International Journal for Multidisciplinary Research (IJFMR)
E-ISSN: 2582-2160 ● Website: www.ijfmr.com ● Email: editor@ijfmr.com

Artificial Intelligence (AI) in Nursing: Redefining Standards of Care in the Digital Era

Ravliya Urmila S[1], Chisla Unnati P[2]

[1,2]2nd year M.Sc. Nursing, P P Savani School of Nursing, PPSU, Gujarat, India

Abstract

The Artificial intelligence (AI) is transforming path way for nursing in this digital era by introducing advanced technologies that enhance patient care and improve efficiency of care. In this Digital Era how AI is redefining standards of care in nursing by assisting with tasks such as patient monitoring, data analysis, and decision-making. Through the integration of AI, nurses can provide more accurate and timely care, ultimately improving patient outcomes and satisfaction. The study highlights various work of AI applications in nursing and discusses the potential benefits scopes and challenges associated with their implementation. Also, the AI has created a biggest impact on routine task of Nurses and reduced the overload. This advancements in the field of nursing are not only enhancing the quality of care but also redefining the nursing profession by making it more efficient**.**

Keywords: Artificial Intelligence (AI); Nursing Care; Data Analysis; Decision-Making.

1. Introduction

Artificial Intelligence is defined as the mixture and team work of science and engineering on creating intelligent computer system that are able to perform activity or task without any Direct instruction from human being. We cannot deny the impact of artificial intelligence on multiple sectors, and the healthcare Sector, is not an exception. With its ability to enhance patient care and optimize workflows, AI has the potential to revolutionize nursing and redefined a new path for Nursing acre with help of Artificial Intelligence So Here in this article, we are going to see the ways AI is being applied in nursing, how it creates impact on patients' health and give new uphold standard to Nursing Field. AI has Created The intelligent machines are usually required a require human cognitive abilities to perform a task. For example, Understand the speech of patient and Relatives by translating language also can support healthcare providers to make more informed choices and can enhance patient results by minimizing the mistakes.

2. AI AND NURSE

Nurses is a person in health care system who deliver the best possible care by engaging in core practices of patient such as assessment, Diagnosis, planning, and outcome evaluation. however, possess an understanding of AI applications it including machine learning, deep learning, and natural language processing (NLP) and their implications for nursing research and practice, as well as their potential role in improving patient care and health care systems outcomes.

3. BENEFITS OF ARTIFICIAL INTELLIGENCE IN NURSING

- **Enhance Patient Care:** AI algorithms can automate routine tasks such as data entry, documentation, and scheduling, allowing nurses to focus more on direct patient care. It will also help to Store the data of patient and improve the patient care.
- **Streamlined Processes:** By This Process reducing errors, and optimizing resource allocation, AI-powered nursing solutions can help healthcare organizations save costs and make better use of limited resources within healthcare.
- **Cost Reduction:** AI-powered nursing solutions can help healthcare organizations save costs and make better use of limited resources.
- **Improved health care experience:** AI technologies may be able to improve the nursing care of various health conditions, provide complete information to support decision-making, manage medical records, minimize medical errors, optimize nursing care processes, make healthcare more accessible, provide better patient experience, improve nursing care.
- **Time saving:** AI in nursing solutions offer numerous opportunities to save time for both patients and nurses by automating tasks, accelerating processes, and improving efficiency in healthcare delivery.

4. IMPACT OF AI IN PATIENT CARE

- **Improves Quality of Services** Through advanced technologies such as machine learning and digital diagnosis and Investigations, healthcare professionals can perform more accurate in diagnoses of curtain Disease, personalize treatment plans. They can also improve overall patient prognosis.
- **Improves Medical Records,** AI systems can help free up the time for busy health team members by transcribing notes, entering and organizing patient data into different health related portals and diagnosing patients, potentially serving as a means for providing a second opinion for physicians and also the reference and it is a tool that store and record the data in comprehensive manner for long time by manipulating according to given format.
- **AI can reduce medical errors** by enhancing diagnostic accuracy and providing decision support for healthcare professionals.

For example, AI algorithms can analyse medical imaging with high precision, identifying abnormalities that may be overlooked by human eyes.

- **Virtual nursing assistants** is an AI-powered application program that accepts voice commands and performs the desired actions for the patients and assist them at all time. This tool can perform many tasks, including scheduling an appointment for the patient, sending emails and messages for follow up and Medication and also give reminder to patient, opening applications, playing songs, and setting alarm clocks.
- **Dosage error reduction,** AI-powered medication management systems can assist the Nurses and Doctors in prescribing and administering medications safely and according to dose . These systems can check for potential drug interactions, allergies, and dosage errors, ensuring accurate medication management and reducing the risk of adverse drug events.

5. SCOPE

Reduce Cost of Treatment:

AI can streamline administrative tasks, optimize resource allocation, and support clinical decision-making to lower the overall costs of healthcare delivery. This includes minimizing unnecessary tests, improving operational efficiencies, and preventing costly medical errors.

Patient Experience:

AI technologies can enhance patient experience by providing personalized care, improving communication between patients and healthcare providers, and ensuring timely interventions. AI-powered virtual assistants and chatbots can offer 24/7 support, reducing wait times and improving patient satisfaction.

Population Health:

AI can analyse large datasets to identify trends and patterns in population health. This aids in predicting outbreaks, understanding the spread of diseases, and developing targeted interventions to improve the health of communities. AI can also support public health initiatives by providing insights into social determinants of health and enabling precision medicine.

Well-being of Healthcare Team:

AI tools can alleviate the workload of healthcare professionals by automating routine tasks and providing decision support. This can reduce burnout, enhance job satisfaction, and improve the overall well-being of the healthcare team. AI-driven scheduling systems can optimize shifts and ensure better work-life balance.

Inclusion and Equity:

AI can help address health disparities by ensuring equitable access to healthcare services and identifying underserved populations. AI algorithms can be designed to be inclusive, reducing biases in treatment recommendations and ensuring that all patients receive appropriate and fair care.

These areas collectively define the scope of AI in nursing, aiming to enhance efficiency, effectiveness, and equity in healthcare delivery.

6. HOW ARE ROBOTS CHANGING THE NURSING PROFESSION?

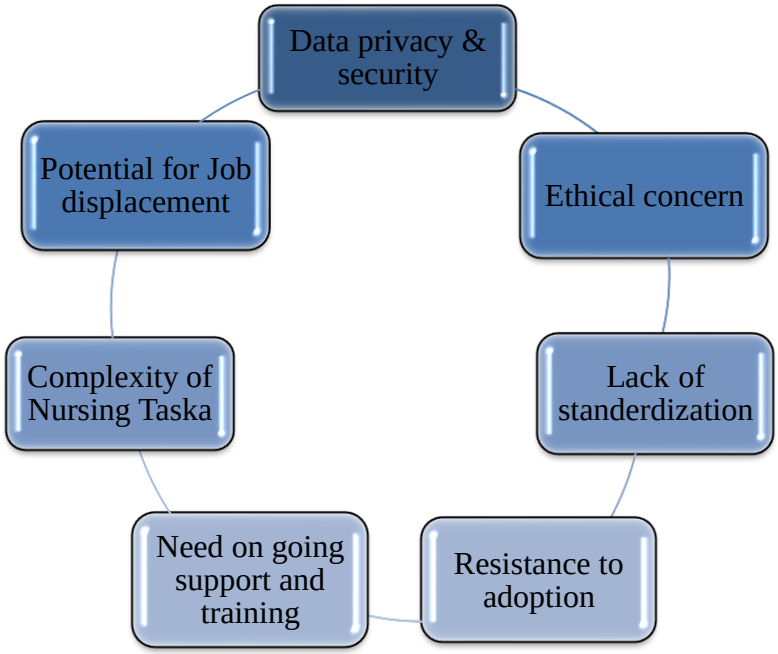
Now a days robots and, Machine learning are everywhere, from knowledge creation to the first implementation in healthcare sector . The majority of the time, these robots behave more like, a human being yet they have a significant influence on the medical field . Robots in medicine help, by freeing up medical staff an d other health care workers by diverting their attention from more essential obligations and by enhancing the safety and affordability of medical operations. They can also move hazardous materials and conduct precise surgery in tight spaces. Numerous applications of robotic technology have

a direct impact on patient care and their outcomes. They could be work by disinfecting the operating rooms and case flats, lowering risks for patients and the medical workforce. They do sample collection, transportation, dissection, and storage tasks in labs also. This is particularly encouraging news if you've ever had blood taken by a technician who struggled to obtain a "good tone" the first time. With less discomfort and concern for the patient, the robotic lab assistant can find that blood vessels and take the blood sample easily.

In laboratories of pharmaceutical, robots and machine learning also produce and distribute medicines. In bigger systems, robotic carts ride elevators and pass through mechanized doors as they transport bed linens or rather reflections from top to bottom. Additionally, there are "gears and cables" robotic companions that may provide physical therapy to the patient who have actual need and treating the paraplegics patient in moving.

Whether automation will displace people from work in the healthcare industry is the key issue. The machines won't take the place of their mortal counter parts for a number of reasons.

7. CHALLENGES AND LIMITATIONS: In the Care of Digital Era



8. COLLABORATION BETWEEN NURSES AND AI SYSTEMS

Collaboration between nurses and AI systems in India is rapidly evolving to enhance healthcare delivery. Telemedicine and remote consultations, powered by AI, are enabling nurses to reach patients in remote areas, providing timely detection and care , that reducing the burden on traditional healthcare facilities. AI-driven decision support systems are assisting nurses in making more accurate clinical decisions by analysing vast amounts of medical data. Automated triage systems help prioritize patient care based on urgency, ensuring efficient use of resources. Integration of AI with Electronic Health Records (EHR) allows for seamless data management and better patient outcomes.

Also, AI-powered tools are enhancing medication management by ensuring proper dosage and adherence to prescriptions without medication error by following rights of drug administration. Mobile

health applications are providing nurses with real-time access to patient data and health information, facilitating better care coordination. AI systems are also playing a significant role in health education and training, offering interactive and personalized learning experiences for nurses. Robotic assistance is being used for routine tasks such as lifting patients and delivering supplies, reducing physical strain on nurses. AI-powered diagnostic tools are aiding in early disease detection, while infection control and prevention systems are crucial in managing hospital-acquired infections. Lastly, data-driven public health initiatives supported by AI are helping to improve healthcare outcomes at the population level, showcasing the transformative potential of AI in nursing in India.

Patient monitoring systems equipped with AI are used to continuously track vital signs and alert nurses to any anomalies, improving patient safety. Predictive analytics are being employed to forecast disease outbreaks and manage chronic diseases more effectively, aiding nurses in preventive care measures. Virtual nursing assistants are helping with routine tasks such as patient inquiries and hemodynamic parameters monitoring, medication reminders, freeing up nurses to focus on more critical aspects of patient care in health care sectors.

9. FUTURE TRENDS AND INNOVATIONS

In the era of AI, the future of nursing in worldwide is poised for transformative changes driven by several emerging trends and innovations. One key trend is the increased integration of AI-powered telehealth services, which will expand access to quality healthcare in rural and remote areas. These services will enable nurses to conduct virtual consultations, monitor patients remotely, and provide timely interventions, significantly enhancing healthcare accessibility.

AI-driven predictive analytics will become more prevalent, allowing nurses to anticipate patient needs and manage chronic diseases more effectively. By analysing patient data and identifying patterns, these tools can predict potential health issues before they become critical, enabling proactive and preventive care. Personalized medicine, supported by AI, will also gain traction, with AI systems analysing genetic, environmental, and lifestyle data Robotics and automation will revolutionize routine nursing tasks. Robotic systems will assist with tasks such as:

- patient lifting,
- medication delivery,
- basic care procedures,
- reducing physical strain on nurses and allowing them to focus on more complex clinical duties.
- AI-enabled robotic surgery and rehabilitation will enhance precision and recovery.

10. ETHICAL CONSIDERATIONS AND PATIENT PRIVACY

- Ethical considerations in Al and machine learning include ensuring fairness, transparency, and accountability in algorithmic decision-making in patient care.
- Ensuring the responsible and ethical use of Al by healthcare personals such as docters , nurses and lab technicians , and researchers.
- Respecting patient autonomy and informed consent when using Al technologies in healthcare.
- Avoiding discrimination and bias in the collection and use of data is crucial to prevent unfair treatment or outcomes in health care setting.
- Engaging in ongoing ethical discussions, stakeholder involvement, and regulatory oversight to guide the development and deployment of Al technologies in healthcare.

- Balancing the benefits of Al with the need to protect patient and family members privacy and confidentiality within treatment.
- To Addressing concerns about job displacement and the impact of Al on the healthcare workforce.
- Considering the social and cultural implications of Al and machine learning in healthcare setting and its impact on patient and relatives.

11. Conclusion

In conclusion, AI is significantly reshaping the pathway of nursing profession by improving the quality and efficiency of patient care. AI tools help nurses monitor patients more effectively, analyze large sets of data quickly in predefined formats, and make better-informed decisions. While there are challenges to overcome, such as ensuring data privacy and training nurses to use new technologies, the benefits of AI in nursing are substantial. By embracing AI, the nursing field can advance to meet the demands of modern healthcare, ultimately leading to better patient outcomes and a higher standard of care. In the digital Era AI robots also play a crucial role by handling routine tasks, and this has reduced the workload of nurses. By accepting the AI in this Digital Era nursing can evolve to meet the needs of modern health care, resulting in better patient outcomes and higher standard of care.

Example of List of References

1. Sutton, R. T., Pincock, D., Baumgart, D. C., Sadowski, D. C., Fedorak, R. N., & Kroeker, K. I. (2020). "An overview of clinical decision support systems: benefits, risks, and strategies for success." NPJ Digital Medicine, 3(1), 1-10.
2. Topaz, M., & Pruinelli, L. (2017). "Big data and nursing: Implications for the future." Nursing Outlook, 65(5), 485-495
3. Shilo, S., Rossman, H., & Segal, E. (2020). "Axes of a revolution: Challenges and promises of big data in healthcare." Nature Medicine, 26(1), 29-38.
4. Reddy, S. (2020). AI and Big Data in Healthcare: A Perspective from India. CRC Press-243-247.
5. https://nha.gov.in/
6. https://www.niti.gov.in/sites/default/files/2023-03/National-Strategy-for-Artificial-Intelligence.pdf
7. https://healthcare.report/Resources/Whitepapers/31b40935-fca9-4018-b44b-1c08034d11c4_Artificial-Intelligence-AI-in-healthcare-and-research
8. http://www.indiannursingcouncil.org/aiinnursingeducation
9. Topaz, M., & Pruinelli, L. (2017). Big data and nursing: Implications for the future. *Nursing Outlook*, *65*(5), 485-495.
10. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6691444/
11. Lakhani P, Sundaram B. Deep learning at chest radiography: Automated classification of pulmonary tuberculosis by using convolutional neural networks. *Radiology*. 2017;284:574–82
12. Clark L, editor. Google's Artificial Brain Learns to Find Cat Videos. [Last accessed on 2019 Mar 27]; *Wired UK Science*. 2012 Available from: http://www.wired.com/2012/06/google-xneural-network