



INTERNATIONAL JOURNAL OF INNOVATIVE RESEARCH IN HEALTH SCIENCE

An International Open Access, Peer-reviewed, Refereed Journal

Advancements in Nursing: A Review

¹C. JEEVA

¹B.Sc. Nursing, Puducherry, India.

Abstract:

The rapid integration of digital health technologies, nursing informatics, and artificial intelligence (AI) has transformed modern nursing practice, education, and healthcare delivery. Nurses are increasingly required to develop digital competencies to provide safe, effective, and patient-centered care in technology-driven environments. Information and communication technologies improve healthcare quality, clinical decision-making, and patient outcomes. Artificial intelligence is influencing several nursing domains, including clinical practice, administration, research, and education, through applications such as predictive analytics, virtual assistants, and intelligent monitoring systems.

The growing use of digital technologies highlights the need for nursing education reform and competency-based training. Educational institutions are incorporating informatics and AI competencies into nursing curricula through innovative teaching strategies such as electronic health record simulations and mobile learning technologies. Nurse leaders also play a key role in supporting digital transformation and technology adoption within healthcare organizations. Continuous professional development is essential to prepare nurses for evolving digital healthcare systems and to ensure quality and evidence-based patient care.

Keywords: Artificial intelligence, digital health, nursing informatics, nursing education.

Introduction:

Nursing has undergone significant transformation driven by the rapid integration of digital health technologies and informatics. Nurses, constituting the largest segment of the healthcare workforce, are central to patient care and increasingly required to possess robust digital competencies [1,2]. Information and communication technologies have been shown to promote patient-centered healthcare and improve quality of care [3], while nursing informatics competencies have become essential for effective participation in digitally enabled environments [4].

Artificial Intelligence in Nursing

Artificial intelligence (AI) is predicted to transform nursing across all domains—administration, clinical practice, education, policy, and research [5]. Emerging AI technologies including predictive analytics, virtual health assistants, and robots are already influencing nursing roles and workflows [5]. Curricular reform is urgently needed to prepare nurses for safe AI integration [6], with calls for embedding AI competencies across undergraduate and graduate nursing education [7].

Leadership and Digital Competencies

Nurse leaders play pivotal roles in technology adoption and digital health transformation [8,9]. However, nurses' digital health leadership potential remains underutilized and not systematically enabled [9]. Development of digital and informatics competencies for nurse managers—encompassing communication, decision-making, leadership, and adaptability—has been identified as essential [10–12].

Nursing Education Reform

Nursing education must evolve to incorporate informatics, digital health, and AI competencies [13,14]. Diverse teaching strategies, including electronic health record simulations, mobile technologies, and interdisciplinary collaboration, have been identified to support competency development [4,15].

BIBLIOGRAPHY:

1. Shankar, R., Devi, F., Ang, E., & Er, J. (2025). Barriers and facilitators to nurses' adoption of artificial intelligence-driven solutions in clinical practice: A protocol for a systematic review of qualitative studies. *BMJ Open*, 15(8), e099875. <https://doi.org/10.1136/bmjopen-2025-099875>
2. Isidori, V., Diamanti, F., Gios, L., et al. (2022). Digital technologies and the role of health care professionals: Scoping review exploring nurses' skills in the digital era and in the light of the COVID-19 pandemic. *JMIR Nursing*, 5(1), e37631. <https://doi.org/10.2196/37631>
3. Rouleau, G., Gagnon, M., & Côté, J. (2015). Impacts of information and communication technologies on nursing care: An overview of systematic reviews (protocol). *Systematic Reviews*, 4(1). <https://doi.org/10.1186/s13643-015-0062-y>
4. Chu, C. H., Siganevich, Y., Donato-Woodger, S., et al. (2025). Teaching informatics competencies within nursing education: A scoping review of teaching strategies. *Applied Clinical Informatics*, 16(4), 911–929. <https://doi.org/10.1055/a-2648-4914>
5. Buchanan, C., Howitt, M. L., Wilson, R., et al. (2020). Predicted influences of artificial intelligence on the domains of nursing: Scoping review. *JMIR Nursing*, 3(1), e23939. <https://doi.org/10.2196/23939>
6. Buchanan, C., Howitt, M. L., Wilson, R., et al. (2021). Predicted influences of artificial intelligence on nursing education: Scoping review. *JMIR Nursing*, 4(1), e23933. <https://doi.org/10.2196/23933>
7. Kleib, M., Arnaert, A., Nagle, L., et al. (2024). Digital health education and training for undergraduate and graduate nursing students: Scoping review. *JMIR Nursing*, 7, e58170. <https://doi.org/10.2196/58170>
8. Kassam, I., Nagle, L., & Strudwick, G. (2017). Informatics competencies for nurse leaders: Protocol for a scoping review. *BMJ Open*, 7(12), e018855. <https://doi.org/10.1136/bmjopen-2017-018855>

9. Janes, G., Chesterton, L., Heaslip, V., et al. (2024). Current nursing and midwifery contribution to leading digital health policy and practice: An integrative review. *Journal of Advanced Nursing*, 81(1), 116–139. <https://doi.org/10.1111/jan.16265>
10. Arias, J. M. V., Peres, A. M., Nunes, M. G. J., et al. (2024). Essential competencies required of nurse managers in times of COVID-19: A scoping review. *International Nursing Review*, 72(3). <https://doi.org/10.1111/inr.13070>
11. Hajizadeh, A., Khodavandi, M., Eslami, Z., et al. (2023). A systematic review of informatics competencies: Requirements for nurse managers in healthcare organisations. *Journal of Research in Nursing*, 28(4), 301–311. <https://doi.org/10.1177/17449871231177165>
12. Lo, B., Nagle, L., White, P., et al. (2021). Digital and informatics competencies: Requirements for nursing leaders in Canada. *Healthcare Management Forum*, 34(6), 320–325. <https://doi.org/10.1177/08404704211015428>
13. Tischendorf, T., Hasseler, M., Schaal, T., et al. (2024). Developing digital competencies of nursing professionals in continuing education and training – A scoping review. *Frontiers in Medicine*, 11. <https://doi.org/10.3389/fmed.2024.1358398>
14. Nazeha, N., Pavagadhi, D., Kyaw, B. M., et al. (2020). A digitally competent health workforce: Scoping review of educational frameworks. *Journal of Medical Internet Research*, 22(11), e22706. <https://doi.org/10.2196/22706>
15. Purabdollah, M., Zamanzadeh, V., Ghahramanian, A., et al. (2023). Competencies expected of undergraduate nursing students: A scoping review. *Nursing Open*, 10(12), 7487–7508. <https://doi.org/10.1002/nop2.2020>

Cite this Article: C. Jeeva (2025). Advancements in Nursing: A Review. *International Journal of Innovative Research in Health Science*, 1(7), 18-20. <https://doi.org/10.63349/ijirhs.202444>