THE UTILIZATION OF ARTIFICIAL INTELLIGENCE IN ENHANCING HEALTHCARE QUALITY IMPROVEMENT IN SAUDI ARABIA: SYSTEMATIC REVIEW

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Abstract

Background: The use of artificial intelligence (AI) in healthcare has been one of the processes that guide and influence the management of the healthcare processes. The actualization of the healthcare processes comes with the management of the requirements for sustaining the management of quality. The quality factor would have implications on the generation and actualization of the healthcare processes. Objective: The objective of the review was to appreciate the role of AI in improving the healthcare quality in Saudi Arabia. The review focused on the current use of AI, the role of AI and the best practices to help increase of AI to improve the healthcare quality. Methodology: The research used a systematic review, which focused on the evaluation of the medical literature relating to the use of the AI and the application on healthcare quality. The use of the JBI and PRISMA tools helped in the analysis, which played a critical role in promoting the actualization of the healthcare quality processes. The inclusion and exclusion criteria were implemented using the PRISMA flowchart, which resulted in the selection of 12 publications. Results: The application of the inclusion and exclusion criteria led to the identification of 12 articles that helped on the study of the use of AI in addressing healthcare quality. The main themes came in the role of AI in improving decisions making and actualizing the needs for sustaining the healthcare development needs. The main findings indicated that the use of the AI processes has an impact in improving the healthcare quality, through influencing decisions, their impacts and timeliness in addressing healthcare issues. The main issues came in the lack of commitments and procedures for sustaining the AI systems in Saudi's healthcare systems. Conclusion: The conclusions from the review indicated that the use of AI could help improve the healthcare quality, through improving decisions making and enabling an effective process for addressing the healthcare requirements. The recommendations included the identification of the research on the processes for AI implementation to help address the healthcare quality processes.

Keywords: AI, Saudi's Healthcare System; Improving Healthcare, Quality, AI Concepts.

INTRODUCTION

Healthcare quality is one of the consistent goals in any healthcare system (Housawi et al., 2020). The arguments in healthcare quality have focused on the presence of standards that would determine and influence the realization of the healthcare outcomes. From a global perspective, it is necessary to work with the baselines that would help the healthcare systems to meet the patient needs. The focus has been on the role of the resource allocations and infrastructural development to help suffice the demands for the

healthcare quality development (Chen & Decary, 2020). Intelligence has been developed from the use of advanced skills and qualities that help in addressing the quality needs.

In Saudi Arabia, healthcare quality has included the necessity for investment in healthcare technologies. The healthcare quality has been developed from the integration of the requirements for improving the overall processes for actualizing the healthcare needs (Secinaro et al., 2021). The use of technologies has been recognized as an important process for realizing the overall strategy for handling the issues within healthcare. Through technologies, the development of advanced systems for decision development and implementation has been possible.

Studies on the mandate and roles of the artificial intelligence (AI) concepts have elaborate on the need to sustain quality, through electronic systems (Schwalbe & Wahl, 2020). The development of the intelligence concepts within the decision-making processes would come from the integration of the additional inputs to help manage the issues within the systems (Reddy et al., 2019). The qualitative aspects are important, based on the need to work with the AI inputs that can work towards meeting the required effectiveness. Healthcare organizations capitalize on the intelligence, which can include human and artificial, to boost the approaches for decision making (Abdullah & Fakieh, 2020). The global approaches for improving the quality of outcomes have been related to the use of the commitments to promote the actualization of the healthcare quality needs.

The current review intends to cover the gaps in appreciating the utilization of AI in improving healthcare quality in Saudi Arabia. Since AI has been a consistent input in the healthcare sector, the focus will be to address the information and data on the role of AI in influencing the healthcare quality.

Healthcare quality has been recognized as an important pillar in Saudi Arabia, which justifies the need to study the factors that would influence the improvement in quality (Secinaro et al., 2021). The study will address the problem in appreciating the extent of use of AI and the requirements to ensure that AI can help promote the healthcare quality in Saudi Arabia. The realization of the quality outcomes that are linked to the use of AI will be developed from the various article reviews.

The current review intends to study the role of the artificial intelligence in improving the healthcare quality in Saudi Arabia. The development of the healthcare quality is an important venture that can influence the requirements to develop and sustain the organizational processes. With the inclusion of AI, the focus would be on the benefits in addressing errors and issues that could affect the management of the healthcare management process. The commitments to promote quality and actualization of the healthcare processes would come from the approaches used to address any issues that affect quality. AI has been related to improved management of the healthcare processes, which would be an important process for addressing the needs for healthcare improvement. The study would therefore provide significant insights on the appreciation of the use of AI to improve the healthcare quality.

LITERATURE REVIEW

Defining Artificial Intelligence

According to Syed et al., (2023). artificial Intelligence (AI) refers to the simulation of the human intelligence processes by machines. The development of the AI comes with the inclusion of machine learning systems that help in addressing the intelligence needs. Another definition of artificial intelligence by Housawi et al., (2020), focuses on the "smart" concepts, which comes with the inclusion of digital systems in managing the decision-making processes. AI has also been defined as a complementary intelligent system for human intelligence, which has been influential in addressing the gaps involved in human intelligence. The inclusion of machines, internet and connectivity aspects has therefore remained an important aspect when addressing the actualization of AI. In the healthcare systems, the role of the AI would be related to the concepts of decision making, which would be improved based on the AI inputs.

Defining Healthcare Quality

According to Alghamdi et al., (2021), the healthcare quality focuses in the balance between all the aspects that defines the access to healthcare services. The balance prevents underuse and overuse of the healthcare services, which helps attain the expected standards of quality. Another definition of healthcare quality comes from the existing standards and policies that would define the expected access to healthcare services (Syed et al., 2023). The standardization of the healthcare quality and services has been defined from the goals in the healthcare outcomes. The need for developing the healthcare quality comes with the continuous development and investments towards sustaining the healthcare quality needs. Countries can use the national and international policies and standards, focusing on addressing the healthcare needs and meeting the requirements for sustaining the actualization of the healthcare processes.

The Use of AI In Saudi's Healthcare System

Saudi Arabia's healthcare systems have been considering the uptake of upcoming technologies such as AI, which can help in addressing the criteria for promoting the actualization of the intended decisions. The use of AI in Saudi's healthcare systems has been linked to the healthcare technologies that are been used in the country (Saeed et al., 2023). The link comes in the ability to develop and use systems that help in promoting the goals and roles for actualizing the healthcare needs. The use of the electronic health systems has been linked to the easier access to patient data and improved medical interventions. In the healthcare systems, one of the prioritization factors comes from the cost versus the benefits that come with the implementation of the systems (Aboalshamat et al., 2022). The systems should have the criteria and procedures that can actualize the decisions required for the organizations.

One of the baselines for assessing the use of the AI systems has considered the need to work with the technological inputs that can help in addressing the requirements to boost the use of the information systems. The prevalence of use of the systems including AI

has been determined by the national approaches towards healthcare technologies (Schwalbe & Wahl, 2020). The national prioritizations in Saudi Arabia have been focusing on factors such as affordability and accessibility, which could have reduced the deliberations on the technological approaches. The slow adaptation of the healthcare technologies has remained a challenge for Saudi Arabia in implementing the AI systems as part of improving the healthcare quality (Noorbakhsh-Sabet et al., 2019). The implications of the slow uptake for the technological infrastructure remains an important factor and baseline that can help in promoting the creation of an effective way to accommodate the AI inputs for the healthcare systems.

In the healthcare system, the role of the decision-making processes determines the processes that the patients undergo. In the actualization of the systems, it is necessary to have protocols and standards that would help measure the existing criteria for meeting healthcare quality (Housawi et al., 2020). The use of AI was related to the capacity development, as a source of measures and criteria towards improving the quality. The AI systems included the information systems, which are important when addressing and promoting the sources of information for decision making. The application of the healthcare technologies in Saudi Arabia has been one of the gradual sources of the improvements in addressing issues within the healthcare systems (Alotaibi & Alshehri, 2023). With the technologies, it is possible to invest in the procedures and measures that can improve the overall management of the healthcare quality needs that could be affecting the healthcare sector.

The Role of AI In Improving the Healthcare Quality in Saudi Arabia

The need for improving the healthcare quality is one of the prioritizations that can help in addressing the healthcare outcomes. The understanding of the role of the AI is an important strategy that can influence the decision and realization of the commitments towards meeting the healthcare quality processes. In a study on the role of AI in the healthcare systems, one of the major benefits came from the quality of the outcomes (Alotaibi & Alshehri, 2023). The quality of the outcomes integrated aspects such as the patient safety, quality and the consistency in the results. The realization of the criteria would depend on the AI inputs, which would help promote the creation of a system that can accommodate the requirements to enable the healthcare systems attain the goals and procedures (Aboalshamat et al., 2022). AI improves the decisions making processes, which enables the access to quality services, which can be incorporated into the healthcare systems.

One of the major goals in Saudi's healthcare system is to attain the healthcare quality, which guides the commitments at the system and facility level (Qurashi et al., 2021). The commitments towards quality comes with the identification of investments and criteria that can be used to meet the intended goals in the healthcare systems. The focus would be on the measures and criteria that can be used to improve the access to quality care. Due to the aspects and factors that affect the procedures for healthcare development, it is necessary to address the requirements and procedures towards attaining the healthcare

outcomes. The investments towards the AI systems have been related to the generation of qualitative measures that would be used to generate the required approaches in promoting the quality (Reddy et al., 2019). Factors such as the consistency and reliability have been consistent with the management and actualization of the goals when it comes to the healthcare quality processes.

In Saudi Arabia, the use of AI has been related to the consistent measures that lead to the realization of the healthcare quality needs. The vision 2030 has been recognized as an important strategy that can help in addressing the processes for managing the healthcare needs (Alelyani et al., 2021). One of the inputs from the AI is the use of the additional decision-making processes for improving the quality of the decisions made. The inclusion of additional decision-making criteria and inputs are among the benefits that come with the AI in healthcare (Qurashi et al., 2021). The use of healthcare technologies in Saudi Arabia has been related to the achievement of the results leading to the quality realization. AI has led to the increased use of information systems, which can be used as a source of actualizing the procedures and systems that can help generate the consistent benefits from the AI systems.

Best Practices to Ensure Utilization of AI To Improve Healthcare Quality in Saudi Arabia

The determination of the requirements that can help in improving the use of the AI systems capitalizes on the policies and systems that would help in actualizing the systems in the healthcare systems. The development of the link between the healthcare quality and the use of the AI comes from the actualization of practices that integrates the required activities (Nasseef et al., 2022). All AI systems come with technologies that enable data collection, analysis and outcomes. In the healthcare systems, the commitments towards quality should also focus on the safety aspects that are defined in the quality standards. The focus would be on the procedures that can help in incorporating the AI processes that would deliver the overall systems that can meet the intended goals (Noorbakhsh-Sabet et al., 2019). Such issues have a role in determining the need for building an infrastructure for sustaining the quality.

The issues of resources and their impacts on the processes that come from the AI remain integral factors that would help in meeting the healthcare outcomes. Studies have also revealed on the need to have resources that align the AI systems with the healthcare outcomes (Alowais et al., 2023). The allocation of personnel and cultures were found to be crucial approaches' that would influence the successful use of AI as part of improving the healthcare outcomes, including quality. The quality perspectives and commitments are defined based on the ability to meet the quality processes that relate with the national deliberations. The use of the healthcare goals in Saudi's vision 2030 has been one of the influencers that would help in addressing the requirements for use of AI (Abdullah & Fakieh, 2020). The commitments towards technologies and AI would be one of the influencers that would promote the use of technologies in the healthcare processes.

In Saudi Arabia, the development of the vision 2030 has been an important influencer of the changes and improvements in the healthcare sector (Housawi et al., 2020). The actualization of the vision 2030 would have implications on the healthcare sector, especially when addressing the healthcare outcomes. In the management of the outcomes, the focus areas have been the use of technologies such as AI. In the National Transformational Program (NTP), the investments in technologies have been considered as pone of the major goals and considerations to help attain the goals. Such factors have a role in addressing the requirements for generating the qualitative measures for promoting the healthcare quality inputs (Alotaibi & Alshehri, 2023). Through the vision 2030, it would be possible to attain the healthcare quality aspects that come with the realization of the goals set for healthcare improvement in Saudi Arabia.

METHODOLOGY

The current research follows the systematic review design, which assesses the secondary data sources. In the systematic review, the aim is to develop a rigorous and step-wise strategy to identify, assess and integrate the various research articles. The focus was to utilize data sources that would help meet the research objectives.

The choice of the research instrumental would determine their inputs towards the research. The current review uses the PRISMA and JBI instruments. The PRISMA tools helps in screening the identified articles, while the JBI assessment would help in qualitative analysis of the selected articles for the research. The data sources for the systematic review were published and peer reviews articles that provide information on the use of AI in promoting healthcare quality. The search strategy was based on keywords such as use of AI in Saudi's healthcare system, role of AI in improving healthcare quality and AI concepts in healthcare.

We include studies focusing on the use of AI in the management of healthcare quality; studies that use surveys, cross-sectional, controlled research designs, interviews and quantitative researches; all articles used should be peer reviewed or presented and published in academic conferences; studies written in English language; studies published between 2019 to date.

We exclude studies that do not include information on the use of AI in the management of the healthcare quality; articles and studies that do not uphold academic-based information, such as opinion- based articles; studies not written in English language unpublished studies and literature; articles published before 2019

The data analysis process in the systematic review targets the data extraction form the selected articles, based on the current research topic. The focus will be to utilize the PRISMA and JBI assessments to help locate and screen the articles, to ensure the data used matches with the research objectives. The use of the PRISMA analysis guides on the identification of the procedures to define the inclusion and exclusion criteria. The diagram for the current research is as shown Figure 1.

RESULTS

Figure 1 depicts the generated publications from each selected database after PRISMA and JBI assessments. PRISMA is an evidence-based approach for reporting review results, which includes identifying eligible research and using inclusion and exclusion criteria. Following the initial search, 92 articles were discovered, and they were divided based on the inclusion and exclusion criteria, resulting in the removal of 20 duplicates. After reviewing the titles and abstracts, 20 papers were eliminated from the study. From the remaining 52 articles, 30 were eliminated from the study because they did not meet the inclusion criteria. The remaining 22 publications were thoroughly evaluated and subjected to additional screening based on study findings. 12 publications were included in the study and were determined to be appropriate (Figure 1). The section provides the presentation of the data collected from the various articles. The tabulation of the findings helped in identifying the respective themes and concepts that related the AI concepts to the improvement on the healthcare quality. The section therefore presents the table of included studies and the JBI assessment checklist table.

General Characteristics of Included Studies

The characterization of the included studies focused on the identification of the various inputs emanating from the 12 articles selected for the review. The variables included the use of AI and the commitments to utilize AI for improving the healthcare quality. The characterization also considered the use of PECO framework to formulate a research question and to facilitate literature review.
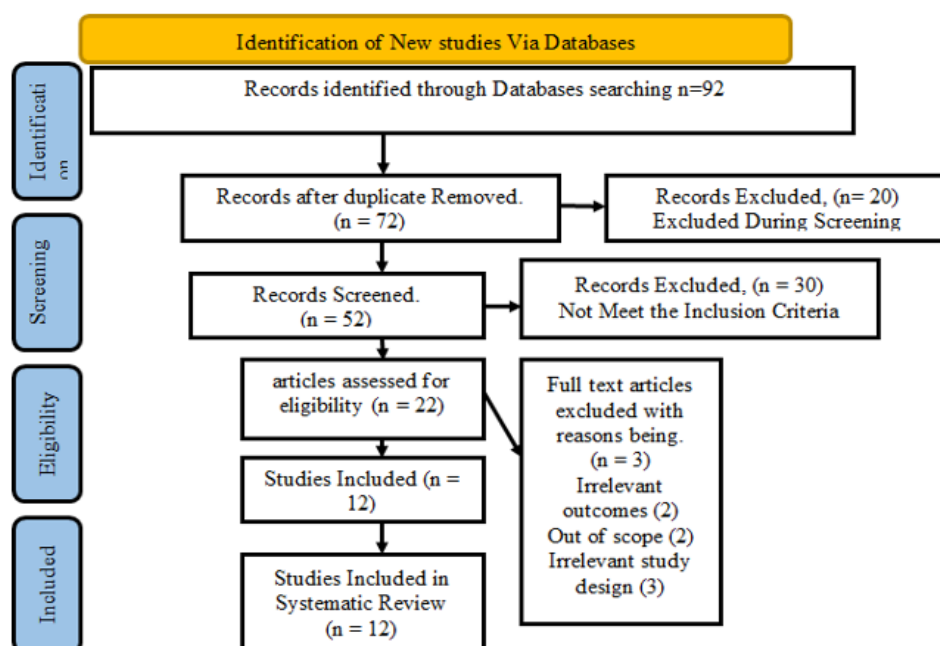

Figure 1: PRISMA Flow Diagram

Table 1: Included Studies

Author and Year	Title	Study Design	Sample size and Characteristic s	Main Themes	Main Findings
Abdullah & Fakieh, 2020	Health care employees' perceptions of the use of artificial intelligence	Survey study	300 healthcare workers in Saudi	The perception of AI depends on the skills and qualities	The development of the perceptions of the AI depends in the
Aboalsha ma t et al., 2022	Medical and dental professionals' readiness for artificial intelligence for Saudi Arabia vision 2030	Cross sectional Study	100 dental professionals	The vision 2030 has a role in influencing the use of AI	AI can be used to improve precision of the interventions made for the patients
Alelyani et al., 2021	Radiology community attitude in Saudi Arabia about the applications of artificial intelligence in radiology	Cross sectional Study	20 Patients in primary healthcare facilities in Saudi Arabia	The use of AI in radiology can improve the diagnosis	Lack of adequate information and understanding of the AI can affect the success of its utilization
Alghamdi et al., 2021	Digital Health platforms in Saudi Arabia: Determinants from the COVID-19 pandemic experience	Survey	Analysis of 7 digital platforms	The use of digital health platforms can influence the perception on AI use	AI use has been developed to meet the specific needs that affect the actualization of the organizations
Alowais et al., 2023	Revolutionizin g healthcare: the role of artificial intelligence in clinical practice	Cross sectional study	100 clinical PR actioners	AI has been contemporar y in influencing management of clinical processes	The changes through the AI have affected the commitments made towards improved quality of care
Chen & Decary, 2020	Artificial intelligence in healthcare: An essential guide for health leaders	Focus Group Study	57 General physicians	AI can improve the management of healthcare leadership	The use of AI promotes health leadership for the organizations
Housawi et al., 2020	Evaluation of key performance indicators (KPIs) for sustainable postgraduate medical training: an opportunity for implementing an innovative approach to	Cross sectional	115 healthcare facility	The KPIs for healthcare quality have included use of AI	The improvement of the healthcare access and utilizations capitalize on the use of AI systems for the success of the organizations

	advance the quality of training programs at the Saudi Commission for Health Specialties (SCFHS).				
Nasseef et al., 2022	Artificial intelligence- based public healthcare systems: G2G knowledge- based exchange to enhance the decision- making process.	Cross sectional study	110 Primary healthcare facilities	AI in primary healthcare can help actualize the demand for Healthcare management	The application of the AI in public healthcare can promote the intended healthcare quality needs
Noorbak hsh-Sabet et al., 2019	Artificial intelligence transforms the future of health care.	Cross sectional study	200 Healthcare professionals	The future of healthcare depends on AI application for healthcare quality	The future of healthcare depends on the use of technologies such as AI
Qurashi et al., 2021	Saudi Radiology Personnel's Perceptions of Artificial Intelligence Implementation	Cross Sectional Study	320 Healthcare stakeholders in Saudi Arabia	The access to skills and capacities can influence the management of healthcare quality needs	AI can be used as a transformativ e agenda for actualizing the intended success for the organizations
Reddy et al., 2019	Artificial intelligence-enabled healthcare delivery.	Cross Sectional study	200 healthcare stakeholders	Healthcare delivery can depend on inputs made towards healthcare improvement	The development of an adequate process for managing healthcare can come from AI
Schwalb e & Wahl, 2020	Artificial intelligence and the future of global health	Quantitativ e study	500 healthcare professionals	Consistent investment in AI can promote the health development	The need to promote AI use comes from the global approaches for managing its utilizations

JBI Assessment

The JBI checklist uses questions that help in the qualitative analysis of the articles chosen for use in the current research. The JBI checklist questions are as follows

Is the review question clearly and explicitly stated?

Were the inclusion criteria appropriate for the review question?

Was the search strategy appropriate?

Were the sources and resources used to search for studies adequate?

Were the criteria for appraising studies appropriate?

Was critical appraisal conducted by two or more reviewers independently?

Were there methods to minimize errors in data extraction?

Were the methods used to combine studies appropriate?

Was the likelihood of publication bias assessed?

Were recommendations for policy and/or practice supported by the reported data?

Were the specific directives for new research appropriate?

The JBI checklist table is as follows:

Table 2: JBI Checklist

Authors	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Score
Abdullah & Fakieh, 2020	Y	Y	Y	Y	Y	Y	Y	N	Y	Y	Y	90.9%
Aboalshamat et al., 2022	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	100%
Alelyani et al., 2021	Y	Y	Y	Y	Y	Y	N	Y	Y	Y	N	81.81%
Alghamdi et al., 2021	U	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	90.9%
Alowais et al., 2023	Y	Y	Y	Y	Y	Y	Y	Y	Y	U	Y	90.9%
Chen & Decary, 2020	Y	Y	Y	Y	Y	Y	Y	N	Y	Y	Y	90.9%
Housawi et al., 2020	Y	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	90.9%
Nasseef et al., 2022	Y	Y	Y	Y	Y	Y	Y	N	U	Y	Y	81.81%
Noorbakhsh-Sabet et al., 2019	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	100%
Qurashi et al., 2021	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	90.9%
Reddy et al., 2019	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	90.9%
Schwalbe & Wahl, 2020	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	U	90.9%

The JBI table helped in the qualitative assessment of the articles identified and considered for the research. The benchmark for the qualitative assessment is above 70% is high quality, between 40-70% is moderate and below 40% is low quality. From the JBI assessment all the 12 articles selected for the review had scores above 70%, meaning that they met the high- quality threshold.

DISCUSSION

The utilization of the artificial intelligence in Saudi Arabia focuses on the role of the benefits gained from using the AI. From the various studies, the intended benefits include the commitments towards healthcare quality, eliminating the errors and forming an effective information source for the decisions made (Manne & Kantheti, 2021; Noorbakhsh-Sabet et al., 2019).

With such benefits, organizations could consider the investments, given the chances of having an efficient way to deal with the respective factors and inputs affecting the success in the system's goals. The role of the AI systems was also been linked to the creation of continuous improvement strategies for the organizations (Qurashi et al., 2021).

Such strategies have been part of the healthcare organizations in Saudi Arabia, especially when dealing with the requirements for an effective process in addressing the inputs for success (Noorbakhsh-Sabet et al., 2019). Saudi Arabia has been at the forefront of

generating the integrated processes that would enable the identification and management of the healthcare processes.

Two studies linked the prevalence and incidence of using the AI systems depends on factors such as policies, the adaptiveness and the requirements to work with the respective processes of actualizing the intended gains (Manne & Kantheti, 2021; Kelly et al., 2020). The procedures for improving the healthcare concepts have been related to the improved decision making that comes with the additional intelligence developed through the AI applications. Qurashi et al., (2021) recognized that the AI inputs have been consistent with the vision 2030, which creates a transformational agenda for the sectors, including healthcare.

The healthcare quality is evaluated based on the existing standards and their roles in addressing the measures towards the realization of the healthcare goals. Studies by (Hazazi & Wilson, 2021) showed that healthcare quality remains an important process for addressing the measures towards healthcare outcomes and goals. Factors such as the subjective and objective aspects of the healthcare quality has always been a factor of consideration, especially when working with the management of measures towards quality (Hazazi & Wilson, 2021).

One of the consistent goals in the healthcare organizations comes in the development of the continuous improvement strategies (Alghamdi et al., 2021; Esmaeilzadeh, 2020). The continuous improvement strategies can be derived from the commitments towards meeting the total quality management, which can be related to the AI investments. In the total quality management models, the use of the quality aspects comes with the identification of the criteria that would enable the creation of effective measures towards sustainable goals (Hazazi & Wilson, 2021).

The development of the strategic processes and models at the organizational level would have impacts on the ability to create continuous improvement processes. The outcomes would include the national facility and individual goals, all which can be used to assess the development of the quality processes for the organizations. Studies by (Esmaeilzadeh, 2020; Javaid et al., 2021) revealed such strategies as the quality administration, based on the set standards that would help improve the criteria expected for realizing the intended goals.

One of the main issues that comes with the use of AI is the challenges that come with the use of technologies in Saudi's healthcare systems (Hazazi & Wilson, 2021; Schwalbe & Wahl, 2020). Another study by Rahman & Al-Borie, (2021), linked the the issues of healthcare quality to the benefits that the AI systems would bring for the healthcare organizations.

The use of machine learning, Internet of Things and robotics were identified as critical influencers of the AI use in managing healthcare quality. Such aspects would be important when addressing the criteria and measures that should be considered when organizations are prioritizing to invest in the AI systems.

The national approaches in the management of healthcare quality remains a critical factor for determining the ability to use AI to manage the healthcare quality processes. According to, Schwalbe & Wahl, (2020), the organizations need to work with the aspects and measures that would be integrated in the actualization of the intended quality processes.

The focus would be on the measures that can be used to realize the patient outcomes, such as the creation of consistent goals that can be used to influence the decisions. AI systems have an impact on the development of consistent goals, which can be attributed to the need for sustaining the procedures in promoting healthcare quality (Rahman & Al-Borie, 2021).

In Saudi Arabia, the focus on the management of the organizational strategies and measures would have implications on the ability to address the use of AI as part of meeting the organizational quality (Hazazi & Wilson, 2021). The vision 2030 has been one of the influencers of the strategies and measures towards healthcare development. From the study by Asmri et al., (2020), the vision 2030 has emphasized on the need for developing and influencing the use of healthcare technologies. The vision 2030 also focuses on the need for improving the healthcare quality, which would determine the inputs made towards a sustainable healthcare system (Rahman & Al-Borie, 2021).

CONCLUSION

The advancement of healthcare quality in Saudi Arabia is essential for optimizing outcomes from healthcare investments, especially through the integration of AI technologies. Despite challenges such as access and priority gaps, AI—through tools like machine learning, IoT, and robotics—has the potential to enhance decision-making and reduce human error.

Aligning AI with Vision 2030 can support national goals for improved care delivery. To achieve this, comprehensive analysis of AI's direct and indirect impacts is needed, along with intensified research into context-specific quality management methodologies. Future studies should also explore emerging AI trends to ensure Saudi Arabia remains adaptive and progressive in leveraging AI to enhance healthcare quality and support ongoing system transformation.

List of Abbreviations

AI: Artificial Intelligence

COVID: Coronavirus Disease G2G: Government to Government JBI: Joanne Briggs Institute

KPIs: Key Performance Indicators

NTP: National Transformational Program

PECO: Population, Exposure, Comparison, and Outcome.

PRISMA: Preferred Reporting Items for Systematic Reviews and Meta-Analyses

SCFHS: Saudi Commission for Health Specialties

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