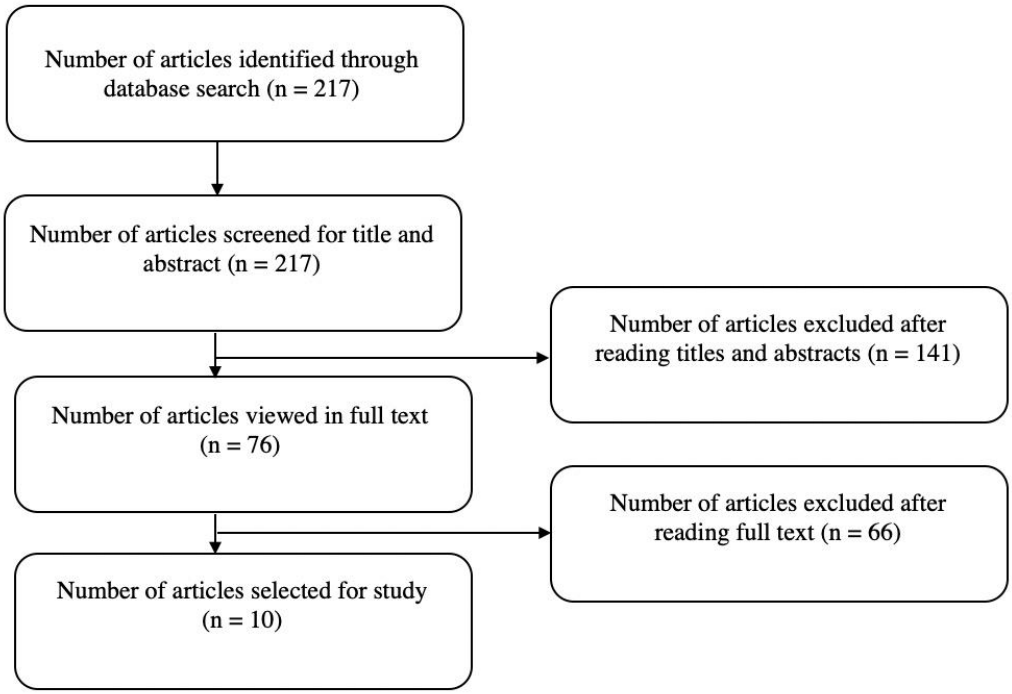

Table 1. Main results from eligible articles

Author and collaborators, Year	Sample size	Research design	Key results
Seibert K et al., 2021, [1]	292	Overview	AI has the potential to support clinical decision making and automate tasks, allowing nurses to focus on direct care. Lack of evidence on the effectiveness of AI in nursing. Ethical, legal, and social considerations. Basic knowledge of AI is needed for nurses to mediate between technology and care practice. Nursing education in AI is needed.
Von Gerich H et al., 2022, [2]	93 articles	Scope Overview	AI has the potential to support and improve nursing care. Concerns about data bias and impact on certain populations. Lack of evidence on the effectiveness of AI technologies in nursing. Need for nursing involvement in AI research and development. Need to integrate AI knowledge into nursing education.
Vasquez BA et al., 2023,[3]	N/A	Theoretical discussion	AI can improve the efficiency and accuracy of care. Overreliance on technology can impact the quality of care and patient satisfaction. Nurses need to be able to use and evaluate AI technologies. There is a need to balance the use of technology with maintaining human care and attention.
Milne-Ives M et al., 2020, [4]	31 studies	System Overview	Automating tasks can free up time for nurses and increase access to healthcare. Stronger evidence is needed on the effectiveness and feasibility of conversational AI applications. Nurses can play a role in

			developing and evaluating conversational AI applications.
O'Connor S et al., 2024, [5]	20 studies	System Overview	AI has the potential to improve patient outcomes and care. More electronic oncology nursing data is needed to develop and deploy AI tools. Oncology nurses need training in machine learning and natural language processing to take a leadership role in AI development.
Martinez-Ortigosa A et al., 2023, [6]	21 articles	System Overview	AI can be a valuable resource for nurses, managers, and supervisors. AI adoption in healthcare is still limited. Nurses need to leverage AI to support decision making and ensure safety and quality of care.
Lee DH, Yoon SN, 2021 , [7]	N/A	Document Overview	AI helps deliver new value to patients and improve operational efficiency. Effective planning and strategy are needed for successful AI implementation. Nurses play a key role in planning and implementing AI to optimize care.
Chew HSJ, Achananuparp P, 2022 , [8]	26 articles	Overview	AI can improve healthcare delivery. Need to overcome concerns about data privacy, information reliability, and technology maturity. Deep understanding of user perceptions and needs is needed to drive AI adoption in healthcare.
Zhang M et al., 2023, [9]	30 studies	Overview	AI can improve patient outcomes and the efficient use of healthcare resources. More research is needed to assess the feasibility and effectiveness of AI-based interventions in pain management. Nurses play a key role in the use and evaluation of AI tools for pain management.
González-Castro A et al., 2024, [10]	22 articles	System Overview	AI can help prevent falls and reduce the consequences of falls. Larger, more detailed studies are needed to develop more robust fall prediction models. Nurses can use AI tools to assess fall risk and implement prevention measures.

Studies have shown that AI can support clinical decision-making, automate administrative tasks, improve care efficiency, and improve patient outcomes. However, the implementation of AI in nursing also faces many challenges, including lack of evidence of effectiveness, ethical and legal issues, risk of data bias, user acceptance, and training needs. Overall, the results suggest that AI can provide many opportunities for nursing, but further research and proactive measures are needed to address the associated challenges.

4. DISCUSSION

4.1. Characteristics of research time:

In terms of research time characteristics, the studies summarized in the table have publication times ranging from 2020 to

2024, which shows a significant acceleration in the exploration of AI applications in nursing care in recent years. Moreover, the focus on recent studies (2023, 2024) shows a clear trend of specialization and delving into specific aspects of AI in nursing, rather than just stopping at initial overviews. In fact, this reflects the rapid development of the field and the urgent need for more in-depth studies to support practical implementation. From the perspective of applied significance, analyzing studies over time allows researchers to identify current “hot spots” in nursing AI research and predict potential future directions. This, in turn, helps shape research programs to address the field’s most pressing needs and avoid duplication of effort. At the same time, healthcare organizations can use this information to ensure that AI strategies and technologies are based on the latest scientific evidence. And this is especially important in a rapidly evolving field like AI, where old information can quickly become outdated. In short, healthcare managers can make more informed investment decisions by prioritizing AI solutions that are backed by recent, high-quality research.

4.2. Research methodological characteristics:

Regarding the research methodological characteristics, the results table shows the diversity in the research methods used, namely overviews, scoping reviews, theoretical discussions and systematic reviews. In fact, this diversity is necessary to explore a complex topic such as AI applications in nursing, because it allows researchers to approach the problem from multiple angles and with different objectives. Notably, systematic reviews play an important role in providing high-quality evidence on the effectiveness and feasibility of specific AI applications. Typically, the studies by Milne-Ives M et al. (2020) and O'Connor S et al. (2024) provide a comprehensive and in-depth look at the existing evidence, which can help practitioners and policymakers make evidence-based decisions [4, 5]. In terms of applied implications, combining different research methods in future studies could provide a more comprehensive understanding of the impact of AI on nursing. For example, qualitative

studies could explore nurses' experiences of using AI tools, while randomized clinical trials could evaluate the effectiveness of specific AI technologies on patient outcomes. On the other hand, managers and nurses can use information about research methods to assess the reliability and validity of different studies. This allows them to make more informed decisions about adopting AI technologies and practices. For illustration, systematic reviews are generally considered to provide stronger evidence than observational studies or expert opinion.

4.3. Key findings of the study:

In terms of research opportunities and challenges, the studies are consistent in highlighting the enormous potential of AI to revolutionize nursing care. Specifically, AI can assist nurses in making more complex clinical decisions, automate time-consuming administrative tasks (such as documentation), improve the efficiency and accuracy of care, and ultimately improve patient outcomes and overall quality of care [1, 3, 5, 7]. More importantly, AI can help free up nurses' time so they can focus more on direct patient interactions and provide more personalized care [1, 4]. However, along with these opportunities, the studies also highlight a number of important challenges that need to be addressed to ensure successful and ethical implementation of AI in nursing. First, many AI applications are still in the development and testing stages, and more robust evidence is needed regarding their effectiveness and feasibility in clinical practice [1, 2, 4]. Second, the use of AI in healthcare raises complex ethical and legal questions, such as accountability, patient privacy, and equitable access [1, 8]. Additionally, AI algorithms may be biased if they are trained on biased data, which could lead to inequities in care [2]. In addition, nurses and patients may be reluctant to adopt new AI technologies, especially if they are concerned about losing human interaction. Finally, nurses need to be trained to effectively use and evaluate AI technologies, as well as to understand the ethical and legal issues involved [1-3, 5, 6, 9]. In terms of application implications, future research should focus on addressing these challenges to promote responsible and effective use of AI in nursing. This

includes conducting rigorous clinical trials to evaluate the effectiveness of AI applications, developing ethical and legal frameworks to guide the use of AI, and exploring strategies to enhance user acceptance. At the same time, healthcare facilities need to take a proactive approach to AI implementation that takes into account both the opportunities and challenges. This includes investing in nursing education and training, developing policies and procedures to address ethical and legal issues, and engaging in ongoing quality assurance activities to monitor the effectiveness and safety of AI applications.

5. CONCLUSION

Artificial Intelligence (AI) offers enormous potential to transform nursing care, promising to improve work efficiency, enhance the quality of care, and support patients. However, to realize this potential responsibly and effectively, significant investment is needed in further research, especially studies that involve nurses, focusing on assessing the real-world clinical impact of AI and addressing ethical, legal, and social challenges. At the same time, healthcare facilities need to proactively develop comprehensive AI implementation strategies, including staff training, policy and process development, and ensuring ongoing monitoring to maximize benefits and minimize risks.

REFERENCES

1.Seibert, K., et al., Application scenarios for artificial intelligence in nursing care: rapid review. Journal of medical Internet research, 2021. 23(11): p. e26522.

2.Von Gerich, H., et al., Artificial Intelligence-based technologies in nursing: A scoping literature review of the evidence. International journal of nursing studies, 2022. 127: p. 104153.

3.Vasquez, B., et al., Technological machines and artificial intelligence in nursing practice. Nursing & health sciences, 2023. 25(3): p. 474-481.

4.Milne-Ives, M., et al., The effectiveness of artificial intelligence conversational agents in health care: systematic review. Journal of medical Internet research, 2020. 22(10): p. e20346.

5.O'Connor, S., et al., The application and use of artificial intelligence in cancer nursing: A systematic review. European Journal of Oncology Nursing, 2024. 68: p. 102510.

6.Martinez-Ortigosa, A., et al., Applications of artificial intelligence in nursing care: a systematic review. Journal of Nursing Management, 2023. 2023(1): p. 3219127.

7.Lee, D. and S.N. Yoon, Application of artificial intelligence-based technologies in the healthcare industry: Opportunities and challenges. International journal of environmental research and public health, 2021. 18(1): p. 271.

8.Chew, H.S.J. and P. Achananuparp, Perceptions and needs of artificial intelligence in health care to increase adoption: scoping review. Journal of medical Internet research, 2022. 24(1): p. e32939.

9.Zhang, M., et al., Using artificial intelligence to improve pain assessment and pain management: a scoping review. Innovation in Aging, 2021. 5(Suppl 1): p. 633.

10.González-Castro, A., et al., The applications of artificial intelligence for assessing fall risk: systematic review. Journal of medical internet research, 2024. 26: p. e54934.