

## "The Reality of Using Artificial intelligence "AI" in Hospitals and Health Care Centers as Seen by Workers in Medicine, Nursing, Laboratory, Public Health, Nutrition, and Health Information in Riyadh Region"

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### **Abstract**

*This study aimed to identify the reality of Using Artificial intelligence "AI" in Hospitals and Health Care Centers as Seen by Workers in Medicine, Nursing, Laboratory, Public Health, Nutrition, and Health Information in Riyadh Region. The study followed the descriptive survey method. The study sample consisted of (80) workers in medicine, nursing, laboratory, public health, health information, and nutrition, and a questionnaire was used to collect data consisting of (18) items distributed among the fields of artificial intelligence: (databases used, senior management support, users system, computerized health). Information systems used and performance improvement. Results showed that the arithmetic averages of the study sample's responses to the reality of applications of artificial intelligence fields in health administration in the General Directorate of Health Affairs in the Riyadh region ranged between (3.40-3.12), with an average application rate for all fields, and the field of databases used came in first place. In health administration, with a mean of (3.40) and a moderate degree, followed by the field of Support senior management, with a mean of (3.36) and a moderate degree, the "Users of the system" field came third, with an arithmetic mean of (3.32) and a moderate degree, followed by the field Computerized health information systems used, with an arithmetic mean (3.28) and a moderate degree, and the field of Improve the Performance came in last place, with an arithmetic mean (3.12) and a moderate degree, and the average reached General arithmetic for areas of artificial intelligence applications in health management (3.29), with a moderate degree of application.*

**Keywords:** *Artificial intelligence, Hospitals, Health Care Centers, Medicine, Nursing, Laboratory, Public Health, Nutrition, Health Information.*

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## INTRODUCTION

The Industrial Revolution has brought about tremendous and continuous progress in the field of artificial intelligence and the use of its technical applications in various service fields, including medical care services in hospitals and health care centers (Ali et al., 2022). With the introduction of artificial intelligence, many manual or human tasks have been replaced by technological progress in artificial intelligence innovations (Khattoon & Rehman, 2021). Artificial intelligence (AI) is a major technological advance that has enabled humans to replace manual labor with superior mental capabilities and intellectual levels in a variety of industries (Kumar et al., 2023).

AI has already digitally transformed the manual health system into an automated version in many areas, whereby in some applications, humans are now only required to perform more fundamental duties in medical practice to manage patients and medical resources, leaving complicated procedures to be handled by or dependent on AI components (Dharani & Krishnan, 2021). AI-based healthcare systems are rapidly evolving, particularly for early detection and diagnostic applications (Chen & Hwang, 2020). These developments enable AI to accomplish tasks that humans sometimes cannot perform with the pace, simplicity, reliability and diligence that AI can deliver at a lower cost (Sqalli & Al-Thani, 2019). When Information Systems (IS) developers can effectively design AI systems to carry out specific tasks, the technological advancement from healthcare digitization can also overcome additional challenges, for example, AI can significantly enhance patient care while simultaneously lowering healthcare expenses (Tobore et al., 2019).

The growing human population is likely to increase the need for healthcare services to be delivered at a rapid pace; therefore, innovative AI solutions are needed in the healthcare sector to improve effectiveness and efficiency without increasing costs (Pee et al., 2019). This is one area where AI continues to play a pioneer role in providing innovative solutions. Rapid technological advancements, particularly in the realm of AI, have already supported the management of the healthcare industry's growth (Comito et al., 2020).

Recent AI technologies encompass Big Data, machine learning Applications, and robots that are utilized to monitor, detect, and measure risks and benefits in the healthcare industry (Tsang et al, 2020). To enhance procedures and facilitate the administration of medical services, the healthcare business relies heavily on medical data and analytics. In recent years, the amount of gathered medical data and its dimensions have exponentially expanded. For example, medical professionals, researchers, and patients generate massive amounts of data, such as electronic health records (EHRs), medical imaging data, and other data from various monitoring devices, including health tracking devices and apps, that people are increasingly using in normal circumstances beyond the need for medical attention (Antoniou et al., 2018).

In this environment, AI technology has the capacity to capture data, process it, perform dynamic analyses and produce results that can be effectively used for medical intervention (Anbarasi & Dhivya, 2017). This function is typically executed using machine learning algorithms supported by data storage and processing power (Charan et al., 2018). For example, patient behavior patterns may be able to establish reliable predictions via daily observation of medical data. As a result, AI may offer suggestions toward diagnosis, medical intervention, therapeutic insights and strategies for mitigating health deterioration and supporting proactive strategies to prevent patient conditions from worsening, thereby enhancing patient outcomes at various phases of diagnosis and illness, as well as medication prescription and use. Technologically advanced hospitals are now exploring the use of AI technologies to help improve the accuracy of practice and lower the cost of operations (& AlThani, 2019). By presenting detailed information on a variety of treatment options, AI enables medical staff and patients to make informed decisions about treatment plans (Deng, 2019).

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power. For example, patient behavior patterns may be able to establish reliable predictions via daily observation of medical data. As a result, AI may offer suggestions toward diagnosis, medical intervention, therapeutic insights and strategies for mitigating health deterioration and supporting proactive strategies to prevent patient conditions from worsening, thereby enhancing patient outcomes at various phases of diagnosis and illness, as well as medication prescription and use. Technologically advanced hospitals are now exploring the use of AI technologies to help improve the accuracy of practice and lower the cost of operations (Sqalli & Al-Thani, 2019).

By presenting detailed information on a variety of treatment options, AI enables medical staff and patients to make informed decisions about treatment plans (Deng et al., 2019). Regardless of the AI challenges, one of the most important benefits of AI is its support in preventative care in the healthcare system that promotes all humans to become and remain healthy. For example, apps have been used to give patients more control over their health (Samuel et al., 2022), allowing them to make evidence-based decisions on the matters of preventative health issues, such as type 2 diabetes and high blood pressure. However, early detection and diagnostics of health information require many AI apps (Stamford et al., 2016).

These AI apps are used in a variety of settings to diagnose different types of illnesses for precise, rapid and reliable results, at the simplest level, AI performs a significant level of comparative analysis using Big Data so that information from a patient is compared with data and digital images from huge datasets compiled from other patients in relevant and related settings (Charan et al., 2018). This type of self-learning mechanism recognizes patterns and provides information for medical practitioners to support their diagnosis and intervention strategies (Charan et al., 2018). While supporting this complex medical procedures, AI technologies can also improve the efficiency of medical care administration (Deng et al., 2019).

This systematic review includes a discussion of the benefits, challenges, methodologies, and functionalities related to AI in the health-care sector (Maduri et al., 2020). To fully understand these dimensions of AI, additional research is needed on both the practical and theoretical aspects of AI (Johnson et al., 2022). There are interesting evolving insights of AI, such as the power of AI to exercise doctors' rights and obligations. AI issues regarding privacy protection, and how AI can store, process, edit, and share health data in consideration of permission from patients and ethics committees? Governments could also establish legislative guidelines to secure healthcare data.

Furthermore, raw data acquired from patients and hospital are used by machine learning and expert systems, however while collecting these data, ethical considerations should be considered (Liu et al., 2020). The norms of technology development and health applications must be established to optimally use AI technology in medical care. To meet this objective, this review study presents the state-of-the-art of the application of AI in the healthcare sector and proposes a classification framework to determine the benefits, challenges, methodologies, and functionalities of the use of AI in health services.

AI or machine intelligence is an area of computer science whereby machines are programmed with the ability to perform intelligent tasks that are usually undertaken by humans. Computers and machines use AI techniques to understand, analyze, and learn from data through specifically designed algorithms (Sasubilli et al., 2020). For example, with today's AI technologies, cameras can automatically recognize faces, computers can translate from one language to another, it is easy to search and find products in e-commerce, computers can assist doctors in making decisions and so on (Sasubilli et al., 2020). In the 1930s, Alan Turing developed the first Turing machines for intelligent mathematical calculations that can be undertaken automatically paving a way for the start of the AI technology. AI was founded as an academic discipline since.

### **Artificial Intelligence in Healthcare of Saudi Arabia**

The combination of rising technologies like artificial intelligence and healthcare is one of the hottest topics today, artificial Intelligence is defined as the ability of machines to mimic human intelligence and perform tasks that would normally require human cognition. Integrating artificial intelligence with healthcare has the potential

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to change the way healthcare is delivered and managed to become a comprehensive, effective and integrated health system, as artificial intelligence can help analyze large amounts of data, identify patterns, and even make predictions of future patient outcomes (Alhashmi & Salloum, 2019).

Kingdom Vision (2030) plan, launched by the Saudi government in 2016, includes a comprehensive strategy to transform the healthcare system. The plan aims to create a more patient-centered health care system. It also emphasizes the importance of preventive health care, health education, and reducing health care costs. The program includes several goals, such as increasing the number of health care providers, enhancing health care infrastructure, and applying new health care technologies. It also aims to make the Kingdom one of the most efficient countries in the field of health care (Alijerin & Arfat, 2022).

In light of the development of global health systems, and with the acceleration and increase in the use of artificial intelligence in health care, and research and health organizations racing to adopt artificial intelligence technology to improve the patient experience and help address some of the pressing problems facing health care today, and in order to obtain a deeper understanding of the impact of these emerging technologies. To patients, healthcare professionals and wider society (Ministry of health Saudi Arabia, 2021). To ensure the continued development of health care services in the Kingdom of Saudi Arabia and to focus efforts in this sector to face the challenges related to health services by raising their quality and efficiency, we can discuss the following topics: Excerpts from the current health care situation; A closer look at ways to use artificial intelligence technology in health care; potential future impact; Challenges in implementation and adoption of emerging technologies in health care (Abu Shanab, 2019).

AI in healthcare is an important part of Vision 2030, the Saudi Data and Artificial Intelligence Authority (SDAIA) was created for this purpose, and other entities including the National Healthcare Command and Control Center (NHCCC). According to the 2023 Artificial Intelligence Index report issued by Stanford University, Saudi Arabia has the second largest amount of knowledge and awareness of the benefits of artificial intelligence among countries (Shaban & Buckeridge, 2018). According to the results of this recent index, the Kingdom of Saudi Arabia ranked highly among the most "efficient" countries in the health sector, occupying second place directly after Singapore, recording 44.17 points, and surpassing the overall average of the index in the group of 16 countries, by a difference of 17 points, as this represents Points: Rates of countries' spending on the health care sector versus the returns achieved in the health sector.

As part of the Kingdom Vision 2030 strategy, the first World Summit on Artificial Intelligence was held in September 2020 under the patronage of His Royal Highness Prince Mohammed bin Salman bin Abdulaziz, Crown Prince, Deputy Prime Minister and Minister of Defense. The summit included 30 sessions attended by 60 speakers, including ministers, leaders of global entities, academics, investors and businessmen from 20 countries (Alijerin & Arfat, 2022). Health institutions in the Kingdom of Saudi Arabia are witnessing tremendous technological changes, the most important of which are the applications of Artificial Intelligence, which have brought about radical developments in various health services, which requires the preparation of employees with advanced digital skills to achieve productivity and creativity and are able to fill jobs and professions and meet their requirements in the fields of Artificial intelligence, cryptography, cybersecurity, Internet of Things, mobile application development, etc.

## **Statement Problem**

Various health institutions in the Kingdom of Saudi Arabia have witnessed digital progress in artificial intelligence, and have worked to benefit from artificial intelligence in providing and managing health care services and administrative work in hospitals and health care centers. Thus, it has become available for its medical staff to program; carry out medical tasks, and administrative work through the use of artificial intelligence techniques. By studying the reality of artificial intelligence and its applications in various health institutions in general, it is noted that they still suffer from some kind of difficulties that often appear in the technical or human aspects. Therefore, the study attempts to answer the following question: What is reality of using artificial intelligence "AI" in hospitals and health care centers as Seen by workers in medicine, nursing, laboratory, public health, nutrition, and health information in Riyadh Region?.

## METHODOLOGY AND INSTRUMENT

The study followed the descriptive survey method. The study sample consisted of (80) workers in medicine, nursing, laboratory, public health, health information, and nutrition, and a questionnaire was used to collect data consisting of (18) items distributed among the fields of artificial intelligence: (databases used, senior management support, users system, computerized health). Information systems used and performance improvement.

## RESULTS

To answer the study question, Arithmetic means and deviations were calculated for the study sample's responses on the areas of artificial intelligence applications hospitals and health care centers as Seen by workers in medicine, nursing, laboratory, public health, nutrition, and health information in Riyadh Region. Table (1) shows that:

**Table (1): Arithmetic means and standard deviations of the study sample's responses to the areas of artificial intelligence applications**

Fields	Arithmetic mean	standard deviation	Sig value
Databases used.	3.40	0.78	0.842
Support senior management.	3.36	0.82	0.878
Users of the system.	3.32	0.86	0.762
Computerized health information systems used.	3.28	0.92	0.872
Improve the performance.	3.12	0.96	0.980
All Fields	3.29	0.87	0.866

Table (1) shows that the arithmetic averages of the study sample's responses to the reality of using artificial intelligence "AI" in hospitals and health care centers as seen by workers in medicine, nursing, laboratory, public health, nutrition, and health information in Riyadh Region, The arithmetic averages of the study sample's responses regarding the reality of using artificial intelligence fields in hospitals and health care centers ranged between (3.40-3.12), and the field of databases used came in first place. In health administration, the mean is (3.40) and a medium score, followed by the field of senior management support, with a mean (3.36) and a medium score. The field of "system users" came in third place with a mean of (3.32) and a moderate degree, followed by the field of computerized health information systems used, with a mean of (3.28) and a moderate degree. In last place came the field of performance improvement, with a mean of (3.12) and a moderate degree. The general arithmetic mean for the fields of artificial intelligence was (3.29), with a moderate degree of application.

Also, it is clear from the results shown in Table (1) that the probability value (Sig) of the study fields is greater than the significance level ( $\alpha \leq 0.05$ ). Thus, the distribution of data for these fields follows the natural distribution, where the scientific tests will be used to answer the hypotheses of the study. The following statistical tools were used:

Frequencies & Percentages: to describe the sample of the study.

Arithmetic mean and relative arithmetic mean.

The Cronbach's Alpha test: to determine the persistence of the paragraphs of the questionnaire.

K-S test: Kolmogorov-Smirnov Test: to see whether the data follow normal distribution.

Pearson Correlation Coefficient: to measure the degree of correlation: This test examines the relationship

between two variables. It has been used to calculate internal consistency and structural honesty of the questionnaire, and the relationship between variables.

T test in the case of a single sample: to determine whether the average response has reached the intermediate approval level (3) or increased or decreased. It has been used to ascertain the mean significance of each paragraph of the questionnaire.

## CONCLUSION

The results of the study showed that the arithmetic averages of the study sample's responses to the reality of using artificial intelligence "AI" in hospitals and health care centers as seen by workers in medicine, nursing, laboratory, public health, nutrition, and health information in Riyadh Region, the arithmetic averages of the study sample's responses regarding the reality of using artificial intelligence fields in hospitals and health care centers ranged between (3.40-3.12), and the field of databases used came in first place. In health administration, the mean is (3.40) and a medium score, followed by the field of senior management support, with a mean (3.36) and a medium score. The field of "system users" came in third place with a mean of (3.32) and a moderate degree, followed by the field of computerized health information systems used, with a mean of (3.28) and a moderate degree. In last place came the field of performance improvement, with a mean of (3.12) and a moderate degree. The general arithmetic mean for the fields of artificial intelligence was (3.29), with a moderate degree of application.

## Conclusion

In light of the results of the study, the researchers recommend establishing specialized department using artificial intelligence systems to provide medical services to patients, providing computerized health information in health centers and hospitals, in addition to encouraging medical staff to use artificial intelligence in carrying out their medical or administrative work.

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