Review of Contemporary Philosophy
ISSN: 1841-5261, e-ISSN: 2471-089X
Vol 22 (1), 2023
pp. 85–98

Healthcare Professionals' Perceptions of the Use of Artificial Intelligence Applications in Decision Making in Saudi Healthcare Settings

[1]Ahmed Saad Alzahrani, [2]Jawharh Sharf Al-Meer, [3]Saleh mohammed yousef alsaygh, [4]Abdulrahman nasser Mustafa, [5]Abdullah Ibrahim Alqoair, [6]Abdulatif Metaab Almutairi, [7]Maram Ali Alsagabi, [8]Abdullah Salem Almutairi, [9]Mohammad Salem Almutairi, [10]Mohammed Abdulrahman Abdullah Alotaibi, [11]Salman Dubays Mirsan Alharbi, [12]Mashan Faeh Ali Alotaibi, [13]Shayeeaa Faeh Alotabi , [14]Tahani Suad Al Otaibi , [15]Nasser Eid Saad Alotaibi

[1]Speciality Rank //: Nursing Technician
Hospital Work//: Dammam Medical Complex
[2]Nursing Tech, Faysliah Primary Health Care Center
[3]General Dentist, Dental Center North Riyadh
[4]Family Dentistry, Dental Clinics Complex In North Riyadh
[5]General Dentist, Dental Center North Riyadh
[6]Senior Nursing Specialist, Psychiatric Hospital, Al Hasa Health Cluster
[7]Nurse Technician, Al Rass General Hospital
[8]Laboratory Technician, Prince Sultan Hospital
[9]Pharmacy, Alhassa Mental Health Hospital
[10]Medical Laboratory Specialist, Afif General Hospital
[11]Technician-Laboratory,Dhariya Generl Hospital
[12]Technian Laboratory, Al Ateef Health Center
[13]Nursing, Alhawaya East
[14]General Nursing, Jalil Phc
[15]Technician Radiology, Zalm General Hospital

Abstract: This study aimed to assess healthcare professionals' perceptions of the use of artificial intelligence applications in decision making in Saudi healthcare settings. Employing the descriptive quantitative approach, the research utilized a questionnaire as the primary data collection instrument. The research sample included (80) healthcare professionals in at King Fahad Medical City (KFMC) in Riyadh city using the convenience sampling method. The findings from healthcare professionals indicated a cautious optimism about AI tools for patient diagnoses. There is strong confidence in AI's diagnostic capabilities and workload reduction, aligning with literature on AI's efficiency in clinical settings. However, concerns about ethical issues such as patient privacy, informed consent, and algorithmic bias underscore the need for ethical oversight in AI implementation. While there is a positive view of AI's potential to enhance operational efficiency and access to medical information, skepticism remains regarding its effectiveness in reducing medical errors and providing valuable insights. This highlights the importance of validating AI outputs and ensuring healthcare professionals are properly trained. To address these challenges, several recommendations are suggested: creating comprehensive training programs focused on AI data interpretation and ethics, establishing clear ethical guidelines for AI use, promoting standardization of AI tools, conducting regular audits for accuracy, and fostering collaboration among healthcare professionals and data experts. By adopting these strategies,

healthcare organizations can improve the integration of AI tools, build trust, and enhance patient care and operational efficiency.
Keywords: *Artificial Intelligence. Decision Making, Healthcare Professionals, Perceptions, Challenges, Saudi Arabia.*

Received: 25 May 2023 **Revised:** 22 July 2023 **Accepted:** 30 July 2023

1. INTRODUCTION

The rapid advancement of Artificial Intelligence (AI) technologies has transformed various sectors, including healthcare, where decision-making processes are increasingly influenced by computational tools and algorithms (Loftus et al., 2020). As healthcare systems grapple with the complexities of patient care, operational efficiencies, and resource management, the integration of AI applications offers promising solutions (Phillips-Wren & Gain, 2006).

The healthcare landscape is characterized by vast amounts of data generated from patient records, clinical trials, and medical imaging (Secinaro et al., 2021). The utilization of AI in this domain aims to harness this data, providing insights that can lead to improved patient outcomes and enhanced operational efficiency (Jiang et al., 2017). AI applications, which include machine learning, natural language processing, and predictive analytics, have the potential to assist healthcare professionals in diagnosing diseases, personalizing treatment plans, and predicting patient outcomes (Shahid et al., 2019).

AI applications can support various aspects of healthcare decision-making, ranging from administrative tasks to clinical judgments (Giordano et al., 2021). For instance, AI can optimize scheduling processes, manage patient flow, and predict resource needs, thereby enhancing operational efficiencies (Khosravi et al., 2024). In clinical settings, AI technologies can analyze medical images, assist in diagnostic processes, and recommend treatment options based on large datasets (Ogolodom et al., 2023). The ability of AI to process and analyze data at a scale and speed beyond human capability positions it as a valuable tool in the healthcare decision-making arsenal (Fan et al., 2020).

One of the most significant impacts of AI in healthcare is its potential to enhance diagnostic accuracy (Palanca et al., 2019). For example, studies (e.g. Sun & Medaglia, 2019; Loftus et al., 2020) have demonstrated that AI algorithms can outperform human radiologists in detecting certain diseases, such as breast cancer. Such advancements not only improve patient outcomes but also reduce the cognitive burden on healthcare professionals, allowing them to focus on more complex clinical decisions.

AI applications also play a critical role in supporting clinical decision-making (Secinaro et al., 2021). By integrating patient data, medical history, and clinical guidelines, AI can provide evidence-based recommendations tailored to individual patients. This personalized approach can lead to more effective treatment plans and improved patient engagement (Phillips-Wren & Gain, 2006).

International studies showed that AI applications play a role in decision making for healthcare professionals (e.g. Fan et al., 2020; Sun & Medaglia, 2019). In Saudi Arabia, a recent nationwide survey found that only 7% of radiology residents reported using artificial intelligence in their daily practices (Mirza et al., 2022). This suggests that AI's application in healthcare is likely to expand significantly in the future. As AI and machine learning (ML) technologies become more prevalent, it is essential for healthcare professionals to develop a solid understanding and positive perceptions of these tools, as they will soon be integrated into clinical workflows. Insufficient knowledge about AI and ML among healthcare workers could lead to suboptimal patient outcomes, primarily due to challenges in selecting effective tools and incorporating them into patient care effectively.

However, the successful implementation of AI in clinical settings relies heavily on the perceptions and acceptance of healthcare professionals (Abdullah & Fakieh, 2020). The perceptions of healthcare professionals regarding AI applications are influenced by several factors, including their familiarity with technology, the perceived reliability of AI systems, and concerns about the implications of AI on their roles. Research indicates

that while many healthcare professionals recognize the potential benefits of AI, there is also skepticism regarding its practical applications and the implications for clinical practice (Jiang et al., 2017). Therefore, this study seeks to examine healthcare professionals' perceptions of the use of artificial intelligence applications in decision making in one of the Saudi large hospitals which King Fahad Medical City (KFMC).

1.2. Statement of the Problem

The healthcare system in Saudi Arabia is undergoing rapid growth and transformation, significantly influenced by the increasing utilization of advanced technologies, particularly AI applications (Syed et al., 2024). This evolution aligns with the broader Vision 2030 to modernize healthcare services, enhance service delivery, and improve patient outcomes across the nation (Saudi Vision 2030). Government investments in digital health initiatives and the adoption of AI tools present substantial opportunities for streamlining operations, supporting clinical decision-making, and fostering innovative healthcare solutions (Alghamdi & Alshban, 2024).

Despite the potential benefits of AI in enhancing diagnostic accuracy, improving patient outcomes, and streamlining workflows, there exists a significant gap in the understanding and acceptance of these technologies among Saudi healthcare providers. A recent survey indicated that only 7% of radiology residents in Saudi Arabia actively utilize AI in their daily practice, underscoring a concerning lack of engagement with these emerging tools (Mirza et al., 2022). This limited adoption raises critical questions about the knowledge and perceptions of healthcare professionals regarding AI and Machine Learning (ML) (Secinaro et al., 2021).

While some healthcare professionals recognize the advantages of AI—such as improved diagnostic capabilities and more efficient workflows—many express mixed feelings about its implementation (Abdullah & Fakieh, 2020). Concerns about job displacement, the reliability of AI systems, and ethical considerations regarding patient care and data privacy contribute to a level of skepticism (Abdo, 2024). This dichotomy in perceptions highlights the need for a comprehensive understanding of healthcare professionals' views on AI applications in decision-making.

A deficiency in understanding AI technologies may hinder effective implementation, potentially leading to suboptimal patient care and outcomes (Alanzi, 2023). As AI continues to evolve and play a more prominent role in clinical settings, it is imperative to investigate the perceptions of healthcare professionals, identify barriers to adoption, and address the knowledge gaps that could impede the successful integration of AI applications in decision-making processes (Shawli, 2024; Mirza, 2022).

By examining these dynamics within a significant healthcare setting like King Fahad Medical City (KFMC), this study aims to uncover the underlying factors influencing attitudes towards AI. Understanding these perceptions is essential for developing effective strategies that facilitate AI integration in Saudi Arabia's healthcare system, ensuring the realization of AI's potential benefits while addressing the concerns of healthcare professionals. Ultimately, fostering a positive perception of AI among healthcare workers will be crucial for the successful implementation and sustainability of these advanced technologies in the evolving healthcare landscape.

1.3. Research Questions

This research seeks to answer the following questions:

1. How do healthcare professionals perceive the role of AI Applications in decision making at KFMC?
2. What are the challenges of using AI Applications in decision making at KFMC from the perspective of healthcare professionals?

1.4. Research Objectives

This study aims to achieve the following objectives:

1. To examine healthcare professionals' perceptions of the role of AI applications in decision-making at KFMC.
2. To identify the challenges faced by healthcare professionals in using AI applications for decision-making at KFMC.

1.5. Research Significance

This research contributes to the growing body of literature on AI applications in healthcare by providing insights into the perceptions of healthcare professionals in Saudi Arabia. Given the rapid advancements in AI technology, understanding how these professionals perceive AI's role in decision-making is crucial. This study will help bridge the knowledge gap by elucidating the current level of familiarity and acceptance of AI among healthcare workers, thereby informing educational initiatives and training programs aimed at enhancing their competence in utilizing these technologies.

The findings of this study have the potential to inform healthcare policies and practices in Saudi Arabia. As the healthcare sector increasingly integrates AI solutions, it is essential for policymakers to understand the attitudes and concerns of frontline healthcare workers. By identifying barriers to AI adoption and areas of resistance, this study can guide the development of strategies that promote the effective integration of AI into clinical workflows, ensuring that these technologies are used to their fullest potential to improve patient care.

The perceptions of healthcare professionals regarding the use of AI applications in decision-making are critical to the successful integration of these technologies in clinical practice. While there is a recognition of the potential benefits of AI, concerns about data privacy, algorithm interpretability, and the implications for professional roles persist. Addressing these challenges through targeted training, transparent communication, and collaborative efforts among stakeholders will be essential for fostering a positive perception of AI in healthcare. As the field continues to evolve, understanding and addressing the perceptions of healthcare professionals will play a pivotal role in harnessing the full potential of AI applications in decision-making.

1.6. Research Scope

This study investigates the utilization of artificial intelligence (AI) applications in decision-making processes, specifically within the context of King Fahad Medical City (KFMC), a prominent public hospital located in Riyadh, Saudi Arabia. The focus of this research is exclusively on the perceptions of healthcare professionals, aiming to explore their views regarding the role of AI applications in decision-making and the associated challenges they face. The study encompasses healthcare professionals of all genders and nationalities, ensuring a comprehensive representation of perspectives. An online questionnaire serves as the primary data collection instrument, facilitating a quantitative analysis of the findings. The data collection phase was conducted over a duration of one month.

2. LITERATURE REVIEW

AI applications are increasingly utilized in clinical decision-making, where they assist healthcare providers in diagnosing diseases, predicting patient outcomes, and personalizing treatment plans (Loftus et al., 2020). For instance, AI algorithms can analyze vast amounts of medical data, including imaging studies, laboratory results, and patient histories, to identify patterns that may not be immediately apparent to human clinicians (Phillips-Wren & Gain, 2006). This capability is particularly evident in fields such as radiology, where AI systems have demonstrated proficiency in detecting conditions like breast cancer and diabetic retinopathy with accuracy comparable to that of experienced radiologists (Secinaro et al., 2021).

Moreover, AI-driven Clinical Decision Support Systems (CDSS) provide real-time recommendations to clinicians, enhancing their ability to make informed decisions (Jiang et al., 2017). These systems leverage machine learning and natural language processing to synthesize information from diverse sources, thereby facilitating timely and accurate clinical judgments (Shahid et al., 2019). The integration of AI in clinical settings not only improves diagnostic accuracy but also reduces the cognitive load on healthcare providers, allowing them to focus on patient care (Giordano et al., 2021).

Beyond individual clinical decisions, AI applications play a crucial role in organizational decision-making within healthcare systems (Khosravi et al., 2024). AI tools can optimize resource allocation, streamline operations, and enhance patient flow management (Ogolodom et al., 2023). For example, predictive analytics powered by AI can forecast patient admissions and discharges, enabling healthcare facilities to allocate staff

and resources more effectively (Fan et al., 2020). This proactive approach to management helps mitigate bottlenecks in care delivery and improves overall operational efficiency (Palanica et al., 2019).

Artificial intelligence applications in healthcare decision-making are diverse and continually evolving, leveraging advanced technologies to enhance patient care and improve operational efficiency. One prominent area of application is diagnostic imaging, where AI algorithms, particularly those utilizing deep learning, are increasingly employed to analyze medical images such as X-rays, MRIs, and CT scans (Sun & Medaglia, 2019). For example, IBM Watson Health utilizes AI to assist radiologists by detecting anomalies in imaging studies, such as tumors or fractures, with remarkable accuracy (Loftus et al., 2020). This capability not only enhances diagnostic precision but also supports timely interventions.

Another critical application is found in Clinical Decision Support Systems (CDSS) (Secinaro et al., 2021_. These AI-driven systems provide real-time recommendations to healthcare providers based on patient data. Epic Systems, for instance, integrates AI tools with Electronic Health Records (EHR) to deliver alerts and treatment suggestions that align with current clinical guidelines (Abdo, 2024). By synthesizing vast amounts of patient information, CDSS can significantly improve the quality of clinical decisions and reduce the likelihood of errors.

Predictive analytics is another powerful AI application that analyzes historical patient data to forecast future outcomes, such as readmission rates or disease progression (Giordano et al., 2021). The use of Natural Language Processing (NLP) in healthcare is also gaining traction, as it helps extract meaningful information from unstructured data found in clinical notes and medical literature (Jiang et al., 2017). Google Health has developed NLP tools that analyze clinical notes to identify patient health risks and provide treatment suggestions, thereby enhancing clinical decision-making (Ogolodom et al., 2023). By transforming unstructured data into actionable insights, NLP applications can significantly support healthcare providers in their decision-making processes.

Despite the promising potential of AI in healthcare decision-making, several challenges and ethical considerations must be addressed. One significant concern is the potential for bias in AI algorithms, which can arise from the data used to train these systems (Fan et al., 2020). If the training data is not representative of diverse patient populations, AI applications may inadvertently perpetuate health disparities (Sun & Medaglia, 2019).

Additionally, the integration of AI into clinical workflows raises questions about accountability and transparency (Mirza, 2022; Shwali, 2024). Healthcare providers must understand how AI systems arrive at their recommendations to maintain trust and ensure patient safety. This necessitates the development of clear guidelines and governance frameworks that address the ethical implications of AI use in healthcare (Giordano et al., 2021).

The exploration of perceptions regarding AI applications in healthcare reveals a complex landscape marked by both optimism and concern. Recent studies, including Sommer et al. (2024), Syed et al. (2024), Shawli et al. (2024), and others, provide valuable insights into how different stakeholders view AI applications across various contexts.

Sommer et al. (2024) conducted research in Germany, focusing on nurses' perceptions, experiences, and knowledge about AI. Their findings indicated that while nurses associate AI with essential functions such as decision-making and learning, they also express concerns about its uncontrollability and potential threats, with administrative staff seen as the primary beneficiaries. This highlights an ambivalence within the nursing profession towards AI—a recognition of its benefits coupled with apprehensions about its implications.

In Saudi Arabia, Syed et al. (2024) assessed public perceptions of AI in healthcare, finding a generally favorable opinion among 830 participants. This positive outlook suggests a readiness for AI integration in healthcare, emphasizing the need for health management strategies that prioritize patient safety during this transition. Complementing this, Shawli et al. (2024) explored the views of physical therapists, who raised significant concerns regarding ethical issues and patient privacy in the context of AI adoption. The emphasis on

establishing guidelines for AI in rehabilitation underscores the necessity of addressing ethical considerations to foster acceptance among healthcare professionals.

Further investigations, such as those by Baghdadi et al. (2024), revealed that while patients are interested in understanding AI's role in diagnostic radiology, they still value personal interaction with healthcare providers. This points to a crucial gap in the integration of AI—balancing technological advancements with the human aspect of care.

Alanzi (2023) examined the impact of AI tools like ChatGPT on teleconsultations, identifying both positive and negative themes. While AI enhances efficiency and communication, concerns regarding misdiagnosis and ethical issues persist, echoing the sentiments found in other studies. Similarly, Abdullah and Fakieh (2020) highlighted a lack of awareness among healthcare employees about the advantages and challenges of AI, indicating a critical need for targeted training programs to prepare professionals for AI integration.

Sarwar et al. (2019) found positive attitudes towards AI among pathologists, with a significant proportion expressing excitement about its potential to enhance diagnostic quality and workflow efficiency. This enthusiasm, however, contrasts with the apprehensions voiced in other studies, illustrating a varied landscape of acceptance across different healthcare roles.

The concerns regarding job displacement due to AI, as discussed by Brougham and Haar (2018), and the mixed feelings of HR professionals about AI's role in recruitment and employee management (Alamanova, 2018), further illustrate the uncertainty surrounding AI's integration into existing professional frameworks. Oh et al. (2019) found that while doctors generally maintain a positive attitude towards AI, many believe it will not replace their roles, emphasizing a desire for collaboration between human expertise and AI capabilities.

Despite the wealth of research on AI perceptions among various healthcare stakeholders, significant gaps remain, particularly in the context of Saudi healthcare settings. While previous studies have explored perceptions among specific groups—such as nurses, physical therapists, public opinions, and patients—there is a lack of comprehensive research focusing on the voices of healthcare professionals as a collective entity within Saudi Arabia.

The current study aims to fill this gap by providing a holistic view of how various healthcare providers perceive AI's role in decision-making processes. This research will not only address the existing concerns and knowledge gaps identified in previous studies but also explore the collaborative dynamics between different healthcare roles in adopting AI technologies.

Moreover, the current study will investigate the implications of these perceptions on clinical workflows and patient outcomes, a critical aspect that has not been thoroughly examined in the existing literature. By focusing on healthcare professionals' collective experiences and insights, this research will contribute significantly to understanding how to effectively integrate AI into Saudi healthcare, ultimately improving patient care and organizational efficiency.

3. RESEARCH METHODOLOGY

3.1. Research Design

This study uses the descriptive approach in its quantitative form. The descriptive quantitative approach is a research methodology that focuses on systematically describing the characteristics of a population or phenomenon (Crowther & Lancaster, 2012). This approach is particularly useful in fields such as healthcare, social sciences, and education, where researchers seek to gather measurable data to understand patterns, relationships, and trends within specific contexts. By emphasizing objective data collection and analysis, this methodology allows researchers to present findings that are quantifiable and replicable, thereby reducing researcher bias and increasing the validity of the results.

Researchers employing a descriptive quantitative approach typically utilize structured data collection methods, such as surveys and questionnaires designed with closed-ended questions that can be quantitatively analyzed (Walliman, 2021). These tools enable the gathering of information on respondents' demographics, attitudes, behaviors, and experiences. Additionally, systematic observations may be employed to quantify behaviors or

events, often using checklists or rating scales. Researchers can also analyze existing databases and records, extracting relevant information about health outcomes or demographic trends from secondary data sources.

3.2. Participants

The participants in this study included all healthcare professionals employed at King Fahad Medical City (KFMC) in Riyadh. The research population comprised 400 healthcare professionals. To facilitate recruitment and enhance cost-effectiveness, the study employed a convenience sampling method. Participants were approached and invited to participate voluntarily. Those who consented to take part were given a brief overview of the role of artificial intelligence (AI) in decision-making. Following this, they were asked to complete a self-administered electronic questionnaire, administered via Google Forms, available in both Arabic and English according to their preferences. Ultimately, the researchers collected 80 responses from the participants, which were subsequently subjected to statistical analysis.

3.3. Data Collection

The researcher employed a questionnaire as the primary data collection instrument for this study. The questionnaire was designed by the researchers by getting insights from the relevant studies. It consisted of two sections: the first section gathered demographic information from participants, including three variables: education level, job title, and years of experience. The second section contained 24 items distributed equally across two sections. The first section consisted of (12) statements that address the healthcare professionals' perceptions of the role of AI applications in decision-making at KFMC. The second section consisted of (12) statements that address the challenges faced by healthcare professionals in using AI applications for decision-making at KFMC.

To measure responses, a five-point Likert scale was utilized, offering the following options: strongly agree (5), agree (4), neutral (3), disagree (2), and strongly disagree (1).

The content validity of the questionnaire was established by submitting it to a panel of experts in healthcare management. The researcher addressed the feedback and suggestions provided by the experts, leading to the development of a final version of the questionnaire. Additionally, the reliability of the instrument was assessed using Cronbach's Alpha, with the results presented in Table 3.1.

Table 3.1

Cronbach's Alpha for Questionnaire Reliability

Sections	No of Items	Cronbach's Alpha
The Role of AI applications in Decision-Making	12	0.822
Challenges of Using AI Applications in Decision-Making	12	0.798

Table 3.1 demonstrates robust reliability, suggesting that the questionnaire is a dependable tool for capturing healthcare professionals' perceptions regarding AI in decision-making. These findings enhance the credibility of the data collected and affirm the suitability of the questionnaire for subsequent statistical analyses.

Study.

Participants were informed about the purpose of the questionnaire and provided their informed consent to participate in the research. They were assured that their responses would be kept confidential. Prior to distributing the questionnaire, approval was obtained from the hospital management to ensure adherence to institutional guidelines. The questionnaires were administered to participants during their regular working hours, with a request for them to return the completed questionnaires by the following day.

Upon data collection, the researchers conducted a statistical analysis to derive the results, ensuring a thorough examination of the responses gathered from the participants.

Data Analysis

The Statistical Package for the Social Sciences (SPSS) software was utilized for data analysis. The following statistical tools were employed in this research:

1. **Percentage and Frequency:** they are used to indicate the percentage and frequency for each data point.
2. **Standard Deviation:** This is employed to indicate the degree of variation present among participants' responses.
3. **Mean:** This measure was used to determine the relative importance of items in relation to the study outcomes.
4. **Cronbach's Alpha:** this measure was used to determine the reliability of the questionnaire.

4. RESULTS & DISCUSSION

This section presents the research findings derived from the questionnaire, along with a discussion of these results in light of relevant literature.

Table 4.1

Demographics of the Participants

Education	**Frequency**	**Percentage**
Master	21	26.25%
Doctorate	18	22.5%
Bachelor	41	51.25%
Total	**80**	**%100**
Years of Experience	**Frequency**	**Percentage**
Less than 5 years	13	16.25%
From 5 to less than 10 years	25	31.25%
From 10 to less than 15 years	17	21.25%
More than 15 years	25	31.25%
Total	**80**	**%100**
Job	**Frequency**	**Percentage**
Nursing	28	38%
Physician	15	18.75%
Technician	29	36.25%
Pharmacists	8	10%
Total	**80**	**%100**

Table 4.1 provides a detailed overview of the educational background, years of experience, and job roles of the participants in the study.

In terms of education, the majority of the respondents hold a Bachelor's degree, comprising 51.25% of the sample. This is followed by those with a Master's degree, making up 26.25%, and Doctorate holders at 22.5%. This distribution indicates that more than half of the participants have foundational qualifications, which may influence their perspectives on AI applications in decision-making.

Regarding years of experience, the data reveals that 31.25% of participants have between 5 to less than 10 years of experience, as well as those with more than 15 years of experience. This suggests a significant portion of the workforce has substantial experience in the field. Additionally, 21.25% have between 10 to less than 15 years of experience, while 16.25% have less than 5 years. This variety in experience levels may provide a broad range of insights regarding the implementation of AI technologies in healthcare.

Lastly, in terms of job roles, the largest group of respondents is from the Nursing profession, accounting for 38%. This is closely followed by Technicians at 36.25%. Physicians represent 18.75%, and Pharmacists make

up 10% of the sample. The predominance of nursing and technician roles may reflect the practical engagement with AI tools in clinical settings, as these positions often interact directly with technology in patient care.

Table 4.2

Healthcare Professionals' Perceptions of the Role of AI applications in Decision-Making at KFMC

s	Statements	Responses					Mean	Standard Deviation
		Strongly Agree	Agree	Neuter	Agree	Strongly Disagre		
1	AI applications improve the accuracy of clinical decision-making in my practice.	26	20	24	6	4	3.73	1.21
2	I feel confident in using AI tools to assist with patient diagnoses.	44	15	15	3	3	4.18	1.25
3	AI applications help reduce the workload of healthcare professionals.	38	15	17	6	4	3.96	1.18
4	I believe that AI can provide valuable insights that support clinical judgments.	5	22	28	9	16	2.89	1.11
5	Training on AI technologies is essential for effective utilization in my work.	6	20	30	6	18	2.88	1.11
6	The use of AI has led to more efficient patient management in our hospital.	17	19	26	13	5	3.38	1.15
7	I am concerned about the ethical implications of using AI in patient care.	16	36	18	5	5	3.66	1.17
8	AI applications contribute to reducing medical errors in my department.	9	25	25	6	15	3.09	1.13
9	I believe that AI can personalize treatment options based on individual patient needs.	7	25	30	10	8	3.16	1.11
10	I feel that the hospital leadership supports the integration of AI in our workflows.	6	31	21	12	10	3.14	1.08
11	AI applications have improved my ability to access relevant medical information quickly.	8	34	23	8	7	3.35	1.12
12	I am open to adopting new AI technologies in my practice.	5	29	23	11	12	3.05	1.05
Total Mean		**3.37**						

Table 4.2 presents healthcare professionals' perceptions of the role of AI applications in decision-making at KFMC with mean scores indicating varying levels of agreement across different statements. The highest-rated

statement, "I feel confident in using AI tools to assist with patient diagnoses," received a mean score of 4.18, reflecting strong confidence among healthcare professionals in their ability to utilize AI effectively for diagnostic purposes. This positive sentiment is reinforced by the following statement, "AI applications help reduce the workload of healthcare professionals," which garnered a mean of 3.96. This suggests that respondents view AI as a valuable resource for enhancing efficiency and alleviating some of the burdens associated with their roles.

The perception that "AI applications improve the accuracy of clinical decision-making in my practice" ranks third, with a mean score of 3.73. This indicates that healthcare professionals recognize the potential of AI to enhance decision-making accuracy, albeit with slightly less enthusiasm than their confidence in using these tools. Additionally, the mean score of 3.66 for the statement "I am concerned about the ethical implications of using AI in patient care" highlights a significant awareness of the ethical considerations surrounding AI integration, suggesting that while there is optimism about AI's capabilities, ethical concerns are a notable focus.

Further down the scale, the statement "The use of AI has led to more efficient patient management in our hospital" received a mean of 3.38, indicating a moderate perception of AI's effectiveness in improving patient management. Similarly, "AI applications have improved my ability to access relevant medical information quickly," with a mean score of 3.35, suggests that while some benefits are recognized, there remains room for improvement in how AI supports medical information access.

The statements regarding personalization and institutional support are met with more neutral responses. The statement "I believe that AI can personalize treatment options based on individual patient needs" received a mean of 3.16, indicating uncertainty about AI's effectiveness in tailoring treatments. Furthermore, the perception of hospital leadership support for AI integration, with a mean score of 3.14, reflects a moderate belief in institutional backing, which is critical for successful AI adoption.

The perception that "AI applications contribute to reducing medical errors in my department" received a mean of 3.09, indicating some belief in AI's potential to minimize errors, though skepticism remains. This skepticism extends to the statement "I am open to adopting new AI technologies in my practice," which received a lower mean of 3.05, suggesting that while there is some openness, hesitations may persist among healthcare professionals regarding new technologies.

Lastly, the two statements with the lowest mean scores—"I believe that AI can provide valuable insights that support clinical judgments" (mean 2.89) and "Training on AI technologies is essential for effective utilization in my work" (mean 2.88)—indicate a lack of consensus on the value of AI insights and a perceived lack of necessity for training.

Overall, the findings, represented by an average mean score of 3.37, suggest a generally positive but cautious attitude among healthcare professionals towards AI applications in decision-making. This finding corresponds with the findings of several studies such as Jiang et al (2017) and Shahid et al (2019) who reported that while there is confidence in certain aspects of AI, such as its role in diagnostics and workload reduction, significant concerns regarding ethical implications, the need for training, and the perceived value of AI insights highlight the importance of addressing both the potential benefits and challenges of integrating AI technologies into healthcare practices. Also, this finding is supported by Fan et al (2020) who reported that this balanced perspective is essential for enhancing acceptance and promoting effective utilization of AI in clinical settings.

The healthcare professionals expressed high confidence in AI's diagnostic capabilities and its potential to reduce workload, aligning with previous studies that highlight AI's effectiveness in enhancing diagnostic accuracy and streamlining clinical tasks (Loftus et al., 2020; Secinaro et al., 2021).This confidence reflects a broader trend in healthcare, where AI is increasingly recognized for its ability to assist clinicians in making informed decisions and improving efficiency in patient care (Alghamdi & Ashban, 2024; Baghdadi et al., 2024). The findings suggest that as AI technologies continue to develop, they could play a pivotal role in transforming healthcare delivery by supporting professionals in their daily responsibilities.

Table 4.3

s	Statements	Responses					Mean	Standard Deviation
		Strongly Agree	Agree	Neuter	Agree	Strongly Disagre		
1	I have concerns about the accuracy of AI-generated recommendations in patient care.	2	37	18	12	11	3.09	1.09
2	Data privacy concerns hinder my willingness to use AI applications in decision-making.	3	23	24	18	12	2.84	1.01
3	I believe that the cost of implementing AI technologies is a significant barrier for our hospital.	6	25	24	12	13	2.99	1.09
4	I find it challenging to interpret the data provided by AI applications.	7	30	26	6	11	3.20	1.13
5	The lack of standardization in AI tools creates difficulties in their application across departments.	2	21	29	15	13	2.80	1.04
6	I worry that AI may lead to job displacement within the healthcare workforce.	3	25	27	13	12	2.93	1.08
7	The integration of AI into existing workflows is often disruptive and inefficient.	2	37	18	12	11	3.09	1.09
8	Technical issues and system failures with AI applications are a frequent concern.	3	23	24	18	12	2.84	1.01
9	I believe that AI tools can undermine the importance of human judgment in clinical decision-making.	6	25	24	12	13	2.99	1.09
10	There is a lack of clear guidelines on how to effectively use AI in my practice.	7	30	26	6	11	3.20	1.13
11	Communication barriers exist when integrating AI tools into multidisciplinary teams.	2	21	29	15	13	2.80	1.04
12	The complexities of AI systems make them difficult to understand for many healthcare professionals.	3	25	27	13	12	2.93	1.08
Total Mean		**2.97**						

Table 4.3 shows that the healthcare professionals at KFMC reported several challenges related to using AI applications in decision-making. The most prominent concern was the accuracy of AI-generated recommendations, with a mean score of 3.09. This suggests a significant level of apprehension regarding the reliability of AI's suggestions in patient care. Similarly, concerns about data privacy (mean = 2.84) and the disruptive and inefficient integration of AI into existing workflows (mean = 3.09) were also noteworthy. The difficulty in interpreting AI-generated data (mean = 3.20) and the lack of clear guidelines for effective AI use (mean = 3.20) further highlight the need for improved user support and training.

Other challenges included the perceived high cost of implementation (mean = 2.99), fears of job displacement (mean = 2.93), and the lack of standardization across AI tools (mean = 2.80), which creates difficulties in their application across departments. Concerns about AI undermining human judgment (mean = 2.99) and communication barriers during multidisciplinary team integration (mean = 2.80) also emerged. The complexity of AI systems (mean = 2.93) was identified as a barrier to understanding and effective utilization.

The overall mean score of 2.97 indicates a generally negative perception of the challenges associated with AI implementation at KFMC. These findings emphasize the need to address concerns about accuracy, data privacy, workflow integration, data interpretation, and the lack of clear guidelines and standardization to facilitate the successful and confident adoption of AI in clinical decision-making.

This apprehension about the reliability of AI suggestions in patient care is consistent with findings from previous studies that highlight concerns over the accuracy and dependability of AI systems in clinical settings (Mirza, 2022; Sun & Medaglia, 2019). These studies indicate that inaccuracies in AI outputs can lead to misdiagnoses or inappropriate treatment plans, reinforcing the need for robust validation of AI tools.

Concerns about data privacy were also prominent among KFMC professionals. This aligns with literature emphasizing the critical importance of safeguarding patient information when implementing AI technologies (Khosravi et al., 2024). The potential for data breaches and the misuse of sensitive information raises significant ethical questions that need to be addressed to foster trust in AI applications.

Additionally, the disruptive and inefficient integration of AI into existing workflows presents a notable challenge. Previous research has shown that integrating new technologies into established systems can lead to operational disruptions, resulting in resistance from staff and inefficiencies in patient care (Giordano et al., 2021). The difficulty in interpreting AI-generated data further underscores the necessity for improved user support and comprehensive training programs, as highlighted by studies advocating for better education on AI tools to enhance their usability (Abdo, 2024; Alanzi, 2023).

Other challenges identified included the perceived high cost of implementation and fears of job displacement. These issues reflect concerns noted in the literature regarding the economic implications of adopting AI technologies and the potential impact on the workforce (Ogolodom et al., 2023). The lack of standardization across AI tools also complicates their application within healthcare settings, echoing findings from other studies that highlight the need for uniform protocols to ensure effective use (Shawli, 2024).

Concerns about AI undermining human judgment and communication barriers during multidisciplinary team integration further complicate the adoption of AI. Research has indicated that reliance on AI can sometimes lead to devaluation of human expertise, which can affect team dynamics and decision-making processes (Loftus et al., 2020). The complexity of AI systems poses additional challenges, as healthcare professionals may struggle to understand and effectively utilize these technologies without adequate training and support (Secinaro et al., 2021).

5. CONCLUSION & RECOMMENDATIONS

The findings from healthcare professionals at KFMC illustrate a landscape of cautious optimism regarding AI tools for patient diagnoses. While there is strong confidence in AI's diagnostic capabilities and its potential to reduce workload, reflecting literature that supports AI's ability to enhance efficiency in clinical settings, concerns about ethical implications also emerge prominently. The growing awareness of issues such as patient privacy, informed consent, and algorithmic bias highlights the need for ethical oversight in the adoption of AI technologies.

Moreover, although there is a positive outlook on AI's ability to improve operational efficiency and access to medical information, skepticism remains regarding its effectiveness in reducing medical errors and providing valuable insights. This underscores the importance of validating AI outputs and ensuring that healthcare professionals are well-equipped to utilize these tools effectively. The identified gap in training indicates a critical need for enhanced educational support to facilitate the successful integration of AI into healthcare practices.

The challenges faced by healthcare professionals at King Fahad Medical City (KFMC) regarding the use of AI applications in decision-making highlight significant concerns about accuracy, data privacy, workflow integration, and the potential impact on clinical judgment. While there is recognition of the benefits AI can bring to healthcare, these apprehensions underscore the need for comprehensive strategies to ensure successful implementation. Addressing these challenges is essential for fostering trust and confidence in AI technologies, which can ultimately enhance patient care and operational efficiency.

To enhance the effective integration of AI tools in healthcare settings, several recommendations can be made based on the findings from healthcare professionals. First, it is crucial to develop comprehensive training programs tailored for healthcare professionals. These programs should focus on the interpretation of AI-generated data, ethical considerations, and practical applications of AI technologies. By equipping professionals with the necessary skills and knowledge, organizations can alleviate concerns about the reliability of AI systems and foster confidence in their use. Ongoing education and training will ensure that staff remain updated on advancements in AI and its implications for patient care.

Second, establishing clear ethical guidelines for the use of AI in healthcare is essential. These guidelines should address critical issues such as patient privacy, informed consent, and algorithmic bias. By creating a framework for responsible AI implementation, healthcare organizations can build trust among professionals and patients alike. Regular reviews and updates of these guidelines will help ensure they remain relevant as technology evolves.

Third, promoting standardization across AI tools used in healthcare is vital. This can reduce confusion and streamline the integration process across different departments. Standardized protocols will also facilitate better data sharing and collaboration among healthcare teams, ultimately enhancing patient care.

Fourth, conducting regular audits and evaluations of AI systems will help ensure their accuracy and effectiveness. By monitoring the performance of AI applications, healthcare organizations can identify potential issues early and make necessary adjustments. This proactive approach will contribute to the continuous improvement of AI technologies and their impact on clinical decision-making.

Finally, fostering a culture of multidisciplinary collaboration is essential for the successful adoption of AI in healthcare. Encouraging communication and teamwork among healthcare professionals, data scientists, and ethicists can help address the complexities associated with AI integration. This collaborative approach will promote a deeper understanding of AI tools and enhance their effective utilization in clinical settings.

REFERENCES

[1] Abdo, K. W. (2024). The role of artificial intelligence in improving healthcare operations in Saudi Arabia: Analytical study of current and future systems. *Nanotechnology Perceptions*, 743-758.

[2] Abdullah, R., & Fakieh, B. (2020). Health Care Employees' Perceptions of the Use of Artificial Intelligence Applications: Survey Study. *Journal of medical Internet research*, *22*(5), e17620.

[3] Alamanova, M. (2018). The Perception of Artificial Intelligence and Other Technological Innovations Among Human Resources Specialists. *Tallinn, Estonia: Tallinn University Of Technology*.

[4] Alanzi, T. M. (2023). Impact of ChatGPT on teleconsultants in healthcare: perceptions of healthcare experts in Saudi Arabia. *Journal of multidisciplinary healthcare*, 2309-2321.

[5] Alghamdi, S. A., & Alashban, Y. (2024). Medical science students' attitudes and perceptions of artificial intelligence in healthcare: A national study conducted in Saudi Arabia. *Journal of Radiation Research and Applied Sciences*, *17*(1), 100815.

[6] Baghdadi, L. R., Mobeirek, A. A., Alhudaithi, D. R., Albenmousa, F. A., Alhadlaq, L. S., Alaql, M. S., & Alhamlan, S. A. (2024). Patients' Attitudes Toward the Use of Artificial Intelligence as a Diagnostic Tool in Radiology in Saudi Arabia: Cross-Sectional Study. *JMIR Human Factors*, *11*(1), e53108.

[7] Brougham, D., & Haar, J. (2018). Smart technology, artificial intelligence, robotics, and algorithms (STARA): Employees' perceptions of our future workplace. *Journal of Management & Organization, 24*(2), 239-257.

[8] Crowther, D., & Lancaster, G. (2012). *Research methods*. Routledge.

[9] Fan, W., Liu, J., Zhu, S., & Pardalos, P. M. (2020). Investigating the impacting factors for the healthcare professionals to adopt artificial intelligence-based medical diagnosis support system (AIMDSS). *Annals of Operations Research*, *294*(1), 567-592.

[10] Giordano, C., Brennan, M., Mohamed, B., Rashidi, P., Modave, F., & Tighe, P. (2021). Accessing artificial intelligence for clinical decision-making. *Frontiers in digital health*, *3*, 645232.

[11] Jiang, F., Jiang, Y., Zhi, H., Dong, Y., Li, H., Ma, S., & Wang, Y. (2017). Artificial intelligence in healthcare: past, present and future. *Stroke and vascular neurology*, *2*(4).

[12] Khosravi, M., Zare, Z., Mojtabaeian, S. M., & Izadi, R. (2024). Artificial intelligence and decision-making in healthcare: a thematic analysis of a systematic review of reviews. *Health services research and managerial epidemiology*, *11*, 23333928241234863.

[13] Loftus, T. J., Tighe, P. J., Filiberto, A. C., Efron, P. A., Brakenridge, S. C., Mohr, A. M. & Bihorac, A. (2020). Artificial intelligence and surgical decision-making. *JAMA surgery*, *155*(2), 148-158.

[14] Mirza, A. A., Wazgar, O. M., Almaghrabi, A. A., Ghandour, R. M., Alenizi, S. A., Mirza, A. A. & Aljuaid, S. M. (2022). The use of artificial intelligence in medical imaging: A nationwide pilot survey of trainees in Saudi Arabia. *Clinics and Practice*, *12*(6), 852-866.

[15] Ogolodom, M. P., Ochong, A. D., Egop, E. B., Jeremiah, C. U., Madume, A. K., Nyenke, C. U., & Nwodo, V. K. (2023). Knowledge and perception of healthcare workers towards the adoption of artificial intelligence in healthcare service delivery in Nigeria. *AG Salud, 1*, 16-16.

[16] Oh, S., Kim, J. H., Choi, S. W., Lee, H. J., Hong, J., & Kwon, S. H. (2019). Physician confidence in artificial intelligence: an online mobile survey. *Journal of medical Internet research*, *21*(3), e12422.

[17] Palanica, A., Flaschner, P., Thommandram, A., Li, M., & Fossat, Y. (2019). Physicians' perceptions of chatbots in health care: cross-sectional web-based survey. *Journal of medical Internet research*, *21*(4), e12887.

[18] Phillips-Wren, G., & Jain, L. (2006, October). Artificial intelligence for decision making. In *International Conference on Knowledge-Based and Intelligent Information and Engineering Systems* (pp. 531-536). Berlin, Heidelberg: Springer Berlin Heidelberg.

[19] Sarwar, S., Dent, A., Faust, K., Richer, M., Djuric, U., Van Ommeren, R., & Diamandis, P. (2019). Physician perspectives on integration of artificial intelligence into diagnostic pathology. *NPJ digital medicine*, *2*(1), 28.

[20] Saudi Vision 2030. (2016). *Vision 2030 Kingdom of Saudi Arabia*. https://www.vision2030.gov.sa

[21] Secinaro, S., Calandra, D., Secinaro, A., Muthurangu, V., & Biancone, P. (2021). The role of artificial intelligence in healthcare: a structured literature review. *BMC medical informatics and decision making*, *21*, 1-23.

[22] Shahid, N., Rappon, T., & Berta, W. (2019). Applications of artificial neural networks in health care organizational decision-making: A scoping review. *PloS one*, *14*(2), e0212356.

[23] Shawli, L., Alsobhi, M., Chevidikunnan, M. F., Rosewilliam, S., Basuodan, R., & Khan, F. (2024). Physical therapists' perceptions and attitudes towards artificial intelligence in healthcare and rehabilitation: A qualitative study. *Musculoskeletal Science and Practice*, *73*, 103152.

[24] Sommer, D., Schmidbauer, L., & Wahl, F. (2024). Nurses' perceptions, experience and knowledge regarding artificial intelligence: results from a cross-sectional online survey in Germany. *BMC nursing*, *23*(1), 205.

[25] Sun, T. Q., & Medaglia, R. (2019). Mapping the challenges of Artificial Intelligence in the public sector: Evidence from public healthcare. *Government Information Quarterly*, *36*(2), 368-383.

[26] Syed, W., Babelghaith, S. D., & Al-Arifi, M. N. (2024). Assessment of Saudi Public Perceptions and Opinions towards Artificial Intelligence in Health Care. *Medicina (Kaunas, Lithuania)*, *60*(6), 938.

[27] Walliman, N. (2021). *Research methods: The basics*. Routledge.