



# Maximizing Artificial Intelligence for Patient Satisfaction: Marketing Strategies in The Digital Health Era

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## Track Record Article

Accepted: 24 January 2024  
Revised: 01 February 2024  
Published: 26 March 2024

### How to cite :

Hotmangatur, Parsaoran, A., & Bachtiar, A. (2024). Maximizing Artificial Intelligence for Patient Satisfaction: Marketing Strategies in The Digital Health Era. *Contagion: Scientific Periodical Journal of Public Health and Coastal Health*, 6(1), 575-584.

## Abstract

*The advent of the Fourth Industrial Revolution has catalyzed transformative changes in the healthcare sector, highlighting the need to optimize Artificial Intelligence (AI) to improve patient satisfaction. This research examines the role of AI in revolutionizing the healthcare market and its potential to improve patient outcomes. Using a systematic literature review, we collected and analyzed studies published from 2017 to 2022 from various databases such as ProQuest, Science Direct, PubMed, CINAHL, and Scopus, focusing on AI applications in healthcare and its impact on patient satisfaction. Inclusion criteria for the initial screening were articles that were freely available in full text, had open access, and were published in English or Indonesian, as well as ensuring no duplication in the records found. Significant findings were synthesized through thematic and descriptive analysis to ascertain the efficacy of AI in patient care. Of the 25 articles relevant for further evaluation, 12 studies met the inclusion criteria and were included in the qualitative analysis. The chosen methodology allowed the authors to conduct a comprehensive and systematic review. A practical suggestion that can be drawn from these findings is the importance of investing in the development of artificial intelligence (AI) in healthcare. This requires adequate training for staff to understand and use these technologies effectively. In addition, healthcare institutions should ensure that the use of AI remains compliant with applicable privacy and ethical regulations. Collaboration between various parties such as healthcare institutions, technology providers, and researchers is also necessary to accelerate innovation and knowledge exchange. By utilizing real-time data analysis powered by AI, healthcare can be improved, and governments can support innovation in AI by providing incentives, supportive regulations, and adequate research funding.*

**Keywords:** Artificial Intelligence, Digital Transformation, Healthcare Revolution, Patient Satisfaction, Service Optimization

## INTRODUCTION

In the transformative Fourth Industrial Revolution era, information and communication technology (ICT) plays a key role in various industries, particularly to improve operational effectiveness and competitive advantage (Lee et al., 2018; Wilson et al., 2019). The healthcare sector is experiencing a significant impact from this revolution, where the adoption of advanced digital technologies such as Artificial Intelligence (AI), machine learning, smart sensors, robots, big data analytics, and the Internet of Things (IoT) has become crucial (Lee, 2018). Integrating these technologies in healthcare has become necessary, not just an option, especially in developed economies.

Digital technology facilitates faster access to health information, enabling patients and healthcare providers to easily access medical history, test results, and other crucial data for

effective care (Ayaad et al., 2019). AI aids in faster, accurate disease diagnosis by analyzing large medical data, identifying patterns, reducing misdiagnosis, and facilitating more appropriate treatment (Kumar et al., 2023).

IoT enables real-time medical data collection through connected devices like heart rate monitors and blood sugar sensors, enabling healthcare professionals to accurately monitor patients' conditions and provide faster interventions (Alfian et al., 2018). Digital technology, AI, and IoT enable proactive health practices, allowing patients and healthcare providers to focus on disease prevention rather than treatment after symptoms appear (Wang et al., 2021)

A report from Aruba (2017) revealed that more than 60% of hospitals worldwide have integrated IoT technologies into their facilities, indicating a major shift in the delivery and management of healthcare services. The use of AI-powered technologies in healthcare is prominent, encompassing machine learning, natural language processing, and smart robotics, providing extensive innovation opportunities in a highly specialized field (Terry, Beth & Zeinomar, 2019). This is part of a broader digital transformation transforming society and how business is done across sectors (Korz, 2021; Flessa & Huebner, 2021).

However, challenges remain on the road to digital transformation in the healthcare sector. Managing stakeholder interactions poses a significant challenge for innovation in business models (Aceto et al., 2018). The trend of patient-centred care has driven the development of healthcare models that emphasize direct interactions between doctors and patients to reduce the duration of hospital stays without compromising the quality of care (Stoumpos et al., 2023).

The rapid adoption of Industry 4.0 technologies has revolutionized the competitive landscape of healthcare, emphasizing the importance of leveraging digital technologies as a key strategy to gain a competitive advantage. AI-based digital technologies have shown promise in improving process quality, reducing healthcare costs, and increasing accessibility, heralding a new era in healthcare delivery and management (H. Lee & Yoon, 2021)

## **METHODS**

To systematically conduct a literature review on the theme "Healthcare Market Revolution: Optimizing Artificial Intelligence for Patient Satisfaction", the first step that needs to be taken is to identify an appropriate research question. The research question is: "How can artificial intelligence (AI) be optimized to improve patient satisfaction in the context of an evolving healthcare market?" Relevant keywords and phrases for the literature search include

"artificial intelligence", "AI", "patient satisfaction", "healthcare market", and "technology optimization".

After determining keywords, research was conducted in electronic databases such as ProQuest, Science Direct, PubMed, CINAHL, and Scopus. The PRISMA approach illustrated the literature selection process, ensuring transparency and comprehensive reporting.

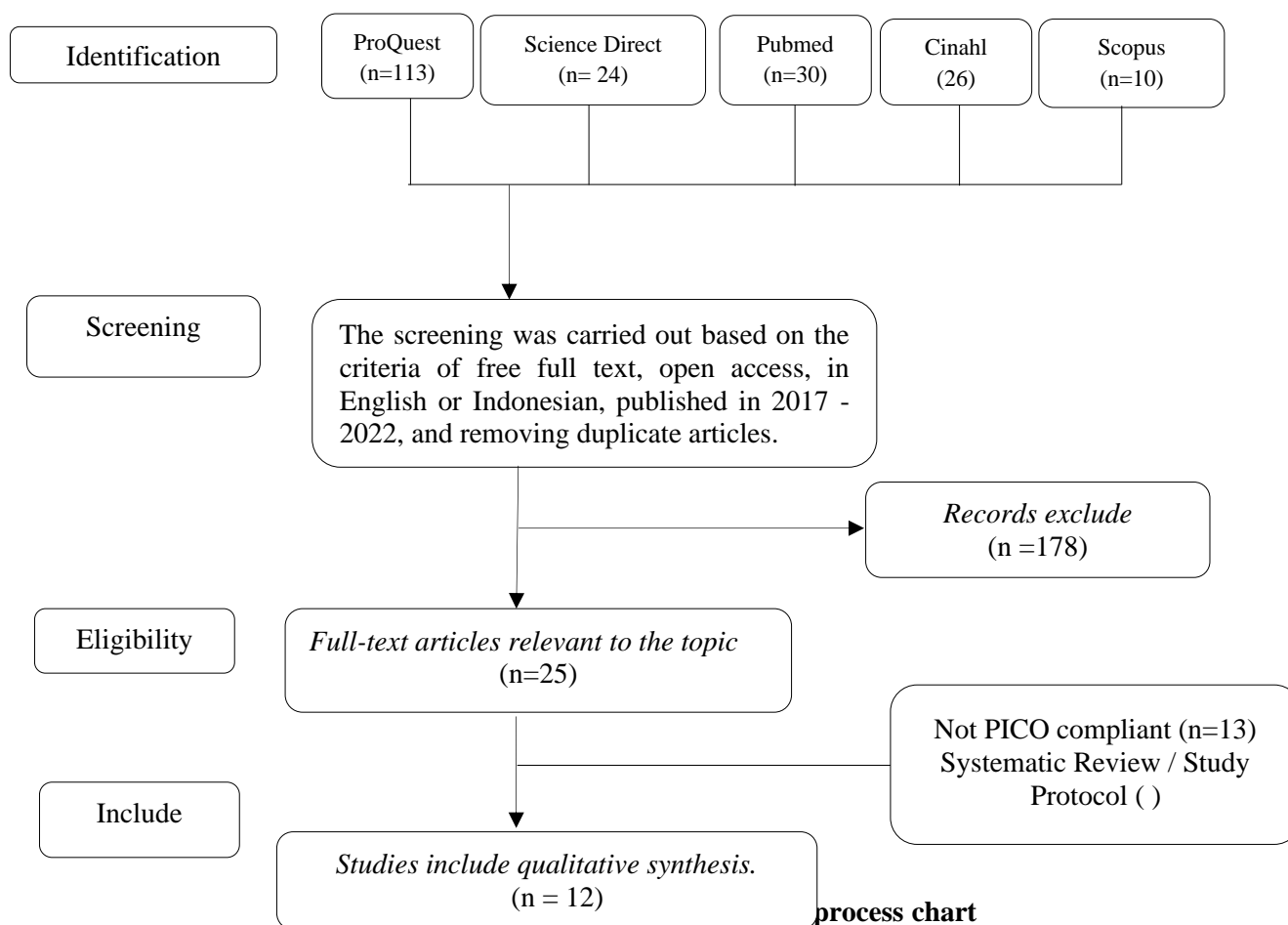
The review was designed to develop research questions and methods in the planning stage. A search was conducted during data collection to collect relevant publications published between 2017 and 2022. Inclusion criteria were publications in English or Indonesian that had open access and described AI applications in improving patient satisfaction in the healthcare sector. Exclusion criteria were literature required to be more AI, patient satisfaction, and duplicate publications.

Thematic and descriptive analysis will be used to extract and highlight key findings from previous studies on the application of AI in the healthcare context, with a particular focus on aspects of patient satisfaction. This review will explore how healthcare management utilizes AI to improve patient outcomes and satisfaction.

In the synthesis step, gaps in the current literature regarding the use of AI for patient satisfaction in the healthcare market will be identified, and areas that require further research will be emphasized. This will help determine future directions for research that will help increase the effectiveness of using AI in improving patient satisfaction in the healthcare sector. This study used a systematic approach in collecting and analyzing literature relevant to using natural language processing (NLP)--based conversational agents in healthcare. The research began with an extensive literature search through scientific databases, resulting in 203 records.

Inclusion criteria for the initial screening were articles that were freely available in full text, had open access, and were published in English or Indonesian between 2017 and 2022, as well as ensuring no duplication in the records found. Of the 25 relevant articles for further evaluation, 12 studies fit the inclusion criteria and were included in the qualitative analysis. The chosen methodology allowed the authors to conduct a comprehensive and systematic review of NLP conversational agent applications in healthcare practice. This ensured that only quality and relevant studies were the basis for the conclusions and recommendations.

## Flowchart



## RESULTS

**Table 1. Literature extraction results**

Author and year	Main focus	Main findings
(Thuemmler et al., 2017; Prado-Prado et al., 2020)	Technology Digitalization Healthcare	& Advances in technology and digitalization emphasize the need in for significant changes in the healthcare ecosystem.
(Ferreira et al., 2021)	Innovation Health	in Today's competition challenges the development of innovative goods and services based on existing resources and skills.
Ziyadin et al., (2018)	Digital Technology in Developing Countries	Developing countries must adopt digital technologies, in Developing business processes, and managerial capabilities to remain competitive.
(Hong et al., 2018)	IT Systems Healthcare	in Modern IT systems improve the quality of care and reduce diagnostic and treatment delays.
(Teece, 2018; Ardito et al., 2019)	Impact of Technology Advancement	of Technological advancements and digital innovations affect every aspect of human life, especially the healthcare industry.

Author and year	Main focus	Main findings
(Jatoba et al., 2023)	The Impact of AI on HR Management	AI significantly impacts human resource management, including decision support, work automation, talent acquisition, and staff training.
(Martins et al., 2020)	AI-based Methods for Service Quality Assessment	AI-based methods help assess service quality by understanding cause-and-effect relationships and minimizing overlooked criteria.
(Rodríguez-Rodríguez et al., 2019)	Challenges for Private Hospitals	Private hospitals face significant challenges in adjusting to their context, such as Europe's ageing population.
(Eckrich & Schlesinger, 2011)	Growth of Health Institutions	Healthcare institutions are the fastest-growing service segment globally.
(Butt et al., 2019; Hamet et al., 2017)	Advanced Technology in Healthcare	Understanding patient behaviour and preferences is important in to develop programs that meet each patient's expectations personally.
(Waring et al., 2020)	AI in Industrial Marketing	AI is identified as a critical technology infrastructure in various enterprise activities and processes.
(Agrawal et al., 2019; Krakowski et al., 2023)	AI Substitution and Augmentation	AI can replace or enhance human capabilities, especially in diagnosing and predicting diseases.
(Rialti et al., 2019; Bohr et al., 2020; Balta et al., 2021)	Business Model Adaptation in Healthcare	Healthcare organizations must adapt their business models and in strategies to the rapidly changing socioeconomic landscape.

Based on these findings, the integration of artificial intelligence (AI) in healthcare significantly improves patient satisfaction, operational efficiency, and overall quality of care. AI helps to streamline care processes, improve responsiveness to patients, and enable a more personalized approach to healthcare.

In addition, AI also facilitates innovation in healthcare technology and helps healthcare institutions adjust to technological changes, provided it is accompanied by staff education and effective change management. Thus, the use of AI has great potential to revolutionize the healthcare market by creating more efficient, patient-focused, and quality services.

## DISCUSSION

In the context of the healthcare market revolution, artificial intelligence (AI) optimization is a significant catalyst for improving patient satisfaction. Based on the articles presented, technology and digitalization are shaping an increasingly complex and dynamic healthcare ecosystem (Thuemmler et al., 2017; Prado-Prado et al., 2020). Ferreira (2021) emphasized the importance of innovation in nurturing patient empowerment and ensuring efficient access to quality healthcare resources.

As described by Wamba-Taguimdje (2020), AI in health data management contributes to operational efficiency and managerial ability to remain competitive. AI optimises business

processes and improves patient experience through more personalized and responsive processes. Thus, AI improves patient satisfaction by simplifying and accelerating healthcare processes.

As discussed by Hong (2018), the application of modern IT technologies in healthcare improves the quality of care by reducing diagnostic and treatment delays. Advanced IT systems, supported by AI, can process patient data quickly, provide accurate information for medical personnel, and directly affect patient satisfaction through more effective and efficient care.

Innovation in health technology, according to Teece, (2018), Appio (2018) and Leone (2018) range from improving medical equipment to developing health information systems that can accommodate the needs of patients and healthcare practitioners as a whole. The use of AI-based methods in decision-making and human resource management, as described by Jatoba (2023), strengthens the ability of healthcare institutions to deliver better and more personalized services, ultimately improving patient satisfaction.

Rodriguez (2019) highlighted the challenges hospitals face in adjusting to technological advancements. Healthcare institutions must quickly adapt to these changes to meet patients' increasing expectations and needs. Artificial intelligence, through its use in data processing and analysis, helps overcome these challenges by providing more responsive and precise services.

Pfotenhauer & Jasanoff (2017) and Balogun & Ogunnaike (2017) recognize that artificial intelligence has great potential to change the way healthcare institutions deliver their services, strengthening aspects of patient satisfaction through a more integrated and individual needs-oriented healthcare process. In conclusion, revolutionizing the healthcare market with the integration of artificial intelligence creates operational efficiencies and enables a more patient-focused approach, directly improving their satisfaction in receiving healthcare services.

Healthcare management can utilize AI for real-time data analysis, supporting faster and more accurate decision-making, improving operational efficiency, and proactively responding to patient needs. AI enables care that is more tailored to patient's individual needs, which improves satisfaction and health outcomes through more relevant and focused care.

The importance of training staff to master new technologies and effective change management strategies to facilitate successful adaptation to AI innovations in healthcare practice. Managers should ensure compliance with AI privacy and ethics regulations while encouraging collaboration between different disciplines to develop ethical and impactful AI solutions in healthcare.

## CONCLUSIONS

Thus, the conclusion from these findings is that the use of artificial intelligence in healthcare has great potential to improve patient satisfaction, operational efficiency, and overall quality of care.

A practical suggestion that can be drawn from these findings is the importance of investing in the development of artificial intelligence (AI) in healthcare. This requires adequate training for staff to understand and use these technologies effectively. In addition, healthcare institutions should ensure that the use of AI remains compliant with applicable privacy and ethical regulations. Collaboration between various parties such as healthcare institutions, technology providers, and researchers is also necessary to accelerate innovation and knowledge exchange. By utilizing real-time data analysis powered by AI, healthcare can be improved, and governments can support innovation in AI by providing incentives, supportive regulations, and adequate research funding.

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