The Revolution of Artificial Intelligence in Nursing Education and Practice

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Abstract: *Artificial Intelligence (AI) is the science and engineering of making intelligent machines, especially intelligent computer programs. AI in healthcare isn't new; In fact, it's currently used in many ways that are relevant to nurses both in nursing practice as well as nursing education. It comprises many healthcare technologies transforming nurses' roles and enhanced patient care. It eases the burden on nurses, reducing the nurses' workload. Ethical principles are important in AI because the technology not only may impact an individual patient's end result but also may affect its uses in health care throughout the development design and testing processes and its integration and ongoing use. Nursing AI tools include clinical decision support, mobile health and sensor-based technologies including voice assistants and robotics. Nurses should be involved in the conceptualization, development, and implementation of AI, especially when it impacts nursing practice.*

Keywords: Artificial Intelligence, nursing, healthcare, practice, education

1. Introduction

What is Artificial Intelligence?

When we think of Artificial Intelligence or AI, may be many things comes to our mind like – "AI means robots!!" or "Is AI technology new??" or "AI tools help_and_hurt patient care" or "Can AI replace nurses??" and so on. AI is already a part of our everyday lives and we have been using it in some way or other to make our work easier. Smart home devices, mobile map application, voice assistants like Siri, Alexa, Google assistant, online banking, behavioural changing apps, and countless other things requires the use of AI in some way or other. And the world of healthcare is no different. Artificial intelligence in nursing is just a precipice of making its full impact.

Artificial Intelligence, or AI, is the development of computer system that are capable of performing tasks that normally require human intelligence such as decision making, object detection, solving complex problems and so on.
AI can be broken up into two main subfields: Machine Learning (ML) and Deep Learning.

Machine Learning is focused on improving performance of a technology by taking in new data.

Deep Learning uses artificial neural networks - algorithms that are trained (by a human) - to mimic the way a human brain learns from large amount of data in order to perform tasks. For example: Auto - generated captions on YouTube and facial recognition to unlock phone or grouping photos in digital photo galleries.

History of AI

John McCarthy, also known as the Father of AI, coined the term Artificial Intelligence in the year 1956.

Although AI technologies have existed in some form for years, its often underutilized in nursing education as well as practice. To help nursing education keep pace with the AI expansion its necessary that nurses keep themselves advanced with the new technology. Also, the nursing education should be delivered using the various available AI technologies. AI comprises many healthcare technologies transforming nurses' roles and enhancing patient care.

Need of AI

- To save time, energy and money.
- To provide specialized care for rural population.
- For uniform accessibility of healthcare across the country.
- To decrease the chances of clinical mistakes and diminish the costs related to tedious errands.
- To enhance patient care and monitoring.
- It helps in streamlining administrative tasks.

Ethical Principles

Ethical concerns about AI exist because the nurses integrating AI into practice have a responsibility to ensure the validity of the AI, the appropriate application and use of AI, transparency in the process, and ongoing evaluation for reliability. Justice, Fairness and equity are interrelated concepts in the AI literature (AMA, 2018). AI has the potential to improve health for many but without proper oversight can also perpetuate and cause injustices and inequities.

Role of AI in Nursing Practice

- *Predicting Health Trajectories*: Machine learning tools can help predict the likelihood that a patient's condition will deteriorate. Various applications include prediction of acute kidney injury, Targeted real - time early warning score (TREWScore) for Septic Shock etc.
- *Decision making*: AI enabled tools can also recommend treatment to health care providers based on the patient condition. By using all the data that can be found within the Electronic Health Record (EHR) system AI potentially helps the nurses and doctors make decisions that are more effective and patient - specific. For example: Deciding when to wean patients receiving ventilator treatment is an essential aspect of care. AI could predict when to successfully wean patients from ventilators.
- *Assistive Robots in Surgical care:* Various machine learning tools are available that enables the intra and post operative care. Currently Robot assisted surgeries are

much in use and are active areas of research. Recently the first ever Robotic surgery was performed in Swagat Super speciality Hospital in Guwahati Assam; it is the first and only hospital in entire north eastern region to adopt robotic surgery.

- *Monitoring Patients*: AI enabled tools like Electronic Health Records (EHR), wearables and other sensors help monitor patients in health care facilities. Health care facilities uses AI enabled monitoring tools to prevent patient falls.
- *Improving Medication Adherence:* To address compliance concerns, creative solutions utilizing Artificial Intelligence and Machine Learning are being used. Some of the solutions that have shown results include Chatbots, Smart pills, Gamification Fellow Smart Pillbox etc. Recently FDA approves pill with an ingestible sensor (Abilify MyCite) that digitally tracks if patient have ingested their medication.
- *Recording Digital Clinical Notes*: In various clinical areas providers began using speech recognition and natural language processing technologies for recording digital notes into EHR system.
- *Automating Laborious Tasks*: AI can automate some tasks that are simple but labor - intensive, allowing providers more time to spend with patients. Hospitals are already employing robots for delivering supplies, other non - nursing activities thus reducing wastage of time and energy for nurses.
- *Public Health*: Infectious disease outbreaks and sources of epidemics are major global health concerns and national security threats. AI could potentially aid in their detection, isolation and help achieve disease eradication goals. Mobile apps like Aarogya Setu and sensor-based technologies like smart watches which monitors activity, sleep, heart rate and rhythm
- *Tele nursing or Mobile health*: Mobile health provide opportunities to reshape a nurse's ability to deliver care and monitor patients, particularly with limited resources and staffing. For example: Tele MANAS, is a comprehensive mental health care service provided free of cost.
- *End - of - life care*: AI - enabled robots communicate with the elderly to help them feel less lonely and isolated. They have the ability to communicate, retrieve, assist and provide emotional support.

Role of AI in Nursing Education:
Enhanced Simulation: Simulations allow students to practice real world scenarios in a real - world environment. With advancement in AI, the line between reality and simulation is increasingly blurred - which is good for nursing education. Hence educators can observe students critical thinking as they practice communication and bedside manner with patients (high - fidelity simulators) through decisions that have consequences.
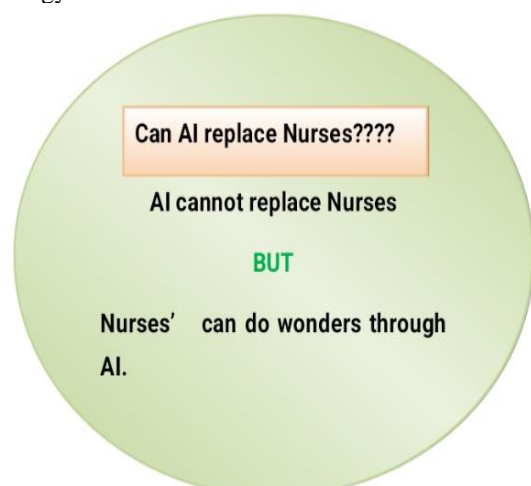
- *Curriculum change:* To bridge the overall gap between AI understanding and nursing, the INC has introduced the subject "Nursing Informatics" in the revised BSc Nursing syllabus. It will help the nurses to understand the principles behind AI health technologies that the students will likely encounter in clinical setting.
- *Assessment*: Facial recognition software or Face Tracker Software is widely known and utilized in a number of

professional fields. Study evidences shows that it has power to transform nursing education too. Researcher used facial recognition software to assess nursing students emotion throughout the simulation sessions, hence making the learning more effective.

- *Environment Safety*: Myo Armband to measure students' handwashing technique. This uses machine learning to improve the quality of the handwashing process thus ensuring proper skill learning and thus reducing infection.
- *Research*: A sector of the healthcare system which is currently slowly transitioning to AI is the research community in health sciences. The benefit of AI is that it can be used to analyze large pools of complex information within datasets faster. It can also be used to search scientific journal databases for relevant studies pertaining to the research topic of interest in order to combine data and aid discovery.
- *AI Smart home technology*: Research studies suggest that smart homes are expected to influence graduate nursing curricula. It is predicted that students need to understand how AI Smart home technology uses sensor data to assist older adults by monitoring their movement at home.
- *Virtual Avatar Apps*: Various virtual avatar apps, including virtual patient gaming apps and virtual tutor chatbots (eg, VCAAI i. e; Virtual Counselling Application using Artificial Intelligence) may influence the delivery of nursing education in academic settings as educators use them as teaching tools to stimulate interactive clinical scenarios and increase students' comprehension of specific nursing concepts.
- *OpenAI*: ChatGPT is an openAI (2023) trained model chatbot capable of responding to prompts in various texts formats. It can help the educators and students as well in many ways in academic fields and education like content generation, tutoring, making powerpoint presentation, assessment, online learning etc.

2. Conclusion

AI technology is used around the world by healthcare professional including doctors, nurses and others for various purposes ranging from the detection of diseases and management of chronic conditions to the delivery of healthcare services including telenursing and drug discovery. Nurses can use AI to enrich the nursing practice by aiding nurses in making sound clinical judgements, comprehend new technology.

Declaration by the Author

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