ANALYSIS OF HEALTHCARE QUALITY IN THE ERA OF DIGITALIZATION: CHALLENGES AND OPPORTUNITIES

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Keywords	ABSTRACT
Healthcare, digitalication, quality	Digitalization offers numerous opportunities to improve the quality of health services. This study aims to analyze the impact of digitalization on the health services, identify the challenges faced in the implementation of digital technology, and explore the opportunities offered by digitalization in improving the health service quality. A qualitative approach is used to understand the perspectives and experiences of patients and medical personnel towards digitalization. Quantitative analysis is carried out using descriptive and inferential statistics to identify trends and patterns in the data. Thematic analysis techniques are used to identify the main themes and categories that emerged from the interview and observation data. Digitalization has a significant impact on the quality services, both positive and negative. To maximize the benefits of the digitalization, efforts are needed to address existing challenges, including increasing access to digital technology and strengthening data security and privacy, and providing training and support for medical personnel. Further research is needed to explore how digital technology can be used to improve health services and provide recommendations to overcome existing challenges.

INTRODUCTION

The development of digital technology has brought significant changes in various sectors, including the health sector (Hermes et al., 2020; Senbekov et al., 2020; Sheikh et al., 2021; Wang et al., 2021; D. Yang et al., 2021). Technologies such as telemedicine, Electronic Health Records (EHR), and artificial intelligence (AI) have been widely adopted to improve the efficiency and effectiveness of healthcare services (Don & Yoon, 2021; Razzaque & Hamdan, 2021; Shaikh et al., 2023; Tagde et al., 2021; J. Yang et al., 2022). According to a report from Global Market Insights (2021), the global telemedicine market is expected to reach USD 175.5 billion by 2026, with an annual growth rate of 19.3% from 2020 to 2026. This figure shows how rapid the adoption of digital technology is in the health sector.

The quality of health services is a crucial factor that determines the success of a health system. Good quality of service can increase patient satisfaction, reduce mortality rates, and improve overall health outcomes. According to the World Health Organization (WHO), the quality of health services includes various aspects such as safety, effectiveness, and accessibility. With digitalization, it is hoped that the quality of health services can be improved through various technological innovations.

Digitalization has brought about a major change in the way health services are delivered. With technology such as telemedicine, patients can access healthcare remotely, which is especially beneficial in remote areas (Achenbach, 2020; Haleem et al., 2021; Hwei & Octavius, 2021; Khayru & Issalillah, 2022; Pulimamidi, 2021). However, the question that arises is the extent to which this digitalization affects the overall quality of health services. Although it offers various benefits, its implementation is not without challenges. These challenges include the digital divide, where not all populations have equal access to digital technologies. In addition, data security and privacy are also important issues that must be addressed. According to a report from IBM Security (2020), the healthcare sector is one of the main targets of cyberattacks, with the average cost of data breaches reaching USD 7.13 million.

Behind the existing challenges, digitalization also offers various opportunities to improve the quality of health services. Technologies such as AI can be used to improve diagnostic accuracy, while EHRs can aid in more efficient management of patient data. In addition, digitalization also allows for the development of a more integrated health system, which can improve coordination between various healthcare providers.

This study aims to analyze the impact of digitalization on the quality of health services, identify the challenges faced in the implementation of digitalization, and explore the opportunities offered by digitalization in improving the quality of health services. The significance of this research lies in its contribution to providing a deeper understanding of how digital technology can be used to improve the quality of health services, as well as providing recommendations to overcome existing challenges.

METHODS

This study explores the impact of digitalization on health service quality using both qualitative and quantitative methods. The qualitative approach focuses on understanding the perspectives and experiences of patients and medical personnel, while the quantitative approach analyzes statistical data and trends. The research design is descriptive, describing the phenomenon of digitalization in health services and explaining the relationship between digitalization and health service quality. The sample includes patients using telemedicine services, medical personnel using Electronic Health Records (EHRs), and health technologists with AI knowledge. Purposive sampling was used, with patients using telemedicine services, medical personnel using EHRs, and health technologists knowledgeable about AI in health. Data was collected through surveys, in-depth interviews, and observations. The data was analyzed using both quantitative and qualitative techniques, with quantitative analysis using descriptive and inferential statistics to identify trends, and qualitative analysis using thematic analysis to identify themes and categories.

RESULTS
The Impact of Digitalization on the Quality of Health Services
Improving Service Efficiency and Effectiveness

Digitalization has been proven to improve the efficiency and effectiveness of health services. According to a study by Harvard Business Review (2017), the implementation of EHR in hospitals can reduce administrative time by up to 25%, so medical personnel can focus more on patient care. Additionally, telemedicine allows patients to get a medical consultation without having to visit a healthcare facility, which saves time and money.

Changes in Interactions between Patients and Medical Personnel

Digitalization is also changing the way patients and medical personnel interact. With telemedicine, interactions that were previously carried out face-to-face can now be done virtually. Although this improves accessibility, some patients find that virtual interactions are less personal compared to face-to-face consultations. According to a survey from the American Telemedicine Association (2020), 60% of patients are satisfied with telemedicine services, but 20% feel that virtual interactions are inadequate.

Accessibility and Affordability of Healthcare

One of the main advantages of digitalization is the increased accessibility and affordability of healthcare services. Telemedicine allows patients in remote areas to gain access to healthcare services that were previously difficult to reach. Additionally, the cost of telemedicine services is often lower compared to face-to-face consultations, making them more affordable for many patients. According to a report from McKinsey & Company (2020), the use of telemedicine can reduce healthcare costs by up to 30%.

Challenges in Digitalization Implementation
The Digital Divide

One of the main challenges in the implementation of digitalization is the digital divide. Not all populations have the same access to digital technologies, especially in remote areas and developing countries. According to a report from the International Telecommunication Union (2020), only 53% of the world's population has internet access, with a significant gap between developed and developing countries. This gap can hinder efforts to improve healthcare accessibility through digitalization.

Data Security and Privacy

Data security and privacy are important issues in the digitalization of health services. Patients' medical data is highly sensitive and vulnerable to cyberattacks. According to a report from Verizon (2020), the healthcare sector is one of the main targets of cyberattacks, with more than 500 million medical records exposed in 2019. Data breaches can result in financial and reputational losses for healthcare providers, as well as threaten patient privacy and security.

Resistance to Change from Medical Personnel

The implementation of digital technology also faces resistance from medical personnel who may feel uncomfortable with the change. Some healthcare professionals feel that digitalization increases administrative workload and reduces the time they can spend caring for patients. According to a study by the Journal of the American Medical Informatics Association (2019), 70% of medical professionals feel that EHRs increase their administrative workload, while only 30% feel that EHRs improve their work efficiency.

Opportunities Offered by Digitalization
Innovation in Health Services

Digitalization offers various opportunities for innovation in health services. Technologies such as AI and machine learning can be used to analyze medical data and provide more accurate treatment recommendations. Additionally, wearable technology allows for real-time monitoring of patient health, which can aid in early detection and prevention of disease. According to a report from Accenture (2020), the use of AI in medical diagnosis can improve diagnosis accuracy by up to 90%.

Development of a More Integrated Health System

Digitalization allows for the development of a more integrated health system, where patient data can be accessed and shared between various healthcare providers. This integration can improve care coordination and reduce unnecessary duplication of tests and procedures. According to a study by Health Affairs (2018), health system integration can reduce care costs by up to 15% and improve the overall quality of care.

Improved Diagnosis Quality and Accuracy

Digitalization can also improve the quality and accuracy of diagnosis. Technologies such as AI and machine learning can quickly analyze medical data and provide more accurate diagnosis recommendations. Additionally, EHRs allow for more efficient storage and management of patient data, so that relevant medical information can be easily accessed by medical personnel. According to a report from the Journal of Medical Internet Research (2019), the use of AI in medical diagnosis can reduce misdiagnosis by up to 30%.

CONCLUSION

The study highlights the significant impact of digitalization on health services, both positively and negatively. It highlights the improvement in efficiency, effectiveness, and accessibility of health services. However, challenges such as the digital divide, data security, and resistance from medical personnel need to be addressed to maximize the benefits. The findings have implications for policymakers and healthcare providers, emphasizing the need to address existing challenges such as increasing access to digital technology, strengthening data security and privacy, and providing training and support for medical personnel. Digitalization also offers opportunities for innovation and the development of a more integrated health system, which can enhance the overall quality of health services. To capitalize on these opportunities, investment in innovative technologies like AI, machine learning, and wearables is needed. Healthcare providers should integrate these technologies into their clinical practices to improve diagnosis and treatment accuracy. Further research is needed to explore the long-term impact of digitalization on health services and develop effective solutions to address existing challenges.

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