



Research Article

Exploring the Acceptance of Artificial Intelligence in Healthcare in Saudi Arabia

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Abstract:

The integration of artificial intelligence (AI) into various sectors has garnered global attention, notable within the healthcare domain. In Saudi Arabia, discussions surrounding AI's application in healthcare have been particularly pronounced, highlighted at significant gathering during the World Economic Forum in the nation's capital. This paper aims to explore the multifaceted incorporation of AI into medical practices in Saudi Arabia, with a focus on enhancing healthcare delivery. Drawing upon insights from cultural anthropology and medicine, this study illuminates key aspects of AI adoption among Saudi medical professionals. Despite growing interest, there remains a dearth of comprehensive studies assessing AI acceptance, readiness, and proficiency among healthcare personnel, necessitating larger-scale investigations for more accurate insights. Current literature suggests that while some practitioners have embraced AI, many lack formal education and exhibit apprehension towards its utilization. Consequently, there is a pressing need for undergraduate and postgraduate educational programs tailored to AI integration within Saudi Arabia's healthcare system. Such initiatives not only empower practitioners to harness AI's full potential but also address concerns and apprehensions, particularly among senior professionals. By fostering a culture of AI education and proficiency, Saudi Arabia can effectively leverage AI to enhance healthcare outcomes and address emerging challenges in the medical landscape.

Keywords: Artificial Intelligence (AI), Healthcare delivery, Saudi Arabia, Medical professionals, Education.

Dataset link: -

1. Introduction

Artificial intelligence (AI) has gained international interest recently. What is more, we see its quick incorporation into several spheres of society, the international healthcare system being one of them. On the other hand, there is a conscious discussion on the application of AI in several domains, particularly the healthcare system, within the framework of Saudi society. This was emphasized at a special gathering that took place in the Kingdom of Saudi Arabia's capital at the World Economic Forum 2024. The Saudi perspective on AI integration is significant. The purpose of this paper is to take the reader on a tour through the various facets of AI adaptation in Saudi medical procedures. Improving the delivery of healthcare is the goal. Utilizing knowledge from the fields of cultural anthropology and medicine, these studies will highlight the salient features of AI adoption in Saudi medical professionals.

According to [1], integrating artificial intelligence (AI) is not just a fortuitous trend that Saudi Arabia is following; rather it is a crucial part of “Saudi Vision 2030,” which aims to promote prosperity in both the area and society at large. It is clear that Saudi Arabia is aware of international trends because it is investing a significant amount of money in artificial intelligence [2]. The introduction of “Neom,” a new metropolis that intends to integrate AI into the majority of its activities and replace its traditional hydrocarbons-based economy with one powered by AI, is a noteworthy illustration of this knowledge [3]. Since AI has just lately become a part of our everyday lives and is still in its early stages of development, we recognize that discussing its consequences in detail is premature. However, the idea of AI is not wholly novel from an anthropological standpoint; it has been acknowledged for a while. One important component of the human cultural revolution that aims to change society’s structure is artificial intelligence [4]. Even the question of whether artificial intelligence qualifies as a science or not has been debated [5]. How much will AI alter cultural norms? Prior to exploring healthcare, let us endeavor to address this overarching query.

2. Method

How Artificial Intelligence is Reshaping Healthcare Culture

There is little question that the introduction of artificial intelligence (AI) into the healthcare industry will lead to important cultural changes in the following ways:

- a. **Redefining Work Dynamics:** AI automation has the potential to change traditional employment arrangements, thereby to making some jobs obsolete while also resulting in the creation of new job positions [6], [7]. Work cultures may change as a result of this transition, which calls for upskilling, flexibility, and a move toward a more tech-oriented and dynamic workplace.
- b. **Data-driven Decision Making:** Decision-making procedures in a variety of businesses may be impacted by AI’s capacity to analyze enormous volumes of data and produce useful insights. The healthcare industry could experience a shift in patient-provider dynamics as a result of AI-driven diagnoses and treatment recommendations [8]–[10] that promote evidence-based medicine and individualized care.
- c. **Ethical Considerations:** Talks about justice, accountability, and transparency are sparked by the ethical implications of AI, which include bias in algorithms or privacy concerns [11]–[13]. This promotes a climate of ethical consciousness and critical reflection, which shapes society norms and values around the use and management of technology.

To ensure that everyone in the audience is clear, we confirm that the aforementioned elements are related to the healthcare system. However, several factors, such as social views, legal frameworks, technological breakthroughs, and the ethical considerations guiding AI’s development and deployment, while determine how much AI changes culture. If these issues are appropriately resolved, AI may change for the betterment of society. Before discussing the acceptability of AI in the healthcare system, it is critical to examine the ways in which these variables affect the integration of AI and the possible effects it may have on patient care and medical procedures.

3. Results and Discussion

Artificial Intelligence Knowledge Prevalence Among Physicians

Before delving into detailed descriptions regarding the applications of AI in healthcare and the consequences it will carry, whether these consequences concerns ethics or the working environment, the acceptance and perception of AI and its applications by healthcare professionals ought to be explored.

One of the first applications of AI and machine learning (ML) that was explored in Saudi Arabia is its implementation as tools to assist in medical diagnosis, decision making and treatment designs. Especially in clinical laboratory settings, which are a paramount aspect of the healthcare process that provide investigations' results that are bound to influence or change the physicians' diagnosis or treatment plans. Such was the purpose of a cross-sectional study conducted in Saudi Arabia gauging clinical laboratory professionals attitudes regarding the implementation of AI and ML in medical diagnosis, alongside their knowledge, experiences, concerns, and most importantly their capability of applying AI and ML to assist in the healthcare process. A questionnaire was sent to measure AI or ML knowledge, experience, personal thoughts and agreement levels of AI and ML implementations in medical diagnosis. 98 eligible responses were received out of 500. 56.7% have answered (Yes) to having previous experiences with AI/ML compared to 42.3% answered that answered (No). Concerning attitudes, 58% of respondents showed predictions that AI could save time and cost, and 64.1% displayed worries that AI could replace their jobs in the future. Subgroup analysis showed a significant difference between those who used AI and those who did not. Showing a generally positive opinion of AI usage in clinical labs [14].

Another study was conducted in Saudi Arabia to measure the impact of AI among healthcare field professionals and their awareness of AI programs alongside their insights into its applications. 1400 surveys were sent that only received 234 responses. The results revealed that AI applications were not used in the work of 40.2% of the participants. 35.9% do not know the difference between machine learning and deep learning. The daily use of AI work applications was noted only in 13.7% of participants. When it comes to attitudes, 82.1% of participants presented suspicions of serious privacy issues relating to AI usage, and 76.9% agreed that AI poses more danger than nuclear weapons with 73% fearing it could replace their jobs in the future. Finally, 88.9% think that AI could be of use in their area of work. These results showed a clear contrast when it comes to agreeing on the possible useful applications of AI in healthcare, the physicians' limited knowledge of AI tools and the fear of the possible consequences of implementing AI in the medical field [15].

The possible applications of AI tools in the healthcare sector could be of great importance, whether it assists in organizing information, in treatment planning or its general time and cost savings uses. These tools, however, could be discarded due to physicians' limited knowledge of AI tools, limited utilization of AI, or their fears that it could replace their jobs in the future. As presented by the aforementioned studies. As such the awareness of AI tools, what they are, how do they function and how they could be implemented needs to be raised in physicians before they can be integrated into the healthcare field. For if these tools were introduced in a field that fears them or is skeptical of them due to restricted knowledge. AI tools could not be utilized to their fullest potential.

Artificial Intelligence Acceptance and Readiness in Healthcare in Saudi Arabia

With the general knowledge and perception regarding AI among healthcare professionals determined, the acceptance and readiness among physicians already employing AI or willing to implement it needs to be gauged. Such as the adequate knowledge, attitudes, skills and preparedness in using AI tools. Which was the purpose of a cross-sectional study aimed to measure the medical and dental professionals AI readiness in Saudi Arabia. 334 medical and dental personnel were questioned. Data analysis indicated the health care professionals had low levels of readiness. Dental practitioners, however, had significantly higher levels of readiness compared to the rest. Arriving at recommending undergraduate and postgraduate training of healthcare professionals in AI [16]. As it has been indicated that younger practitioners had more positive attitude and willingness to employ AI tools compared to older practitioners [17].

Another study questioned 250 employees from 4 of the largest hospitals in Riyadh, Saudi Arabia. Resulting at 3.11 of 4 respondents having fears of AI replacing them and a general lack of knowledge with AI. Indicating a need for training for the respondents were not even aware of the challenges and advantages of using AI. Interestingly, the job replacement fear was more prevalent among technicians as their jobs required the least human interaction [18]. Furthermore, the awareness, perceptions and opinions of King Saud University's pharmacy undergraduate students towards AI was evaluated with a cross-sectional, questionnaire-based study. Of 157 responses 75.2% (n = 118) were males and generally 73.9% (n = 116) had prior knowledge about AI. More importantly, 69.4% (n = 109) students agreed that AI can be helpful to healthcare professionals and 57.3% (n = 90) were aware that AI tools can make healthcare professionals better considering their widespread. With 75.1% of students agreeing that AI can assist in reducing medical errors. Finally concluding that the students displayed better awareness of AI in Saudi Arabia and generally showed more positive perceptions regarding the benefits of AI. Nevertheless, more education and training in AI is still needed.

Table 1: Summary of Key Findings

Aspect	Finding
AI Acceptance	Limited research on AI acceptance among healthcare personnel
AI Readiness	Younger practitioners show more readiness to adopt AI compared to older counterparts
AI Utilization	Majority self-taught, lacking full proficiency
General Sentiment	Presence of fear and reluctance towards AI among healthcare personnel
Educational Integration	Need for AI education at undergraduate and postgraduate levels to reduce fear and improve proficiency

As summarized in **Table 1**, younger practitioners demonstrate a higher readiness to adopt AI compared to their older counterparts, highlighting the importance of targeted educational initiatives.

Recommendations for Future Research and Policy Development:

- 1. Research:** Conduct larger-scale studies to accurately measure AI acceptance and readiness among healthcare personnel in Saudi Arabia
- 2. Education:** Implement robust educational programs focusing on AI for both current and future healthcare professionals to bridge the knowledge gap.

3. **Policy:** Develop policies that support continuous AI training and education, ensuring that healthcare practitioners are well-prepared to adopt AI technologies.
4. **Implementation:** Encourage initiatives that facilitate the practical application of AI in healthcare settings, fostering a culture of innovation and proficiency.

These areas should be addressed so that Saudi Arabia can enhance its position in AI-driven healthcare innovation, improving patient outcomes and the overall quality of healthcare services.

4. Conclusion

This paper has highlighted to evolving landscape of AI integration within the healthcare sector of Saudi Arabia. The current studies reveal a need for more comprehensive research on AI acceptance, readiness, and utilization among healthcare personnel, given the small sample sizes and limited studies on actual AI implementation.

Key findings indicate that those employing AI are often self-taught, lacking full proficiency, while others exhibit fear and reluctance towards AI. Younger practitioners show more readiness to adopt AI compared to their older counterparts. Therefore, integrating AI education at the undergraduate and postgraduate levels is crucial. This can reduce fears and enhance the ability of healthcare professionals to utilize AI to its fullest potential.

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