Quality of patient Care with new Privatized Healthcare system: A Systematic Review of Technology Integration and Health Insurance"

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Abstract

Background: The quality of patient care is effective for new privatized healthcare system. For providing the effective services to the patients' technology tools play important role. Also, new privatized healthcare organizations introduce the healthcare insurance. The aim of current systematic review is to explore the quality of patient care with new privatized healthcare system in the context of technology integration and health insurance. Method: A thorough search of databases, including Scopus, PsycINFO, and Web of Science, was conducted in order to categorize relevant research that was published between 2020 and 2024. The inclusion criteria for this research were English-language papers that focused on exploring the quality of patient care with new privatized healthcare system in the context of technology integration and health insurance.Following an initial screening and quality evaluation, eleven studies were included in the synthesis. Results: The study database was searched through electronic databases, identifying 1679 records. 15 unique records were assessed for eligibility based on titles and abstracts. After initial screening, 11 studies were selected for full-text assessment. After independent review, 11 studies met criteria and were included in the systematic review. The selected studies were conducted between 2020-2024 and varied in design. The PRISMA flowchart illustrates the selection process. Quality evaluation involves peer-reviewed journals, overall assessment, and quality management. Conclusion: As the SR concluded that advanced technologies like electronic health records, telemedicine, and predictive analytics can improve

patient care and treatment accuracy. However, challenges like rising costs, complex insurance plans, and data security need to be addressed. Effective training for healthcare providers, clear insurance plans, and robust information security systems are crucial for maximizing profits.

Keywords: Emerging Technologies, Nurses Practice, Patents' Outcome, Systematic Review.

1. Introduction

Patient safety is defined as healthcare organization that needs to protect the patients from harm injuries, accidents, infections and medication errors. Healthcare injuries affect 1 in 10 patients and result in less than 3.5 million deaths annually. Over 50% of these injuries are preventable, with half due to medications. Common negative events leading to avoidable harm include medication errors, unsafe surgical procedures, infections, diagnostic errors, patient falls, pressure ulcers, incorrect patient identification, unsafe blood transfusions, and venous thromboembolism. Patient injuries can reduce global economic growth by over 0.5% per year and have significant indirect costs of trillions of dollars annually. Investing in reducing patient harm can lead to cost savings and better patient outcomes. Patient engagement can reduce harm by up to 16% if done correctly (Raoofi et al., 2023; Hodkinson et al., 2020). Factors contributing to patient harm include system and organizational factors, technological factors, human factors, patient-related factors, and external factors. Understanding the underlying causes of errors in healthcare requires a shift from a blame-oriented approach to a more systems-based thinking. This involves attributing errors to poorly designed system structures and processes, acknowledging the human nature of healthcare workers, and recognizing carelessness or inappropriate behavior from healthcare providers, leading to substandard medical management (Slawomirski & Klazinga, 2022; Markwart et al., 2020; Gunderson et al., 2020).

Innovations in fields such as information technology, biotechnology, robotics, artificial intelligence, materials science, energy, and transportation are considered emerging technologies because they have the potential to significantly impact economies, society, and industries (Shahbal & Khalily, 2023; Khalid et al., 2023). This includes blockchain, quantum computing, biotechnology and gene editing, advanced robotics, renewable energy technologies, artificial intelligence (AI) and machine learning, the Internet of Things (IoT), and 3D printing/additive manufacturing. While the Internet of Things connects physical elements together, artificial intelligence (AI) and machine learning enable machines to learn from data without explicit programming. Blockchain technology enables secure and transparent transactions without the need for intermediaries. By using concepts from quantum mechanics to accelerate computational processes, quantum computing has the potential to completely transform industries such as materials science and cryptography (Al Ali et al., 2022; Alruwaili et al., 2023). Some examples of emerging technologies include advanced robotics, renewable energy technologies, biotechnology and gene editing methods, and additive manufacturing/3D printing. (Sosa, Salinas & De Benito, 2022; Palanivel, 2020).

Moreover, health organizations are integrating device data into patient portals, and 10 start-up organizations are developing or developing technology to improve wearable health technology and enable EHR integration. These organizations have partnered with 16 health systems to address challenges in meaningful use of device data and streamlining provider workflows (Malathi et al., 2024; Dinh-Le et al., 2020). A framework explored that a human-centered approach to service design can harness the potential of technology and advance healthcare systems towards person-centered care need to be addressed. Also, a transformational approach to service design can go beyond explanatory studies of phenomena in healthcare to develop innovative solutions for changes in health and well-being; and how the perspective of service systems can address the complexity of healthcare systems, thereby moving towards integrated care (Patrício et al., 2020).

2. Methods

Research Objective

The objective of this systematic review is to explore the quality of patient care with new privatized healthcare system in the context of technology integration and health insurance.

Research Question

1. What are the perceived impacts of integrating emerging technologies, such as artificial intelligence, telehealth, wearable devices, and robotics, on quality of patient care within new privatized healthcare system

Literature Search Strategy

A comprehensive search strategy was developed to identify relevant studies. Databases such as Scopus, PsycINFO and Web of Science were searched using a combination of keywords related to “quality of patient care”, “new privatized healthcare system” and “technology integration and health insurance”.

Table 1. Syntax Search

Syntax 1	“Quality of Patient care”, “New Privatized Healthcare System”
Syntax 2	“Technology Integration and Health Insurance”.

Table 2. Statistics from the Data Base

No	Database	Syntax	Year	No of Researches
1	Scopus	Syntax 1	2020 - 2024	243
		Syntax 2		167
2	Web of Science	Syntax 1		387
		Syntax 2		259

3	PsycINFO	Syntax 1 Syntax 2	346 277

The study utilized Scopus, Web of Science, and PsycINFO databases to identify relevant research publications from 2020-2024. The most significant articles were found in Web of Science 646 and PsycINFO 623 whereas Scopus had 410 demonstrating thoroughness in the scientific search. The total researches were searched as 1679.

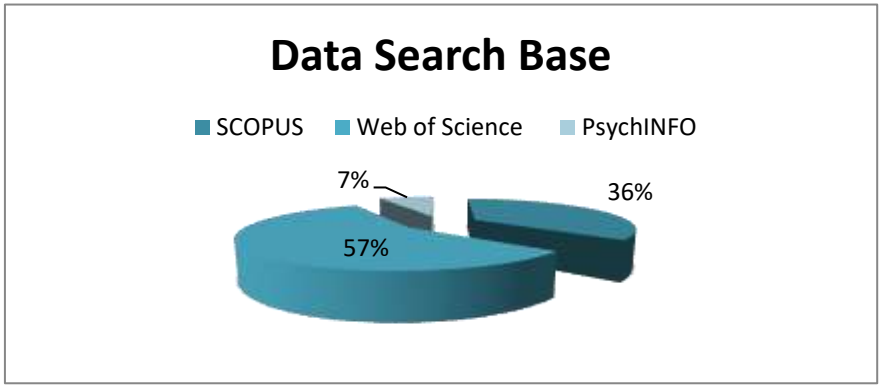

Figure 1. Graphic representation of search database according to different search engines

Inclusion and Exclusion Criteria

The review included studies about impacts of integrating emerging technologies, such as artificial intelligence, telehealth, wearable devices, and robotics, on quality of patient care within new privatized healthcare system published in peer-reviewed journals, conference proceedings, or English-written reports, and was excluded if they did not meet the criteria or was duplicate.

Quality Assessment

The included studies were evaluated for quality and methodological rigor using suitable instruments, such as the Joanna Briggs Institute Critical Appraisal Checklist for different research designs. The evaluation took into account variables including sample size, data gathering techniques, research design, and potential biases. The quality evaluation led to the exclusion of certain studies, but the results were nonetheless interpreted considering the strengths and limits of the respective methods.

Table 3 Assessment of the literature quality matrix

Sr #	Author	Are the selection of studies described appropriately	Is the literature covered all relevant studies	Does the method section describe?	Were findings clearly described?	Quality rating
1	Cerchione et al.2023	Yes	Yes	Yes	Yes	High

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2	Ferreira & Marques	Yes	Yes	Yes	Yes	High
3	Amin et al. (2020)	Yes	Yes	Yes	Yes	High
4	Al-Omar et al. (2020)	Yes	Yes	Yes	Yes	High
5	Rahman (2020)	Yes	Yes	Yes	Yes	High
6	Alumran et al. (2021)	Yes	Yes	Yes	Yes	High
7	Sheikh et al. (2021).	Yes	Yes	Yes	Yes	High
8	Elangovan et al. (2022)	Yes	Yes	Yes	Yes	High
9	Wang et al. (2021)	Yes	Yes	Yes	Yes	High
10	Sajjad & Qureshi (2020)	Yes	Yes	Yes	Yes	High
11	Ahmed (2021)	Yes	Yes	Yes	Yes	High

The systematic review of studies provided clear descriptions, methods, selection processes, literature coverage, and clear conclusions, resulting in a "High or Good" rating for their quality.

Study Selection

Two independent reviewers screened retrieved studies for eligibility, then reviewed full-text articles against inclusion and exclusion criteria, with disagreements resolved through discussion or consultation with a third reviewer

Table 4 Selected Studies for SR (Systematic Review

No	Author	Research	Year
1	Cerchione et al.	Blockchain's coming to hospital to digitalize healthcare services: Designing a distributed electronic health record ecosystem	2023
2	Ferreira & Marques	Public-private partnerships in health care services: Do they outperform public hospitals regarding quality and access? Evidence from Portugal	2021
3	Amin et al.	The potential and practice of telemedicine to empower patient-centered healthcare in Saudi Arabia	2020
4	Al-Omar et al.	What local experts expect from a health technology assessment (HTA) entity in Saudi Arabia: workshop conclusions	2020
5	Rahman	The privatization of health care system in Saudi Arabia	2020
6	Alumran et al.	Comparing public and private hospitals' service quality	2021
7	Sheikh et al.	Health information technology and digital innovation for national learning health and care systems	2021
8	Elangovan et al.	The use of blockchain technology in the health care sector: systematic review	2022
9	Wang et al.	Integrating digital technologies and public health to fight Covid-19 pandemic: key technologies, applications, challenges and outlook of digital healthcare	2021
10	Sajjad & Qureshi	An assessment of the healthcare services in the Kingdom of Saudi Arabia: an analysis of the old, current, and future systems	2020
11	Ahmed	Current practice of using technology in health-care delivery in Saudi Arabia: challenges and solutions	2021

3. Result

Study Database

A systematic search of electronic databases identified 1679 records. After removing duplicates, 11 unique records were assessed for eligibility based on titles and abstracts.

Title and Abstract Screening

The reviewer evaluated the titles and abstracts of the identified records in the first screening. Eleven studies were chosen for full-text review using this procedure. The reviewers' disagreements were settled by consensus and discussion.

Full-Text Assessment

The full texts of the 11 selected studies were found and independently reviewed against the inclusion and exclusion criteria by two reviewers. Following the full-text assessment, 11 studies met the criteria and were involved in the systematic review.

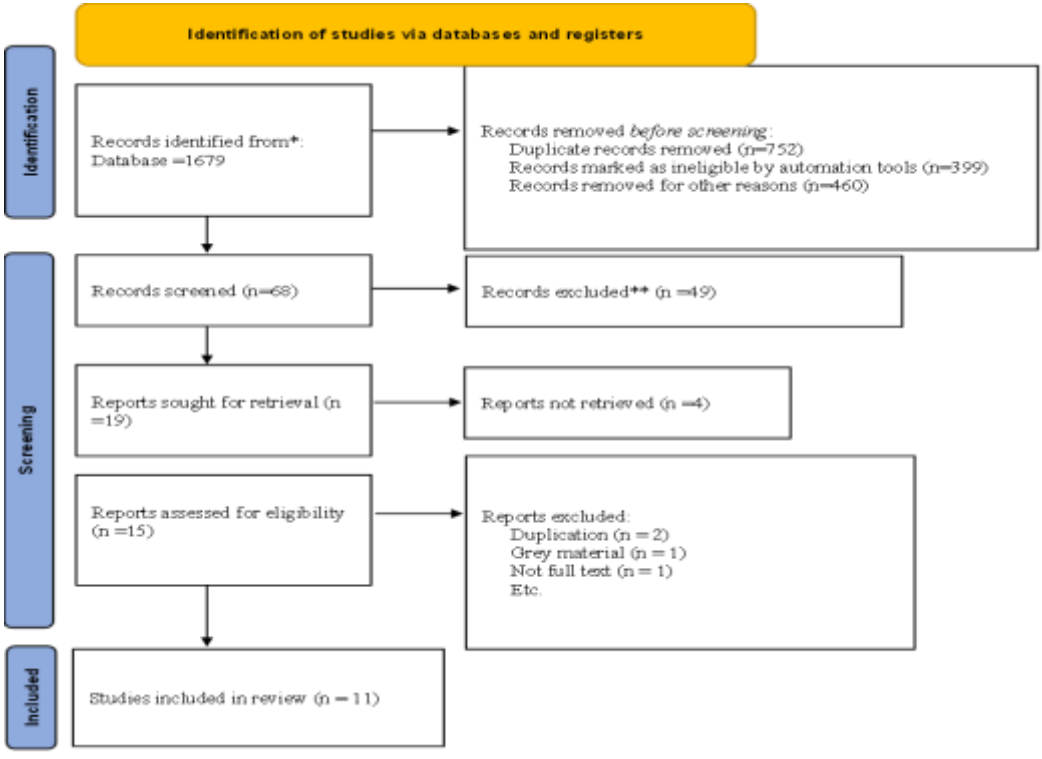
PRISMA Flowchart

The study selection process is illustrated in the PRISMA flowchart (Table 4). It provides a visual representation of the number of records at each stage of the selection process, from initial database search to final inclusion in the systematic review.

Identification of studies via databases and registers

Quality evaluation is a systematic process that includes assessing study quality using data from peer-reviewed journals, largely assessment, and quality management, providing valuable information on research techniques and pressure application.

Table 5 Identification of Studies via Database



Data Extraction

For assessment, a uniform data extraction form was created. Key findings, participant characteristics, research characteristics (authors, publication year), and any other pertinent information were retrieved by two reviewers separately from the selected papers. Consensus was used to settle disagreements.

Table 6 Research Matrix

No	Author, Year	Aim of Study	Methodology	Sample	Setting	Result
1	Cerchione et al., 2023	To design a distributed electronic health record ecosystem using blockchain technology.	Design and conceptual framework	N/A	Hospital	Proposed a blockchain-based system to enhance digitalization and interoperability in healthcare.
2	Ferreira & Marques, 2021	To evaluate if public-private partnerships (PPP) outperform public hospitals	Comparative analysis	Public and private hospitals in Portugal	Portugal	Found that PPPs generally offer better quality and access

		in terms of quality and access.				compared to public hospitals.
3	Amin et al., 2020	To explore the potential and practice of telemedicine in enhancing patient-centered care in Saudi Arabia.	Review and analysis of existing practices	Healthcare providers and patients in Saudi Arabia	Saudi Arabia	Identified telemedicine as a valuable tool for patient-centered care but noted challenges in implementation.
4	Al-Omar et al., 2020	To determine what local experts, expect from a health technology assessment (HTA) entity in Saudi Arabia.	Workshop and expert consultation	Local health experts	Saudi Arabia	Experts expressed a need for a well-structured HTA entity to improve health technology assessments.
5	Rahman, 2020	To analyze the impacts and implications of privatizing the healthcare system in Saudi Arabia.	Descriptive analysis and review of literature	General overview of Saudi healthcare	Saudi Arabia	Discussed various challenges and potential benefits of healthcare privatization.
6	Alumran et al., 2021	To compare the service quality between public and private hospitals.	Comparative study using survey and service quality metrics	Public and private hospitals	Saudi Arabia	Found variations in service quality, with private hospitals often providing better services.
7	Sheikh et al., 2021	To assess the role of health information technology and digital innovations in national learning health systems.	Review and synthesis of literature	Various national health systems	International	Highlighted the benefits of digital innovations in improving health systems but noted implementation challenges.
8	Elangovan et al., 2022	To systematically review the use of blockchain technology in the healthcare sector.	Systematic review and meta-analysis	Various studies on blockchain in healthcare	Global	Found blockchain has significant potential to improve healthcare processes but faces implementation barriers.
9	Wang et al., 2021	To analyze how digital technologies can be integrated into public health efforts to combat COVID-19.	Review of key technologies and applications	Digital health technologies and applications	International	Identified key digital tools and their applications in managing the COVID-19 pandemic.
10	Sajjad & Qureshi, 2020	To assess the evolution and effectiveness of healthcare services in Saudi Arabia.	Historical and current system analysis	Saudi healthcare systems	Saudi Arabia	Provided insights into the progress and future directions of healthcare services in Saudi Arabia.
11	Ahmed, 2021	To review current practices and challenges in using technology for healthcare delivery in Saudi Arabia.	Review and analysis of existing practices	Healthcare systems and technology in Saudi Arabia	Saudi Arabia	Highlighted the challenges faced in technology adoption and proposed

						solutions for improvement.

As per Figure 1, it was also found additionally about the included studies' research areas. For more details can be viewed in the figure 1.

Data Synthesis

The synthesized findings were presented through a narrative synthesis approach; to explore the impacts of integrating emerging technologies, such as artificial intelligence, telehealth, wearable devices, and robotics, on quality of patient care within new privatized healthcare system. Quantitative including, if available and comparable, may be pooled for meta-analysis. Heterogeneity among studies was assessed using appropriate methods.

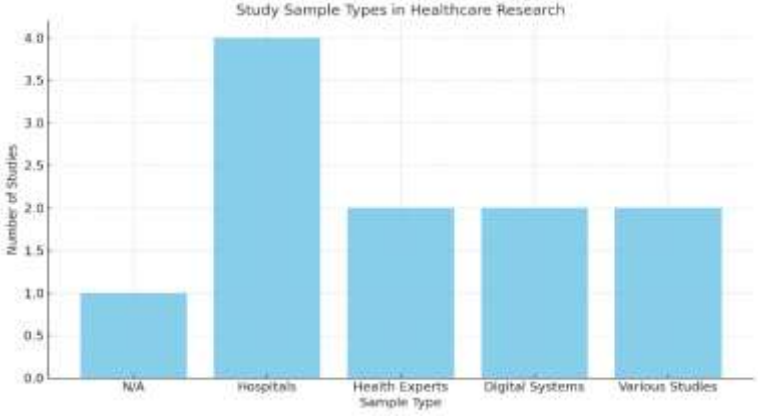


Figure 1

4. Discussion

In the context of KSA

A study examines the differences in service quality between public and private hospitals in Saudi Arabia and shows that private hospitals generally provide better care. This topic highlights the deficiencies in systems that could provide guidance for policies and investment decisions in the future aimed at improving health and care standards. This research serves as a foundation for understanding how various health centers operate and their impact on patient satisfaction. (Alumran et al., 2020).

Moreover, Sajad and his colleagues, in 2020, provided a comprehensive review of the development of healthcare services in Saudi Arabia and analyzed previous systems, current practices, and future perspectives. They identified trends and shortcomings in service quality and provided suggestions for future policy improvements. The study also examines the integration

of technology in delivering healthcare services in Saudi Arabia and focuses on the challenges and solutions related to its adoption. Amin and colleagues, 2020, provided special examples of applications and their effects.

Also, the establishment of a health technology assessment (HTA) institution in Saudi Arabia is considered an important step towards improving the quality of healthcare services and the adoption of technology. Al-Amri and his colleagues, 2020, emphasized the need for a systematic approach to evaluating and integrating new technologies in the field of health and care. This study examines the results of the privatization of the healthcare system and care in Saudi Arabia and investigates the potential benefits and challenges it may bring. This topic provides insights into how privatization has affected the effectiveness of service delivery and the adoption of technology, which is related to the broader issue of improving health systems. (Rahman, 2020). However, Sheikh and his colleagues, in 2021, studied the role of information technology in health and digital innovations in advancing national health systems. In a study focused on national-level advancements, this research supports topics related to technology adoption and system improvements discussed in previous studies.

In the context of Globe

A study explores the design of a blockchain-based electronic health record (EHR) ecosystem to improve digitalization in healthcare settings. It proposes a distributed system for managing health records, aiming to improve data security, interoperability, and efficiency. The research is connected to studies on blockchain applications in healthcare, such as Elangovan et al. (2022), which highlight its potential in transforming healthcare data management. The study also evaluates whether public-private partnerships (PPPs) offer better quality and access to healthcare services compared to public hospitals. The findings align with themes of improving service delivery, as seen in the examination of blockchain and digital technologies' impacts on healthcare. The systematic review analyzes the applications and impact of blockchain technology in healthcare, demonstrating its potential in improving data security, patient privacy, and overall healthcare efficiency. Moreover, the study also explores how digital technologies have been integrated into public health responses to the COVID-19 pandemic, emphasizing the importance of digital solutions in managing public health crises (Cerchione et al., 2023; Ferreira & Marques, 2021; Wang et al., 2021).

5. Limitation & Implications

A review was conducting to explore the quality of patient care with new privatized healthcare system in the context of technology integration and health insurance in Saudi Arabia. It has limitations due to the limited number of studies, variability, and potential publication bias. Language bias can affect the critique. However, this study will have significant implications for future research, legislation, medical practice, and education. It can identify areas for further research and fill the knowledge gap that influences health practices in Saudi Arabia. The results

can be used to assist healthcare organizations and leaders in making informed decisions regarding the implementation of new technologies and insurance in clinical practice.

6. Recommendations

Advanced technologies like electronic health records, telemedicine, and predictive analytics can improve patient care by improving information management and treatment accuracy. Comprehensive health insurance reduces financial barriers and ensures access to essential services. However, challenges like rising costs, complex insurance plans, and data security need to be addressed. Effective training for healthcare providers, clear insurance plans, and robust information security systems are crucial for maximizing benefits.

7. Conclusion

It is concluded that advanced technologies such as electronic health records, telemedicine, and predictive analytics can enhance patient care by improving information management and the accuracy of treatments. Comprehensive health insurance reduces financial barriers and ensures access to necessary services. However, we need to address challenges such as rising costs, complex insurance plans, and data security. Effective training for healthcare providers, clear insurance plans, and robust information security systems are essential for maximizing profits. This research holds significant implications for future studies, legislation, medical practice, and education, aiding healthcare institutions in Saudi Arabia to make informed decisions regarding the implementation of new technologies and insurance.

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