The Effect of Artificial Intelligence on Healthcare Staff Performance and Patient Care Satisfaction

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Abstract

Aim: This study aimed to investigate the perceived effects of artificial intelligence (AI) on nurse performance and patient care satisfaction in a hospital setting. Specifically, it sought to: (1) explore nurses' perceptions of AI's impact on clinical performance; (2) assess patient satisfaction with nursing care; and (3) examine the relationship between nurses' AI perceptions and patient satisfaction.

Methodology: A quantitative research design was employed to assess the perceived effects of artificial intelligence (AI) on healthcare staff performance and patient care satisfaction. The study involved 140 participants, consisting of 67 staff nurses and 73 patients, selected through non-probability convenience sampling. Data were collected using two standardized survey instruments: one adapted from Lagman (2021) to measure AI's impact on time management, decision-making support, and workload reduction; and another from Vaughn (2020) to assess patient satisfaction in terms of quality of care, communication, and timeliness of service. Both instruments utilized a 4-point Likert scale and demonstrated acceptable reliability coefficients (0.81 and 0.87, respectively). Statistical treatments included frequency and percentage distributions for demographic data, weighted means and standard deviations for interpreting Likert-scale responses, and linear regression analysis to examine the relationship between AI perception and patient satisfaction. The patient population was predominantly older adults (aged 60–69), while the majority of nurses were in the 25–29 age group.

Results: By automating repetitive procedures, artificial intelligence is thought to be useful in increasing clinical decision-making, improving time management, and lowering the workload for nurses. Patients were very happy with the nursing care they received, especially when it came to prompt responses and clear communication. Regression analysis, on the other hand, showed that patient satisfaction was not significantly impacted by the perceived impacts of artificial intelligence (p-value = 0.925).

Conclusion: While AI was perceived to enhance nurse workflow and efficiency, it did not significantly influence patient satisfaction. Thus, integrating AI into nursing practice should be done cautiously and ethically. Though perceptions of AI did not directly affect patient satisfaction, continuous training can optimize its indirect benefits on workflow and care quality, aligning technological efficiency with patient-centered care.

Keywords: Artificial Intelligence, healthcare staff, patient care satisfaction, healthcare innovation

INTRODUCTION

Over time, technology has transformed various aspects of daily living—from transportation and education to the healthcare industry. In the modern era, Artificial Intelligence (AI) has emerged as one of the most transformative innovations. Artificial intelligence, defined by Copeland (2025) as "the ability of a digital computer or robot to perform tasks commonly associated with intelligent beings," is increasingly being integrated into healthcare systems worldwide.

In the healthcare sector, AI demonstrates potential to enhance diagnostics, streamline administrative functions, and improve patient care. Obermeyer, et al. (2021) reported that artificial intelligence can reduce diagnostic

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errors by up to 30%, while Topol (2019) emphasized that automating routine tasks enables healthcare staff to dedicate more time to direct patient care. In the Philippines, AI adoption is gaining momentum across various industries, including healthcare (Rosales et al., 2020), but its integration into clinical practice remains uneven. Studies also suggest that fostering digital literacy and organizational readiness among healthcare professionals is crucial for effective AI integration (Amihan & Sanchez, 2023).

Despite AI's potential, several implementation challenges persist in the Philippines. Only 20% of healthcare workers have formal AI training (Santos, et al., 2023), and 65% express reservations regarding its accuracy (Mendoza et al., 2022). Moreover, most existing literature focuses on system-wide applications or physicians' perspectives, with limited attention to nurses' experiences. This aligns with broader observations in other sectors, where digital innovation requires deliberate strategies to bridge practice gaps and enhance workforce competencies (Carvajal et al., 2025).

Extant literature primarily examines AI adoption in urban or higher-tier health institutions, with rural and basic healthcare facilities remaining underrepresented. Infrastructure deficits and limited digital literacy hinder AI readiness in underserved regions, even though nursing students in Eastern Visayas report positive attitudes and a willingness to adopt AI tools (Labrague, et al., 2023). In this context, the present study aims to provide evidence-based recommendations for incorporating artificial intelligence into nursing care, especially in marginalized or resource-limited areas.

The study focuses on:
- Enhancing staff performance (e.g., time management, decision support, workload reduction).
- Improving patient satisfaction (e.g., timeliness of service, quality of care, effective communication).

By addressing digital literacy gaps, usability concerns, and implementation barriers, the study seeks to propose a localized AI integration framework that optimizes nursing workflows and improves patient care while mitigating nurse burnout. As emphasized by Abenojar et al. (2025), integrating innovative approaches in practice must consider the perspectives of all stakeholders to ensure meaningful and sustainable adoption.

Nursing Administration: AI-based data management can inform policy and procedure development to promote efficiency and ethical practice among healthcare staff.

Nursing Education: Early integration of AI competencies in the nursing curriculum prepares future nurses for technology-enhanced care delivery.

Nursing Research: Findings will provide a foundation for future studies exploring AI's impact on clinical performance and patient outcomes, particularly in underserved or rural settings.

Drawing from automation history and AI ethics literature (Hazarika, 2020), this study conceptualizes artificial intelligence not as a replacement for healthcare workers but as a cognitive support tool to enhance informed decision-making and clinical efficiency. A careful balance between technological innovation and human compassion remains essential. In the Philippine healthcare context, AI is being strategically adopted to alleviate resource constraints, improve diagnostic turnaround times, and enhance patient engagement (Mirasol, 2024). The Department of Science and Technology (DOST) has also advocated for AI's responsible and complementary use, emphasizing that it should augment rather than replace human care delivery (Burgos, 2023; Solidum, 2025).

Theoretical Framework

This study is anchored on Systems Theory, Roy's Adaptation Model, and the Human-Computer Interaction (HCI) Theory. Systems Theory posits that healthcare organizations function as dynamic systems composed of interrelated components—such as staff, technology, and patient engagement—working cohesively to achieve optimal outcomes (Katz & Kahn, 1978; Donabedian, 1988). In this context, AI serves as an integrative mechanism, improving task coordination, workflow efficiency, and decision support, thereby enhancing nursing performance and service delivery.

Roy's Adaptation Model emphasizes an individual's ability to respond to internal and external stimuli through four adaptive modes: physiological, self-concept, role function, and interdependence (Roy, Whetsell, & Frederickson, 2009). AI applications contribute to these adaptive processes by facilitating real-time patient monitoring, supporting clinical decisions, and enabling timely interventions to enhance care quality and satisfaction.

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The Human-Computer Interaction (HCI) Theory explains how users engage with technology, emphasizing usability, efficiency, and contextual relevance (Gross, 2014; Abolkasim & Ramachandran, 2021). Its application in this study lies in promoting seamless nurse-technology interactions, resulting in improved workflow and patient outcomes (Dino et al., 2022; Hutch & Luo, 2024).

Conceptual Framework

Grounded on Systems Theory and Roy's Adaptation Model, this study conceptualizes AI as a catalyst for enhancing healthcare delivery through two interconnected pathways:

1. Staff Performance Improvement – AI streamlines workflows, optimizes time management, and reduces workload, allowing nurses to focus on complex patient care tasks.
2. Patient Satisfaction Enhancement – AI facilitates faster service delivery, strengthens communication, and supports personalized care planning.

By integrating these pathways, the study proposes a localized AI integration model to optimize nursing practice, reduce burnout, and advance patient-centered care in the Philippine context.

Objectives

This study determined the presence of a significant effect between the perceived effects of Artificial Intelligence (AI) on healthcare staff performance and patient care satisfaction. It also aimed to propose guidelines for the integration of AI into nursing care delivery, focusing on enhancing both staff performance and patient satisfaction.

Specifically, it sought to answer the following questions:
1. What is the demographic profile of the respondents in terms of;
    1.1 Age; and
    1.2 Gender?
2. How may the perceived effects of AI be described in terms of:
    2.1 Efficiency in time Management;
    2.2 Decision-making Support; and
    2.3 Workload Reduction?
3. How may the patient care satisfaction be described in terms of:
    3.1. Quality of Care;
    3.2. Communication; and
    3.3. Timeliness of Service?
4. Is there a significant effect of the perceived effects of AI on patient care satisfaction?
5. Based on the findings of the study, can guidelines be proposed?

Hypothesis

Given the stated research problems, the following hypotheses were tested at 0.05 level of significance:

H_0: There is no significant effect of artificial intelligence on the perceived effects of healthcare staff performance and patient care satisfaction.

H_a: There is a significant effect of artificial intelligence on the perceived effects of healthcare staff performance and patient care satisfaction.

METHODS

Research Design

This study employed a non-experimental, cross-sectional descriptive-correlational quantitative research design to assess the perceived effects of artificial intelligence (AI) on healthcare staff performance and patient care satisfaction. Structured survey questionnaires were administered at a single point in time to nurses and patients, enabling the objective analysis of their perceptions regarding AI's influence on time management, decision-making, workload reduction, and the quality of healthcare services. The design allowed for both the description of current perceptions and the examination of statistical relationships between variables.

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Population and Sampling

The respondents of this study were the 67 staff nurses working in different areas of the hospital and 73 patients, for a total of 140 people, during the time of the conduct of the study. Non-probability sampling was utilized in this study. Staff nurses were included if they were registered nurses with at least one year of clinical experience and consented to participate. Patients were selected based on their availability and willingness to participate, excluding those with cognitive impairments or those in emergency situations. Nurses who were unavailable or refused participation were excluded from the study.

Instrument

Two standardized and adopted instruments were utilized for data collection. The first, adapted from Lagman (2021), assessed AI's perceived impact on efficiency in time management, decision-making support, and workload reduction across 30 items, each rated on a 4-point Likert scale (1 = Strongly Disagree to 4 = Strongly Agree), with a reliability coefficient of 0.81.

The second instrument, adapted from Vaughn (2020), assessed patient satisfaction in terms of quality of care, communication, and timeliness of service, also across 30 items rated on the same scale, and demonstrated a reliability coefficient of 0.87.

Data Collection

Data collection was conducted in the hospital setting through face-to-face administration of the validated survey questionnaires. After an orientation explaining the study's purpose and procedures, informed consent was obtained from each eligible participant. Questionnaires were distributed and collected in person on scheduled dates. Assistance was provided for clarification if needed. Completed forms were checked for completeness, securely stored, and encoded confidentially by the research team.

Treatment of Data

Demographic data such as age and gender were analyzed using frequency and percentage distributions. To describe the perceived effects of AI on staff performance and patient satisfaction, average weighted means were computed. Furthermore, to examine the relationship between these variables, a linear regression analysis was conducted to determine whether perceived AI effects predicted levels of patient care satisfaction.

Ethical Considerations

Prior to implementation, the study obtained ethical clearance from the Research Ethics Committee (REC). Participants were fully informed about the study's goals, procedures, risks, and benefits through a written and verbal consent process. Participation was strictly voluntary, and individuals were assured of their right to withdraw at any time without penalty. Confidentiality and anonymity were preserved by coding data and restricting access to authorized research members only.

To minimize risks, particularly among healthcare workers exposed to high-stress environments, the researchers ensured that no sensitive or intrusive questions were included. A mechanism was in place to refer participants experiencing distress to appropriate support services. All documentation, including informed consent forms and data handling protocols, was submitted to and approved by the REC in compliance with national ethical standards.

RESULTS and DISCUSSION

This interprets the outcomes of the research "The Effects of Artificial Intelligence on Healthcare Staff Performance and Patient Care Satisfaction." The data that had been collected from respondents was systematically analyzed and interpreted in the fulfillment of the research objectives and hypotheses. The findings are illustrated in tables and figures to give readers a clear and comprehensive picture of the impact of artificial intelligence integration in healthcare settings. Significantly identifies using statistical procedures, ensuring that the findings are reliable and valid. This study provided findings on how artificial intelligence affects healthcare staff performance, job satisfaction, and patient care satisfaction.

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Table 1. Demographic Profile of Respondents

Variable	Classification	Frequency (Patients)	%	Frequency (Nurses)	%
Age	20–29 (Patients) / 20–24 (Nurses)	4	5.48%	7	10.45%
	30–39 (Patients) / 25–29 (Nurses)	7	9.59%	47	70.15%
	40–49 (Patients) / 30–34 (Nurses)	11	15.07%	9	13.43%
	50–59 (Patients) / 35–39 (Nurses)	15	20.55%	4	5.97%
	60–69 (Patients)	26	35.62%	–	–
	70–79 (Patients)	10	13.70%	–	–
Gender	Male	34	46.58%	22	32.84%
	Female	39	53.42%	45	67.16%
Total		**73**	**100.0%**	**67**	**100.0%**

Discussion Highlights:

- Majority of patients were older adults (60–69), consistent with global healthcare usage patterns (WHO, 2021; Salive, 2020).
- Majority of nurses were young (25–29), reflecting workforce trends and openness to technology (ICN, 2021).

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Table 2. Perceived Effects of AI on Healthcare Staff Performance

AI Performance Domain	Overall Mean	SSD	Interpretation
Time Management	3.23	0.42	Agree
Decision-Making Support	3.20	0.40	Agree
Workload Reduction	3.21	0.41	Agree

Discussion Highlights:

- Staff **agree** that AI supports clinical workflow via efficiency, faster decision-making, and workload reduction.
- Supports literature from Topol (2019), Liu et al. (2021), and Denecke et al. (2019).

Table 3. Patient Satisfaction in Nursing Care

Satisfaction Domain	Overall Mean	SSD	Interpretation
Quality of Care	3.27	0.45	Agree
Communication	3.20	0.40	Agree
Timeliness of Service	3.18	0.42	Agree

Discussion Highlights:

- Patients **agree** they received high-quality, responsive, and well-communicated care.
- Echoes Aiken et al. (2018, 2020), and Haskard Zolnierek and DiMatteo (2019) regarding the role of nurse-patient interaction in satisfaction.

Table 4. Regression Analysis – Perceived Effects of AI vs. Patient Satisfaction

Variable	B	Std. Error	Beta	t	Sig. (p-value)
Perceived Effects of AI	0.015	0.160	0.012	0.094	0.925

Statistic	Value
Pearson r	0.012
R² (Coefficient of Determination)	0.000
F-value	0.009
p-value	0.925
α-level	0.05

Conclusion:

- No significant relationship between perceived AI use and patient satisfaction ($p > 0.05$).
- Suggests other factors may influence satisfaction (Aiken et al., 2020).

Table 5. Summary of Key Findings Aligned with Research Questions

Research Question	Summary of Findings	Supported By
1. How do nurses perceive the impact of AI on their performance?	Nurses agreed AI improved time management, decision-making, and reduced workload.	Topol (2019), Zhang et al. (2021), Denecke et al. (2019)
2. What is the level of patient satisfaction with nursing care in an AI-supported environment?	High satisfaction in quality, communication, and timeliness of care.	Aiken et al. (2018), Ong et al. (2020)

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3. Is there a significant relationship between perceived effects of AI and patient satisfaction?	No statistically significant relationship found.	Regression output; Aiken et al. (2020)

Table 6. *Proposed Guidelines*

Section	Details
1. Introduction	The research findings showed that the perceived effect of Artificial intelligence was low and statistically insignificant with patient satisfaction and healthcare staff performance. On the other hand, AI may provide benefits such as increased operational efficiency and effectivity of the processes, they do not appear to directly boost patient satisfaction. As a result, this approach suggests a balanced integration strategy that integrates technology with conventional approach, patient-centered care service. The objective is to use AI to enhance clinical operations while also improving nurse-patient relationship, individualized patient treatment, and overall quality healthcare service.
2. Objectives	- Encourage continuous education for both non-AI and AI applications in delivering healthcare services to patients. - Implement AI-based monitoring system technology which improves nursing care quality. - Improve communication between nurses, patients, and other healthcare providers. - Improve effectiveness and efficiency in healthcare service delivery through artificial intelligence applications.
3. Goals and Expected Outcomes	- Using a real-time monitoring system can improve patient satisfaction and safety levels. - Improve communication using AI tools to ensure accurate and timely information. - Improve nursing efficiency by using automation as a support rather than replacing human inputs, which is crucial when dealing with our patients.
4. Proposed Guidelines for AI Integration	**Quality of Care:** - AI-powered monitoring systems and decision support. - Error prevention and clinical decision assistance. **Communication:** - Patient-nurse communication tools. - Real-time updates to other healthcare professionals for the changes in patient conditions. **Timeliness of Service:** - AI-enhanced workflow management. - Automation of routine tasks. - Real-time resource allocation.
5. Training and Support for Nurses	- **AI Literacy Programs:** Training on AI tools and their benefits. - **Ongoing Professional Development:** comprehensive education support and updates. - **Collaborative Approach:** Involve nurses & other healthcare personnel in AI tool development and feedback.
6. Ethical and Legal Considerations	- **Patient Consent:** providing concise information to patients and patients' relatives, that might lead to any uncertainties to both parties. - **Accountability Framework:** maintaining a stable workflow in the institution by

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		considering delegated personnel for the task and responsibility to an assigned healthcare unit. - **Regular Audit:** An in-house audit should be implemented for proper screening of the healthcare facility and personnel if they are following the necessary protocols required from an institution.
7. Implementation Plan		**Phase 1 (0-6 months):** Pilot program with selected nurses and tools. Considering selected nurses as training AI champions that is equipped with the knowledge to troubleshoot the system as soon as possible when problems arise. **Phase 2 (6-12 months):** Evaluation, feedback collection, and refinement. With the data on hand from the previous months the patient should be included as part of evaluators. More than 50% of healthcare professionals should be familiar with the said system. **Phase 3 (12+ months):** Full-scale system integration across all healthcare facilities. Almost 100% of the healthcare personnel can utilize the said system without fail. Errors in the system usage are minimal.
8. Budget and Resources		- **AI Tool Acquisition:** Cost for purchasing or licensing tools. - **Training and Education:** Development of training materials which is readily available within the healthcare facility. - **Ongoing Support:** Budget for IT- technical support and maintenance in order to prevent unnecessary disruption of the system.
9. Expected Challenges and Solutions		- **Resistance to Change:** Some nurses may be afraid to use the current technology and prefer the traditional way in the healthcare service. - **Technological Limitations:** Ensure reliable vendors and troubleshooting protocols and use the technology as a support for our nurses in enhancing effectiveness and efficiency which elevates patient satisfaction. - **Privacy Concerns:** Comply with healthcare privacy standards (e.g., HIPAA). Providing a system that has a summary in who, when, and what data had been accessed in the specific file.

Conclusions

This study concludes that while healthcare services in the Philippines primarily cater to elderly patients, the predominantly young and female nursing workforce requires further specialization in geriatric and gender-sensitive care. The results show that Artificial Intelligence (AI) is perceived to improve clinical workflow by enhancing efficiency, optimizing task management, and supporting decision-making, thereby improving care delivery. Patient satisfaction was notably influenced by the nursing staff's professionalism, communication skills, and responsiveness. However, the study found no statistically significant relationship ($r = 0.012$, $p = 0.925$) between perceived AI effects and patient satisfaction, suggesting that interpersonal and systemic factors may play a more prominent role. Despite this, artificial intelligence remains a promising tool in nursing practice, contingent on responsible implementation and overcoming resistance, ethical concerns, and data privacy risks.

Recommendations

In light of the key findings and conclusions discussed above, the study recommends the implementation of targeted training programs in geriatric care and gender-sensitive nursing, aligned with the demographic needs of patients. While AI was perceived to enhance nurse workflow, time management, and decision-making, it did not significantly influence patient satisfaction. Therefore, integrating AI into nursing practice should be approached with caution. Though perceptions of AI did not directly affect patient satisfaction, continuous training can help optimize its indirect benefits on workflow and care quality, ultimately supporting human-centered care. Healthcare institutions should further institutionalize the integration of AI tools in clinical practice by providing structured professional development focused on AI literacy and application. To maximize patient satisfaction, hospitals should strengthen communication protocols and foster a patient-centered approach among nursing staff. Future studies should examine broader variables that may significantly influence patient outcomes and expand the sample scope for generalizability.

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Finally, nursing institutions and healthcare administrators are urged to establish ethical frameworks, monitoring systems, and feedback mechanisms to ensure responsible and equitable AI adoption in nursing care.

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