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Artificial Intelligence (Ai) And Impacts In Nursing

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Abstract
The tradition is to generate new things over time. Health care system is also evolving over time. Researchers are continuously paying attention to make the health care system stronger with evidence based practices. In our daily efforts to find solutions for complex healthcare problems, AI is becoming more and more an accepted method. The growth of new technologies in the fields of data science and data analysis has allowed researchers to identify specific patterns in large complex data sets that in the past were apparently hidden. These advanced methods combined with increased computer processing power allowing the health care system to work more accurately and smoothly. To clarify doubts and meet the advance nursing care, artificial intelligence is necessarily to be incorporated into nursing science and health care system. Transformation of these expanded technologies to be carried out for the benefits of patients. Though there are certain positive outcomes, AI technology also have some negatively impacts that can affect the nursing profession adversely. This aimed to explore and discuss the impact of AI in nursing care, healthcare system, nursing education and nursing research.

Keywords*: artificial intelligence, impacts, nursing, nursing care*

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I. Introduction

Artificial intelligence (AI) is a field of study in computer science where it represents the intelligence of machines or software, as opposed to the intelligence of humans or animals. Alan Turing was the first person to carry out substantial research in the field that he called Machine Intelligence.(1) Artificial intelligence was founded as an academic discipline in 1956.(2)AI technologies are being developed, tested , evaluated and applied to healthcare in many countries, with limited involvement of nurses across settings and specialties around the world.(3,4) AI is becoming an important part of daily life. For providing accurate and advance nursing care, AI is been incorporated. Generally machine learning and AI tools can make life easier .Whether these tools can be used in major care settings properly or not, that remains a major issue.

II. Discussion of the topic

To work in new ways is always challenging and the implementation of AI technologies is no exception. From mobile phone verification to self driving cars, from fraud detection to pattern recognition, from Google translation to natural language processing, everywhere is Artificial Intelligence. Computer was invented and a brilliant chapter opened for civilization. Now is the turn of high level computational power, more accuracy, more complex problem solving capacity. Now AI is everywhere, almost every fields like – social media, space exploration, banking, agriculture, gaming, marketing and healthcare. Looking forward, a question is arising in mind that what can be the potential impacts of AI on nursing's role? Indian health care system is facing certain challenges like- awareness or the lack of it, access or lack of it, absence or the human power crisis in health care, affordability or the cost of healthcare, accountability or lack of it.(5) Thus AI is becoming an important aspect of our health care system day by day. We are also in a view to achieve ' Health for all' by WHO. Collaboration is necessary with AI in development of desired health care system .

III. Impact of AI

A study has been done on the impact of implementing speech recognition technology on the accuracy and efficiency (time to complete) clinical documentation by nurses: a systematic review by Joseph Joseph et all, published in the year 2020. They have concluded that speech recognition technology when applied to nursing documentation could open up a promising new interface for data entry from the point of care, though the full potential of technology has not been explored.(6)

The Rothman Index is an illness-severity index embedded within the electronic medical record. It continuously tracks 26 variables .(7) When there is rapid drops in the Rothman Index, or a low absolute value of the Rothman Index, deterioration is predicted. The Rothman Index has a variety of uses like: identifying sick patients who need more urgent attention (e.g. transfer to ICU),identifying the healthiest patients in the ICU, who

may be ready to transition to the floor, identifying patients who aren't improving, who may benefit from palliation.[8] Research now suggests that Rothman Index performance is positively impacted by nursing assessment data, so the potential for nurses to impact patient care is significant.[9]

High expenditures of nurses' working hours are frequently reported as being used for the documentation of care processes, with some care facilities reporting up to almost a third of daily working hours being expended for documentation processes [10]

In a rapid review by Seibert K et all, fall detection, fall prevention, and fall risk classification are frequently mentioned purposes for topics in AI. The other purposes with a high degree of specificity are the recognition, classification, reduction of alarms, and risk prediction and classification of pressure ulcers. Addressing nurse rostering or scheduling problems was the purpose of an AI solution in 4.1% studies. [11]

Robots in nursing profession are creating positive impact in nursing care. Emotionally responsive robots are commonly called social or companion robots. Robots are entering in healthcare delivery sites positively. Social robots are designed to interact with humans that by responding to human interactions. Researchers are creating robots to help people in driving, providing support in clinical telehealth applications, performing specific nursing care like ambulation support, vital signs measurement, medication administration, and infectious disease protocols. Research suggests that between 8% and 16% of nursing time is spent on nonnursing activities and tasks that should be delegated to others.[12] Robots are collecting medical information so accurately that is changing nursing care view. In near future, nurses will be fulfilling a practitioner role and will deliver care across the continuum as new AI tools become available to support nurses anytime and anywhere.

IV. AI for nursing education

A study was conducted by Chang with the aim to investigate the use of AI powered simulation to enhance nursing clinical decision making skills. The result showed that the students performed significantly better who underwent AI-enhanced simulation than those who received traditional simulation training. [13] Chatbots are used for nursing training about vaccines for pregnant women and this is showing significantly better results. [13,14] In a systemic review by Adrian Martinez- Ortigosa et all. It has been noted that AI based educational resources have potential to increase and enhance learning outcomes. [15]

V. Ethical issues in using AI

Biasness and algorithm transparency are major concern today for different applications with AI. Predetermined and preset biased information will create biased results. Accountability and responsibility for nursing practice and impact on patient care are clearly stated by American Nurses Association's Code of Ethics for Nurses . [16] The code addresses accountability for nursing judgments, decisions, and actions, and specifically refers to systems and technologies as aids rather than substitutions for nursing skill and judgment. The code states, "Systems and technologies that assist in clinical practice are adjunct to, not replacements for, the nurse's knowledge and skill." [16] Nurses have to be aware about the data which will be used as input. Data transparency are gradually been established by AI teams of Technology companies.

VI. Concerns of using AI in healthcare

- Proper training is necessary for the new users of AI applications to avoid certain complications. Periodical training is important as applications update but change in applications can be difficult to manage.
- There are security concerns due to data dealings.
- Issues of unemployment can be a major factor of concern but new employments are also necessary as AI applications need human input.
- Inaccuracies can occur if there is presence of data bias.
- Critical ideological and ethical nature of nursing practice still needs to be considered
- The role of decision-making, understanding emotional wellbeing can not be easily granted by AI applications and it remains uncertain in the context of providing ethical and transparent nursing care [17]

VII. Conclusion

New AI technologies will some tasks performed by nurses today. As technology will change, the way of delivering patient care will change but the need for nurses will remain same in future too. In 2017, the McKinsey Global Institute (MGI) published the report "Jobs Lost, Jobs Gained: Workforce Transitions in a Time of Automation."[18] Nothing can replace nursing experience, knowledge, and skills but the process of transition to learning things in a new way will occur. Nurse will always act as information integrator, health coach. Nurses will be supported by AI technologies, not replaced by them. An extensive overview of the evidence base research on AI for application in nursing practice need to be generated. By identifying promising

application scenarios for AI in nursing practice, different research studies can contribute and enhance nursing care practices in future as AI applied in health care and nursing care is still a growing practice.

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