



International Journal of Science, Architecture, Technology and Environment

Exploring the Role of Artificial Intelligence in Healthcare: Perception, Impact, and Future Directions

Nilambari Sanjekar^{1*}, Rashmi Dhodhapkar², Archana A. Ramesh³, Shruti Kayal⁴

¹Assistant Professor of Computer, Badruka College of Commerce and Arts, Hyderabad

²Assistant Professor in management, Badruka College of Commerce and Arts, Hyderabad

³Assistant Professor in Commerce, Badruka College of Commerce and Arts, Hyderabad

⁴Assistant Professor in Sanskrit, Badruka College of Commerce and Arts, Hyderabad

Nilambarikale0@gmail.com

*Corresponding author

DOI: <https://doi.org/10.63680/ijstate0525162.27>

Abstract

Artificial intelligence (AI) is transforming the healthcare landscape, offering improved outcomes, enhanced efficiencies, and empowered patients. This study investigates the perception of AI in healthcare, its impact on patient care, and future directions. A mixed-methods approach was used, combining primary and secondary data. The results reveal a significant association between awareness of AI in healthcare and education levels. Additionally, a significant difference in the importance of AI-driven diagnosis in healthcare was found between males and females. The study highlights the potential of AI in predictive analysis, while also identifying data privacy concerns as a primary concern. Furthermore, the findings indicate that AI can improve patient engagement and empowerment through personalized health information. The study's results have significant implications for healthcare policymakers, practitioners, and researchers. The findings emphasize the need for responsible AI integration, addressing data privacy concerns, and ensuring that AI systems are transparent, explainable, and fair. Moreover, the study highlights the importance of educating healthcare professionals and patients about the benefits and limitations of AI in healthcare. Ultimately, this study contributes to the growing body of research on AI in healthcare, providing valuable insights into the perception, impact, and future directions of AI in the healthcare sector.

Keywords: Artificial Intelligence, Healthcare, Perception, Impact, Future Directions, Patient Engagement, Empowerment, Personalized Health Information.

Introduction

AI refers to the use of computer systems that can perform tasks that naturally requires human intelligence,

such as reasoning, decision making and critical analysis. In healthcare, AI is used to analyse humongous data related to patient's health record, imaging studies, lab reports, diagnosis, which help for clinical decision making. Machine Learning (ML) is a sub branch of AI which is used to develop algorithms and structured models, which eases the hardship of developing programs rather uses data driven analysis. The ML can become a boon for early diagnosis. This helps both the clinical experts and patients. The cloud networking used to run both AI and ML, is used to manage and work with large datasets of patients' data records which helps to access the complete records of patients for better treatment. As the rapid acceptance of AI in many places, the need is to understand the inclusion of AI in health care as priority sector. Artificial Intelligence (AI) revolutionizes healthcare by empowering cases and perfecting issues. AI provides substantiated health information, enables virtual consultations, and facilitates remote monitoring. In medical radiology, AI enhances image analysis, complaint vaticination, and quality control, reducing radiation exposure. In individual histopathology, AI improves delicacy, automates towel segmentation, and predicts complaint progression. AI streamlines patient complaint operation, analyses feedback, and predicts outfit conservation needs. also, AI helps in detecting medical crimes, making informed opinions with real time guidance, reflect on performance, identify areas for growth and get enhanced patient satisfaction. By using AI, healthcare providers can deliver more effective, effective, and substantiated care, eventually transubstantiating the healthcare experience. AI's eventuality to ameliorate healthcare is vast, and its integration is poised to bring about significant advancements in medical care.

Objectives:

1. To understand the role of AI in health care as a catalyst to change in present healthcare process.
2. To analyse the perception of of use of AI in healthcare.
3. To explore the role of AI in enhancing patient engagement and empowerment through personalized health information

Review of Literature

1. (Patel, 2023) In the study Manas patel and Neil Patel, emphasis on the inclusion of Ai in healthcare and transforming. The study explored the use of AI in healthcare, its impact on patient care, diagnosis, treatment. They also studied the impact of AI of publishing scientific article publishing and its impact on student learning and teaching practices. The study also dwells into how the AI has made a virtual care system and consultation a possibility for better medical practice and improved medical management. The study also has touched the use of AI in improved diagnosis.
2. (Kumar, 2017)In the paper AI in health and health care: Meet Ashok kumar Joshi” studied the application of AI in healthcare in medical imaging and drug discovery, predictive analytics and collaborative efforts between AI experts, healthcare professionals and emergence of virtual health care assistants. The study explores the role of AI in robotics surgery, fraud detection and cybersecurity, medicinal and treatment plans also covering the benefits and challenges of integration of AI in healthcare emphasising on maintaining safety and privacy standards for building trust between patients and healthcare providers and robotics in healthcare discuss about societal implications and equity in healthcare, about social acceptance and trust issues in AI robotics. The study also throws light on the regulatory and legal challenges. The paper concludes by focusing on the transformative journey representing a monumental shift in the healthcare field, promising improved diagnosis, treatment and healthcare delivery.

3. (Elundu, 2023) in the study “Ethical implications of AI and robotics in healthcare discuss about societal implications and equity in healthcare, about social acceptance and trust issues in AI robotics. The study also throws light on the regulatory and legal challenges. The paper concludes by focusing on the transformative journey representing a monumental shift in the healthcare field, promising improved diagnosis, treatment and healthcare delivery.
4. (Kuranamurthy, 2022) “Quing: According to Karunamurthy in the impact of artificial intelligence on healthcare, the study explores the current application of AI in healthcare and NLP, natural language processing which enables the ML to enable to understand the human language. He also explores future possibilities of AI in healthcare, concluding how AI has the potential to revolutionize patient care by improving outcomes and enhancing efficiencies. The study also emphasis on robust regulatory framework through validation and certification, ensuring that technology is used in responsible and equitable manner.

Need of the study

Though AI's entrance in healthcare is evident, there is still a lack of comprehensive understanding of its impact on patient outcomes, healthcare quality and cost effectiveness. The rapid evolution of AI technologies urges on the need of continuous research to ensure proper inclusion in the healthcare systems. After, the pandemic, the need for AI driven healthcare solutions has emerged more demanding solutions to address global health care crisis.

Scope of the Study

The study is limited to the city of Hyderabad and addresses the inclusion of AI in healthcare sector only. The scope is limited to the present status of AI and only considers the next 5 years prospect development in healthcare through AI.

Research methodology

The study is based on both the primary and secondary data. Primary data is collected through a structured questioner and secondary data is collected through the various books, journals publications. The various statistical tools will be applied to analyse the primary data.

Hypothesis

H₍₀₁₎- There is no Significance digfferance between awareness of AI in healthcare and education Levels.

H₍₁₀₎- There is significance digfferance between awareness of AI in healthcare and education Levels.

H₍₀₂₎- There is no significance between gender and Importance of AI driven dignosis in healthcare .

H₍₂₀₎- There is significance between gender and Importance of AI driven dignosis in healthcare .

H₍₀₃₎: There is no significant correlation between the perceived importance of AI-driven diagnosis in healthcare and the expectation of AI's impact on healthcare in the next 5 years.

H₍₃₀₎- There is a significant correlation between the perceived importance of AI-driven diagnosis in healthcare and the expectation of AI's impact on healthcare in the next 5 years.

Data Analysis

Results						
	Yes	No	May be			Row Totals
12th	2 (4.48) [1.37]	1 (0.24) [2.38]	2 (0.28) [10.45]			5
GRADUATE	56 (53.71) [0.10]	2 (2.90) [0.28]	2 (3.39) [0.57]			60
POST GRADUATE	51 (49.23) [0.06]	2 (2.66) [0.16]	2 (3.10) [0.39]			55
PHD	2 (3.58) [0.70]	1 (0.19) [3.36]	1 (0.23) [2.65]			4
Column Totals	111	6	7			124 (Grand Total)

TABLE 1

Interpretation : It is observed from Table 1 that the chi-square test result is statistically significant ($p < 0.05$), with a p-value of 0.000991. This indicates that there is a significant association between the variables being tested; hence, the null hypothesis (H₀₁) is accepted.

Anova: Single Factor						
SUMMARY						
Groups	Count	Sum	Average	Variance		
GENDER	123	291	2.365854	0.233906437		
How important is AI driven diagnosis in healthcare?	123	395	3.211382	0.725443156		
ANOVA						
Source of Variation	SS	df	MS	F	P-value	F crit
Between Groups	43.96748	1	43.96748	91.66101695	1.22103E-18	3.879851784
Within Groups	117.0407	244	0.479675			
Total	161.0081	245				

TABLE 2

Interpretation : The Table 2 ANOVA results show a significant difference in the importance of AI-driven diagnosis in healthcare between males and females ($p\text{-value} < 0.001$, F-statistic = 91.66101695). The mean importance rating is higher for one gender group (average rating = 3.211382); therefore, the null hypothesis

(H02) is rejected.

CORRELATION		
	How important is AI driven diagnosis in healthcare?	Do you think AI will bring in a great change and impact in healthcare in next 5 years?
How important is AI driven diagnosis in healthcare?	1	
Do you think AI will bring in a great change and impact in healthcare in next 5 years?	-0.177068244	1

Table 3

Interpretation: From the above table, it is observed that there is a weak negative correlation ($r = -0.177$) that exists between the importance of AI-driven diagnosis and the expectation of AI's impact on healthcare. Individuals valuing AI-driven diagnosis tend to be less optimistic about AI's future impact; hence the null hypothesis (H03) is rejected.

Findings

- The survey had a greater number of male respondents.
- Maximum respondents are graduate level.
- It was observed that there is a significant association between awareness of AI in healthcare and education levels ($p\text{-value} = 0.000991$).
- Predictive analysis in healthcare seems more promising, according to the respondents.
- The ANOVA results show that the mean importance rating is higher for one gender group (average rating = 3.211382).
- There is a weak negative correlation ($r = -0.177$) between the importance of AI-driven diagnosis and the expectation of AI's impact on healthcare. Individuals valuing AI-driven diagnosis tend to be less optimistic about AI's future impact.
- It is analysed that data privacy is a primary concern regarding AI in healthcare.

Conclusion

The study aimed to understand the role of AI in healthcare, analyze the perception of AI in healthcare, and explore the role of AI in enhancing patient engagement and empowerment. The findings indicate a significant association between awareness of AI in healthcare and education levels. Additionally, the study reveals a significant difference in the importance of AI-driven diagnosis in healthcare between males and females. The results also show a weak negative correlation between the importance of AI-driven diagnosis and the expectation of AI's impact on healthcare. The study highlights the potential of AI in healthcare, particularly in predictive analysis. However, data privacy concerns were identified as a primary concern regarding AI in healthcare. Overall, the study concludes that AI has the potential to revolutionize healthcare by improving

outcomes, enhancing efficiencies, and empowering patients. However, addressing data privacy concerns and ensuring responsible AI integration are crucial for its successful adoption in healthcare.

Declaration of Conflicting Interests

The authors declare no potential conflicts of interest with respect to the research, authorship and publication of this article.

Funding

The author received no financial support for the research, authorship and publication of this article.

References

1. <https://www.nature.com/articles/s41415-023-5845-2#citeas>
2. https://journals.lww.com/md-journal/fulltext/2023/12150/ethical_implications_of_ai_and_robotics_in.101.aspx
3. https://www.healthit.gov/sites/default/files/jsr-17-task-002_aiforhealthandhealthcare12122017.pdf
4. <https://www.elsevier.es/en-revista-journal-innovation-knowledge-376-articulo-a-systematic-literature-review-artificial-S2444569X2300029X>
5. "Quing: International Journal of Innovative Research in Science and Engineering" "Available at <https://quingpublications.com/journals/ijirse>
6. <https://link.springer.com/article/10.1007/s00330-024-10839-9>
7. https://doi.org/10.48009/3_iis_2018_33-41 Issues in Information Systems Volume 19, Issue 3, pp. 33-41, 2018 https://iacis.org/iis/2018/3_iis_2018_33-41.pdf
8. <https://ieeexplore.ieee.org/stamp/stamp.jsp?tp=&arnumber=9565155>
9. <https://www.erikdrysdale.com/figures/implementing-ai-in-healthcare.pdf>
10. https://journals.lww.com/md-journal/fulltext/2023/12150/ethical_implications_of_ai_and_robotics_in.101.aspx