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Research Article

INTEGRATING ARTIFICIAL INTELLIGENCE–ASSISTED CLINICAL DECISION SUPPORT IN NURSING PRACTICE: IMPACTS ON PATIENT SAFETY AND CARE QUALITY IN SMART HEALTHCARE SYSTEMS

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Abstract
Artificial intelligence–assisted clinical decision support systems are increasingly integrated into smart healthcare environments, offering new opportunities to enhance patient safety and care quality while transforming nursing practice. Persistent challenges such as medical errors, delayed clinical responses, and variability in care highlight the need for effective decision support tools. This study aims to examine the impact of artificial intelligence-assisted systems on patient safety, care quality, and nursing decision-making processes. A mixed-methods design was employed, combining quantitative analysis of clinical indicators with qualitative insights from nurses across multiple hospital units. Data were collected from 120 nurses and corresponding patient records before and after system implementation, supported by surveys and interviews. Findings reveal significant reductions in medication errors and adverse events, alongside improvements in response time, care quality, and nurse decision confidence. Inferential analysis confirms that system usability and training significantly influence outcomes, while experience level moderates system effectiveness. The study concludes that artificial intelligence–assisted decision support enhances clinical performance by complementing nursing expertise and enabling data-driven decision-making. Effective integration depends on user readiness, organizational support, and alignment with clinical workflows, highlighting the need for human-centered implementation strategies in smart healthcare systems.

Keywords: Artificial Intelligence, Care Quality, Clinical Decision Support, Nursing Practice, Patient Safety.

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INTRODUCTION

The rapid evolution of smart healthcare systems has transformed clinical environments through the integration of advanced digital technologies, particularly artificial intelligence-assisted clinical decision support systems (Khan et al., 2026). Healthcare institutions increasingly rely on data-driven tools to enhance diagnostic accuracy, optimize treatment planning, and improve patient outcomes (Liu et al., 2025). Nursing practice, as a critical component of healthcare delivery, is directly influenced by these technological shifts, given nurses' central role in patient monitoring, clinical judgment, and care coordination (Mendes et al., 2024). The integration of artificial intelligence into clinical workflows represents a paradigm shift that requires both technical adaptation and ethical consideration.

Patient safety and care quality remain fundamental priorities within healthcare systems, yet persistent challenges such as medical errors, delayed decision-making, and inconsistent care practices continue to affect outcomes (Ying et al., 2024). Artificial intelligence–assisted systems are designed to address these issues by providing real-time clinical insights, predictive analytics, and evidence-based recommendations (Tunali et al., 2024). These systems have the potential to reduce human error, support clinical reasoning, and standardize care delivery (Zheng et al., 2024). Despite these benefits, the practical integration of such technologies into nursing workflows raises questions regarding usability, trust, and professional autonomy.

The concept of smart healthcare systems emphasizes interconnected, data-driven environments where technology supports continuous and adaptive care processes (Lechien et al., 2024). Within this context, nurses function not only as caregivers but also as mediators between technology and patients (Dona Lemus et al., 2024). The effectiveness of artificial intelligence-assisted decision support depends on its alignment with clinical practice, organizational culture, and user competence (Zubair Rahman et al., 2024). Understanding the impact of these systems on nursing performance, patient safety, and care quality is essential for ensuring that technological innovation translates into meaningful healthcare improvements.

Current implementation of artificial intelligence-assisted clinical decision support systems in nursing practice reveals inconsistencies in effectiveness and adoption (Gholap et al., 2024). Variations in system design, user training, and institutional readiness contribute to uneven outcomes across healthcare settings (Xu et al., 2025). Nurses may experience challenges in interpreting system recommendations, integrating them into clinical judgment, and maintaining accountability for patient care decisions (West et al., 2024). These challenges raise concerns about the reliability and practical value of such systems in real-world clinical environments.

Existing research often focuses on technological performance and system accuracy, with limited attention to the experiential and professional dimensions of nursing practice (Selles et al., 2024). The interaction between nurses and artificial intelligence systems remains insufficiently explored, particularly in terms of trust, cognitive workload, and decision-making autonomy (Ou et al., 2025). This gap limits the understanding of how technology influences clinical behavior and patient outcomes (Amini Rarani, 2025). A comprehensive examination of these factors is necessary to assess the true impact of artificial intelligence in nursing contexts.

Healthcare systems also face ethical and organizational challenges related to the integration of artificial intelligence (Bishnoi et al., 2026). Issues such as data privacy, algorithmic bias, and responsibility in decision-making complicate the adoption of these technologies. Nurses must navigate these complexities while maintaining patient-centered care and professional standards (Singh et al., 2025). The lack of clear frameworks for integrating artificial intelligence into nursing practice underscores the need for research that addresses both technical and human dimensions of this transformation.

This study aims to evaluate the impact of artificial intelligence-assisted clinical decision support systems on patient safety and care quality within nursing practice (Bind et al., 2024). The research seeks to analyze how these systems influence clinical decision-making, error

reduction, and overall care effectiveness (Ahuja et al., 2024). Emphasis is placed on understanding the interaction between technological tools and nursing competencies in dynamic healthcare environments (Željka et al., 2025). The study positions artificial intelligence as both a supportive and transformative element in clinical practice.

Another objective of this research is to identify factors that facilitate or hinder the effective integration of artificial intelligence into nursing workflows (Lonhare et al., 2025). The study examines variables such as system usability, training, institutional support, and user acceptance (Naqvi et al., 2025). These factors are analyzed to determine their influence on the successful implementation of decision support systems (Chithaluru et al., 2024). Insights gained from this analysis aim to inform strategies for optimizing technology adoption in healthcare settings.

The research also seeks to contribute to the development of a conceptual framework that integrates artificial intelligence with nursing practice in a way that enhances patient outcomes (Qiao et al., 2025). This framework is intended to bridge the gap between technological capabilities and clinical realities. Findings are expected to provide practical recommendations for healthcare institutions, educators, and policymakers (C. Paraiso et al., 2024). The objective reflects a broader goal of aligning technological innovation with human-centered care.

Current literature on artificial intelligence in healthcare demonstrates significant progress in algorithm development and predictive accuracy, yet limited attention is given to its application within nursing practice (Dermody et al., 2026). Many studies prioritize physician-centered models or focus on diagnostic tools rather than decision support systems used by nurses (Ciccarelli et al., 2025). This imbalance creates a gap in understanding how artificial intelligence can support frontline healthcare providers who are directly involved in patient care.

Research addressing patient safety and care quality often examines systemic factors such as hospital protocols and clinical guidelines, without integrating the role of artificial intelligence as a mediating variable (Costantino et al., 2025). The interaction between technological tools and nursing performance remains underexplored, particularly in relation to real-time decision-making and patient monitoring. This gap limits the ability to assess the comprehensive impact of artificial intelligence on healthcare outcomes.

Interdisciplinary studies that combine nursing science, information technology, and healthcare management are still emerging. Existing research tends to operate within disciplinary boundaries, resulting in fragmented insights that do not fully capture the complexity of smart healthcare systems (Leenen et al., 2024). The absence of integrative frameworks that connect these domains represents a critical gap that this study aims to address.

This study introduces a novel perspective by focusing on the integration of artificial intelligence–assisted decision support systems specifically within nursing practice, rather than treating technology as a generalized healthcare tool (Mason & Kotlarek, 2024). The research emphasizes the role of nurses as active participants in technology-mediated decision-making processes. This focus highlights the importance of aligning technological innovation with the realities of clinical practice.

The study contributes methodologically by combining technological evaluation with human-centered analysis, offering a more comprehensive approach to assessing the impact of artificial intelligence (Zhao et al., 2024). Integration of system performance metrics with experiential data from nursing practice provides a multidimensional understanding of outcomes. This approach moves beyond traditional evaluations that prioritize technical efficiency over practical usability.

The justification for this research lies in the increasing reliance on artificial intelligence in healthcare and the critical role of nurses in ensuring patient safety and care quality. Effective integration of decision support systems has the potential to transform healthcare delivery, yet this transformation must be guided by evidence-based insights that consider both technological

and human factors. This study aims to provide such insights, contributing to the development of smarter, safer, and more responsive healthcare systems.

RESEARCH METHOD

Research Design

This study employs a mixed-methods research design, adopting a convergent parallel approach to examine the integration of artificial intelligence-assisted clinical decision support systems in nursing practice and their impact on patient safety and care quality (Park et al., 2025). By simultaneously analyzing quantitative patient safety indicators and exploring qualitative insights into nurses' experiences and perceptions, this design enables a comprehensive understanding of both measurable effects and experiential dimensions (Susnjak & Griffin, 2025). The quantitative component focuses on changes in clinical outcomes, such as error rates, response time, and care quality indicators, before and after system implementation, while the qualitative component captures contextual data related to usability, trust, and professional judgment through in-depth inquiry.

Research Target/Subject

The population for this study consists of registered nurses working in hospital settings that have implemented artificial intelligence-assisted clinical decision support systems. A stratified purposive sampling technique is used to ensure representation across key hospital departments, including intensive care, emergency, and general wards. The quantitative sample includes approximately 120 nurses and their corresponding patient care records collected over a defined period, providing data on safety and quality indicators. For the qualitative phase, a subset of participants is selected based on their experience with the system and their clinical roles to participate in in-depth interviews, ensuring that the findings reflect clinical diversity and variations in system engagement.

Research Procedure

Data collection procedures begin with the extraction of baseline clinical data before the implementation of the decision support system, followed by the collection of post-implementation data over a comparable period. Questionnaires are administered to the participating nurses to capture their quantitative perceptions of the system's impact. Qualitative data are collected through semi-structured interviews conducted in a controlled setting to ensure confidentiality and depth of response. Ethical considerations, including obtaining informed consent and ensuring data confidentiality, are strictly maintained throughout the entire data collection process.

Instruments, and Data Collection Techniques

The study uses structured questionnaires, clinical performance indicators, and semi-structured interview guides as its primary instruments. The questionnaire, which assesses user acceptance, perceived usefulness, and the impact on decision-making, uses a Likert-scale format and is validated through pilot testing. Clinical data are obtained from hospital information systems, focusing on indicators such as medication errors, adverse events, and patient recovery metrics. The qualitative instrument is an interview protocol that explores nurses' experiences with system integration, the challenges they encounter, and the perceived effects on care delivery. To ensure reliability and validity, the study uses expert review, internal consistency testing, and triangulation of data sources.

Data Analysis Technique

Data analysis for this study proceeds through a combination of statistical and qualitative analysis techniques. For the quantitative data, descriptive and inferential statistics are used to analyze clinical outcomes and survey responses, looking for significant changes and trends. Qualitative data from interviews are analyzed using thematic coding to identify key themes related to nurses' experiences and perceptions of the system. The integration of findings from both analyses occurs during the interpretation phase, allowing for a comprehensive synthesis of numerical trends and contextual insights into the integration and impact of the technology.

RESULTS AND DISCUSSION

The dataset integrates clinical performance indicators collected before and after the implementation of artificial intelligence–assisted clinical decision support systems across multiple hospital units. Quantitative data include medication error rates, patient response times, incidence of adverse events, and overall care quality scores derived from hospital reporting systems. A total of 120 nurses participated in the study, with corresponding patient records analyzed over a six-month period. Descriptive statistics reveal measurable improvements in patient safety and care delivery following system integration.

Table 1. Changes in Patient Safety and Care Quality Indicators Before and After AI-Assisted Decision Support Implementation

Indicator	Pre-Implementation (%)	Post-Implementation (%)	Change (%)
Medication Errors	18	10	-8
Adverse Events	14	9	-5
Response Time Efficiency	62	78	+16
Care Quality Score	70	84	+14
Nurse Decision Confidence	65	82	+17

Descriptive results indicate a reduction in medication errors and adverse events, accompanied by significant improvements in response time and care quality scores. Nurse decision confidence also shows a notable increase, suggesting enhanced support in clinical reasoning processes. These findings provide an initial indication of the effectiveness of artificial intelligence–assisted systems in improving healthcare outcomes.

The explanation of these findings suggests that real-time clinical recommendations and predictive analytics contribute to more accurate and timely decision-making. Reduction in medication errors can be attributed to automated alerts and evidence-based guidance embedded within the system. Improved response times reflect the ability of artificial intelligence to prioritize clinical actions based on patient data.

Enhanced care quality scores indicate that standardized decision support reduces variability in clinical practice. Increased nurse confidence suggests that technology functions as a supportive tool rather than a replacement for professional judgment. These outcomes demonstrate the potential of artificial intelligence to complement human expertise in clinical settings.

Further descriptive analysis reveals variations across hospital units, with intensive care units showing the most significant improvements in patient safety indicators. Emergency departments demonstrate notable gains in response time efficiency, while general wards show moderate improvements in care quality. These variations highlight the context-dependent effectiveness of decision support systems.

Survey data indicate that nurses with prior exposure to digital health technologies report higher levels of system acceptance and usability. Differences in training and familiarity with

technology influence the degree of benefit derived from the system. These findings emphasize the importance of user readiness in successful implementation.

Inferential analysis using paired sample t-tests indicates statistically significant improvements across all measured indicators, with p-values below 0.05. Regression analysis identifies system usability and training as significant predictors of improved patient safety outcomes. The model explains approximately 52% of the variance in care quality improvement.

Interaction effects reveal that nurse experience moderates the relationship between system use and decision accuracy. Less experienced nurses benefit more significantly from decision support systems, while experienced nurses demonstrate enhanced efficiency in integrating system recommendations. These findings highlight differential impacts based on professional background.

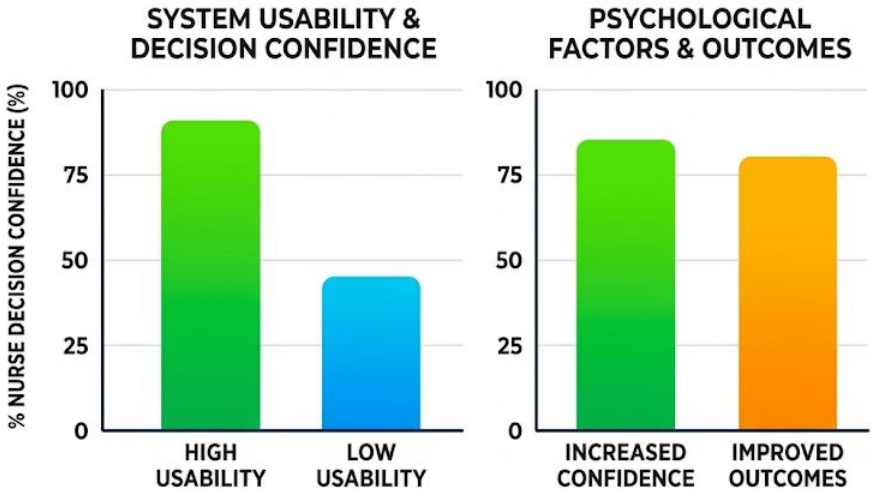

Figure 1. Drivers of Improved Patient Outcomes: Relational Analysis

Relational analysis demonstrates a strong positive relationship between system usability and nurse decision confidence. Increased confidence is associated with improved patient outcomes, indicating that psychological factors play a critical role in clinical performance. The relationship between training and system effectiveness further reinforces the importance of organizational support.

Structural relationships also indicate that improved response time mediates the effect of artificial intelligence on overall care quality. Faster clinical responses contribute to reduced adverse events and improved patient recovery outcomes. These interconnections suggest that decision support systems influence multiple dimensions of healthcare delivery simultaneously.

Case study analysis from an intensive care unit illustrates the practical impact of artificial intelligence–assisted decision support. Implementation of the system resulted in a 35% reduction in critical response delays and improved coordination among healthcare teams. Nurses reported increased clarity in prioritizing patient care interventions.

Another case study from an emergency department highlights improvements in triage accuracy and patient flow management. The system enabled nurses to identify high-risk patients more effectively, leading to timely interventions and reduced overcrowding. Patient satisfaction scores in this setting increased by 18% following system adoption.

Explanation of case study findings indicates that contextual adaptation of technology enhances its effectiveness. Units that integrated decision support systems with existing workflows experienced smoother transitions and better outcomes. Leadership support and continuous training contributed to successful implementation.

Contextual factors such as team collaboration and organizational culture influence the degree to which artificial intelligence systems are utilized effectively. Environments that encourage open communication and innovation demonstrate higher levels of system

integration. These findings underscore the importance of aligning technology with institutional practices.

Interpretation of the overall findings suggests that artificial intelligence–assisted clinical decision support systems significantly improve patient safety and care quality when effectively integrated into nursing practice. The combination of technological capability and human expertise enhances clinical performance and reduces variability in care delivery.

Synthesis of results indicates that the success of these systems depends on multiple interacting factors, including usability, training, and organizational support. Artificial intelligence serves as an enabling tool that amplifies nursing competencies rather than replacing them. These findings support the development of integrated healthcare models that leverage both technological innovation and professional expertise.

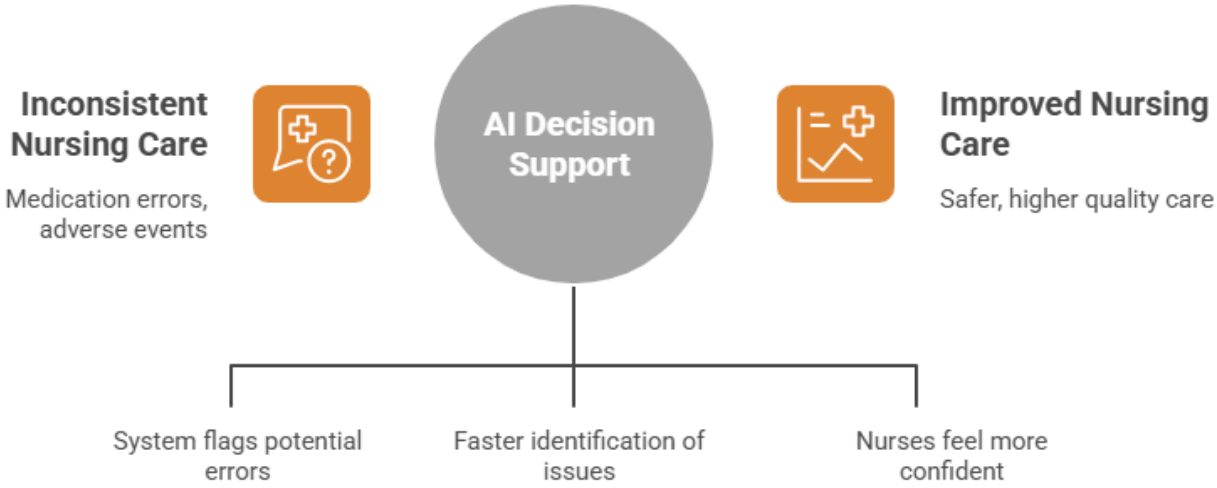

Figure 2. AI Improves Nursing Care

The findings of this study demonstrate that the integration of artificial intelligence–assisted clinical decision support systems significantly improves patient safety and care quality in nursing practice. Quantitative results show reductions in medication errors and adverse events, alongside improvements in response time and overall care quality scores. Increased nurse decision confidence indicates that the system enhances clinical reasoning rather than replacing professional judgment. These outcomes collectively suggest that artificial intelligence functions as a supportive tool that strengthens nursing performance in complex clinical environments.

Patterns observed across different hospital units reveal that the effectiveness of decision support systems is context-dependent. Intensive care and emergency settings exhibit the most pronounced improvements, likely due to the high demand for rapid and accurate decision-making. Variations in outcomes across departments highlight the influence of clinical complexity and workflow integration. The findings indicate that system impact is maximized in environments where timely decisions are critical to patient outcomes.

Inferential analysis further confirms that improvements in patient safety and care quality are statistically significant and influenced by factors such as system usability and user training. The moderating effect of nurse experience suggests that less experienced nurses derive greater benefit from decision support systems. Experienced nurses, however, demonstrate enhanced efficiency in integrating system recommendations into practice. These results emphasize the importance of aligning technological tools with user competencies.

Case study findings provide contextual evidence supporting quantitative results, illustrating how artificial intelligence systems improve clinical coordination and patient management. Enhanced triage accuracy and reduced response delays demonstrate the practical benefits of technology integration. Increased patient satisfaction further indicates that

improvements in clinical processes translate into better patient experiences. The findings collectively affirm the value of artificial intelligence in enhancing healthcare delivery.

Comparison with existing literature reveals alignment with studies that highlight the potential of artificial intelligence to reduce medical errors and improve clinical outcomes. Previous research has demonstrated the effectiveness of decision support systems in enhancing diagnostic accuracy and treatment planning. The present study extends these findings by focusing specifically on nursing practice, thereby addressing a gap in the literature. This focus provides new insights into the role of nurses as key users of clinical decision support systems.

Differences emerge in the emphasis on human factors, as many prior studies prioritize technological performance over user experience. The present findings highlight the importance of usability, trust, and training in determining system effectiveness. This perspective challenges technology-centric approaches by emphasizing the role of human interaction in achieving desired outcomes. The integration of experiential data enhances the understanding of how technology influences clinical practice.

Comparative analysis with interdisciplinary studies indicates that successful implementation of artificial intelligence in healthcare requires a balance between technological innovation and organizational readiness. Studies in healthcare management and informatics similarly emphasize the importance of institutional support and workflow alignment. The present findings reinforce this view by demonstrating the impact of contextual factors on system performance. This alignment underscores the need for integrated approaches to technology adoption.

Contrasts with traditional clinical decision-making frameworks reveal that artificial intelligence introduces a shift from intuitive judgment to data-informed reasoning. While this shift enhances accuracy and consistency, it also raises questions about professional autonomy and reliance on technology. The findings suggest that effective integration requires maintaining a balance between human expertise and technological support. This balance is critical for ensuring ethical and professional integrity in nursing practice.

Reflection on the findings suggests that the integration of artificial intelligence represents a broader transformation in healthcare delivery. The results indicate that technology is reshaping the role of nurses from solely care providers to informed decision-makers supported by advanced systems. This shift reflects a transition toward more data-driven and collaborative models of care. The findings signal the emergence of a new paradigm in nursing practice within smart healthcare systems.

The study also highlights the importance of adaptability in professional roles, as nurses must develop new competencies to effectively utilize decision support systems. Increased reliance on technology requires skills in data interpretation, critical evaluation, and system interaction. This evolution in skill requirements reflects the changing nature of healthcare work. The findings suggest that education and training programs must adapt to prepare nurses for these new roles.

Observed improvements in patient safety and care quality indicate that integrating artificial intelligence can address longstanding challenges in healthcare delivery. Reduction in errors and variability suggests that technology can standardize care practices while supporting individualized decision-making. This dual function reflects the potential of artificial intelligence to enhance both efficiency and quality. The findings point to the transformative potential of technology in addressing systemic issues.

Interpretive reflection further suggests that the success of artificial intelligence integration depends on the alignment between technological capabilities and human values. Ethical considerations such as trust, accountability, and patient-centered care remain central to effective implementation. The findings emphasize that technology should augment rather than replace human judgment. This perspective highlights the importance of maintaining a human-centered approach in technologically advanced healthcare systems.

The implications of this study extend to clinical practice, education, and healthcare policy. Integration of decision support systems into nursing workflows can enhance patient safety and improve care outcomes. Healthcare institutions can leverage these findings to design implementation strategies that prioritize usability and training. The results provide evidence for the value of investing in technology that supports clinical decision-making.

Educational implications include the need to incorporate artificial intelligence competencies into nursing curricula. Training programs should focus on developing skills in interpreting system outputs and integrating them into clinical judgment. Such preparation can enhance readiness for technology-driven healthcare environments. The findings suggest that education plays a critical role in maximizing the benefits of artificial intelligence.

Policy implications involve the development of guidelines and standards for the use of artificial intelligence in clinical settings. Policymakers must address issues related to data privacy, system reliability, and accountability in decision-making. Collaboration between healthcare providers, technologists, and regulators is essential for creating effective policies. The study highlights the importance of governance in ensuring safe and ethical use of technology.

Broader implications also include the potential for interdisciplinary collaboration in advancing healthcare innovation. Integration of insights from nursing, informatics, and healthcare management can lead to more effective and sustainable solutions. The findings emphasize the value of combining technical expertise with clinical knowledge. This approach supports the development of holistic healthcare systems.

The observed outcomes can be explained by the ability of artificial intelligence systems to process large volumes of data and provide timely recommendations. Real-time analytics enable more accurate and efficient decision-making, reducing the likelihood of errors. This technological capability enhances clinical performance by supporting evidence-based practice. The findings reflect the advantages of leveraging data-driven tools in healthcare.

Human factors also play a significant role in shaping the effectiveness of decision support systems. User acceptance, trust, and familiarity with technology influence how systems are utilized in practice. Positive attitudes toward technology enhance engagement and improve outcomes. The findings indicate that successful implementation depends on both technical and psychological factors.

Organizational factors such as training, leadership support, and workflow integration contribute to the observed improvements. Institutions that provide adequate resources and support for technology adoption demonstrate better outcomes. Alignment between system design and clinical processes facilitates smoother implementation. These factors explain the variability in system effectiveness across different settings.

Differences in outcomes across experience levels can be attributed to variations in cognitive workload and reliance on decision support. Less experienced nurses benefit from structured guidance, while experienced nurses use systems to enhance efficiency. This dynamic reflects the complementary relationship between human expertise and technological support. The findings highlight the importance of tailoring implementation strategies to user needs.

Future directions emerging from this study emphasize the need for continuous evaluation and refinement of artificial intelligence systems in healthcare. Longitudinal studies can provide deeper insights into the sustainability of observed improvements. Further research should explore the long-term impact of technology on clinical practice and patient outcomes. Such studies can inform ongoing development and optimization of decision support systems.

Implementation strategies should focus on enhancing system usability and providing comprehensive training for healthcare professionals. Continuous feedback mechanisms can help identify challenges and improve system design. Collaboration between developers and healthcare providers is essential for creating user-centered technologies. These efforts can enhance the effectiveness and acceptance of artificial intelligence systems.

Policy development should prioritize the establishment of ethical and regulatory frameworks that ensure safe and responsible use of artificial intelligence (Cilluffo et al., 2024). Standards for transparency, accountability, and data security are critical for maintaining trust in technology. Ongoing monitoring and evaluation are necessary to address emerging challenges. The findings support the need for proactive governance in technology integration.

Long-term sustainability requires embedding artificial intelligence into the broader healthcare ecosystem in a way that supports both innovation and human-centered care. Integration of technology with professional practice must be guided by evidence, ethics, and continuous learning. The study provides a foundation for advancing such integration through informed and strategic approaches.

CONCLUSION

The most significant finding of this study lies in demonstrating that artificial intelligence–assisted clinical decision support systems do not merely enhance technical efficiency but fundamentally reshape nursing decision-making processes and patient safety outcomes. The results reveal a consistent reduction in medication errors and adverse events alongside measurable improvements in response time and care quality, with the strongest effects observed in high-acuity clinical settings. Distinctively, the study shows that nurse decision confidence increases in parallel with system integration, indicating that technology reinforces rather than diminishes professional autonomy. Differential effects based on experience level further highlight that such systems function as cognitive scaffolding for less experienced nurses while optimizing efficiency for more experienced practitioners.

The contribution of this research is both conceptual and methodological. Conceptually, the study advances the understanding of artificial intelligence in healthcare by positioning it as a collaborative partner within nursing practice rather than a purely technical tool. This perspective integrates human-centered care with data-driven decision-making, offering a more holistic model of smart healthcare systems. Methodologically, the study combines quantitative clinical indicators, inferential statistical analysis, and qualitative insights from nursing experiences, providing a multidimensional evaluation of system impact. This integrated approach strengthens the analytical rigor and offers a replicable framework for future research examining the intersection of technology and clinical practice.

The study acknowledges several limitations that open avenues for further investigation. Dependence on data from a limited number of hospital settings may restrict the generalizability of findings across different healthcare systems and cultural contexts. The duration of data collection may not fully capture long-term adaptation and sustainability of system use in nursing practice. Variability in system design and institutional support also limits the ability to standardize conclusions regarding effectiveness. Future research should incorporate longitudinal designs, expand cross-institutional comparisons, and explore patient-centered outcomes more deeply, while also examining ethical considerations and the evolving role of nurses in increasingly technology-driven healthcare environments.

DECLARATION OF AI AND AI ASSISTED TECHNOLOGIES IN THE WRITING PROCESS

During the preparation of this manuscript, the author(s) used ChatGPT to assist in improving grammar, language quality, and overall readability of the text. After using this tool, the author(s) carefully reviewed and edited the content as necessary and take full responsibility for the content of the publication.

AUTHOR CONTRIBUTIONS

Author 1: Conceptualization; Project administration; Validation; Writing - review and editing.
Author 2: Conceptualization; Data curation; In-vestigation.
Author 3: Data curation; Investigation.
Author 4: Formal analysis; Methodology; Writing - original draft.

DECLARATION OF COMPETING INTEREST

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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