

SPOTLIGHT ON NURSING

Artificial Intelligence in Nursing Education: Opportunities and Challenges

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The Spotlight on Nursing is a recurring column from the University of Hawai'i at Mānoa Nancy Atmospera-Walch School of Nursing (NAWSON). It is edited by Holly B. Fontenot PhD, APRN, WHNP-BC, FAAN; Associate Dean for Research, Frances A. Matsuda Chair in Women's Health, and Professor for NAWSON, and HJH&SW Contributing Editor; and Joanne R. Loos PhD, Science Writer for NAWSON.

Acronyms

AI = Artificial Intelligence
AACN = American Academy of Colleges of Nursing
ANA = American Nurses' Association
EHR = Electronic health records
ICMJE = International Committee of Medical Journal Editors
NAIL = Nursing and Artificial Intelligence Leadership

The rapid growth of Artificial Intelligence (AI) has generated excitement and concern in both health care and higher education. The potential benefits of AI in the health care arena promise to revolutionize the approach to some of the most vexing care and systems problems. These include improved diagnosis and treatment; enhanced health research and drug development; and additional aid with the public health interventions, such as disease surveillance, outbreak response, and health systems management.¹ Health education is also poised for major shifts in the way health professionals are trained for a future in which AI is ubiquitous. Health professional educators enthusiastic about AI innovations anticipate an era of “precision education,” analogous to “precision medicine,” where data can be leveraged to provide students with individualized training and assessment.² However, others are concerned about the rapid pace of AI innovation and the lack of knowledge related to the potential risks and unintended consequences associated with these nascent technologies.

AI is the theory and development of computer systems that perform specific tasks that in the past only a human could do, such as visual perception, speech recognition, decision-making, and language translation.³ Generative AI is a form of AI that can create text or media from prompts written by a human. OpenAI's ChatGPT (OpenAI, L.L.C., San Francisco, CA) and Google's Bard (Google Inc., Mountain View, CA) are examples of generative AI that use natural language processing, or the ability to interpret, manipulate, and take in human language to process and respond to user prompts.⁴ Generative AI with

natural language processing capabilities allows users to analyze and create content with a few keystrokes, making them popular in classrooms and workplaces.

Transforming Nursing Care

AI has the potential to transform the way that nurses provide individualized evidence-based care that aligns with patients' needs and priorities. For example, AI is rapidly demonstrating its versatility in secondary and tertiary prevention, including an increase in accurate screening, reducing medical errors, and improving health service providers' productivity and efficiency.⁵ Benefits may also occur in primary care nursing with AI-augmented primary care settings, where new tools may fuel enhanced individualized patient care and population health tools, such as personalized patient digital health coaching, real-time identification of health and illness trends using data from wearable devices, and improved population health management through patient-centered information systems that more effectively promote healthy behaviors.^{5,6} While AI will influence nursing practice, the inverse is also true: nurses will directly inform future AI tools.⁶ Nurses generate voluminous data in health systems via the documentation they produce during routine practice, and this data will then be used to inform AI-driven health care system innovations.

Guidance for Nursing Professionals and Educators

Sources for practical guidance for the use of AI in nursing education are sparse but becoming more widely available. The American Nurses Association (ANA)⁷ recently published a position paper on the ethical use of AI in nursing practice that emphasizes the need for ensuring transparency, eliminating bias, preventing health disparities, and protecting patient privacy and confidentiality. Most importantly, nurses must ensure AI does not compromise the caring, compassion, and human relationships that are central to nursing. The Nursing

and Artificial Intelligence Leadership (NAIL) Collaborative is another group that has developed strategies for nurses to take leadership roles in shaping the use of AI in health systems and nursing practice. Priorities outlined by NAIL include improving nurses' understanding of the relationship between the data they generate and the AI technologies they use.⁶

Navigating the sea change related to AI in nursing education requires educators to share strategies that keep the well-being of students, patients, and populations at the heart of nursing care. Some examples of foreseeable opportunities and challenges related to AI and nursing education are discussed in the following section.

Opportunities to Enhance Nursing Education

Simulation and Virtual Learning

Simulation is integral to nursing education and practice. It is commonly used as an instructional method to enhance technical patient care skills, decision-making, and interpersonal and communication skills, and is frequently relied upon to explore difficult subjects such as end-of-life issues, critical illness, and cultural sensitivity.⁸ AI has the potential to supercharge simulation by offering scenarios that are realistic and tailored to students' individual learning needs. Some examples of AI-enriched simulation include the use of AI-enhanced robots that can interact with nursing students in a way that is more realistic than current high-fidelity mannequins.⁹ AI is also being integrated into virtual reality and augmented reality to develop immersive virtual simulation experiences.¹⁰ One potential application of this technology would be to simulate settings that are difficult to access in the real-world. For instance, simulation scenarios might include medical emergencies where nursing students could practice skills that might otherwise be hard to reproduce in traditional education settings.

Another application could be virtual exploration of various social determinants of health to illuminate challenges that individuals and populations may encounter (eg, access to health care, nutritious food, and safe housing). AI may also bring to life diverse voices, cultures, and histories to amplify learning related to cultural influences on health. This presents an exciting opportunity for nurse educators in Hawai'i. Nurse educators can work with community and cultural leaders to develop AI-enriched videos where students can immerse themselves in different locales to gain unique regional and cultural perspectives in the state. Students could also visit historical points in time or meet important historical figures. Imagine a community health nursing simulation where students visit Kalaupapa to conduct a key informant interview with Father Damien to gain insight on how to care for Hansen's Disease patients in a low-resource environment. Such experiences can be powerful influences on the way nursing students provide holistic care to people in Hawai'i.

Enhanced Clinical Judgment Tools

Nurse educators see promise in AI as a tool to enhance the development of students' clinical judgement. This application of AI is already in use in clinical practice, allowing nurses to provide more timely and appropriate interventions informed by AI-generated predictions and clinical care suggestions. For example, new AI-enhanced clinical decision support tools rapidly generate nursing diagnoses, calculate patient fall risk predictions, and develop decision trees to prevent catheter-associated urinary tract infections.¹¹ While nurses can carry out these functions without AI, new AI clinical tools have the advantage of being able to rapidly analyze large volumes of data and automate the adjustment of risk-calculations to provide more accurate predictions. Faculty trained to use these new AI-based patient care support tools will be able to guide students on the effective and efficient use of these technologies.

Personalized Learning

AI has the potential to transform education as an individualized tutor for students. AI tutors, such as the Khanmigo model developed by the Khan Academy,¹² are currently available though still experimental. Providing individualized tutoring for students can significantly augment nursing educators' capacity to adapt lessons to students specific learning needs. For example, AI tutors could walk students through a simulated patient interviews or provide instantaneous feedback on assignments such as drafting succinct clinical documentation or calculating medication dosages.¹³

Challenges for Nursing Education

Overreliance on Technology

With the wide availability of chat-based AI tools, nurse educators are increasingly worried that nursing students will rely too heavily on AI tools, neglecting critical thinking, relationship building, and communication skills. Plagiarism is also a major area of concern. While AI tools like ChatGPT can enhance learning and engagement, their ability to rapidly generate text may facilitate student plagiarism, undermining academic integrity. One preliminary strategy being adopted at universities is to outline acceptable use of AI in the course syllabus, with various approaches being discussed ranging from prohibitive to permissive.¹⁴ Nurse educators will need to adopt strategies for incorporating AI into the learning environment in ways that promote ethics and original thinking, while exploring and highlighting its limitations.

AI Algorithm Bias

Bias in AI models are a major concern, especially for programs preparing nurses to work in areas with large minority and Indig-

enous populations. AI uses algorithms to assess data and make inferences. Current AI systems may perpetuate biases inherited from training data that may compound existing inequities based on race/ethnic background, socioeconomic status, gender or sexual orientation, thereby entrenching disparities in health care systems and possibly even exacerbating them.¹⁵ For example, algorithms trained using data aggregated from White patients may not have the same accuracy as when applied to other races, and may prioritize White patients with less severe illnesses over sicker patients of other racial groups.⁶ Health care systems may not have the adequate data infrastructure needed to collect the data to optimally train algorithms to fit their local population and/or the practice patterns, and may not be able to identify bias to assure that AI algorithms perform consistently across patient cohorts.¹⁵ AI models trained on Indigenous populations' health data exist,^{16–18} but they are sparse.¹⁹ This is of great concern for nurse educators, and will require greater understanding of how to identify algorithmic bias in health care and use their clinical expertise to serve as advocates when providing health services to Hawai'i's extremely diverse student and patient populations.

Privacy and Security

Generative AI poses several privacy concerns for nursing educators and students. Personal identifiable information, such as names, addresses, and contact information, as well as health information, may be collected during interactions with AI tools. This may result in unintended exposure or misuse of sensitive information.²⁰ Privacy advocates, educators, and administrators have yet to create or finalize policies that put human interests before that of machines. The White House Office of Science and Technology Policy has issued an *AI Bill of Rights* handbook.²¹ In its report, *AI and the Future of Teaching and Learning*, the US Department of Education advocates for educators to have a voice in AI development for educational use.²² Educators who are early adopters wishing to utilize AI in the classroom should adhere to current institutional-level recommendations. Current AI platforms may not be fully compliant with the Family Educational Rights Act (FERPA), a policy that was created to protect students' privacy and data, especially when used by third parties to provide educational services.

Nursing Scholarship and AI Co-authorship

Nursing faculty have used AI tools to contribute content to publications by interpreting data and generating written responses based on prompts. ChatGPT is listed as a co-author of a *Nurse Education in Practice* editorial, which features 5 paragraphs written by ChatGPT.²³ This provocative article showcased how generative AI can be used to write scientific articles. While some argue that ChatGPT cannot be considered a co-author because it does not currently meet the International Committee of Medical Journal Editors' (ICMJE) authorship criteria,²⁴ authorship criteria may change in the future, allowing AI tools to meet ICMJE's standards.²⁵ Authors will need to carefully reflect on the implications of acknowledging AI tools as co-authors of publications and continually monitor changes in authorship guidelines.

Preparing Students for AI-enhanced Healthcare Workplaces

AI can be integrated in nursing programs to prepare students for the AI-related skills needed in the workplace. This may take varied forms such as teaching students how to engineer generative AI prompts for research, conducting literature reviews, or practicing how to use AI clinical tools. With the increasing prevalence of AI use in the classroom and workplace, it will be important to maintain communication between academic institutions and potential employers so that students are equipped to meet workplace needs. Research efforts to examine AI in education is occurring on a global scale with a principal objective to prepare students for the future workforce.²⁶ Greater understanding of students' use of generative AI for coursework is needed to appropriately guide them toward best practices. Such information will help inform academic policies related to AI use.

While AI offers tremendous opportunities to transform nursing education, there are still serious challenges that will need to be considered and addressed. To best position nursing practice for the changes that AI will bring to the health system and patient care, nurse educators must proactively examine ways AI will influence nursing education in a responsible manner. Nurse educators will play a crucial role in assuring that AI will serve as a tool to prepare compassionate, competent, and technologically adept nurses now and in the future.

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