PERINATAL JOURNAL

Original Article

Perinatal Journal 2026; 34(2):46-61

https://doi.org/10.57239/prn.26.0342006

The impact of artificial intelligence on hospital performance and patient experience in hospitals Indonesia

Christin Angelia[1*], Renata[2], Sylvia Samuel[3]

[1,2,3]Master of Hospital Administration, Universitas Pelita Harapan, Jakarta, Indonesia

Abstract

This study investigates the impact of Artificial Intelligence (AI) implementation on hospital service performance in Indonesia by integrating a socio-behavioral perspective that includes healthcare worker job performance, patient experience factors, patient support for AI, and patient characteristic factors. Using a quantitative explanatory approach, data were collected through questionnaires distributed to healthcare workers and patients who had experience using AI-based services in hospitals, clinics, or community health centers in Indonesia. A total of 140 valid responses were analyzed using Partial Least Squares–Structural Equation Modeling (PLS-SEM). The results reveal that AI implementation has a strong and positive direct effect on hospital service performance, indicating its transformative role in enhancing operational efficiency, clinical accuracy, and service quality. AI also positively influences healthcare workers' job performance and patient experience factors, although their mediating effects on hospital performance are relatively modest. Patient support for AI exhibits a positive relationship with AI utilization, but contributes minimally to overall hospital performance, indicating that patient-facing AI services are still in the early stages of adoption. Patient characteristic factors demonstrate a weak and insignificant moderating effect, indicating that the benefits of AI are relatively consistent across demographic groups. This study contributes to the literature by extending technology acceptance research into a comprehensive socio-technical framework that incorporates both provider and patient perspectives. The findings offer practical insights for hospital managers and policymakers to prioritize workforce readiness, patient-centered AI design, and governance frameworks to optimize AI-driven hospital performance in Indonesia.

Keywords: Artificial intelligence, Hospital service performance, Job performance, Patient support for AI

Introduction

The development of digital technology in health services has accelerated globally, with Artificial Intelligence (AI) emerging as a transformative tool in medicine, research, and hospital management. According to the World Health Organization (2021), AI can improve diagnostic accuracy, accelerate treatment processes, and enhance healthcare efficiency. Globally, AI startups in healthcare have reached more than 2,700 across 79 countries, attracting investments exceeding USD 50 billion (Zahlan et al., 2023). The United States, the United Kingdom, and China currently dominate AI utilization in health services, demonstrating its potential to revolutionize clinical practice and patient care.

While AI has transformed healthcare worldwide, its adoption in developing nations remains limited. In the ASEAN region, Indonesia is still in the early stage of AI implementation compared to countries like Singapore (Tun et al., 2025). Within hospital settings, AI applications such as medical imaging, telemedicine, and clinical decision support systems have started to emerge. However, Indonesia faces persistent barriers, including uneven digital infrastructure, limited regulations on health data, and low digital literacy among healthcare professionals. These conditions slow the pace of hospital digital transformation, despite growing national attention to the issue.

AI adoption in healthcare is not solely a matter of technology readiness; it also depends on human and behavioral dimensions. Healthcare workers' performance determines how effectively new systems are integrated into clinical workflows, while patient support for AI—shaped by trust, ethics, and perceived safety influences acceptance and sustained use (Samah & Samar, 2025). Nevertheless, most existing research still concentrates on technical aspects such as algorithm accuracy, data security, and system performance (Choudhury & Asan, 2020). Socio behavioral studies that link AI implementation with healthcare worker performance and patient support remain limited, particularly in Indonesia.

This study contributes to the existing body of

Correspondence: Christin Angelia, Master of Hospital Administration, Universitas Pelita Harapan, Jakarta, Indonesia, **e-mail:** christinangel42@gmail.com,
Received: December 10, 2025 **Accepted:** January 8, 2026

knowledge in several important ways. First, it extends previous AI-healthcare research by shifting the analytical focus from purely technical aspects of AI systems toward a socio behavioral perspective that integrates both healthcare personnel and patient viewpoints an approach that has been largely overlooked in prior studies. Second, this study simultaneously examines the roles of healthcare worker job performance and patient support toward AI as mediating variables that shape the overall impact of AI utilization on hospital service performance. Existing literature typically analyzes these constructs separately; thus, integrating them into a single empirical framework provides a more holistic understanding of AI adoption in clinical settings. Third, this research offers novel empirical evidence from Indonesia, a developing country context where AI implementation in healthcare is still emerging and characterized by varying levels of digital readiness, regulatory maturity, and public acceptance. By incorporating both medical professionals and patient respondents, this study provides a dual perspective model that enhances the theoretical and practical understanding of how AI technologies can be effectively adopted to improve hospital services.

This study contributes by extending prior technical AI research to a sociobehavioral perspective, emphasizing how healthcare worker performance and patient support influence hospital service performance. Hospital service performance is a critical outcome variable that reflects not only operational efficiency but also patient satisfaction and quality of care. Understanding these linkages provides empirical insights into how non-technical factors shape the success of digital transformation in hospitals.

In response to these challenges, the Indonesian Ministry of Health has introduced the Digital Health Transformation Blueprint (2021–2024) and Regulation No. 24 of 2022 on Medical Records to promote digitalization. However, specific regulations regarding AI implementation in hospitals are still evolving (Kementerian Kesehatan RI, 2021). Therefore, this research aims to analyze the relationships between AI implementation, healthcare worker performance, and patient support for AI, and how these factors affect hospital service performance in Indonesia. Understanding these socio behavioral factors provides evidence for policymakers to design effective AI adoption strategies aligned with Indonesia's national health digitalization agenda.

Literature Review and Hypothesis Development

Customer Behaviour Theory explains how perceptions, attitudes, emotions, and experiences influence the decision-making process as well as customer interactions with a product or service. In this context, customer behaviour is not only determined by rational factors such as quality and price, but also by psychological and social factors such as satisfaction, trust, and commitment, which ultimately shape customer engagement and loyalty (Barari et al., 2021). This statement is supported by a study conducted in 2021, which stated that several factors influence patient experience satisfaction in healthcare services. This is related to the cultural context, particularly the care provided by staff beyond their formal duties, which affects patients' mental and emotional perceptions. Therefore, healthcare providers need to strengthen internal variables such as building trust, fostering positive emotional responses, and encouraging positive cognitive perceptions (Kim et al., 2022).

In the healthcare context, recent literature has extensively utilized the Extended TAM (UTAUT2) model, combined with other AI-relevant variables, such as trust, privacy concerns, perceived risk, and explainability. For example, (Yin et al., 2021) emphasized that trust and transparency in AI systems are key factors in patient acceptance, while (Al Kuwaiti et al., 2023) demonstrated that facilitating conditions and performance expectancy significantly influence patient support for AI technology. Therefore, the use of the Extended TAM (UTAUT2) model provides a more comprehensive framework for understanding the factors influencing patient acceptance of AI in healthcare.

Artificial Intelligence (AI)

Artificial Intelligence (AI) in healthcare is defined as a technology that enables computer systems to analyze large amounts of data, recognize patterns, and support clinical decision-making (Choudhury &

Asan, 2020). AI implementations have been used in medical imaging, clinical decision support systems, telemedicine, patient data management and patient rehab medic (Santamato et al., 2024; Scardoni et al., 2020). Relevant theoretical frameworks include the Technology Acceptance Model (TAM) by Venkatesh et al which emphasizes perceived usefulness and perceived ease of use and the Diffusion of Innovation Theory, which explains the process of innovation adoption in organizations. Thus, AI is viewed as a technological innovation whose success is determined by the interaction of technical, organizational, and user factors(Secinaro et al., 2021).

In terms of functional value, AI has been shown to improve the efficiency, accuracy, and effectiveness of hospital services (Choudhury & Asan, 2020; Wang et al., 2021). AI has also been reported to be effective in controlling healthcare-associated infections, particularly through clinical data monitoring and patient risk stratification (Scardoni et al., 2020). Encouraging positive attitudes among healthcare workers and patients towards the use of technology, for example in AI based clinical care which has been proven to accelerate rehabilitation and improve the quality of life of patients (Santamato et al., 2024; Secinaro et al., 2021).Furthermore, AI developments are not only impacting clinical practice and service management, but also the scientific process itself. Recent studies highlight the potential use of AI in conducting literature reviews, which can accelerate the evidence synthesis process, although challenges related to transparency and validation remain (Bolaños et al., 2024). However, these attitudes are also influenced by transparency and data privacy(Sqalli & Al-Thani, 2020). Recent research also confirms that the success of AI implementation is measured not only by technical performance but also by user acceptance and integration with clinical workflows (Secinaro et al., 2021; Yin et al., 2021). Therefore, it can be concluded that the higher the perceived functional value of AI, the more positive the attitude toward its use.

Therefore, the hypothesis as follow H1. The implementation of AI in healthcare has a positive impact on the quality of hospital services.

Job performance

Healthcare worker performance (job performance) is an individual's ability to carry out professional tasks effectively according to medical service standards, including the dimensions of task performance, contextual performance, and adaptive performance (Krijgsheld et al., 2022). Factors that influence job performance include the work environment, leadership, organizational support, and workload balance (Agus Triansyah et al., 2023). In studies of healthcare human resource management, theories frequently used to explain this variable are the Job Demands-Resources (JD-R) Model, Herzberg's Two-Factor Theory, and Social Exchange Theory. These theories emphasize the balance between workload, organizational resources, and managerial support in improving staff performance (Adamopoulos, 2022; Adamopoulos & Syrou, 2022; Almutairi et al., 2022). From a functional value perspective, increasing organizational resources like training, improved workflow, and technological support can provide tangible benefits in the form of efficiency, diagnostic accuracy, and reduced administrative workload (Almutairi et al., 2022; Krijgsheld et al., 2022). These benefits contribute to the development of positive attitudes in healthcare workers, such as job satisfaction and intrinsic motivation conversely, excessive workload and stress are negatively related to attitudes and performance (Adamopoulos, 2022). Thus, previous research supports the relationship that functional values influence attitudes, which in turn improve job performance (Adamopoulos, 2022).

Therefore, the hypothesis as follow H2. Job performance of health workers has a positive influence on the quality of hospital services.

Patient support for AI

Patient support for AI is the level of patient acceptance, trust, and readiness to use healthcare services that utilize artificial intelligence, encompassing aspects of perceived usefulness, perceived ease of use, and perceived risk (Randall, 2023). This patient support can be explained through several theoretical frameworks like in The Technology Acceptance Model (TAM) perceived usefulness and ease of use will influence patient attitudes. The Unified Theory of Acceptance and Use

of Technology (UTAUT) adds social influence and facility conditions as supporting factors for technology acceptance. Meanwhile, Trust Theory emphasizes the importance of patient trust in the system's capability, integrity, and transparency (Sqalli & Al-Thani, 2020). Furthermore, the Health Belief Model (HBM) is relevant because patients support AI if they perceive the benefits outweigh the barriers and risks (De Micco et al., 2024). Patient acceptance of AI is heavily influenced by trust factors and perceived transparency of the system (Randall, 2023). In the healthcare context, these theories emphasize that patient support is highly dependent on a combination of transparency, data privacy, clinical evidence are key factors in fostering patient support and combine with highlight the importance of governance and regulation in maintaining patient safety (De Micco et al., 2024; Randall, 2023)

From a functional value perspective, AI provides tangible benefits to patients, such as continuous chronic disease monitoring, medication reminders, personalized health education, and early detection of medical risks (Yin et al., 2021). This functional value contributes to shaping positive patient attitudes. This functional value can shape a positive attitude in patients, especially if they feel the system is safe, transparent and useful (Randall, 2023). Research also shows that patients are more supportive of AI use when they perceive their expectations are met, privacy is protected, and transparency in clinical processes is guaranteed (De Micco et al., 2024). Therefore, it can be concluded that the greater the functional value perceived by patients, the more positive their attitudes, thus increasing support for AI implementation in hospitals. Therefore, the hypothesis as follow H3. The functional value of AI services positively influences patient support for AI through shaping positive patient attitudes.

Hospital service performance

Hospital performance is influenced by many factors, one of which is the development of artificial intelligence. Artificial intelligence can affect hospital performance both positively and negatively. This is in line with what was stated by C. Beau Hilton and colleagues, who pointed out the limitations in the healthcare system, the retrospective design, and the lack of accurate information in several variables such as primary diagnosis. In their study, which used a retrospective cohort study model, it was mentioned that artificial intelligence can predict patient care outcomes with the help of machine learning, which improves prediction accuracy (Hilton et al., 2020). Similarly, in other research, the role of AI in healthcare services is found to be difficult to implement effectively due to the dynamic environment, which hinders the optimal functioning of AI. This is associated with the constantly changing patient population, clinical practices, and treatments, which necessitate continuous monitoring and updates to the AI. AI can be implemented in healthcare services if a multidisciplinary approach is taken, involving medical professionals, IT experts, statisticians, administrators, model developers, and regulators. Therefore, collaboration between institutions is required to ensure safety and reliability (Feng et al., 2022).

This contrasts with a study conducted in Toronto in 2023, which stated that AI can serve as a support system for healthcare service management in terms of business transformation, involving leadership, strategic adaptation, and technological expertise. This enables hospitals to build organizations through training and strategic vision aligned with technological advancements, in collaboration with external partners, allowing them to understand and integrate technology in order to become digital hospitals and improve both the healthcare system and hospital performance (Dicuonzo et al., 2023). In a study using the literature review method regarding the use of AI in operating rooms, AI plays many important roles that assist with tasks related to scheduling, management, workforce allocation, and emergency surgery scheduling. AI contributes to decision-making in operating room management, improves scheduling accuracy, reduces delays, and enhances resource utilization, thereby improving hospital service performance in terms of both cost and benefit. However, this also presents challenges in workflow adaptation and ethical concerns regarding data privacy and accountability (Bellini et al., 2024). Therefore, the implementation of AI heavily depends on the acceptance of both patients and healthcare professionals. In a study conducted by Lambert et al., it was noted that there is anxiety over the loss of autonomy in decision-making, integration, and trust in the accuracy of the system. This is also linked to

concerns about medical errors and efficiency, patient satisfaction, lack of doctor-patient communication, and alignment with corporate culture (Lambert et al., 2023). Therefore, the hypothesis as follow H4. Artificial Intelligence positively affects Hospital Service Performance

Patient experience factors

Patient satisfaction is one of the key factors determining a hospital's success. According to a quantitative survey-based study conducted among healthcare professionals in Saudi Arabia, the capability of machine learning has a significant impact on patient satisfaction (Al Oraini, 2024). According to Sauerbrei et al., AI has the potential to either improve or disrupt care through dehumanization, reduced empathy, and the creation of a paternalistic approach, which can shift the doctor-patient relationship away from person-centered care. Therefore, to maintain patient satisfaction, the use of AI in healthcare services requires two main competencies including AI literacy and humanistic skills, including empathy, communication, and ethics (Sauerbrei et al., 2023). Patients' perceptions of AI are considered crucial in the implementation of AI in hospital services. In an experimental study using surveys conducted in the United States in 2021, it was found that patients with acute conditions expressed concern about privacy when AI was used alongside healthcare providers, compared to face-to-face consultations. Similarly, patients with chronic illnesses were less likely to trust AI in providing accurate diagnoses. Patients perceived that using AI reduces human interaction and communication. The study noted that direct interaction with doctors was considered the most valuable, although AI used in conjunction with healthcare professionals was still seen as acceptable. The study concluded that patients demonstrated resistance to the use of AI in healthcare services. While AI has the potential to improve the efficiency of diagnosis and treatment, public acceptance remains hindered by ethical and social concerns (Esmaeilzadeh et al., 2021; Bano, 2023).

Currently, AI is widely used in healthcare as chatbots, diagnostic tools, and for analyzing radiology results. According to a qualitative study based on focus group discussions with patients at the Mayo Clinic in Minnesota and Wisconsin from 2019 to 2020, it was found that patients accept the presence of AI in healthcare services as long as it is accompanied by supervision, transparency, and protection against risks. It was stated that patients' concerns were related to medical ethics issues including cost, discrimination, and limited options (Richardson et al., 2021). This is supported by research conducted by Young et al. in 2021, which found that patients are familiar with AI but have little understanding of its application in the clinical setting, leading to rejection of health chatbots and autonomous surgery. Patients stated that they use AI only as a second opinion (Young et al., 2021).

Therefore, the hypothesis as follow H6. Artificial Intelligence positively affecting Patient Experience.

Patient characteristic factors

The acceptance of artificial intelligence in healthcare is influenced by many factors. Certain patient characteristics support the use of AI in healthcare services, while others do not. This may be affected by the patients' background. A study conducted in Germany in 2020 using a questionnaire survey at one of the hospitals revealed that patients with higher levels of knowledge about AI were more willing to use AI-based healthcare services. However, this contrasted with patients who stated that they trusted doctors more when it came to diagnosis, communication, and empathy (Lennartz et al., 2021; Jam et al. 2025). A study in China in 2020, which examined the acceptance of AI among patients with medical and non-medical backgrounds, showed that both groups of patients welcomed AI. Nevertheless, patients with non-medical backgrounds tended to trust AI more than those with medical backgrounds due to concerns about safety and validity. Male patients were found to be significantly more accepting of AI compared to female patients. Healthcare services involving AI were most readily accepted by patients over the age of 49 and by those with lower levels of education (Xiang et al., 2020). Similar findings were reported by Khanijahani et al., who stated that the acceptance of AI in healthcare is influenced by social factors, public awareness, and patients' knowledge about AI, as well as age, gender, education, occupation, race, and ethnicity. Patients with non-medical occupational backgrounds were

also found to be more accepting of AI, and patients with a history of misdiagnosis were more open to AI use (Khanijahani et al., 2022a).

In 2022, a study was conducted in China using a quantitative survey based on the expectation-confirmation theory (ECT) model by Liu et al., which reported that male patients, younger patients, and those with higher education levels were more likely to accept AI in healthcare services. The literature also emphasized the need for a personalized approach for older patients (Liu et al., 2022). This finding is supported by data from an observational study in London in 2020, which carried out an exploratory pilot study using self-assessment through a smartphone application. The results showed that younger patients with acute clinical symptoms were more willing to use AI as a symptom checker because they felt supported by AI in healthcare services (Miller et al., 2020).

Therefore, the hypothesis as follow H6. Patient characteristic factors positively affecting artificial intelligence in hospital service performance

Method

This study employs a quantitative approach using an explanatory research method. The purpose of this research is to explain the causal relationship between the dependent variable, independent variable, mediating variable, and moderating variable. This study analyzes the impact of artificial intelligence (AI) implementation on hospital service performance by considering job performance, patient experience factors, and patient support for AI as mediating variables, as well as patient characteristic factors as a moderating variable. The research design is cross-sectional, with data collected at a single point in time through the distribution of questionnaires to respondents who meet the inclusion criteria.

Research population and sample

The population in this study consists of two main groups: health workers and the general public who have sought medical treatment at healthcare facilities such as hospitals, clinics, or community health center (PUSKESMAS) in Indonesia and have used AI-based systems or services during the healthcare process.

The research sample was determined using a purposive sampling technique, which is a method of selecting samples based on specific criteria aligned with the research objectives. The inclusion criteria are as follows:

1. Health workers

a) Currently working in a hospital, clinic, or community health center (PUSKESMAS) in Indonesia
b) Have used AI-based services
c) Willing to participate as a research respondent

2. General public

a) Have received medical treatment at healthcare facilities such as hospitals, clinics, or community health center (PUSKESMAS) in Indonesia
b) Have used AI-based services
c) Willing to participate as a research respondent

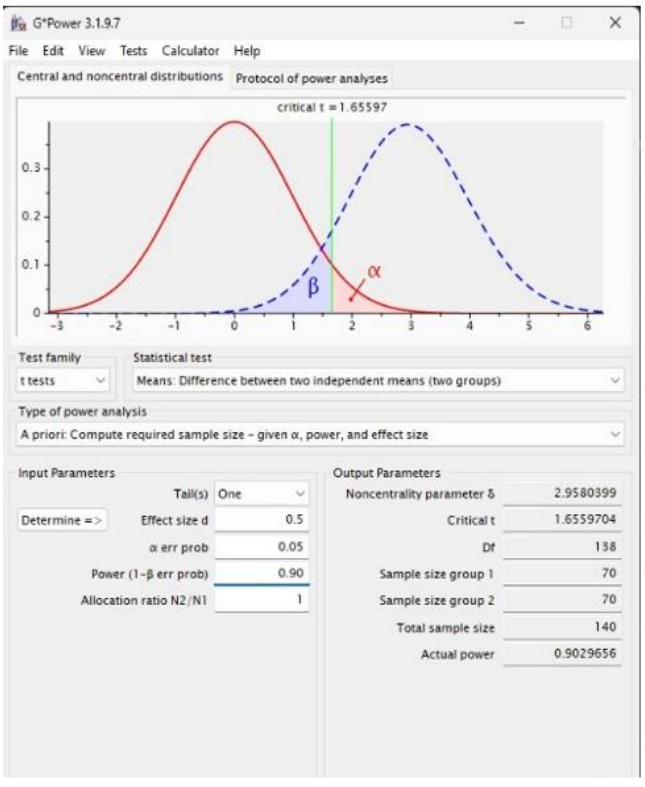

Figure 1 G-power analysis

The number of samples was determined based on the results of the G*Power analysis using a one-tailed t-test with an assumed medium effect size (d = 0.5), a significance level of 0.05, and a desired statistical power of 0.90. These parameters indicate the researcher's intention to detect a meaningful difference between the two groups with a low risk of Type I error and a high probability of correctly identifying a true effect which recommended a minimum of 140 respondents to achieve adequate statistical power for the measurement model. This estimation also aligns with the recommendation of who suggested Hair et al., (2021) that the minimum sample size should range between 5 to 10 respondents per indicator in a structural equation model. With a total of X indicators represented by question items in this study, the minimum recommended sample size ranged between Y and Z respondents**.** Therefore, this study aims to collect data from 140 respondents, consisting of 70 health workers and 70 patients or members of the general public who have received medical services at healthcare facilities such as hospitals, clinics, or community health centers (PUSKESMAS) in Indonesia and have experience using AI-based healthcare services. The output also displays the noncentrality parameter (δ = 2.9588), the critical t-value (1.65597), and the degrees of freedom (138), which together describe the statistical conditions under which the hypothesized group difference would be tested.

Types and sources of data

This study utilizes both primary and secondary data.

1. Primary data are obtained through the distribution of online questionnaires via Google Forms to medical personnel and members of the general public who meet the inclusion criteria.
2. Secondary data are gathered from various sources, including academic publications, scientific journals, and other supporting data relevant to the research topic.

Research variables and operational definitions

This study consists of four types of variables, namely:

1. Independent Variable (X): Artificial Intelligence
2. Mediating Variables (M): Job Performance, Patient Experience Factors, and Patient Support for AI
3. Moderating Variable (Z): Patient Characteristic Factors
4. Dependent Variable (Y): Patient Experience

Measurement

All constructs in this study were measured using previously validated scales and guided by the theoretical and empirical foundations from recent AI and healthcare literature. This research focus based on AI, job performance, patient support AI, hospital service performance, patient experience factor, and patient characteristic factor. All items were assessed using a five-point Likert scale from 1 (strongly disagree) to 5 (strongly agree).

Measuring AI perception were adapted from empirical studies that investigate patients and the general public's reactions toward AI applications in health services (Randall, 2023; Richardson et al., 2021; Young et al., 2021). These AI is assessed by fourteen items (Esmaeilzadeh, 2020). Measuring job performance assessed by nine items (Reegård et al., 2025). Measuring patient support AI assessed by 8 items (Arachchi & Samarasinghe, 2025). Measuring hospital service performance assessed by seven items (Fritsch et al., 2022a). Patient experience factor measuring assessed by seven items (Fritsch et al., 2022a). Measuring patient characteristic factor determined by seven items (Krijgsheld et al., 2022).

Data analysis technique

Data analysis was conducted using the Structural Equation Modeling (SEM) method with a Partial Least Squares (PLS) approach, utilizing the SmartPLS software. This technique was chosen because it can examine complex relationships among variables, including direct, indirect, and moderating effects.

The stages of data analysis include:

1. Descriptive analysis to describe the characteristics of respondents.
2. Validity and reliability testing of constructs

(CFA and Cronbach's Alpha).
3. Structural model testing (inner model) to assess relationships among latent variables.
4. Mediation effect testing using the bootstrapping technique to measure indirect effects.
5. Moderation effect testing by adding an interaction term between the independent and moderating variables.

The analysis results are interpreted based on the path coefficient values, significance levels (p-values), and R-square values to evaluate the strength of the model.

Research ethics

This study was conducted in accordance with the principles of research ethics. Each respondent was provided with an explanation of the research objectives, the confidentiality of the data, and their right to refuse or withdraw from participation at any time without any consequences.

The researcher also ensured that all collected data would be used solely for academic purposes. If required, this study will be submitted to obtain ethical clearance from the university's ethics committee or relevant institution.

Conceptual framework of the research

The relationships among the variables in this study are illustrated as follows:

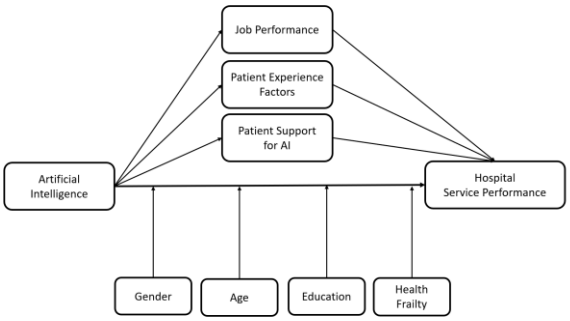

Figure 2. Conceptual Framework

Demographic profile

This study includes respondents' demographic information consisting of gender, age, and respondent status. The demographic distribution was summarized to provide an overview of the characteristics of the sample. Gender was categorized into male and female, with a relatively balanced composition (49.8% male and 50.2% female).

Table 1. Demographic profile

Index	Frequency	%
Gender		
Male	227	49.8
Female	229	50.2
Age (years)		
<20	6	1.3
20-24	113	24.8
25-44	177	38.8
45-59	129	28.3
>60	31	6.8
Respondent Status		
Health workers	216	49.2
General Public	219	49.9

The age of respondents was grouped into five categories (<20, 20–24, 25–44, 45–59, and >60 years), with the majority falling within the 25–44 age group (38.8%), followed by respondents aged 45–59 (28.3%) and 20–24 (24.8%). Additionally, respondents were classified based on their status either as health workers or the general public, representing 49.2% and 49.9% of the sample, respectively. This study's measurement items were evaluated using the five point likert scale (1 = strongly disagree to 5= strongly agree)

Cross Validated Predictive Ability Test (CVPAT)

The Cross-Validated Predictive Ability Test (CVPAT) was conducted to evaluate the predictive capability of the PLS-SEM model by comparing the model's average loss values against the indicator average (IA) as a naïve prediction benchmark (Liengaard, 2021; Guenther et al., 2023). A model with strong predictive ability should demonstrate lower average loss than the IA benchmark, reflected by negative and statistically significant average loss differences. The CVPAT results show that all endogenous constructs in this study produce negative and significant average

loss differences ($p < 0.001$), indicating that the PLS model generates more accurate predictions than the simple indicator-average–based prediction method (IA). The detailed results are as follows:

Table 2. CVPAT

Construct	PLS Loss	IA Loss	Average Loss Difference (PLS–IA)	p-value	Interpretation
Job Performance (JP)	0.601	0.708	−0.108	<0.001	PLS model provides significantly better prediction than IA.
Patient Experience Factor (PEF)	0.372	0.410	−0.038	<0.001	Predictive accuracy of PLS exceeds IA benchmark, though with smaller improvement.
Patient Support AI (PS)	0.304	0.336	−0.032	<0.001	PLS model performs significantly better than IA for predicting PS.
Hospital Performance (HSP)	0.538	0.631	−0.093	<0.001	Strong predictive advantage of PLS over IA.
Overall Average	0.464	0.534	−0.070	<0.001	The model demonstrates strong global predictive ability.

In addition, the overall average loss difference of −0.070 ($p < 0.001$) indicates that the model, as a whole, demonstrates better predictive performance compared with the IA benchmark. Therefore, the CVPAT results confirm that the PLS-SEM model used in this study exhibits strong predictive capability, making it appropriate for predictive analysis in the context of artificial intelligence implementation within healthcare services.

IPMA

Importance–Performance Map Analysis (IPMA) was conducted to identify which predictor constructs contribute most strongly to Hospital Performance while also evaluating their current performance levels.

Table 3. IPMA

Konstruk	Importance (Total Effects)	Performance (0–100)
AI	± 0.44	± 72
Job Performance (JP)	± 0.80	± 47
Patient Characteristic Factor (PCF)	± 0.03	± 88
Patient Experience Factor (PEF)	± 0.03	± 84
Patient Support AI (PS)	± 0.03	± 87

As shown in this table and the IPMA plot, there are substantial differences in the relative importance and performance of the predictors, providing insight into which factors should be prioritized for improvement.

Job Performance (JP) emerges as the most critical determinant of Hospital Performance, with the highest importance value (~0.80) yet relatively low performance (~47). This indicates that improvements in healthcare providers' efficiency, work quality, and task execution would yield the greatest incremental gains in hospital outcomes. Therefore, Job Performance should be considered the top strategic priority for hospital administrators seeking to maximize performance impacts.

Meanwhile, AI shows moderate importance (~0.44) and mid-level performance (~72), suggesting that strengthening AI deployment, integration, and user adoption could still meaningfully enhance hospital performance, although not as strongly as improvements in Job Performance. On the other hand, Patient Support AI, Patient Experience Factor (PEF), and Patient Characteristic Factor (PCF) display very low importance values (≈0.03) despite having high performance levels (≈84–88). These constructs, although functioning well, do not substantially influence hospital performance in the current model and thus require less immediate managerial attention.

Overall, the IPMA results emphasize that interventions aimed at improving Job Performance—such as workforce training, workflow optimization, and competency development—should be prioritized, followed by efforts to strengthen AI utilization and adoption in clinical processes.

Discussion

This study is intended to analyze the relationships between AI implementation, healthcare worker performance, and patient support for AI, and how these factors affect hospital service performance in Indonesia.

Table 4. Results of discriminant validity

	AI	Hospital Performance	Job Performance	Patient Characteristic Factor	Patient Experience Factor	Patient Support AI	Patient Characteristic Factor x AI
AI							
Hospital Performance	0.504						
Job Performance	0.476	0.919					
Patient Characteristic Factor	0.398						
Patient Experience Factor	0.402			0.823			
Patient Support AI	0.385			0.885	0.769		
Patient Characteristic Factor x AI	0.281			0.088	0.099	0.074	

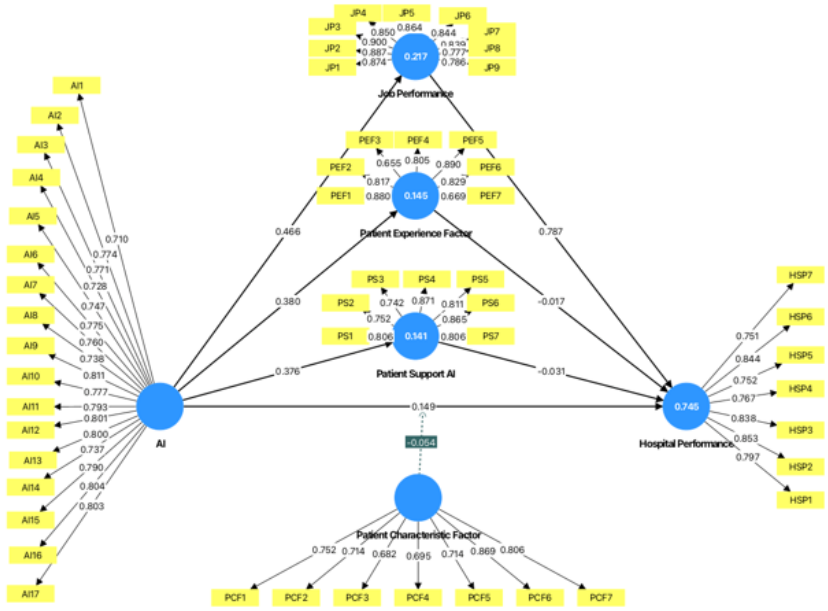

Figure 3. Result of structural model analysis

The findings of this study highlight several important relationships between the use of Artificial Intelligence (AI) in hospitals and key outcomes related to hospital performance, staff performance, and patient-related dimensions. Overall, the model demonstrates that AI makes a meaningful contribution to hospital operations, although its influence varies across different mediating factors.

AI demonstrates a strong direct effect on Hospital Performance (path coefficient ≈ 0.787), suggesting that hospitals leveraging AI technologies—whether for clinical decision support, workflow optimization, diagnostics, or administrative automation—

experienced significant improvements in service outcomes. This aligns with previous literature asserting that AI enhances operational efficiency, speeds up diagnostic workflows, reduces administrative burdens, and supports clinical accuracy. The substantial effect size also indicates that AI's contribution to hospital outcomes is not merely incremental but transformative. The service quality and safety imply that AI contributes substantially to diagnostic accuracy, treatment safety, and clinical consistency. For the operational efficiency indicate that AI-supported workflows reduce waiting times, streamline processes, and optimize resource utilization.

The path from AI to Job Performance is moderate (0.466), showing that AI tools help medical staff enhance their effectiveness, decision-making, and efficiency. However, the relatively lower loading of Job Performance's latent variable on Hospital Performance (0.217) suggests that staff performance contributes, but not as strongly as AI's direct influence. The positive coefficient between the two constructs, supported by strong indicator loadings (JP1–JP9), suggests that AI tools assist staff in carrying out their tasks with greater accuracy and efficiency. Staff members appear to benefit from reduced workload, improved decision-making support, and better access to information. However, the effect of Job Performance on Hospital Performance, although positive, is not as strong as the direct effect of AI. This indicates that improvements in staff performance do contribute to overall hospital outcomes, but the impact may be overshadowed by more direct technological enhancements in operational and clinical workflows.

The relationship between AI and Patient Experience Factors is positive but more modest. The indicator loadings (PEF1–PEF7) show that AI contributes the most to aspects related to process simplicity, clarity of communication, and the reduction of waiting times. Indicators related to emotional comfort and trust show slightly lower loadings, suggesting that AI has limitations in addressing the more interpersonal aspects of patient experience. Even so, Patient Experience Factors still demonstrate a positive contribution to Hospital Performance, meaning that improvements in communication, clarity, and convenience—supported by AI—can strengthen patients' overall perception of hospital quality.

The path between AI and Patient Support AI is also positive, and the indicators (PS1–PS7) show that the tools used directly by patients—such as automated reminders, chatbots, and digital guidance systems—are generally perceived as helpful and easy to use. However, their contribution to Hospital Performance is minimal. This implies that while patient-facing AI services are appreciated, they do not yet play a significant role in shaping core performance outcomes. This may be due to the early stage of adoption, limited scope of use, or patient preference for human reassurance in healthcare settings.

The relationship between AI and Patient Characteristic Factors is weak and negative. Although the indicators defining the construct (PCF1–PCF7) load strongly, the structural path suggests that demographic and personal differences among patients do not significantly influence how AI affects hospital outcomes. This finding indicates that AI's benefits appear relatively uniform across different patient groups. It also implies that hospitals do not need to heavily customize AI services based on demographic characteristics alone, at least within the current level of technological adoption.

Theoretical and practical implications

The present study offers a significant contribution to the growing body of literature on artificial intelligence (AI) in healthcare by addressing a central research gap related to the limited integration of socio-behavioral perspectives in existing models. Previous studies on AI implementation have focused predominantly on technical capabilities such as algorithmic accuracy, data processing speed, and system reliability while paying insufficient attention to how AI interacts with human factors, including healthcare workers performance, patient experiences, and patient support toward AI (Choudhury & Asan, 2020; Randall, 2023; Scardoni et al., 2020; Secinaro et al., 2021). By incorporating these socio-behavioral constructs simultaneously, this research establishes a more comprehensive framework for understanding AI adoption in real-world clinical settings.

This study advances theoretical development by

expanding the predictions of well-established technology acceptance models, including the Technology Acceptance Model (TAM) and Unified Theory of Acceptance and Use of Technology (UTAUT) (Sqalli & Al-Thani, 2020). The empirical findings confirm that AI exerts meaningful effects on job performance, patient experience, and patient support, which collectively contribute to hospital performance. These results reinforce the argument that the usefulness and perceived value of AI are not confined to individual-level acceptance but extend to organizational-level outcomes, thereby strengthening the multilevel perspective of technology adoption in healthcare.

Furthermore, the study contributes a novel empirical model that integrates both the perspectives of healthcare personnel and patients, a dual-perspective framework that has received limited attention in previous research. While earlier studies often examine AI acceptance from either the patient side or the provider side, the current study demonstrates that both groups jointly shape the effectiveness of AI adoption in hospitals. This dual-perspective approach enriches theoretical understanding by positioning AI not merely as a technological system but as a socio-technical ecosystem that requires alignment between human users and digital tools.

The substantial explanatory power of the model reflected in the R^2 value of 0.743 for hospital performance provides robust evidence that AI driven mechanisms embedded in job performance enhancement, patient experience improvement, and patient support formation are critical components that should be incorporated into theoretical frameworks of healthcare service quality. Collectively, these findings establish a more holistic theoretical lens for analyzing the transformative role of AI in healthcare organizations.

Practical implications

The findings of this study also offer several important practical implications for hospital administrators, policymakers, and healthcare practitioners seeking to optimize the integration of AI technologies in clinical practice. First, because AI significantly enhances job performance, healthcare institutions must ensure that medical personnel receive adequate training, operational support, and digital literacy development to maximize the benefits of AI in daily clinical workflows. Hospitals should invest in AI systems that are user-friendly and capable of reducing administrative burden, supporting clinical decision-making, and minimizing diagnostic errors, thereby improving overall workforce efficiency.

Second, the positive effect of AI on patient experience underscores the importance of designing AI systems that prioritize patient-centered interaction. Hospitals must ensure that AI technologies used in front-line services—such as digital triage tools, virtual assistants, or appointment management systems—are intuitive, responsive, and supportive of patient autonomy. Strengthening user experience will not only increase patient satisfaction but also foster greater trust and comfort in interacting with AI-based healthcare systems.

Third, patient support for AI emerges as a meaningful predictor of hospital performance. This implies that hospitals must actively build patient trust by ensuring transparency, data privacy protection, and clear communication regarding the role and safety of AI tools in clinical decision-making. Educational campaigns, patient orientation materials, and publicly accessible information about AI safety and benefits are essential to support patient acceptance.

Finally, the strong overall effect of AI on hospital performance highlights the strategic importance of integrating AI into broader healthcare policies. Policymakers should establish clear regulatory guidelines, ethics frameworks, and operational standards to ensure that AI implementation is safe, effective, and aligned with national healthcare goals. Strengthening regulations surrounding AI reliability, accountability, and data governance will not only protect patients but also enhance the competitive advantage of healthcare organizations adopting AI technologies.

Conclusion

This study demonstrates that Artificial Intelligence plays a significant and strategic role in improving hospital service performance in Indonesia. The findings confirm that AI has a strong direct impact on

hospital performance, surpassing the influence of socio-behavioral mediators such as job performance, patient experience factors, and patient support for AI. While AI contributes positively to healthcare workers' performance and enhances certain aspects of patient experience—such as efficiency, clarity, and convenience—its ability to address interpersonal and emotional dimensions of care remains limited.

The results also indicate that patient support for AI, although positive, has not yet translated into substantial performance gains, reflecting the early stage of AI adoption and ongoing concerns related to trust, ethics, and human interaction. Moreover, patient characteristic factors do not significantly moderate the relationship between AI and hospital performance, suggesting that AI benefits are broadly applicable across different patient groups.

Overall, this research highlights that successful AI implementation in hospitals requires more than technological investment alone. Hospitals should prioritize workforce training, workflow integration, and patient-centered AI design to maximize performance outcomes. Policymakers are encouraged to strengthen regulatory frameworks and ethical guidelines to support safe, transparent, and sustainable AI adoption in healthcare.

Limitation and future directions

First, the present study has limitations related to the generalizability of its findings. Although the sample includes both medical personnel and patients, the distribution of respondents is still limited in terms of age range, education level, and geographical coverage. As a result, the conclusions of this study primarily reflect the characteristics of respondents within the selected healthcare facilities and may not fully represent the broader population of healthcare users and professionals in Indonesia. Future research should consider expanding the sample by including respondents from different regions and healthcare settings to strengthen the external validity of the findings.

Second, this study uses a cross-sectional design, which restricts the ability to draw causal inferences regarding the relationship between AI utilization, job performance, patient experience, patient support, and hospital performance. Longitudinal or experimental designs are recommended for future studies to capture changes in perceptions and outcomes as AI technologies continue to develop and become more integrated into healthcare workflows.

Third, although this study demonstrates that AI has significant effects on job performance, patient experience, and patient support, it does not examine deeper psychological or contextual factors that may influence these variables, such as trust in technology, perceived risk, digital literacy, organizational readiness, or regulatory awareness. Future studies may explore these antecedents to better understand the mechanisms behind the formation of these socio-behavioral constructs.

Finally, the study focuses on self-reported perceptions using Likert-scale questionnaires, which may introduce bias such as social desirability or subjective interpretation. Future research could incorporate objective performance metrics, system log data, or mixed-method approaches combining surveys and interviews to obtain a more holistic and accurate understanding of AI adoption and its impact in healthcare settings.

References

Adamopoulos, I. P. (2022). Job Satisfaction in Public Health Care Sector, Measures Scales and Theoretical Background. *European Journal of Environment and Public Health*, *6*(2), em0116. https://doi.org/10.21601/ejeph/12187

Adamopoulos, I. P., & Syrou, N. F. (2022). Associations and Correlations of Job Stress, Job Satisfaction and Burn out in Public Health Sector. *European Journal of Environment and Public Health*, *6*(2), em0113. https://doi.org/10.21601/ejeph/12166

Agus Triansyah, F., Hejin, W., & Stefania, S. (2023). Factors Affecting Employee Performance: A Systematic Review. *Journal Markcount Finance*, *1*(2), 118–127. https://doi.org/10.55849/jmf.v1i2.102

Al Kuwaiti, A., Nazer, K., Al-Reedy, A., Al-Shehri, S., Al-Muhanna, A., Subbarayalu, A. V., Al Muhanna, D., & Al-Muhanna, F. A. (2023). A Review of the Role of Artificial Intelligence in Healthcare. In *Journal of Personalized*

Medicine (Vol. 13, Issue 6). MDPI. https://doi.org/10.3390/jpm13060951

Al Oraini, B. (2024). The effect of artificial intelligence capability on patient satisfaction. *International Journal of Data and Network Science*, *8*(3), 1429–1436. https://doi.org/10.5267/j.ijdns.2024.3.022

Almutairi, D. R., Alkorbi, S. A., Alghabbashi, M. T., Aly, S. M. M., & Alsulami, S. A. (2022). Effect of work environment on nurses' job performance: Systematic review. *International Journal of Health Sciences*, 4935–4950. https://doi.org/10.53730/ijhs.v6ns6.10636

Arachchi, H. A. D. M., & Samarasinghe, G. D. (2025). Perceived attributes of artificial intelligence (AI) toward consumers' AI attitudes and purchase intention in an AI powered retail shopping space. *European Journal of Management Studies*, 1–25. https://doi.org/10.1108/EJMS-05-2024-0047

Bano, A. (2023). Determinants of Digital Entrepreneurship Success: Role of Formal and Informal Learning Practices Among Malaysian IT Entrepreneurs. *Journal of Digitovation and information system, 3*(2), 186-197.

Barari, M., Ross, M., Thaichon, S., & Surachartkumtonkun, J. (2021). A meta-analysis of customer engagement behaviour. *International Journal of Consumer Studies*, *45*(4), 457–477. https://doi.org/10.1111/ijcs.12609

Bellini, V., Russo, M., Domenichetti, T., Panizzi, M., Allai, S., & Bignami, E. G. (2024). Artificial Intelligence in Operating Room Management. *Journal of Medical Systems*, *48*(1), 19. https://doi.org/10.1007/s10916-024-02038-2

Bolaños, F., Salatino, A., Osborne, F., & Motta, E. (2024). Artificial intelligence for literature reviews: opportunities and challenges. *Artificial Intelligence Review*, *57*(9), 1–49. https://doi.org/10.1007/S10462-024-10902-3/TABLES/5

Choudhury, A., & Asan, O. (2020). Role of artificial intelligence in patient safety outcomes: Systematic literature review. In *JMIR Medical Informatics* (Vol. 8, Issue 7). JMIR Publications Inc. https://doi.org/10.2196/18599

De Micco, F., Di Palma, G., Ferorelli, D., De Benedictis, A., Tomassini, L., Tambone, V., Cingolani, M., & Scendoni, R. (2024). Artificial intelligence in healthcare: transforming patient safety with intelligent systems—A systematic review. In *Frontiers in Medicine* (Vol. 11). Frontiers Media SA. https://doi.org/10.3389/fmed.2024.1522554

Dicuonzo, G., Donofrio, F., Fusco, A., & Shini, M. (2023). Healthcare system: Moving forward with artificial intelligence. *Technovation*, *120*, 102510. https://doi.org/10.1016/J.TECHNOVATION.2022.102510

Esmaeilzadeh, P. (2020). Use of AI-based tools for healthcare purposes: A survey study from consumers' perspectives. In *BMC Medical Informatics and Decision Making* (Vol. 20, Issue 1). BioMed Central Ltd. https://doi.org/10.1186/s12911-020-01191-1

Esmaeilzadeh, P., Mirzaei, T., & Dharanikota, S. (2021). Patients' perceptions toward human-artificial intelligence interaction in health care: Experimental study. *Journal of Medical Internet Research*, *23*(11). https://doi.org/10.2196/25856

Feng, J., Phillips, R. V., Malenica, I., Bishara, A., Hubbard, A. E., Celi, L. A., & Pirracchio, R. (2022). Clinical artificial intelligence quality improvement: towards continual monitoring and updating of AI algorithms in healthcare. *Npj Digital Medicine*, *5*(1). https://doi.org/10.1038/s41746-022-00611-y

Fritsch, S. J., Blankenheim, A., Wahl, A., Hetfeld, P., Maassen, O., Deffge, S., Kunze, J., Rossaint, R., Riedel, M., Marx, G., & Bickenbach, J. (2022a). Attitudes and perception of artificial intelligence in healthcare: A cross-sectional survey among patients. *DIGITAL HEALTH*, *8*, 205520762211167. https://doi.org/10.1177/20552076221116772

Fritsch, S. J., Blankenheim, A., Wahl, A., Hetfeld, P., Maassen, O., Deffge, S., Kunze, J., Rossaint, R., Riedel, M., Marx, G., & Bickenbach, J. (2022b). Attitudes and perception of artificial

intelligence in healthcare: A cross-sectional survey among patients. *Digital Health*, *8*. https://doi.org/10.1177/20552076221116772

Hair, J. F. ., Hult, G. T. M. ., Ringle, C. M. ., Sarstedt, Marko., Danks, N. P. ., & Ray, Soumya. (2021). *Partial least squares structural equation modeling (PLS-SEM) using R : a workbook*. Springer.

Hilton, C. B., Milinovich, A., Felix, C., Vakharia, N., Crone, T., Donovan, C., Proctor, A., & Nazha, A. (2020). Personalized predictions of patient outcomes during and after hospitalization using artificial intelligence. *Npj Digital Medicine*, *3*(1). https://doi.org/10.1038/s41746-020-0249-z

Jam, F. A., Khan, T. I., & Paul, J. (2025). Driving brand evangelism by Unleashing the power of branding and sales management practices. *Journal of Business Research, 190*, 115214.

Kementerian Kesehatan RI. (2021). *Cetak Biru Strategi Transformasi Digital Kesehatan 2024* (1st ed.). https://repository.kemkes.go.id/book/710

Khanijahani, A., Iezadi, S., Dudley, S., Goettler, M., Kroetsch, P., & Wise, J. (2022a). Organizational, professional, and patient characteristics associated with artificial intelligence adoption in healthcare: A systematic review. *Health Policy and Technology*, *11*(1), 100602. https://doi.org/10.1016/j.hlpt.2022.100602

Khanijahani, A., Iezadi, S., Dudley, S., Goettler, M., Kroetsch, P., & Wise, J. (2022b). Organizational, professional, and patient characteristics associated with artificial intelligence adoption in healthcare: A systematic review. *Health Policy and Technology*, *11*(1). https://doi.org/10.1016/j.hlpt.2022.100602

Kim, W., Hantula, D. A., & Di Benedetto, A. (2022). Organizational citizenship behaviors perceived by collectivistic 50-and-older customers and medical-care service performance: an application of stimulus-organism-response theory. *Asia Pacific Journal of Marketing and Logistics*, *34*(10), 2237–2268. https://doi.org/10.1108/APJML-01-2021-0027

Krijgsheld, M., Tummers, L. G., & Scheepers, F. E. (2022). Job performance in healthcare: a systematic review. *BMC Health Services Research*, *22*(1). https://doi.org/10.1186/s12913-021-07357-5

Lambert, S. I., Madi, M., Sopka, S., Lenes, A., Stange, H., Buszello, C. P., & Stephan, A. (2023). An integrative review on the acceptance of artificial intelligence among healthcare professionals in hospitals. In *npj Digital Medicine* (Vol. 6, Issue 1). Nature Research. https://doi.org/10.1038/s41746-023-00852-5

Lennartz, S., Dratsch, T., Zopfs, D., Persigehl, T., Maintz, D., Große Hokamp, N., & Pinto dos Santos, D. (2021). Use and Control of Artificial Intelligence in Patients Across the Medical Workflow: Single-Center Questionnaire Study of Patient Perspectives. *Journal of Medical Internet Research*, *23*(2), e24221. https://doi.org/10.2196/24221

Liu, X., He, X., Wang, M., & Shen, H. (2022). What influences patients' continuance intention to use AI-powered service robots at hospitals? The role of individual characteristics. *Technology in Society*, *70*, 101996. https://doi.org/10.1016/j.techsoc.2022.101996

Miller, S., Gilbert, S., Virani, V., & Wicks, P. (2020). Patients' Utilization and Perception of an Artificial Intelligence–Based Symptom Assessment and Advice Technology in a British Primary Care Waiting Room: Exploratory Pilot Study. *JMIR Human Factors*, *7*(3), e19713. https://doi.org/10.2196/19713

Randall, E. (2023). *Patient Acceptance of the use of Artificial Intelligence in Healthcare*. https://doi.org/10.13140/RG.2.2.22238.41284

Reegård, K., Fernandes, A., & Bloch, M. (2025). Perceptions of Technology-Related Job Insecurity among Healthcare Personnel: A Cross-Sectional Study. *International Journal of Social Robotics*, *17*(9), 1693–1705. https://doi.org/10.1007/s12369-025-01283-w

Richardson, J. P., Smith, C., Curtis, S., Watson, S., Zhu,

X., Barry, B., & Sharp, R. R. (2021). Patient apprehensions about the use of artificial intelligence in healthcare. *Npj Digital Medicine*, *4*(1). https://doi.org/10.1038/s41746-021-00509-1

Samah, T., & Samar, M. (2025). Investigating the Key Trends in Applying Artificial Intelligence to Health Technologies: A Scoping Review. *PLOS One*, *20*(5), e0322197. https://doi.org/10.1371/journal.pone.0322197

Santamato, V., Tricase, C., Faccilongo, N., Iacoviello, M., & Marengo, A. (2024). Exploring the Impact of Artificial Intelligence on Healthcare Management: A Combined Systematic Review and Machine-Learning Approach. *Applied Sciences (Switzerland)*, *14*(22). https://doi.org/10.3390/app142210144

Sauerbrei, A., Kerasidou, A., Lucivero, F., & Hallowell, N. (2023). The impact of artificial intelligence on the person-centred, doctor-patient relationship: some problems and solutions. In *BMC Medical Informatics and Decision Making* (Vol. 23, Issue 1). BioMed Central Ltd. https://doi.org/10.1186/s12911-023-02162-y

Scardoni, A., Balzarini, F., Signorelli, C., Cabitza, F., & Odone, A. (2020). Artificial intelligence-based tools to control healthcare associated infections: A systematic review of the literature. In *Journal of Infection and Public Health* (Vol. 13, Issue 8, pp. 1061–1077). Elsevier Ltd. https://doi.org/10.1016/j.jiph.2020.06.006

Secinaro, S., Calandra, D., Secinaro, A., Muthurangu, V., & Biancone, P. (2021). The role of artificial intelligence in healthcare: a structured literature review. *BMC Medical Informatics and Decision Making*, *21*(1). https://doi.org/10.1186/s12911-021-01488-9

Sqalli, M. T., & Al-Thani, D. (2020). On how chronic conditions affect the patient-ai interaction: A literature review. In *Healthcare (Switzerland)* (Vol. 8, Issue 3). MDPI AG. https://doi.org/10.3390/healthcare8030313

Tun, H. M., Naing, L., Malik, O. A., & Rahman, H. A. (2025). Navigating ASEAN region Artificial Intelligence (AI) governance readiness in healthcare. *Health Policy and Technology*, *14*(2), 100981. https://doi.org/10.1016/j.hlpt.2025.100981

Wang, L., Zhang, Y., Wang, D., Tong, X., Liu, T., Zhang, S., Huang, J., Zhang, L., Chen, L., Fan, H., & Clarke, M. (2021). Artificial Intelligence for COVID-19: A Systematic Review. In *Frontiers in Medicine* (Vol. 8). Frontiers Media S.A. https://doi.org/10.3389/fmed.2021.704256

Xiang, Y., Zhao, L., Liu, Z., Wu, X., Chen, J., Long, E., Lin, D., Zhu, Y., Chen, C., Lin, Z., & Lin, H. (2020). Implementation of artificial intelligence in medicine: Status analysis and development suggestions. *Artificial Intelligence in Medicine*, *102*, 101780. https://doi.org/10.1016/j.artmed.2019.101780

Yin, J., Ngiam, K. Y., & Teo, H. H. (2021). Role of artificial intelligence applications in real-life clinical practice: Systematic review. In *Journal of Medical Internet Research* (Vol. 23, Issue 4). JMIR Publications Inc. https://doi.org/10.2196/25759

Young, A. T., Amara, D., Bhattacharya, A., & Wei, M. L. (2021). Patient and general public attitudes towards clinical artificial intelligence: a mixed methods systematic review. *The Lancet Digital Health*, *3*(9), e599–e611. https://doi.org/10.1016/S2589-7500(21)00132-1

Zahlan, A., Ranjan, R. P., & Hayes, D. (2023). Artificial intelligence innovation in healthcare: Literature review, exploratory analysis, and future research. *Technology in Society*, *74*, 102321. https://doi.org/10.1016/j.techsoc.2023.10232