The Bandwagon of Artificial Intelligence in the Nursing Profession

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Abstract:

Today's High tech and methodological advancements in healthcare are made possible by a broad category of concepts known as artificial intelligence (AI). Global adoption of AI health technologies is increasing. Nurses must adapt, adopt, and accommodate new emerging trends, as well as apply artificial intelligence applications to holistic nursing care without jeopardizing patient safety or privacy. Deep learning, machine learning, and neural networking should all be combined into Nursing Intelligence. Nursing leaders in various domains such as administration, clinical care, education, policy, and research should be available to achieve this apex so that the Nursing profession is empowered.

Keywords: Artificial intelligence, Nursing profession, AI Health technology, Bandwagon, Deep learning, Machine learning, Neural language processing, Clinical decision support system.

INTRODUCTION:

Artificial intelligence is an overture for persuading a computer, a robot that is controlled by a computer, or a piece of software to ponder critically, much like an intelligent individual might. In order, to generate intelligent software and systems, it is essential to know how the human brain works and how people learn to influence judgments and work to resolve problems.[1]

Artificial intelligence's epitome goal is to develop expert systems or machines that can learn, demonstrate, explain, and provide people with advice,and create systems that comprehend, think, learn, and behave like people to implement human intelligence in machines.[3]

The term "artificial intelligence" (AI) is frequently used in the context of healthcare to describe computer software tools that analyze data (such as patient records, administrative claims, medical imaging, and data from mobile devices), learn from that data, and then inform clinical and operational decision-making.[4] AI health technologies (AIHTs) are becoming considerably more common in clinical settings around the world; AIHTs are expected to, directly and indirectly, transform the nursing profession in a variety of ways due to their ability to improve workflows and guide clinical decision-making.[4]Nurses are the most myriad health professionals, with kinds of settings spanning the five domains of nursing activity identified by the Registered Nurses Association of Ontario (RNAO; i.e, administration, education, clinical practice, policy, and research).[13]AIHT trends are expected to change the nature of the nurse-patient relationship; As a result, strong nursing leadership is required to drive this change and ensure the delivery of high-quality, person-centered compassionate nursing care in the future.[5]The impact of AIHTs on nursing roles, workflows, processes, and patient care has recently been examined in studies and expository papers; However, no scoping reviews are available that map the breadth and depth of evidence concerning the current or anticipated influences of AIHTs on the nursing profession.[4] Furthermore, little research has been conducted on nurses' roles in influencing AIHT implementation and co-designing these technologies to protect patients' safety and privacy. Nurses will not fully appreciate the implications of AI for nursing practice, policy, administration, and research unless they understand the existing evidence on the topic.[4] It is critical for nurses to gain a more comprehensive understanding of these emerging technologies to shape them.[4] The industry's future and decision-making regarding nursing care aspects that AIHTs can effectively handle Nurses provide the highest quality of care by utilizing core practices such as assessment, planning, and outcome evaluation. Few nurses, however, are familiar with AI applications such as machine learning, deep learning, and natural language processing (NLP), as well as their implications for nursing research and practice and their potential role in improving patient care and health outcomes.[4]

ARTIFICIAL INTELLIGENCE APPEAL

MACHINE LEARNING:

The potential of machine learning is at the root of much of the excitement surrounding AI in healthcare. Simply put, machine learning is the use of a computer program to autonomously learn from data to perform a specific task. The term "learning" refers to software self-adjustment that fine-tunes an algorithm over time to improve accuracy. The goal of the machine learning tool and the data it has access to are determined by its developer, but how the program uses the data is unknown. This inherent uncertainty is referred to as the "black box."[19-30]

A machine learning tool's operation and use, like any data-dependent tool, are only as good as its data sources. This is where nurses come in handy; Nurses with hands-on experience understand patient care and the information required to make sound clinical decisions. Nurse input increases the applicability and accuracy of machine learning tools.[19-30]

For instance, Wang and colleagues developed a technique to predict the severity of falls to protect high-risk patients. Utilizing information on age, sex, race, bone density, procedure data, and diagnoses, this tool developed a risk score for the likelihood of experiencing a fall with a severe injury.[23] The model was trained using retrospective data, and when it had learned it was able to make accurate predictions. For later phases of the study, nurses are expected to evaluate the tool's practical value. As shown by this machine learning example, risk prediction ratings could not be generated using human calculations or flowsheets coupled with the electronic health record (EHR). [19-30]The ability of nurses to read and translate signals into precise patient monitoring has advanced thanks to the usage of AI and EHR data. Hu's Super Alarm application, for instance, uses patterns of co-occurrence of individual alarms to forecast impending cardiac arrests (such as arrhythmia alerts and hemodynamic monitoring). Hu showed 90% sensitivity in determining when critical care patients would need to be revived. This machine learning technology is pertinent to nursing since it minimizes alert fatigue by consolidating alarm signals into less frequent but important useful information in addition to enhancing patient outcomes.[19-30]

DEEP LEARNING:

Nursing is advanced by deep learning, a branch of machine learning that uses neural networks for sophisticated pattern identification. This allows machine learning to be used for new forms of data, such as speech recognition and picture analysis. By combining information from many sources, AI can precisely personalize medicines to patients' unique genetic make-up, dietary habits, and treatment preferences.[19-30]

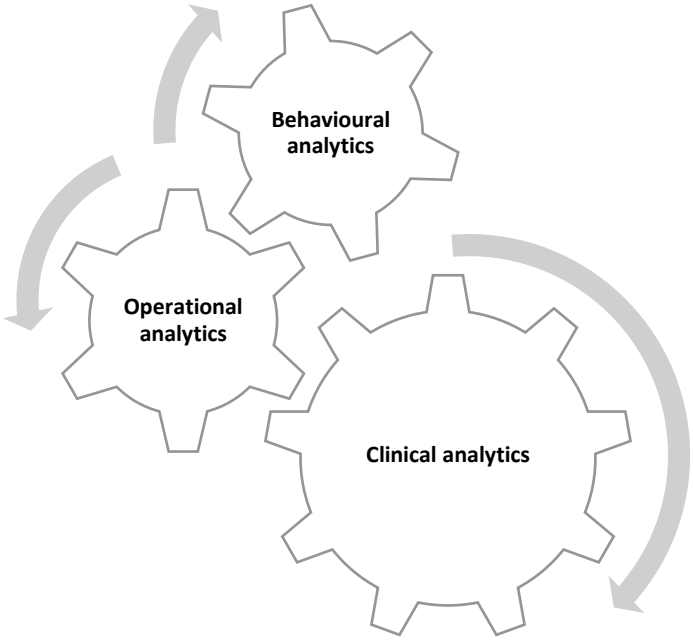
Deep learning applications can help nurses identify at-risk patients who would benefit from clinical interventions to avoid negative health outcomes such as sepsis or hospital readmission. For example, Duke University researchers Theiling and colleagues created Sepsis Watch, which uses deep learning to analyze over 32 million data points to determine a patient's risk of developing sepsis. If the findings require immediate action, the hospital's rapid response team is notified and guided through the first three hours of care administration.[19-30]

Although nurses are not the primary users of imaging technology, its impact on patient care is significant. Advances in deep learning imaging include detection (for example, early or automated detection of neurologic abnormalities or cancer), characterization (staging or diagnosis), and monitoring (tumor changes over time). Many of these tools are as accurate (or even more so) as humans, and they have the potential for further development and widespread adoption.[9,19-30]

NLP:

NLP is the study of text data in EHRs rather than numbers or other countable elements. It can be used alone or in conjunction with machine learning methods, and it may contribute to other areas of artificial intelligence. Sentiment analysis, for example, could be used to determine how positive or negative a clinician or patient feels about a prognosis. [19-30]Because of the lack of formal data intake and reporting, NLP is frequently cited as the most difficult AI application to adopt. Several promising applications that are currently in use, on the other hand, have an impact on patient care and health outcomes. Nursing notes, which are frequently dense with patient information, are a valuable source of text data in nursing.[19-30] Nursing notes have been used to create a variety of applications,nurse notes have been used to predict emergency department patient disposition (Sterling and colleagues), uncover patient financial barriers (Skaljic and colleagues), and predict falls (Nakatani and colleagues).[19-30]

NLP can refer to voice recognition, as in Siri or Alexa, as well as research applications and subsequent decision support. In healthcare, voice recognition could help with note-taking, information retrieval, and chart navigation. Although speech recognition programs convert the language to text, advances in natural language processing (NLP) may provide more sophisticated options.[12,19-30]



AI AND ANALYTICS

CLINICAL ANALYTICS: provide insights and help to improve treatment and outcomes Among the many examples of AI for clinical analytics are clinical pathway prediction, disease progression prediction, health risk protection, predictive risk scoring, and virtual assistants embedded in clinical systems for workflow improvements. AI may also be used in disease management, assisting with a differential diagnosis on medical images and combining patient data with academic evidence and regulatory guidelines to tailor treatment plans.. [6]

OPERATIONAL ANALYTICS:increases the efficiency and effectiveness of care delivery and management systems AI in healthcare includes the ability to predict operational issues, track safety metrics, maintain equipment, monitor the supply chain, and detect fraud. Documentation coding to process claims and new platform interfaces to automatically change claims for reimbursement in revenue cycle management are examples of operational improvements.[6]

BEHAVIORAL ANALYTICS: examines customer behavior patterns to enhance healthcare delivery. Technology also enhances the likelihood of taking efforts to boost the adoption of advised practices. It employs AI to enhance patient engagement, wellbeing, and readmissions health.. [6]

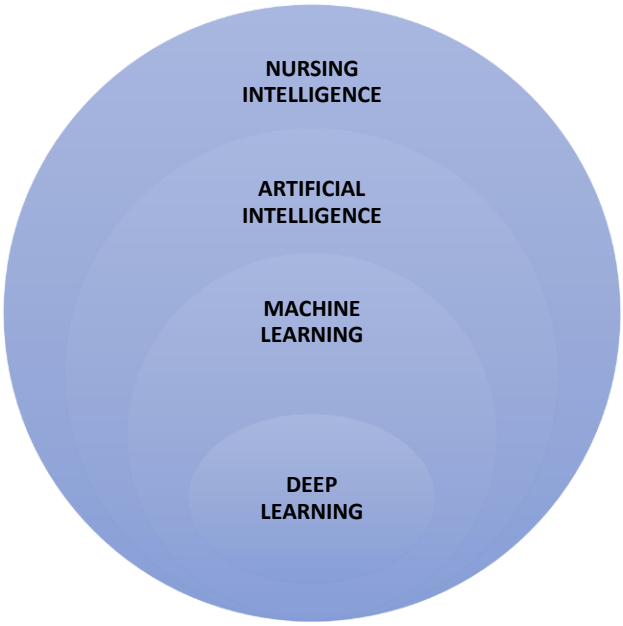


Fig: 2 ARTIFICIAL INTELLIGENCE V/S NURSING INTELLIGENCE

Tab: 1 Artificial Intelligence (AI) Mechanization[19-30]

1. Visual Recognition: The use of physical images and streamed video by computers to identify and diagnose conditions.

Nurses can assess and diagnose skin and wound integrity, as well as identify nonverbal cues for pain, anxiety, or depression.

2. Voice assistance: employs voice commands to identify pertinent information at the time.

Retrieve current Nursing policies, answer patients' questions about appointments and revisits, and upcoming tests, and set timers and reminders for nursing care tasks.

3. Machine learning: Processes data using complex algorithms and then improves itself automatically based on past experiences.

Identifies a patient's course of care on a map and then initiates and completes tasks such as scheduled follow-up appointments and sending results to care team members who need to be notified.

4. Expert solution: Solve complex problems by reasoning through multiple sources to make decisions as accurate as human experts.

Predict the cost of care based on the supplies used and the services provided. Can predict high-risk patients' falls, sepsis, readmission, relapse, financial hardship, or prolonged hospitalization.

5. Virtual reality: A computer-generated image, environment, or experience with which to interact in a seemingly real way.

Patients are assisted with educational assistive avatars and virtual companions, as well as nurse education, simulation, and mock learning exercises.

Connotation of AI in Nursing profession.[8,9,19-30]			
Nursing Practice	**Nursing Administration**	**Nursing Education**	**Nursing Research**
Robots have the potential to reduce nursing workload by assisting with daily activities. One unintended consequence of this emerging trend is that nurses may spend less time with their patients or be assigned a heavier patient load as a result. The anticipated new and changing nursing care delivery models will necessitate strong leadership from nurse executives, who will play a critical role in developing the necessary skills for direct care providers who will use AIHTs in practice. Examining predictive analytics models can help newcomers and less experienced nurses develop their ability to understand AI's individualized decision-making process in the clinical setting. Nurses may find new opportunities as care coordinators, using AIHTs such as robots to assist with patient care tasks, or as case managers who remotely monitor a caseload of patients using smart home technologies.	Applications of AIHTs included planning nursing tasks, reducing the amount of documentation required, and helping nurses prioritize patients using AIHT computer systems. These features could help streamline workflow processes and improve the precision and efficacy of patient care. Using AIHT in a way that fosters high-quality treatment and patient safety in nursing practice Strong leadership will be needed to create new policies and procedures that will support new care models, nursing roles, workflows, and possibly even modifications to the scope of practice for nurses as a result of the integration of AI in nursing.	laboratories for clinical simulation Humanoid robots and cyborgs will become more common in these environments to supplement the existing high-fidelity simulators. Predictive analytics can help students improve their clinical judgment and decision-making skills by observing the AIHT's executed decision path. Virtual patient video games and chatbot tutors may change the way that nursing instruction is given in educational settings as teachers use them as teaching tools to recreate interactive clinical scenarios and improve students' understanding of particular nursing principles. Nurse educators may use AI and machine learning to analyze student data and create personalized learning pathways, which would improve student engagement and retention and meet their learning needs. Educators should use big data to improve the accessibility, visibility, visual appeal, and data quality of nursing knowledge both inside and outside of the classroom. The skill gaps in the nursing profession might be filled by collaborations between a variety of academic subjects, which would	Nurses are uniquely equipped to compete in research on AI and patient-centered in collaboration with other health disciplines, given that compassion is a core tenet of the nursing profession. To promote nursing and patient engagement in AIHT co-design activities, nursing leadership at both the executive and staff nurse levels will be required. Robot use has received the majority of attention in studies on AIHTs and compassion; however, future studies should examine how other AIHTs might affect the provision of compassionate care. The educational prerequisites and basic competencies required for particularly incorporating AIHTs into nursing practice deserve more study. Future studies should concentrate on figuring out the best applications for artificial intelligence in nursing education.

		also benefit careers like clinical data scientists, medical software engineers, and digital medicine professionals.	

CONCLUSION:

This review provides a comprehensive overview of the current and future effects of artificial intelligence in nursing fields. The review's findings will assist nurse leaders at all levels and in all fields in actively creating the nursing-AI interface while maintaining consistency with core nursing principles that support moral, safe, high-quality, and compassionate care for patients, families, and caregivers. This review will help Nursing Professionals prepare for the anticipated growth or trend of AI in nursing. AI is expected to revolutionize nursing in all areas of practice, including administration, clinical care, education, policy, and research. Researchers are increasingly looking into the potential effects of AI health technologies (AIHTs) on nursing and nursing education in general.

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AUTHOR CONTRIBUTION:

Dr.S. Jasmindebora, (Author) created, collected, examined, reviewed, and wrote the article.

SKD,reviewed, modified, and approved the article.

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