



The Role of Artificial Intelligence in Chronic Illness Care: Navigating Challenges in Clinical Nursing Practice

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Abstract: Artificial intelligence (AI) is reshaping chronic illness care by providing precise, data-driven insights and fostering proactive management strategies that have the potential to enhance patient outcomes. However, integrating artificial intelligence into clinical nursing practice presents distinct challenges requiring thoughtful navigation to fully realize its benefits. AI tools promise to improve patient monitoring and enable personalized care plans while optimizing nursing workflows. Yet, as nurses work on the front lines of implementing AI, they encounter ethical, practical, and technical challenges, including data privacy and security concerns, balancing patient expectations with technological capabilities, and addressing algorithmic biases that could compromise equitable care. Nurses are crucial in ensuring that AI applications remain patient-centered, advocating for tools that genuinely reflect the diverse needs of patients with chronic illnesses. Maintaining clinical judgment amidst AI-driven recommendations requires careful consideration, as automated insights must be weighed against individualized care needs. This dynamic underscores the need to empower nurses through interdisciplinary collaboration with data scientists, continuous professional development, and resources that support them in managing potential workflow demands increased by AI tools. Moreover, fostering an adaptive, learning-oriented nursing culture is essential to embrace AI's evolving role in healthcare. Addressing these challenges can harness AI's full potential to improve patient care and quality of life for individuals managing chronic conditions. Supporting nurses in leading AI adoption will be instrumental in transforming chronic illness care and achieving better long-term outcomes for patients.

Keywords: Artificial intelligence, Chronic illness, Clinical nursing practice, Patient outcomes, Preventive strategies

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Recent issues related to AI in chronic care

Integrating artificial intelligence (AI) into chronic illness care represents a transformative shift in clinical nursing practice.¹ This phenomenon offers unprecedented opportunities to enhance patient outcomes while

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presenting many challenges that must be navigated with care.² Chronic conditions (e.g., cancer, diabetes, heart disease) and associated underlying factors (e.g.,

physical inactivity and smoking) increase the likelihood of illness and death.³ Furthermore, the global cost of chronic disease is anticipated to exceed \$47 trillion by 2030.⁴ As chronic diseases become more prevalent globally, healthcare systems seek innovative solutions to manage these complex conditions.⁵ AI technologies have the potential to revolutionize how nurses assess, treat, and support patients with chronic diseases.⁶ Several studies have shown that AI can effectively help manage chronic conditions. For example, AI-powered chatbots can be useful for self-management of chronic illnesses.⁷ An AI-driven clinical decision support system (CDSS) can assist in diabetes care,⁸ and AI-supported stroke diagnosis has significantly progressed in stroke care.⁹ Computer-aided detection (CAD) can identify suspicious skin tissues in the breast.¹⁰ However, implementing these technologies necessitates a thoughtful examination of the ethical, practical, and interpersonal challenges that nurses face in their day-to-day practice.

In the realm of chronic illness management, AI can serve as a powerful ally, providing nurses with tools that facilitate more accurate assessments and personalized care plans. For instance, AI-powered algorithms have the capability to examine extensive patient data, uncovering patterns that might not be readily visible to human healthcare professionals.¹¹ This capability allows for early intervention strategies that enhance patient quality of life and decrease the frequency of hospital admissions.¹² However, the reliance on technology also raises concerns regarding data privacy, the potential for algorithmic bias, and the risk of diminishing the human touch that is essential in nursing. In nursing, the symbiosis between AI and human qualities is vital, as AI should complement rather than replace the unique skills and empathetic aspects of nursing care.¹³ Therefore, nurses must balance the benefits of AI with the imperative to maintain compassionate care, ensuring that technological advancements enhance rather than replace the critical nurse-patient relationship.¹⁴

Furthermore, the successful integration of AI into chronic illness care requires comprehensive training and support for nursing professionals.¹⁵ As AI tools become more prevalent, nurses must be equipped with the technical skills and critical thinking abilities to interpret AI-generated insights in the context of individual patient needs.¹⁶ This dual focus on technology and human-centered care is essential to overcoming the challenges associated with AI implementation. In addition, encouraging a collaborative culture within healthcare teams will be vital in addressing the complexities of chronic illness management.¹⁷ Embracing AI as a complementary resource can enhance nursing practice, leading to improved outcomes and an efficient healthcare system.

AI, nursing theory and nursing care

Integrating AI into nursing practice can significantly enhance the use of nursing theory in patient care. Clinical nurses can better analyze patient conditions, identify patterns, and tailor interventions based on established nursing theories such as Orem's Self-Care Theory¹⁸ or Peplau's Interpersonal Relations Theory.¹⁹ For instance, a study found that AI assisted in assessing a patient's self-care abilities, allowing nurses to create personalized care plans that promote patient autonomy and engagement in pressure ulcer care.²⁰ In that study, AI could help overcome the geographical barriers between nurses and patients, facilitating better access to care.²⁰ Additionally, AI can facilitate real-time monitoring of patient conditions, enabling nurses to respond promptly to changes and apply theoretical frameworks that emphasize timely interventions. Moreover, AI can support nurses in fostering therapeutic relationships by providing insights into patient preferences and needs, aligning with person-centred care principles.²¹ This integration improves nursing interventions and ensures that care is based on theoretical foundations and holistic patient well-being. As AI evolves, ongoing research on AI will be crucial to help nurses effectively integrate nursing theory and enhance their understanding of the profession.

Another example is integrating AI into the Roy Adaptation Model of nursing care to enhance its assessment and intervention processes. The Roy Adaptation Model emphasizes the importance of understanding how individuals adapt to changes in their health and environment.²² AI can collect and analyze data on patients' physiological, psychological, and social responses, providing nurses with deeper insights into each patient's unique adaptation process.²³ Furthermore, AI can analyze patterns in patient information, such as lab results, vital signs, and outcomes, to identify early signs of maladaptation.²⁴ This data-driven approach allows nurses to tailor their interventions more effectively, ensuring that care strategies are personalized and responsive to each patient's specific needs. Integrating AI tools into the assessment phase can enhance nurses' ability to monitor patients' adaptation over time.

Moreover, AI can support the implementation of interventions by providing decision support and resource recommendations aligned with the Roy Adaptation Model's focus on promoting adaptive responses. For example, AI-powered applications can suggest evidence-based interventions that address specific adaptation challenges patients face, whether related to physical health, emotional well-being, or social support systems. Additionally, AI can assist in educating patients about their conditions and the importance of adaptation, enabling them to engage proactively in their healthcare. Using AI to streamline communication and provide real-time feedback can foster a collaborative environment where patients feel supported in their journey toward adaptation. This integration can improve nursing care quality and supports the holistic principles of the Roy Adaptation Model in clinical nursing practice.

Another relevant theory is Benner's Novice to Expert Theory, which outlines the stages of nursing proficiency.²⁵ This theory highlights the development of clinical skills and decision-making abilities in nurse practitioners as they gain experience, emphasizing

their evolving role in providing high-quality care. For example, novice NPs may use AI tools for diagnostic assistance, while expert NPs may refine predictive models for chronic illness care. Applying this theory can effectively engage in patient care, education, and advocacy, ensuring comprehensive and holistic healthcare delivery. A study documented that nurse practitioners (NPs) can contribute to creating and assessment of different AI-driven decision-making and predictive tools utilized in primary care, inpatient care, and emergency care environments.²⁶ This engagement encompasses nurse practitioners as specialists in diagnosis and treatment, and their adoption and integration might have a substantial impact on their performance, decision-making, and clinical activities.

AI, ethical and bias issues in nursing practice

As AI algorithms increasingly impact clinical decisions, addressing ethical and bias issues is essential to ensure fair care for all patients. This responsibility falls significantly on nurses, who are pivotal in managing patient expectations and fostering trust in AI technologies. With effective communication of the benefits and limitations of AI, nurses can help patients understand how these tools can enhance their care while alleviating concerns about potential biases or inaccuracies. Their frontline position allows them to advocate for patients, ensuring that AI applications are developed with a focus on diverse populations and equitable treatment outcomes. Furthermore, by actively engaging in discussions regarding the ethical issues of AI in healthcare, nurses can contribute valuable insights that promote the responsible use of technology. Their involvement is crucial for effective collaboration in managing chronic illnesses as it connects advanced technology with compassionate patient care.

The successful integration of AI into nursing workflows requires thoughtful strategies to prevent additional burdens on staff while promoting interdisciplinary collaboration with AI developers and data scientists. To navigate this complex landscape, nurses must

maintain their clinical judgment and prioritize patient-centered care, all while engaging in continuous learning to adapt to new AI tools. There are ten basic principles for using AI in delivering nursing care in both clinical and community settings. Each of these points highlights the intricate balance nurses must strike in leveraging AI to improve care while upholding the fundamental values of nursing practice: 1) Enhanced patient monitoring and predictive insights; 2) Personalized care plans and treatment recommendations; 3) Data management and privacy concerns; 4) Addressing ethical and bias issues in AI algorithms; 5) Managing patient expectations and building trust; 6) Integrating AI into workflows without increasing burden; 7) Interdisciplinary collaboration with AI developers and data scientists; 8) Maintaining clinical judgment and patient-centered care; 9) Continuous learning and adaptation to AI tools; and 10) Evaluating AI's impact on outcomes.

Future insights into nursing publications

This editorial highlights the transformative potential of AI in chronic illness care. However, studies also underscore significant challenges, including ethical concerns and the need for adequate training for nursing professionals to integrate AI tools into their practice effectively. Future research should focus on developing standardized guidelines for AI implementation in nursing, addressing disparities in AI training, and evaluating the long-term impact of AI on outcomes. Additionally, policymakers must consider frameworks that ensure ethical AI use while promoting interdisciplinary collaboration among healthcare providers, AI developers, and patients to foster a more equitable and effective healthcare system. Academic publications should increasingly emphasize how AI can enhance the human touch in nursing care, recognizing that technology and empathy can solve clinical conditions. Exploring the integration of AI tools can assist nurses in tasks such as allowing for deeper emotional connections and more personalized care, which are essential in addressing the holistic needs of individuals with chronic illnesses. Furthermore, studies can investigate how AI can support nurses in understanding patient preferences

and values, fostering a more patient-centered approach. Focusing on this synergy can encourage new practices that use AI to enhance the compassionate side of nursing, ensuring that care is efficient and empathetic. Another important aspect is that current studies exploring AI integration into nursing theory remain limited in the literature. Further research is recommended to combine nursing theory with AI to optimize patient outcomes and promote a holistic approach to care (e.g., physical, emotional, and social needs).

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บทบาทของปัญญาประดิษฐ์ในการดูแลผู้ป่วยเรื้อรัง : การรับมือกับความท้าทายในการปฏิบัติพยาบาลทางคลินิก

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บทคัดย่อ: ปัญญาประดิษฐ์ (AI) กำลังปรับเปลี่ยนรูปแบบการดูแลผู้ป่วยเรื้อรังที่ให้ข้อมูลเชิงลึกที่แม่นยำและขับเคลื่อนด้วยข้อมูลและส่งเสริมกลยุทธ์การจัดการเชิงรุกที่มีศักยภาพในการปรับปรุงผลลัพธ์ของผู้ป่วย อย่างไรก็ตาม การบูรณาการปัญญาประดิษฐ์เข้ากับการปฏิบัติการพยาบาลทางคลินิกนั้นเป็นความท้าทายที่ต้องดำเนินการอย่างรอบคอบเพื่อให้ได้รับประโยชน์อย่างเต็มที่ เครื่องมือปัญญาประดิษฐ์มักให้ความมั่นใจในการปรับปรุงการติดตามอาการของผู้ป่วยและทำให้สามารถใช้แผนการดูแลส่วนบุคคลได้พร้อมกับเพิ่มประสิทธิภาพระบบการจัดการในการพยาบาล อย่างไรก็ตาม ในขณะที่พยาบาลซึ่งทำงานอยู่แนวหน้าของการนำปัญญาประดิษฐ์มาใช้ ต้องเผชิญกับความท้าทายทางจริยธรรม เชิงปฏิบัติ และทางเทคนิค รวมถึงประเด็นความเป็นส่วนตัวและการรักษาความปลอดภัยของข้อมูล การสร้างความสมดุลระหว่างความคาดหวังของผู้ป่วยกับความสามารถทางเทคโนโลยี และการจัดการกับอคติของปัญญาประดิษฐ์ที่ทำงานตามขั้นตอนจากข้อมูลที่มนุษย์เป็นผู้ป้อนให้ ซึ่งอาจกระทบต่อการดูแลอย่างเท่าเทียมกัน พยาบาลมีความสำคัญอย่างยิ่งในการทำให้แน่ใจว่าแอปพลิเคชัน AI ยังคงเน้นการดูแลที่ยึดผู้ป่วยเป็นศูนย์กลาง โดยสนับสนุนเครื่องมือที่สะท้อนความต้องการที่หลากหลายของผู้ป่วยที่เป็นโรคเรื้อรังอย่างแท้จริง การตัดสินใจทางคลินิกท่ามกลางคำแนะนำที่ขับเคลื่อนด้วยปัญญาประดิษฐ์ต้องได้รับการพิจารณาอย่างรอบคอบ เนื่องจากต้องชั่งน้ำหนักระหว่างข้อมูลเชิงลึกอัตโนมัติกับความต้องการการดูแลส่วนบุคคล การเปลี่ยนแปลงอย่างพลวัตนี้เน้นถึงความจำเป็นในการเพิ่มศักยภาพให้กับพยาบาลผ่านความร่วมมือแบบสหวิทยาการกับนักวิทยาศาสตร์ด้านข้อมูล การพัฒนาอย่างต่อเนื่องในระดับมืออาชีพ และทรัพยากรต่างๆ ที่สนับสนุนการจัดการระบบข้อมูลที่เพิ่มขึ้นจากเครื่องมือปัญญาประดิษฐ์ นอกจากนี้ การส่งเสริมวัฒนธรรมการพยาบาลที่พร้อมปรับตัวและเน้นการเรียนรู้ถือเป็นสิ่งสำคัญในการรองรับบทบาทที่เปลี่ยนแปลงไปของปัญญาประดิษฐ์ในระบบดูแลสุขภาพ การแก้ไขปัญหาล่าช้าสามารถใช้ประโยชน์จากศักยภาพทั้งหมดของปัญญาประดิษฐ์เพื่อปรับปรุงการดูแลผู้ป่วยและคุณภาพชีวิตของบุคคลที่ต้องจัดการกับภาวะเรื้อรัง การสนับสนุนพยาบาลในการเป็นผู้นำการนำปัญญาประดิษฐ์มาใช้จะมีบทบาทสำคัญในการเปลี่ยนแปลงการดูแลผู้ป่วยเรื้อรังและบรรลุผลลัพธ์ระยะยาวที่ดีขึ้นสำหรับผู้ป่วย

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