SCIENTIFIC FORUM

The impact of AI in Nursing

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Abstract

Artificial intelligence (AI) is no longer a distant possibility for nursing; it is a working part of many hospitals, clinics, and community services today. From predictive early-warning systems that flag a deteriorating patient hours before a nurse would notice, to ambient documentation tools that quietly draft a clinical note while a nurse talks with a patient, AI is reshaping how nursing work gets done. This article examines the impact of AI on nursing practice through a critical, evidence-informed lens rather than a purely promotional one. It begins by clarifying what AI means in a clinical context, then reviews its documented effects on clinical decision-making, documentation burden, workflow efficiency, and patient safety, drawing on recent systematic reviews, trials, and position papers published largely between 2023 and 2026. The discussion section weighs the genuine gains against persistent risks, including algorithmic bias, automation complacency, and the erosion of nurses' clinical judgement if oversight is weak. Practical implications for bedside practice, nursing leadership, and nursing education are outlined, followed by an honest account of the barriers that limit AI's benefits in real-world settings: uneven digital infrastructure, insufficient training, and unresolved questions of accountability. The article closes with recommendations for responsible adoption and a conclusion arguing that AI's value in nursing depends less on the sophistication of the technology and more on the judgement, advocacy, and involvement of the nurses who use it.

Keywords: *artificial intelligence, nursing practice, clinical decision support, algorithmic bias, nursing informatics, patient safety, digital health*

Introduction

Nursing has always been a profession shaped by the tools nurses use, from the humble thermometer to the electronic health record (EHR). Artificial intelligence is the latest, and arguably the most

consequential, of these tools. Unlike earlier technologies that simply recorded or transmitted information, AI systems can analyse patterns, generate predictions, and in some cases draft clinical language on a nurse's behalf. This shift changes not only what nurses do but how they think about their own judgement.

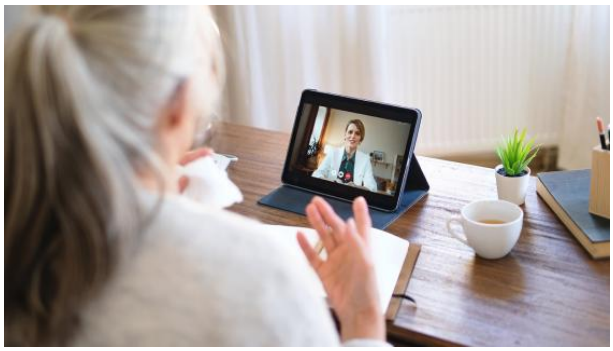

Figure 0. AI-enabled digital health tools, such as telehealth video consultations, are extending nursing and clinical care beyond the traditional hospital setting.

The scale of this change should not be overstated, nor should it be dismissed. AI is not replacing nurses, and there is little credible evidence that it will in the near future. What the evidence does show is more modest but still significant: AI-powered clinical decision support (CDS) systems are measurably improving early detection of patient deterioration, ambient AI scribes are reducing the hours nurses and physicians spend typing notes, and algorithmic tools are helping flag patients at risk of readmission or sepsis before symptoms become obvious (Aggarwal et al., 2023; Elhaddad & Hamam, 2024). At the same time, serious concerns persist about bias, over-reliance, and the erosion of the human relationship at the centre of nursing care.

This article takes a nursing student's perspective on the topic: practical, evidence-based, and honest about both the promise and the problems. It is organised to move from what AI is, through what it currently does in nursing settings, to what nurses and nursing students should do about it.

1. Understanding Artificial Intelligence in a Nursing Context

Artificial intelligence, in the healthcare literature, is often defined broadly as a system's capacity to interpret data, learn from it, and use that learning to perform tasks that would normally require human judgement (Kaplan & Haenlein, 2019, as cited in Cant et al., 2026). In nursing, this translates into several recognisable categories of tools:

- Clinical decision support (CDS) systems, which combine data from EHRs, laboratory results, and bedside monitors to flag risks and suggest interventions.
- Predictive analytics, used for early warning of deterioration, sepsis, falls, or pressure injury risk.

- Natural language processing (NLP) and ambient AI scribes, which listen to or read clinical encounters and generate draft documentation.
- Chatbots and virtual assistants, used for patient education, triage, and post-discharge follow-up.
- Workflow and staffing tools, which forecast patient acuity and support scheduling decisions.

It is worth being precise about this list because "AI" is often used as a single catch-all term in casual conversation, when in reality a sepsis-prediction algorithm and a documentation chatbot raise very different clinical and ethical questions. A nurse evaluating a deterioration alert is engaging in a fundamentally different task than a nurse reviewing an AI-generated note for accuracy.

2. AI and Clinical Decision-Making

Perhaps the most studied application of AI in nursing is its role in supporting clinical judgement. A recent systematic review of AI technologies supporting nurses' clinical decision-making found that, across eight included studies, AI tools were associated with meaningful improvements in decision-making, patient care, and staff performance. One discharge-support system reduced 30-day readmissions from 22.2% to 9.4%, and a deterioration algorithm significantly cut the time taken to contact senior staff and to order diagnostic tests. These are not marginal statistics; a reduction in readmissions of that magnitude has direct implications for patient wellbeing and health system cost.



Figure 1a. Clinicians reviewing AI-assisted diagnostic imaging alongside real-time patient data — a typical example of AI-supported clinical decision-making at the point of care.

Explainable AI (XAI) has emerged as an important sub-theme within this literature. Because many machine learning models operate as "black boxes," researchers have emphasised that AI is most useful to nurses when its reasoning is at least partly visible. Explainable AI allows health professionals to understand the rationale behind a recommendation, which builds trust and supports ethical decision-making in high-acuity settings such as intensive care and long-term care. Interestingly, XAI has also been proposed as a teaching tool: by showing novice nurses the structured reasoning behind a recommendation, it can help them build clinical reasoning skills rather than simply follow the output (Martinez-Ortigosa et al., 2023, as cited in the same review).

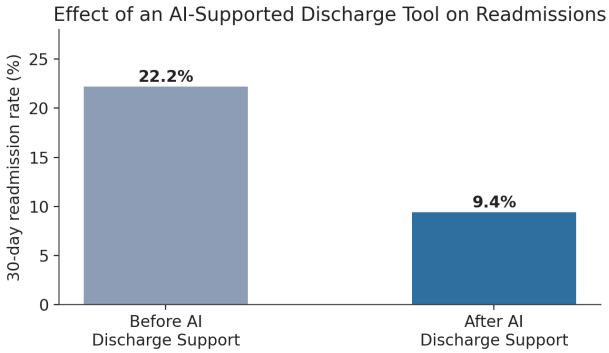

Figure 1. A discharge-support AI tool was associated with a drop in 30-day readmissions from 22.2% to 9.4% (based on findings reported in a systematic review of AI-assisted nursing decision-making).

However, the same body of literature is careful not to overstate AI's reliability. An umbrella review of reviews on AI in nursing decision-making cautioned that AI algorithms remain prone to error, bias, and misinterpretation of data, which poses genuine risks when such tools are applied in real clinical environments. This tension, real benefit alongside real risk, runs through almost every application discussed in this article, and it is the reason critical appraisal, not blind trust, should guide how nurses use these tools.

3. Documentation, Workload, and the Promise of Time Back at the Bedside

Nursing documentation has long been identified as one of the most burdensome and least satisfying parts of the job. Repetitive, duplicative data entry can occupy a substantial share of a nurse's shift, time that might otherwise be spent with patients (O'Brien et al., 2015, as cited in a recent position paper on AI-enabled nursing documentation). This burden has been linked consistently to professional burnout, particularly where EHR systems were designed without meaningful nursing input and therefore fail to match real nursing workflows (Moy et al., 2021; Hobensack et al., 2022).

Ambient AI scribes, which listen to a clinical encounter and generate a draft note using speech recognition and natural language processing, have been tested as one response to this problem. In a multi-site quality improvement study across six U.S. health systems involving 263 clinicians, use of an ambient AI scribe for 30 days was associated with a statistically significant reduction in burnout, from 51.9% to 38.8%, alongside improvements in cognitive task load related to documentation. A related large-scale rollout at an academic health system reported that the technology reduced documentation time by roughly 30 minutes per provider per day and improved note accuracy for diagnosis coding, alongside secondary improvements in wellbeing measures, with adoption scaling to hundreds of clinicians within about a year.

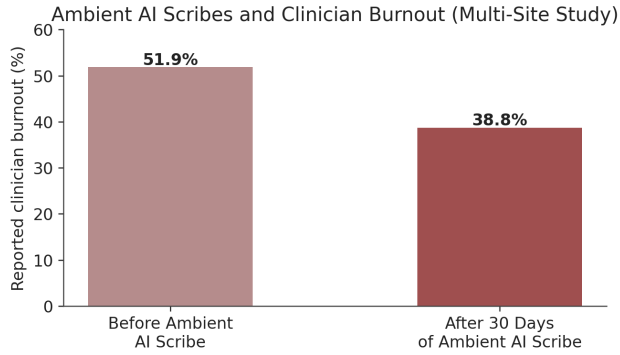

Figure 2. In a six-site U.S. study, clinician burnout fell from 51.9% to 38.8% after 30 days of using an ambient AI scribe.

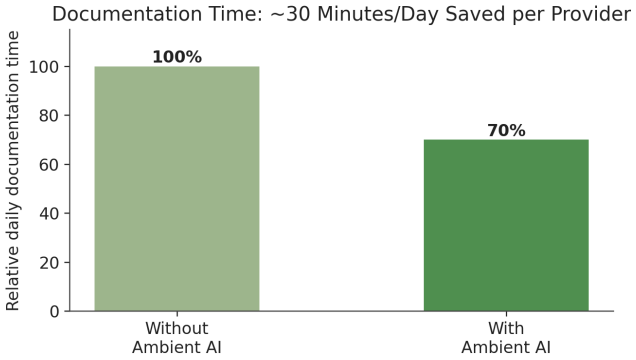

Figure 3. Ambient AI scribes were associated with roughly 30 minutes of daily documentation time saved per provider.

These findings are encouraging, but the technology is not without friction. Clinicians using ambient AI drafts still need to review, correct, and sometimes substantially edit the language the system produces, particularly around clinical hedging and uncertainty, since an AI-generated note can overstate or understate a clinician's confidence if left unchecked (Guo et al., 2026). For nursing specifically, most published evidence so far comes from physician and advanced-practice populations rather than bedside nurses, which means the benefits described above should be extrapolated to core nursing documentation with some caution.

4. Patient Education, Triage, and Remote Monitoring

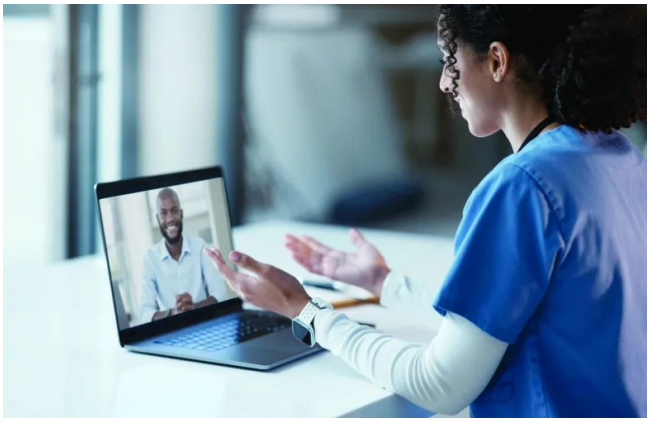

Figure 4. AI-supported telehealth platforms allow nurses to extend patient education, triage, and follow-up monitoring beyond the hospital setting.

Beyond the acute inpatient setting, AI is increasingly used to extend nursing reach outside the hospital walls. Chatbots and virtual assistants are being deployed to answer routine patient questions, remind patients about medications, and support post-discharge symptom monitoring, freeing nurses to focus on more complex cases. Predictive analytics also support population-level nursing work, such as identifying which discharged patients are most likely to require follow-up contact, by combining individual clinical data with broader population-level evidence (Brydges, 2025).

A real-world example that nursing students will likely recognise is the use of AI-assisted triage tools in emergency departments, where predictive analytics and natural language processing help flag high-acuity patients earlier, potentially reducing workflow inefficiencies and improving patient safety in a setting where minutes matter. Yet the same commentary notes an important caveat: current AI applications remain predominantly task-specific and disease-oriented, offering limited support for theory-based, comprehensive nursing assessment that considers the physical, psychological, and social dimensions of care. In other words, AI is good at narrow tasks; holistic nursing assessment is still, and will likely remain, a human skill.

5. Critical Discussion: Weighing Genuine Benefit Against Genuine Risk

It would be easy to write an uncritical account of AI in nursing that simply lists benefits. It would be equally easy to write a fearful account that focuses only on risk. Neither would be honest. A fair reading of the evidence suggests three things need to be held together at once.

First, the benefits are real but uneven. Reductions in readmissions, faster escalation of deteriorating patients, and meaningful cuts to documentation time are not hypothetical; they have been measured in controlled and quality-improvement studies. But these benefits are concentrated in well-resourced settings with mature digital infrastructure, and much of the strongest evidence still comes from

physician-focused rather than nursing-focused research, meaning the picture for frontline bedside nursing is still emerging.

Second, bias is not a hypothetical risk; it is a documented one. Algorithmic tools trained on historically unrepresentative data can reproduce or even amplify existing health disparities. Nursing scholars have argued that nurses have both an opportunity and an obligation to intervene here, given their unique position at the point of care (Cary et al., 2025). Frameworks such as the Algorithmic Bias Playbook and the JustEFAB ethical framework have been proposed specifically to help clinical teams identify and mitigate bias before and after deployment (Obermeyer et al., 2021; McCradden et al., 2023, as cited in Cary et al., 2025). Broader reviews echo this concern, noting growing evidence of racial and gender bias in clinical risk-assessment tools and calling for more diverse, representative training data (Ghassemi & Gusev, 2024, as cited in a 2025 review on AI competency building for nurse scientists).

Third, explainability and trust cut both ways. A system that is transparent enough for a nurse to understand its reasoning builds appropriate trust; a system that is opaque, or one that is trusted too readily, risks a form of automation complacency where nurses defer to the algorithm even when their own clinical judgement suggests otherwise. This is precisely why patient safety scholars have begun asking pointed questions about how AI-driven nursing care shapes error patterns, rather than assuming that more automation automatically means fewer mistakes (Johnson, Dudding, & Carrington, 2024).

Taken together, the evidence supports a position of critical adoption: nurses should use AI tools where the evidence justifies it, while maintaining the professional scepticism that has always been part of sound clinical judgement.

6. Practical Implications for Nursing Practice

For nursing students and practising nurses, several practical implications follow from this evidence base:

- Verify before you trust. An AI-generated deterioration alert, risk score, or draft note should be treated as a prompt for clinical reasoning, not a replacement for it. Cross-check the recommendation against the full clinical picture.
- Advocate at the design stage. Nurses who understand documentation workflows and patient needs are well placed to influence how AI tools are built and deployed, rather than only receiving them after the fact (Cary et al., 2025).
- Build basic AI and data literacy. Understanding, at a conceptual level, how an algorithm was trained and what its limitations are helps nurses ask better questions when a tool behaves unexpectedly (Ball Dunlap & Michalowski, 2024).
- Protect the therapeutic relationship. Time saved on documentation should be reinvested in direct patient contact, not simply absorbed into higher caseloads.

- Escalate concerns about bias or errors. Nurses are often the first to notice when an algorithm behaves oddly for a particular patient population; there should be a clear channel to report this.

7. Challenges and Limitations

Several structural challenges limit how much good AI can currently do in nursing practice:

1. Uneven infrastructure. Many EHR systems were not designed with nursing workflows in mind, and integrating AI on top of a poorly designed system can compound rather than relieve frustration (Busse et al., 2023, as cited in a 2026 position paper).
2. Training gaps. Survey evidence suggests nurses' awareness and confidence regarding AI vary considerably, with many reporting limited formal preparation for working alongside these tools (Alruwaili et al., 2024).
3. Accountability ambiguity. When an AI recommendation contributes to an adverse event, questions of professional and legal responsibility remain unsettled in many jurisdictions.
4. Bias and representativeness. As discussed above, models trained on non-representative populations can under-serve minority or marginalised patients.
5. Evidence still maturing for bedside nursing specifically. Much of the strongest trial evidence to date concerns physicians and advanced-practice providers; direct nursing-specific trials remain comparatively scarce.
6. Risk of skill erosion. Heavy reliance on decision-support tools, particularly among new graduates, may reduce opportunities to develop independent clinical reasoning if not carefully managed.

8. Future Recommendations

Based on the evidence reviewed, several recommendations follow for nursing education, practice, and policy:

- Integrate AI literacy into nursing curricula as a core competency, not an optional add-on, including hands-on exposure to how CDS tools and ambient documentation systems work (De Gagne, Hwang, & Jung, 2024; Castonguay et al., 2023).
- Expand nursing-specific research, since much current evidence is drawn from physician populations; nursing scholars should be funded to conduct trials that reflect nursing-specific workflows and outcomes.
- Adopt formal bias-auditing frameworks in any institution deploying clinical AI, with nurses included in governance committees from the outset.
- Establish clear escalation and accountability pathways so that nurses know how to report AI errors or unexpected behaviour and understand where responsibility sits.

- Preserve protected time for direct patient care as documentation efficiencies are realised, so that time savings translate into better care rather than simply higher throughput expectations.

Conclusion

Artificial intelligence has already begun to change nursing practice in measurable ways: sharper early warning of patient deterioration, meaningful reductions in documentation burden, and new tools for reaching patients beyond the hospital. None of this makes AI a substitute for nursing judgement. If anything, the evidence reviewed here suggests the opposite: AI raises the stakes of clinical judgement, because a nurse who defers uncritically to an algorithm, or who dismisses one without good reason, can both cause harm. The nurses best placed to benefit from AI will be those who understand its strengths and its blind spots well enough to use it as a genuine partner in care rather than either a crutch or a threat. For nursing students entering a profession that will look different from the one their instructors trained in, this critical, informed engagement with AI is quickly becoming as fundamental a skill as any clinical procedure.

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Note: This article synthesises findings from recent peer-reviewed nursing and health-informatics literature (2023-2026). Before final submission, please verify each citation against the original source and confirm formatting against your institution's current APA 7th edition guidelines, as some author lists (indicated with "et al.") were abbreviated from database listings and should be completed in full where required by your instructor.

AUTHOR REVISION ADDENDUM

Clinical Example

Example: A bedside nurse receives an AI-generated alert indicating that a patient has a high risk of developing sepsis within the next six hours. Although the patient's vital signs appear only mildly abnormal, the nurse performs a focused assessment, informs the physician, and initiates the hospital's sepsis protocol. Early treatment prevents further deterioration and improves the patient's outcome. This illustrates that AI supports—but does not replace—clinical judgement.

Figure Interpretation

Each figure should be followed by a brief explanation describing what the figure shows, why the finding is important, and how it improves nursing practice. This links the visual evidence with the discussion.

Pakistan Examples

In addition to the international examples already included, Pakistan is also progressing in digital healthcare. Aga Khan University Hospital has expanded digital health and AI-supported initiatives in clinical care and education. Shaukat Khanum Memorial Cancer Hospital also uses advanced digital systems and data-driven technologies, reflecting Pakistan's growing readiness for AI-supported healthcare.

Revised Final Line

Artificial Intelligence may transform healthcare, but compassionate nursing will always remain a human responsibility.