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SHORT COMMUNICATION

Adoption of Artificial Intelligence in Health Care: A Nursing Perspective

Adopción de la Inteligencia Artificial en la Atención Sanitaria: Una Perspectiva Enfermera

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ABSTRACT

Artificial intelligence (AI) is revolutionizing various areas of health care, particularly the medical and nursing field, called "Adoption of Artificial Intelligence in Health Care: A Nursing Perspective." This article examines the state of artificial intelligence (AI) in healthcare research, its use, its advantages for healthcare, and any challenges that can arise when adopting AI to healthcare organizations. The benefits of AI, such as increased efficiency, cost savings, future direction, improved decision-making, and enhanced patient care experiences. It is the need of the hour to address the challenges to ensure the successful adoption of AI in healthcare operations and treatment modalities including Nursing. The possible difficulties with applying AI, include issues with data protection, the requirement for additional knowledge and training, and moral issues. The Impact of Artificial Intelligence on Healthcare offers organizations looking to use this technology to achieve their cost-effective strategic objectives for improved patient care useful insights into how AI is transforming the medical and nursing fields and interventions.

Keywords: Healthcare; Artificial Intelligence; Adoption of AI; Nursing Perspective; Nursing.

RESUMEN

La inteligencia artificial (IA) está revolucionando diversas áreas de la atención sanitaria, en particular el campo de la medicina y la enfermería, denominado "Adopción de la Inteligencia Artificial en la Atención Sanitaria: Una Perspectiva Enfermera". Este artículo examina el estado de la inteligencia artificial (IA) en la investigación sanitaria, su uso, sus ventajas para la atención sanitaria y los retos que pueden surgir al adoptar la IA en las organizaciones sanitarias. Las ventajas de la IA, como el aumento de la eficiencia, el ahorro de costes, la orientación hacia el futuro, la mejora de la toma de decisiones y la mejora de la experiencia asistencial de los pacientes. Es necesario abordar los retos para garantizar el éxito de la adopción de la IA en las operaciones sanitarias y las modalidades de tratamiento, incluida la Enfermería. Entre las posibles dificultades que plantea la aplicación de la IA se encuentran los problemas relacionados con la protección de datos, la necesidad de conocimientos y formación adicionales y las cuestiones morales. El Impacto de la Inteligencia Artificial en la Asistencia Sanitaria ofrece a las organizaciones que buscan utilizar esta tecnología para alcanzar sus objetivos estratégicos rentables de mejora de la atención al paciente una visión útil de cómo la IA está transformando los campos y las intervenciones médicas y de enfermería.

Palabras clave: Sanidad; Inteligencia Artificial; Adopción de la IA; Perspectiva de la Enfermería; Enfermería.

INTRODUCTION

The correlation between therapeutic approaches and patient outcomes is examined using artificial intelligence (AI). The advantages of AI are improving healthcare treatment by enabling more precise and quick disease sign identification, treatment decision-making, cheaper treatment costs, and a decrease in human error.[1]

Artificial intelligence is defined as the application of science and engineering to the development of intelligent computer systems that are capable of carrying out tasks without direct human instruction.

The field of artificial intelligence is evolving and expanding quickly. It might make patient diagnosis, treatment, and care simpler. Medical personnel must be aware of artificial intelligence and its potential applications in healthcare. The use of artificial intelligence can make diagnosis and treatment easier. Artificial intelligence is the foundation for the future of medicine. It is now time to focus on machine learning accomplishments for biological research to promote human health.

The WHO Global Observatory for eHealth found that in 2015, nations that were just stepping into the field of big data for health had a wide variety of understandings, diverse expectations, and a need for greater technology use and policy development skills. While countries are starting to create legal frameworks that consider individual permission, privacy, openness in data governance, liability for data, and accountability for harm, concerns are raised by the law's slow implementation. International norms and laws will be necessary for the cross-border interchange of data, and the national context is crucial.

It will be crucial for the public to have faith in the accuracy and openness of the data. Enhancing digital skills and knowledge as well as enhancing the developers of devices, apps, and services' transparency are both crucial in the market's dynamic landscape.[2]

Need for AI in HealthCare

Although it may be restricted by the quality of the health data that is now accessible and the lack of artificial intelligence to exhibit some human traits, artificial intelligence has the potential to assist in addressing significant health issues. Several jobs in health care and research, including disease detection, managing chronic conditions, service delivery, and drug discovery, include the use of artificial intelligence or are currently being tested in this area.[3]

Mehdipur[4] explore the perspectives of 130 nursing managers on the usage of artificial intelligence systems in healthcare decisions. The results of the data collection using a questionnaire revealed that although most nursing managers have a high level of awareness about the application of AI in nursing (61 %) and a generally positive attitude towards it (77 %) more than half of nursing managers currently have low levels of skill with AI systems. 41 % of nursing managers believe that nursing AI system proficiency is now at a poor level.

Abdullah et al.[5] studied how healthcare workers felt about deploying applications of artificial intelligence. 250 personnel from four of the largest hospitals in Riyadh, Saudi Arabia, including doctors, nurses, and technicians, replied to the online survey. According to the study's results, 3,11 out of every 4 respondents are afraid of artificial intelligence. lacking a general grasp of artificial intelligence, replacing workers.

Glassman et al.[6] conducted a cross-sectional study titled "Artificial Intelligence to Reduce Technology Interference During Early Childhood." Parents of children younger than five years old were asked to complete an online survey. There were 305 participating parents. 280 delivered information that was suitable for analysis. Parents claimed that on average, 3,03 devices interfered with their relationships with their children every day, according to the study's findings.

Haneef et al.[7] conducted a cross-sectional investigation on data connecting and artificial intelligence practices in various European nations in 2021. According to a survey, the national institutes of public health, health information, and statistics in Europe use data connection and AI in a variety of ways. Most European nations usually employ deterministic approaches for data linkage or a combination of deterministic and probabilistic types.

Julia et al.[8] started a survey study in 2021. The "Principles of Biomedical Ethics" by Beauchamp and Childress (autonomy, beneficence, nonmaleficence, and justice) were used as an analytical framework to conduct an ethical assessment to determine the requirement for explainability in medical AI based on the outcomes of this conceptual study. It is crucial to look into how human actors interact with medical AI from both a medical and a patient perspective. We concluded that failing to include explainability in clinical decision support systems compromises fundamental medical ethics and may have negative effects on the patient and public health.

Despite all of AI's advantages, there are still some restrictions and difficulties that must be overcome. These include potential employment challenges, ethical and legal concerns with data privacy, displacement, and the requirement for ongoing training and education to stay up with the quickly changing AI ecosystem.

AI uses in healthcare

There are numerous uses for artificial intelligence across various industries. Healthcare, agriculture, social

media, marketing, gaming, education, and security are a few of the crucial industries. It has a wide range of uses in the healthcare industry, including storing medical records and other data, doing repetitive tasks, monitoring patient health, using precision medicine, using virtual nurses, digital consultation, analysing the healthcare system, and predicting the development of diseases.
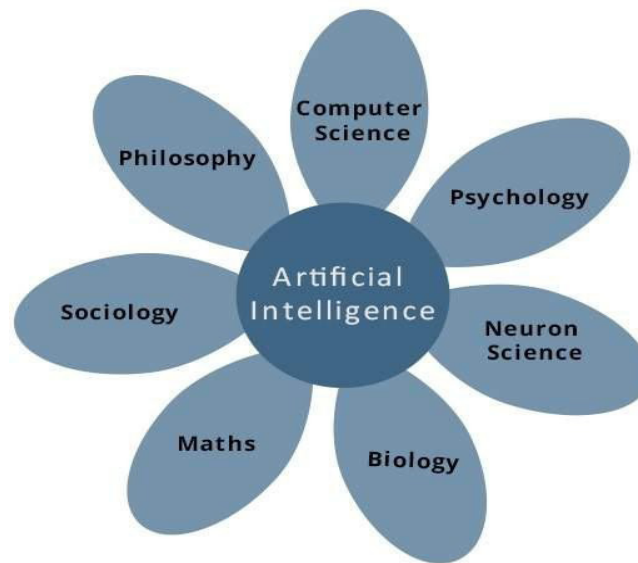
Figure 1. Artificial intelligence and its application in various disciplines

Healthcare is undergoing a revolution thanks to artificial intelligence (AI), which is changing how healthcare businesses operate in many ways. Here are a few noteworthy examples:

• Medical cum nursing diagnosis: it is aided by the analysis of medical and nursing data, including photographs, treatment protocols, and patient symptoms using artificial intelligence (AI). Large-scale medical data analysis performed by AI systems can reveal trends that may be challenging for human doctors to diagnose. Artificial intelligence is being utilised to customise medical and nursing care for specific patients. To develop individualised treatment regimens, AI systems can examine a patient's medical background, genetic information, and other elements.

• Therapy Discovery: AI is being utilised to discover new medications and therapies. The amount of time and money needed for medication development can be decreased by using AI algorithms to analyse enormous volumes of medical data and find prospective drug candidates and test the efficacy of therapies.

• Patient monitoring: AI is being used to track patient progress and monitor their health. AI-powered monitoring systems can analyse data from medical devices, nursing records and other sources to find early indications of health issues, enabling medical and nursing professionals to take quick action.

• Administrative application: healthcare administrative chores are being automated with artificial intelligence to increase efficiency and cut expenses. Appointment scheduling, billing, and the processing of insurance claims are all duties that AI-powered systems can manage.

Overall, AI has the potential to lower costs while simultaneously considerably enhancing healthcare outcomes. To preserve patient privacy and maintain the standard of healthcare, it is crucial to make sure that these technologies are used in a responsible and ethical manner.[9]

Applications of AI Technologies to Healthcare

Numerous AI tools and apps are frequently employed in commercial settings.[9] Among the most typical ones are:

• Machine Learning (ML): thanks to machine learning techniques, computers may now automatically learn from data and improve their performance without explicit programming. Healthcare organizations use this technology for purposes including disease prediction and detection, patient evaluation, and client segmentation.

• Processing of natural language (NLP): processing of natural language Computers can now comprehend and analyze human language thanks to a technology called natural language processing (NLP). The usage of chatbots and virtual assistants for customer care, sentiment analysis for social media monitoring, and text analysis for market research are all examples of how healthcare businesses are utilizing this technology.

• Computer Vision (CV): computers can read and comprehend visual data from pictures and movies thanks to computer vision. For activities like item recognition, radiological prediction, hospital quality control, and security surveillance, use this technology.

- Robotics: the automation of repetitive, routine tasks like assembly line work and material handling is made possible by robotics technology. Assisted in surgery, nursing task and inventory management are all jobs that can be handled by robots.
- Cognitive Computing: computational thinking to replicate human intellect, cognitive computing incorporates many AI technologies such as NLP, machine learning, and computer vision. Business operations employ this technology for things like fraud detection, individualised marketing, and predictive maintenance.
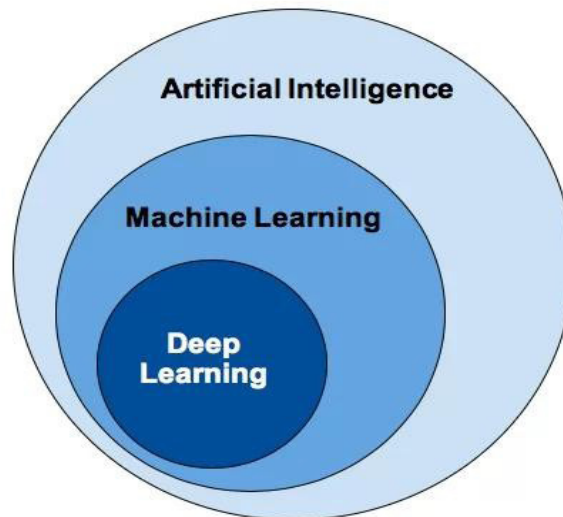
Figure 2. Artificial intelligence and its relation with core areas

Applying AI technology to company processes has the potential to boost decision-making abilities, considerably increase efficiency, and save costs. Businesses are utilising AI technologies more and more to gain a competitive edge and enhance consumer satisfaction.[10]

Prominent AI industry in healthcare
By improving the responsiveness, precision, and efficacy of healthcare services, artificial intelligence (AI) has transformed the healthcare sector. Following are a few instances of businesses that successfully incorporated AI into their healthcare operations:

- IBM Watson Health: IBM Watson Health employs artificial intelligence to examine medical data and deliver healthcare providers' insights. Massive volumes of medical data may be analysed by the company's AI-powered platform, which can then provide patients personalised therapy recommendations.
- GE Healthcare: GE Healthcare employs AI to enhance the capabilities of medical imaging and diagnosis. The company's AI-powered medical imaging tools can evaluate medical images and provide accurate diagnoses in a fraction of the time needed by a human expert.
- Google Health: Google Health employs AI to enhance patient outcomes and cut expenses associated with medical treatment. The business' AI-powered platform can examine medical data and give patients personalised therapy recommendations. Additionally, Google Health is utilising AI to create prognostic models for conditions including diabetes, heart disease, and cancer.
- Johnson & Johnson: to hasten the discovery of novel treatments, Johnson & Johnson has integrated AI algorithms into its drug development process. By analysing massive volumes of data and identifying prospective medication candidates, the company's AI-powered drug discovery system can speed up and lower the cost of drug development.
- Babylon Health: a healthcare technology startup called Babylon Health has created an AI-driven chatbot that offers medical diagnosis and health counselling. In order to accurately diagnose patients and lessen the strain of medical professionals, the chat bot analyses symptoms using AI algorithms. This helps to improve patient outcomes.
- Pfizer: Pfizer employs AI to speed up the development of new drugs. The business' AI-powered platform can analyse enormous volumes of data and find prospective medication targets, which helps to speed up and lower the cost of drug development.

In general, the use of AI in healthcare by these companies has increased patient outcomes, decreased healthcare expenses, and increased the effectiveness of healthcare services. These businesses have been able to remain competitive in the healthcare sector and offer better services to their clients by integrating AI into

their healthcare operations.[11]

Research related to AI in Healthcare

Castagno et al.[12] conducted a qualitative survey study about perceptions of AI among medical workers at the Royal Free Hospital in London. 98 healthcare professionals responded to a published online questionnaire, and data was gathered from their responses. The results showed that 87 % of respondents did not understand the difference between machine learning and deep learning, and 64 % of respondents claimed that they had never come across AI applications in their field of work. even though only 50 % knew what both phrases meant.

Samyuktha et al.[13] investigated the awareness and knowledge of artificial intelligence in healthcare among doctors in a cross-sectional study. 100 medical expert who works in healthcare was surveyed for their opinions. Data analysis was done with SPSS Windows version 20,92 % of respondents agreed with this statement, according to the study's findings.

Varun et al.[14] conducted a qualitative analysis of the present situation of artificial intelligence in medicine and its possibilities for the future. An online survey received responses from 628 medical professionals from North London, including radiologists, doctors, and a few nurses. According to the research, 54 % of healthcare professionals are familiar with how artificial intelligence is used in healthcare. For 46 % of respondents, artificial intelligence in healthcare is unknown.

Rong et al.[15] conducted a review and prediction study using AI for disease detection, living aid, information processing, and biomedical research. A Cambridge hospital in the UK completed an online survey. The study's conclusions showed that applications of artificial intelligence, such as disease diagnosis, living aid, processing of biomedical data, and scientific research, are becoming more and more significant in the field of biomedicine.

Brian et al.[16] studied how healthcare stakeholders felt about AI. Forty French stakeholders from varied backgrounds were interviewed in Paris between October 2017 and June 2018, and their contributions were evaluated using grounded theory. The results show that all relevant parties consider artificial intelligence to be a fiction that needs to be debunked. Contrary to popular belief, they don't always observe the use of these tools in their practise.

William et al.[17] carried out a qualitative analytical study on the use of artificial intelligence in medical imaging by radiographers practising in Africa. Online surveys were employed throughout the inquiry. Using a qualitative content analysis method, the data were examined. Thus, a total of 475 valid responses were gathered. Participants showed a favourable attitude towards AI in terms of enhancing clinical quality, accurate diagnosis, reducing radiation exposure, and advancing research.

Silvana et al.[18] conducted an extensive review of the literature on the use of artificial intelligence in healthcare. The researchers were able to compile 288 peer-reviewed papers from Scopus thanks to their comprehensive literature analysis and reliable, repeatable research technique. The authors looked at the collaboration networks, journals, authors, and keywords of researchers using both qualitative and quantitative qualities. The Bibliometrics R software programme was extremely helpful for the paper. the growth of the literature in this field as a result. The management of health services, patient data and diagnostics, clinical decision-making, and predictive medicine are all featured. A recent study found that artificial intelligence (AI) can assist medical professionals with diagnosis, disease prognosis, and individualised treatment strategies.

Rana et al.[19] performed a survey study to find out how healthcare workers felt about utilising AI technologies. 250 staff from four of Riyadh's top hospitals, including doctors, nurses, and technicians, responded to the online poll. According to the study's findings, 3,11 out of every 4 respondents had no knowledge of artificial intelligence and were concerned about it replacing workers. Training is also necessary because the majority of respondents were not aware of the benefits and most frequent difficulties associated with artificial intelligence applications in the health sector. Due to the nature of their work, which does not include a lot of direct human interaction, the data also revealed that technicians were the group that was most frequently influenced.

Poyang[20] conducted a survey study on the adoption of AI-based tools for healthcare from the consumers' views. 307 people from the United States responded to an online poll, which was performed. The findings demonstrate that perceived dangers associated with employing AI applications in healthcare are greatly influenced by technological, ethical, and regulatory considerations. The three categories are revealed to be most significantly associated with technological concerns as risk belief predictors.

Eman[21] carried out a quasi-experimental study on artificial intelligence as a cutting-edge strategy for investing in Egypt's future healthcare system. Patients and management (nurses and doctors) made up the two groups that made up the study subjects. Data gathering involved the use of three questionnaires. All the supervisors, whether nurses or medical professionals, were found to be ignorant of artificial intelligence. Nurse managers rated most aspects of the use of artificial intelligence in nursing favourably, whereas medical managers saw every aspect of the use of artificial intelligence in medicine favourably. Similarly, to this, the majority of patients agreed that artificial intelligence should be used in healthcare.

Sapci et al.[22] performed a thorough, systematic analysis in the year 2020 with the goal of evaluating

existing AI teaching methodologies and researching the application of AI in medical and health informatics education. It was done in accordance with PRISMA-P (Preferred Reporting Items for Systematic Reviews and Meta-Analysis Protocols) standards. The findings demonstrate that current research backs the inclusion of AI training in medical and health informatics curricula.

Lia et al.[23] carried out a qualitative study on the application of artificial intelligence in sports medicine among male patients aged 19 to 40. Each patient was asked between 25 and 36 questions via the software, with the ability to add more details or examples in the form of pictures. All chosen disorders and wounds were either correctly classified or, at the very least, highlighted with instructions on when it is essential to see a doctor right away.

Xiaoqing[24] performed a retrospective cohort study with the subject artificial intelligence (AI)-reduced patient waiting time. In China, a module with AI assistance by the name of XIAO YI was developed. The total number of visits was 12,342; 6171 were in the conventional group and 6171 were in the AI-assisted group. The median waiting time for the AI-assisted group was 0,38 hours as opposed to 1,97 hours for the traditional group. The AI application supports hospitals' outpatient care procedures.

FINAL REMARKS AND CONCLUSIONS

Bostrom et al.[25] developed a study in artificial intelligence led them to create a quick survey, which they then disseminated in 2012–2013 to four groups of specialists. The respondents' median prediction was that high-level machine intelligence would likely develop around 2040–2050, increasing to a 90 % probability by 2075. In less than 30 years, according to experts, systems will develop superintelligence. They predict that this development will have a one in three likelihood of becoming "bad" or "extremely bad" for humanity.

European Commission[26] conducted a quantitative study with the subject artificial intelligence use by enterprises in Europe is increasing. Four out of ten (42 %) businesses have reportedly implemented at least one artificial intelligence (AI) technology, with a quarter having done so already. However, 78 % of companies in the EU report having a general awareness of AI.

Survey research was done by Vitalii M. Pashkov. Dialectical, comparative, analytical, synthetic, and all-encompassing approaches are its pillars. However, several lesser-known technologies, such as wearable medical equipment, smartphone apps, and other instances of the Internet of Things, also use AI in the healthcare industry. These include Watson Health from IBM, Edison Healthcare from General Electric, and DeepMind from Google. The primary barriers to implementing AI in healthcare are related to the technology's inherent nature, the challenge of securing legal support for its efficacy and safety, privacy, and ethical and liability considerations.[27]

Research and development must continue if the potential of AI in healthcare operations is to be fully realized. Future research should concentrate on creating ethical, transparent, and trustworthy AI systems as well as investigating fresh applications of AI across diverse fields of healthcare systems including the medical and Nursing field.

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