



Editorial

Artificial Intelligence and the Future of Preventive Care in Nursing and Midwifery

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Editorial

Preventive care represents one of the most effective approaches for improving population health, reducing healthcare expenditures, and enhancing quality of life. Nurses and midwives play a fundamental role in preventive healthcare through health promotion, disease prevention, risk assessment, screening, and patient education. As healthcare systems worldwide face increasing challenges, including chronic disease burden, workforce shortages, and growing healthcare demands, innovative solutions are becoming increasingly necessary. Among these innovations, artificial intelligence (AI) has emerged as a transformative technology with the potential to reshape preventive care delivery in nursing and midwifery practice [1,2]. Recent advances in AI have expanded its applications across multiple areas of healthcare. Machine learning algorithms, predictive analytics, and generative AI systems are increasingly being used to support clinical decision-making, identify at-risk populations, improve documentation processes, and facilitate personalized healthcare interventions [2,3]. These capabilities align closely with the core objectives of preventive care, which emphasize early detection, timely intervention, and proactive health management. One of the most promising contributions of AI to preventive healthcare is its ability to predict health risks before the onset of disease. By analyzing large volumes of patient data, AI systems can identify patterns associated with chronic conditions, adverse clinical outcomes, and health deterioration that may not be readily detectable through traditional approaches [2,4]. Such predictive capabilities can enable nurses and midwives to implement targeted preventive interventions, provide tailored education, and improve patient monitoring. In maternal and neonatal health, AI-assisted tools have demonstrated potential for enhancing risk assessment, supporting early detection of complications, and improving clinical outcomes [5].

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Beyond clinical prediction, AI has the potential to strengthen patient engagement and self-management. Digital health platforms integrated with AI technologies can provide personalized health information, behavioral recommendations, medication reminders, and continuous monitoring support. These technologies may improve adherence to preventive strategies and encourage individuals to adopt healthier lifestyles [3,5]. Furthermore, AI-supported telehealth services offer opportunities to expand access to preventive healthcare to underserved and remote populations, thereby contributing to greater health equity and accessibility.

Despite these opportunities, the integration of AI into nursing and midwifery practice raises important ethical, professional, and organizational concerns. Issues related to data privacy, cybersecurity, transparency, accountability, and algorithmic bias remain significant challenges [6]. AI systems are dependent on the quality and representativeness of the data used for their development. Inadequate or biased datasets may result in inaccurate recommendations and potentially exacerbate existing health disparities. A well-documented example of algorithmic bias was reported by Obermeyer et al., who demonstrated that a widely used healthcare risk prediction algorithm systematically underestimated the health needs of Black patients because it relied on healthcare expenditure as a proxy for illness severity. As a result, many patients who would have benefited from preventive interventions were less likely to be identified for additional care. This example highlights the importance of critically evaluating AI systems before their implementation in nursing and midwifery practice to ensure equitable preventive care [7]. Therefore, robust governance frameworks and ethical oversight are essential to ensure responsible implementation of AI technologies within healthcare systems [6].

Another critical challenge relates to workforce preparedness. Emerging evidence indicates that although nurses generally demonstrate positive attitudes toward AI, many report limited knowledge,

skills, and confidence regarding its application in clinical practice [2,8]. Consequently, AI literacy is now widely recognized as a necessary competency for contemporary nursing and midwifery professionals. Educational institutions, healthcare organizations, and professional associations must work collaboratively to develop curricula and training programs that equip healthcare professionals with the knowledge required to critically evaluate and effectively utilize AI technologies [8].

Importantly, the growing adoption of AI should not diminish the humanistic foundations of nursing and midwifery care. Compassion, empathy, ethical judgment, cultural sensitivity, and therapeutic communication remain essential components of professional practice that cannot be replaced by technological systems [3,6]. Rather than viewing AI as a substitute for healthcare professionals, it should be considered a complementary tool that supports clinical expertise and enhances nurses' and midwives' capacity to deliver high-quality preventive care.

As healthcare enters an increasingly digital era, nursing and midwifery professionals have a unique opportunity to shape the responsible adoption of AI in preventive care.

To facilitate this transition, several practical strategies should be prioritized. First, nursing and midwifery schools, together with healthcare organizations, should develop competency-based AI training modules that integrate core concepts such as AI literacy, ethical decision-making, data interpretation, and the safe use of AI-supported clinical tools into undergraduate education and continuing professional development. Second, professional organizations should establish standardized clinical risk-assessment and implementation frameworks to guide nurses and midwives in evaluating the safety, reliability, fairness, and clinical applicability of AI systems before their integration into preventive care pathways. Third, healthcare institutions should promote interdisciplinary AI governance committees involving nurses, midwives, physicians, data scientists, ethicists, and patients to oversee AI

implementation, monitor algorithm performance, and ensure compliance with ethical and regulatory standards.

In addition, researchers and journal editors can accelerate evidence generation by promoting dedicated research initiatives and special journal issues focusing on AI applications in preventive nursing and midwifery care. Future investigations should extend beyond technical performance to evaluate patient-centered outcomes, cost-effectiveness, health equity, workforce preparedness, and implementation challenges in real-world clinical settings. Through competency-based education, standardized implementation frameworks, collaborative governance, and targeted research efforts, artificial intelligence can become a trusted partner in strengthening preventive care, improving health outcomes, and enhancing the sustainability of healthcare systems worldwide.

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