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The Utilisation of Artificial Intelligence (AI) in Advanced Nurse Practitioner's Clinical Decision-Making: A Scoping Review

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ADMINISTRATIVE INFORMATION**Support** - No support.**Review Stage at time of this submission** - Formal screening of search results against eligibility criteria.**Conflicts of interest** - None declared.**INPLASY registration number:** INPLASY202680092**Amendments** - This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 26 August 2026 and was last updated on 26 August 2026.**INTRODUCTION**

Review question / Objective Aim - The study sets out to explore how the utilisation of AI tools influences advanced nurse practitioner's clinical decision-making processes.

Research Question - The review, based on the study's aim, explores the following research questions:

- How are AI tools utilised by ANPs in clinical decision-making processes?
- What are the benefits or opportunities associated with the utilisation of AI tools in ANPs' clinical decision-making?
- What are the challenges, barriers and concerns linked to the utilisation of AI tools in ANPs' clinical decision-making?

Background At present, healthcare systems around the world are struggling to meet healthcare needs (Mikkonen et al., 2026). Increased demands together with scarce resources are prominent

challenges causing the issue of unmet healthcare needs (Kingston et al., 2018). To improve care quality without increasing resources requires innovations (Apell and Eriksson, 2023). Thus, artificial intelligence (AI) could potentially be a significant technology for the acceleration of innovation, as well as support evidence-based clinical decision-making in healthcare. This is because healthcare is increasingly becoming data-rich and digital, and considering the advances in computing power and AI techniques, this creates a lot of opportunities (Jiang et al., 2017; Shang, 2021). In this context, generalised AI tools are for broad clinical applications across several conditions and care settings, whereas specialised AI tools are for specific tasks or outcomes. This clarification is critical to understanding the scope and implementation of different AI solutions in nursing practice. In healthcare delivery, AI is increasingly transforming and redefining how healthcare workers access information, their interpretation of clinical data and decisions regarding patient care. As patient demands, workforce shortages and complexity of care

continue to grow within healthcare systems, AI has emerged as a valuable tool for providing support to clinical decisions and patient outcomes (Khosravi et al., 2024).

clinical decision-making remains a critical aspect of healthcare, especially when it represents the complex cognitive process through which clinicians examine patient information, interpret evidence and determine suitable courses of action (Alnattah et al., 2025). Effective clinical decision-making is important for ensuring positive patient outcomes, especially in increasingly complex healthcare settings (Chen et al., 2023).

This importance is particularly evident in advanced nursing practice, where expectations for Advanced Nurse Practitioners (ANPs) are about synthesising clinical evidence, patient information and professional expertise to deliver safe, timely and effective care (Htay and Whitehead, 2021). Thus, the quality of decisions made by ANPs has a significant influence on patient outcomes, efficiency of healthcare and general quality of care.

In recent AI developments, there are innovative tools capable of supporting healthcare professionals throughout a decision-making process. For instance, AI-enabled clinical decision support systems analyse patient data in large volumes, identify patterns, generate risk predictions and provide recommendations based on evidence for diagnosis and treatment (Fahim et al., 2025; Almadani et al., 2025). Healthcare organisations have taken interest in these capabilities to improve the safety of patients, reduce errors in diagnosis and improve consistency in clinical decision. Studies have indicated that AI technologies can provide support to nurses in their decision-making, improve performance and positively contribute to care outcomes (Dailah et al., 2024; Mikkonen et al., 2026). In spite of these potential benefits, AI integration in clinical practice remains complex. There have been concerns about data privacy, accountability, transparency and over-reliance on technological recommendations. In addition, there are questions about healthcare professionals' perceptions and utilisation of AI tools in real-life clinical situations, as well as how these tools influence their professional autonomy and judgment.

Rationale Empirical Gap

Existing literature shows a growing interest in AI in healthcare, with studies emphasising its potential in terms of providing support to clinical decision-

making, improving diagnostic accuracy and efficiency, as well as contributing to better patient outcomes (Davenport and Kalakota, 2019; Alowais et al., 2023). Similarly, research has highlighted the critical role of ANPs in delivering complex, evidence-based care and has recognised the essence of effective clinical decision-making in advanced nursing practice (International Council of Nurses, 2020). Moreover, emerging evidence shows that experiences, perceptions, acceptance and trust of healthcare professionals in AI technologies are crucial determinants of their successful implementation and utilisation in clinical environments (Longoni, Bonezzi and Morewedge, 2019).

Altogether, these studies provide valuable insights into the usefulness of AI, as well as its implications for the delivery of healthcare. However, much of the existing evidence focuses on healthcare professionals broadly, with comparatively limited attention to ANPs as a distinct group. Dealing with, and addressing this gap is crucial to understanding the relationship between AI technologies and advanced nursing practice in modern healthcare environments.

Theoretical Framework

The Technology Acceptance Model (TAM), developed by Davis (1989), guides this study. The model is one of the widely used frameworks that explain how people accept and use new technologies. According to the model, two major factors influence the intention of a person to use a technological system. These factors are perceived usefulness and perceived ease of use. Perceived usefulness refers to the extent to which people believe that using a specific technology will improve their performance, whereas perceived ease of use refers to the extent to which people believe that using and operating a technology requires minimal effort (Davis, 1989). Based on the model (TAM), technologies are more likely to be accepted and integrated into routine activities if they are useful and easy to use.

In healthcare, TAM is relevant and this is due to the growing adoption of digital health technologies, electronic health records and telehealth systems and more recently, AI-assisted tools. Previous studies have shown that perceptions of the usefulness, reliability and ease of integration of technology influence the willingness of healthcare professionals to adopt and use them (Rahimi et al., 2018). In the context of AI, healthcare practitioners' belief that it (AI) can improve diagnostic accuracy, improve efficiency, support evidence-based

decision-making and contribute to positive patient outcomes is a reflection of perceived usefulness. In the case of perceived ease of use, this is about the extent to which healthcare practitioners are comfortable with the integration of AI-generated recommendations.

The application of TAM is, therefore, relevant to ANPs, whose clinical roles demand that they constantly integrate information, evidence and professional judgment in their decision-making processes.

METHODS

Strategy of data synthesis Data will be extracted from included studies using a standardised charting form developed in line with the review's aim and research question. The charting form will capture the following information from each study: author(s) and year of publication; country and healthcare setting; study design and methodology; type and function of the AI tool examined; the nature of the clinical decision-making process under investigation; key findings relating to the utilisation of AI by ANPs; and reported influences of AI utilisation on the quality of clinical decisions and patient care. The charting form will be piloted on a small sample of included studies and refined iteratively to ensure that it captures all relevant data consistently across the review.

Eligibility criteria Eligibility for inclusion in this scoping review was determined using the Population, Concept and Context (PCC) framework, as recommended by the Joanna Briggs Institute for scoping reviews (Peters et al., 2017). This framework offers a structured basis for defining the boundaries of the review and for ensuring that included studies align closely with the aim and research question. Studies were considered eligible if they examined the utilisation of AI tools by Advanced Nurse Practitioners within clinical decision-making contexts, and if they reported relevant evidence in the English language from 2020 onwards, reflecting the period of most rapid growth in AI-enabled clinical decision support technologies.

Source of evidence screening and selection A comprehensive search will be conducted across five electronic databases, namely PubMed, Cumulative Index to Nursing and Allied Health Literature (CINAHL), Medical Literature Analysis and Retrieval System Online (Medline), Scopus and Education Resources Information Center (ERIC). These databases were selected for their strong coverage of nursing, healthcare and biomedical

literature, as well as their relevance to interdisciplinary research at the intersection of health technology and education. In addition, grey literature sources, including Google Scholar and relevant institutional repositories, will be searched to capture evidence that may not be indexed within the main databases. The search strategy will combine key terms relating to three core concepts, namely advanced nurse practitioners, artificial intelligence and clinical decision-making, using Boolean operators (AND, OR) and truncation symbols (*) to maximise sensitivity and ensure broad coverage of relevant literature. Search terms will include combinations of the following: advanced nurse practitioner*, advanced practice nurse*, nurse practitioner*; artificial intelligence, AI, machine learning, clinical decision support system*, predictive analytics, natural language processing; clinical decision-making, clinical judgment, clinical reasoning. Reference lists of included studies will also be hand-searched to identify any additional relevant sources not captured through the database search.

Data management Charted data will be analysed and presented through a descriptive numerical summary alongside a thematic synthesis. The numerical summary will provide an overview of the characteristics of included studies, such as their geographical distribution, study designs and the types of AI tools examined, illustrated through tables and charts. Thematic synthesis will involve the systematic coding of findings from included studies to identify recurring patterns relating to the utilisation of AI in ANP clinical decision-making (Naeem et al., 2023). Codes will be grouped into broader themes that reflect how AI tools are utilised by ANPs, the perceived influence of this utilisation on the quality of clinical decisions and patient care, and any reported barriers or facilitators relevant to the research question. This approach allows the review to map the breadth of existing evidence while drawing out meaningful patterns across diverse study designs and contexts.

Reporting results / Analysis of the evidence

Data will be extracted from included studies using a standardised charting form developed in line with the review's aim and research question. The charting form will capture the following information from each study: author(s) and year of publication; country and healthcare setting; study design and methodology; type and function of the AI tool examined; the nature of the clinical decision-making process under investigation; key findings relating to the utilisation of AI by ANPs; and reported influences of AI utilisation on the quality

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Presentation of the results Conferences.

Language restriction English.

Country(ies) involved Finland.

Other relevant information Not applicable.

Keywords AI, Advanced practice nurses, decision making.

Dissemination plans Conferences and peer reviewed journals.

Contributions of each author

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