

Artificial intelligence in supporting the implementation of the nursing process: A scoping review

Inteligência artificial no suporte à implementação do processo de enfermagem: revisão de escopo

Inteligencia artificial en el apoyo a la implementación del Proceso de Enfermería: Revisión de alcance

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ABSTRACT

Objective: To identify scientific advances related to the use of Artificial Intelligence (AI) in supporting the implementation of the Nursing Process.

Method: Scoping review developed according to the Joanna Briggs Institute (JBI) methodological guidelines and registered on the International Open Science Framework platform. The search was conducted in the Scopus, Virtual Health Library (BVS), SciELO, and PubMed databases between February and March 2024. Data analysis followed a descriptive approach, with thematic categorization and narrative synthesis.

Results: Thirteen scientific studies were included, revealing significant advances in the application of AI to nursing practice. Contributions were highlighted in four main thematic categories, aligned with the stages of the Nursing Process: support for documentation and records – assessment/evaluation; support for diagnostic inference – diagnosis; prediction of adverse events – planning; and qualification and personalization of care – intervention. Additionally, two cross-cutting categories emerged in support of the implementation of the Nursing Process: professional education and training, and the integration of AI into the work process.

Conclusion: Artificial Intelligence is a promising ally in the implementation of the Nursing Process, provided its incorporation is accompanied by technical training, ethical regulation, and active engagement of professionals.

Descriptors: Nursing Process; Artificial Intelligence; Clinical Decision Support; Machine Learning; Nursing Informatics.

RESUMO

Objetivo: identificar os avanços científicos relacionados ao uso da Inteligência Artificial no suporte à implementação do Processo de Enfermagem.

Método: Revisão de escopo desenvolvida conforme a diretriz metodológica da *Joanna Briggs Institute* (JBI) e registrada na plataforma *International Open Science Framework*. A busca foi realizada nas bases Scopus, Biblioteca Virtual em Saúde, SciELO e PubMed, entre fevereiro e março de 2024. A análise dos dados seguiu abordagem descritiva, com categorização temática diretamente articulada às etapas do Processo de Enfermagem.

Resultados: Foram incluídos 13 estudos científicos que evidenciaram avanços relevantes na aplicação da Inteligência Artificial à prática da enfermagem. Destacam-se contribuições a partir das categorias temáticas que se interrelacionaram às etapas do Processo de Enfermagem: apoio à documentação e registro – avaliação/evolução; suporte à inferência diagnóstica – diagnóstico; predição de eventos adversos – planejamento; qualificação e personalização do cuidado – intervenção. Além dessas, emergiram ainda os temas: educação e capacitação profissional; e integração da Inteligência Artificial ao processo de trabalho.

Conclusão: A Inteligência Artificial é aliada promissora na implementação do Processo de Enfermagem, desde que sua incorporação seja acompanhada de capacitação técnica, regulamentação ética e envolvimento ativo dos profissionais.

Descritores: Processo de Enfermagem; Inteligência Artificial; Suporte à Decisão Clínica; Aprendizado de Máquina; Informática em Enfermagem.

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RESUMEN

Objetivo: Identificar los avances científicos relacionados con el uso de la Inteligencia Artificial (IA) en el apoyo a la implementación del Proceso de Enfermería.

Método: Revisión de alcance desarrollada conforme a las directrices metodológicas del Joanna Briggs Institute (JBI) y registrada en la plataforma International Open Science Framework. La búsqueda se realizó en las bases de datos Scopus, Biblioteca Virtual en Salud (BVS), SciELO y PubMed, entre febrero y marzo de 2024. El análisis de los datos siguió un enfoque descriptivo, con categorización temática y síntesis narrativa.

Resultados: Se incluyeron trece estudios científicos que evidenciaron avances relevantes en la aplicación de la IA a la práctica de enfermería. Se destacaron contribuciones organizadas en cuatro categorías temáticas principales, relacionadas con las etapas del Proceso de Enfermería: apoyo a la documentación y registros – valoración/evolución; apoyo a la inferencia diagnóstica – diagnóstico; predicción de eventos adversos – planificación; y cualificación y personalización del cuidado – intervención. Además, se identificaron categorías transversales comunes al apoyo a la implementación del Proceso de Enfermería: educación y formación profesional; e integración de la Inteligencia Artificial en el proceso de trabajo.

Conclusión: La Inteligencia Artificial representa una aliada prometedora para la implementación del Proceso de Enfermería, siempre que su incorporación esté acompañada de capacitación técnica, regulación ética y participación activa de los profesionales.

Descriptores: Proceso de Enfermería; Inteligencia Artificial; Apoyo para la Toma de Decisiones Clínicas; Aprendizaje Automático; Informática en Enfermería.

■ INTRODUCTION

Artificial Intelligence (AI) stands out as a field of computer science focused on creating systems capable of simulating aspects of human cognition, such as reasoning, learning, and decision-making. Technological developments in this field, such as machine learning, pattern recognition, artificial neural networks, and natural language processing algorithms, are increasingly impacting all aspects of modern life⁽¹⁾. These capabilities are being progressively incorporated into strategic sectors, such as healthcare, with a focus on process optimization and clinical decision-making support⁽²⁾.

In healthcare, experiments with AI have led to significant advances, particularly in diagnostic accuracy, personalized treatments, and reduced operational risks for patients. Studies demonstrate its applicability, increasing the efficiency of care systems and contributing to the development of precision medicine^(2,3). Its ability to learn from data and operate continuously and automatically makes AI a strategic tool to complement, enhance, and improve human clinical reasoning⁽³⁾.

In the nursing field, the adoption of Artificial Intelligence is occurring discreetly, but with promising results. Smart technologies have been used to assist in the analysis of clinical data, automated care documentation, risk prediction, and the generation of nursing diagnoses, contributing to reduced workload and improved care quality. Furthermore, their integration into professional practice can foster greater technical autonomy and scientifically based decision-making, which are key aspects for strengthening the profession^(4,5).

The Nursing Process (NP) emerges as a methodological tool that organizes professional practice into five interdependent stages: assessment, diagnosis, planning, implementation, and progression. Its application aims to promote clinical reasoning, patient safety, and quality of care⁽⁶⁾. However, daily practice still faces significant challenges to its effective implementation, such as a lack of time, work overload, a lack of digital infrastructure, and deficiencies in professional training^(7–10). These obstacles compromise the effectiveness of the NP and highlight the need for strategies that enable its concrete and sustainable implementation.

Artificial Intelligence emerges as a potential ally in overcoming these barriers^(4,5). The ability to automate operational stages, support data-driven clinical decisions, and organize workflows can directly contribute to the implementation of the NP in the routine of health services⁽²⁾. However, its adoption, although promising, poses significant risks, such as the reproduction of algorithmic biases, the automation of decisions without clinical judgment, and the possible reduction of professional autonomy^(1,3). Furthermore, issues such as data security and legal liability remain under debate, requiring nurses to adopt an ethical and critical stance regarding these innovations^(2,3).

Mapping how Artificial Intelligence is being applied to support the Nursing Process is essential to popularize successful initiatives, guide innovation policies, professional education, and the development of technologies aligned with the ethical and technical principles of nursing.

This study aims to identify scientific advances related to the use of Artificial Intelligence to support the implementation of the Nursing Process. The relevance of the research lies in the need to consolidate evidence that guides the safe, ethical, and effective use of Artificial Intelligence in professional practice.

■ METHOD

Scoping review with a descriptive approach, conducted according to the *Joanna Briggs Institute* (JBI) guidelines and based on the PRISMA-ScR (*Preferred Reporting Items for Systematic reviews and Meta-Analyses extension for Scoping Reviews*) framework⁽¹¹⁾. It was registered on the *International Open Science Framework* (OSF) platform under identifier 10.17605/OSF.IO/TGUZ9, ensuring transparency and methodological reproducibility. The protocol followed five stages: identification of the research question, search and selection of studies, data extraction and mapping, and analysis and synthesis of results.

The guiding question was constructed based on the mnemonic PCC, recommended by the *Joanna Briggs Institute* (JBI), which guides the formulation of research questions for scoping reviews. The PCC represents the following elements: Population (P) – nursing professionals; Concept (C) – technological advances in Artificial Intelligence in supporting the implementation of the Nursing Process; and Context (C) – published scientific literature. Thus, the guiding question of this review is: “What technological advances in Artificial Intelligence in supporting the implementation of the Nursing Process are documented in the scientific literature?”

The search was conducted by two researchers between February and March 2024 in the Scopus, Virtual Health Library (VHL), SciELO, and PubMed databases, with the same procedure used in each database. The last update occurred on March 25, 2024. Controlled descriptors from the DeCS/MESH vocabularies were used, combined with Boolean operators: “Artificial Intelligence AND Nursing OR Nursing Process,” “Nursing Process AND Machine Learning” and “Artificial Intelligence AND Nursing AND Nursing Process.” The selected languages were Portuguese, English, Spanish, and Italian, as they represent the main scientific dissemination vehicles in the field of nursing.

Study screening was conducted using Rayyan® software, with blind and independent evaluation by two reviewers. Disagreements were resolved by consensus or by a third reviewer.

Original articles published between 2013 and 2024, in Portuguese, English, Spanish, or Italian, available in full, and directly addressing the use of Artificial Intelligence in nursing were included. The 10-year timeframe is justified by the exponential growth of digital technologies and the application of Artificial Intelligence in healthcare over the last decade, especially after the consolidation of *big data*, machine learning, and intelligent systems in clinical settings. Editorials, abstracts of scientific events, and publications inaccessible in full were excluded.

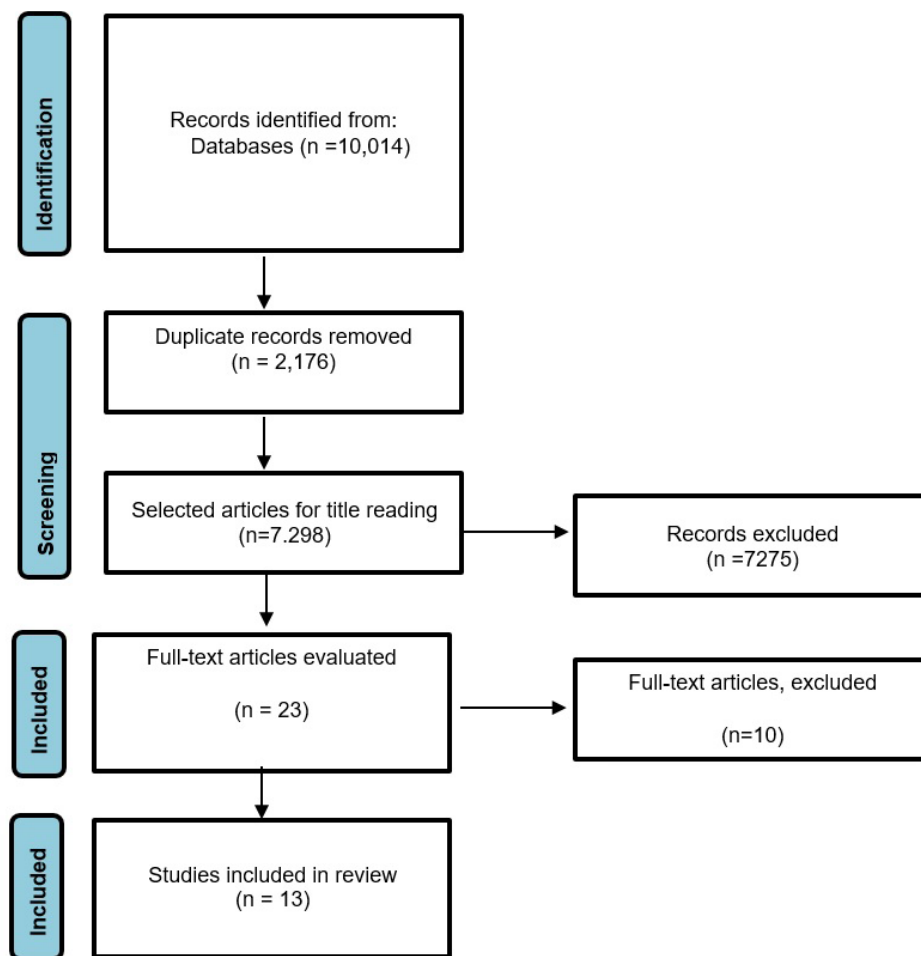
In addition to the systematic database search, a reverse search (analysis of the references of the included studies) was performed to identify possible additional studies, although no new studies were included using this method. Gray literature was not considered in this review, given the focus on peer-reviewed publications and greater methodological robustness.

Data from the included studies were extracted into a standardized spreadsheet, developed based on the JBI model, containing: title, authors, country, language, year of publication, objectives, methodological design, AI resources used, NP stages addressed, and main findings. The analysis followed a descriptive and interpretative approach, with thematic categorization according to the stages of the Nursing Process (assessment, diagnosis, planning, implementation, and evolution)⁽⁶⁾, supported by a structured analytical matrix.

In total, 10,014 records were retrieved, distributed as follows: Scopus (3,712), PubMed (3,008), BVS (2,040), and SciELO (1,254). After removing duplicates and applying the eligibility criteria, 13 studies were included for analysis, as shown in Figure 1.

Data extraction was performed by two independent reviewers using standardized spreadsheets, according to the JBI model. The extracted variables included: title, authors, country, language, year of publication, objective, methodology, and main findings. The data were grouped by thematic categories associated with the EP stages and synthesized descriptively and narratively, supported by a structured matrix.

Figure 1 – PRISMA-ScR flowchart. Caicó, Rio Grande do Norte, Brazil, 2024.



Source: The authors.

All procedures followed PRISMA-ScR guidelines, ensuring rigor, transparency, and validity of the methodological approach. Data management was performed using Microsoft Excel® spreadsheets, with copies stored in a secure environment at the research institution.

RESULTS

There has been a progressive increase in publications on Artificial Intelligence (AI) applied to nursing in recent years. Between 2013 and 2020, only four articles were identified. In 2022, two studies were published, and in 2023, there was a significant increase, with seven publications. These data suggest a growing interest

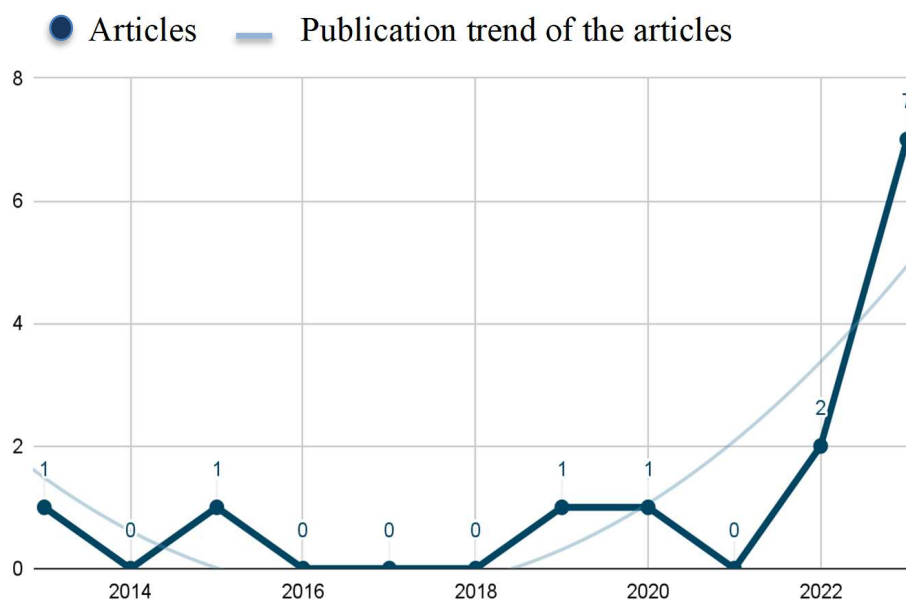
from the scientific community, possibly driven by the expansion of digital technologies and institutional recognition of the potential of Artificial Intelligence in healthcare processes (Figure 2).

The studies included in the review were conducted in different international contexts, reflecting the global scope of the topic. Taiwan, the United States, and Brazil stand out, each with three studies. Publications from Singapore, Indonesia, the Netherlands, and France were also identified, demonstrating an international landscape of engagement in incorporating Artificial Intelligence into nursing practice. Figure 3 shows the map with the geographic distribution of the publications.

Chart 1 presents a summary of the 13 selected studies, including title, authors, country of origin, language, year of publication, and main findings. This systematization allows us to visualize the different approaches and areas of application of Artificial Intelligence in the Nursing Process, as well as identify gaps and emerging trends in the scientific literature.

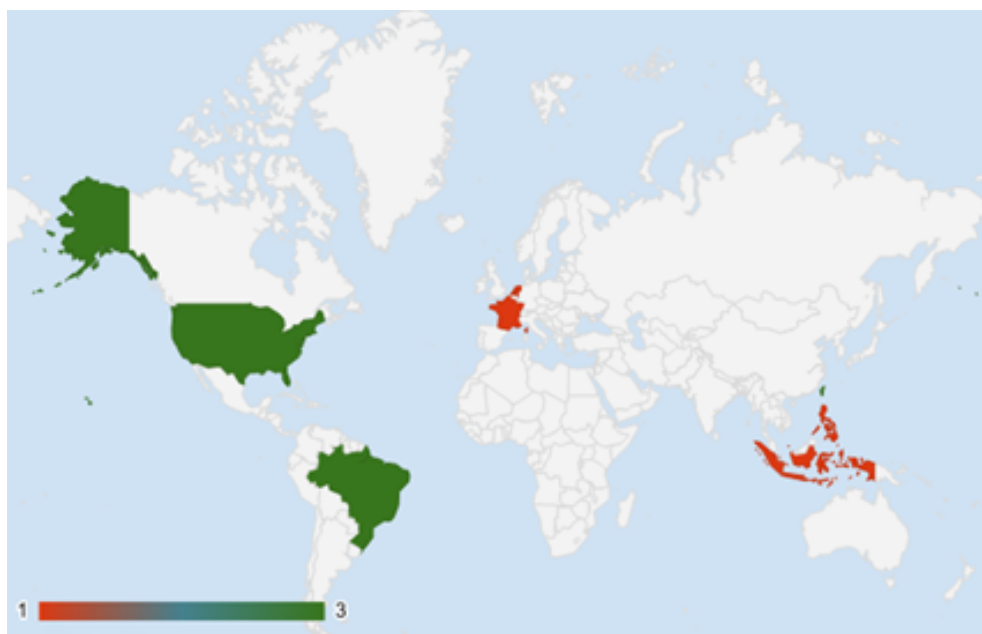
Based on the analysis of the studies included in this review, thematic categories that demonstrate how Artificial Intelligence can enhance the effective implementation of the Nursing Process were identified. These categories were organized according to the NP stage to which they relate, highlighting the main contributions of Artificial Intelligence in supporting clinical

Figure 2 – Distribution of publication years of the included studies. Caicó, Rio Grande do Norte, Brazil, 2024.



Source: The authors.

Figure 3 - Map showing the countries of publication of the included studies. Caicó, Rio Grande do Norte, Brazil, 2024.



Source: The authors.

Chart 1 – Characteristics of the studies included in the review. Caicó, Rio Grande do Norte, Brazil, 2024.

Title	Authors	Country Language	Year of publication	Results
Machine learning-based speech recognition system for nursing documentation – A pilot study ⁽¹²⁾ .	LEE, T.-Y.; LI, C.-C.; CHOU, K.-R.; CHUNG, M.-H.; HSIAO, S.-T.; GUO, S.-L.; HUNG, L.-Y.; WU, H.-T	Taiwan English	2023	Machine learning-based speech recognition system has acceptable recognition accuracy and can reduce the documentation burden for nurses.
Nursing students' attitudes, perceived utilization and intention to use adopting artificial intelligence (AI) technology in nursing practice: a cross-sectional study ⁽¹³⁾ .	LABRAGUE, LJ; AGUILAR-ROSALES, R.; YBOA, BC; SABIO, JB; DE LOS SANTOS, JA	Philippines/USA English	2023	Nursing students had favorable perceptions about the use of AI in nursing practice, expressed strong intentions to adopt AI technology, and maintained positive attitudes toward AI.
The Impact and Issues of Artificial Intelligence in Nursing Science and Health Care Contexts ⁽¹⁴⁾ .	PAILAHA, AD	Indonesia English	2023	AI used in nursing enables expanded access to quality medical care, improved medical records, and improved service quality.
Identification of High-Need Primary Care Patients Using Nursing Knowledge and Machine Learning Methods ⁽¹⁵⁾ .	HEWNER, S.; SMITH, E.; SULLIVAN, S.S.	USA English	2023	Applying nursing knowledge to ML approaches can advance ways of knowing in health systems learning to guide clinical practice.
Proposal of an Android application prototype for nursing diagnoses using artificial neural networks ⁽¹⁶⁾ .	Silva, A. X.; Oliveira, S. C.; Araújo, R. B. G	Brazil Portuguese	2020	Android application that uses neural networks and is expected to be used as an application to promote nursing diagnoses arising from patients' vital signs, assessments of general condition, and information from the patient's electronic medical record, together with the clinical and critical judgment of the nursing professional.

Chart 1 – Cont.

Title	Authors	Country Language	Year of publication	Results
Evolutionary algorithm for predicting children's anthropometric data to support decision- making ⁽¹⁷⁾ .	ASCARI, R. E. de O. S.; BORSOI, B. T.; FÁVERO, E. M. D. B.	Brazil Portuguese	2013	Prediction of children's anthropometric data. The unique feature of the presented algorithm is its ability to predict data on children's growth, thus helping to predict and prevent potential diseases (e.g., childhood obesity and developmental delay).
Implementation of an artificial intelligence algorithm for sepsis detection ⁽¹⁸⁾ .	GONÇALVES, L. S.; AMARO, M. L. de M.; ROMERO, A. de L. M.; SCHAMNE, F. K.; FRESSATTO, J. L.; BEZERRA, C. W.	Brazil Portuguese	2019	The use of an AI algorithm that supported the early identification of sepsis was seen as positive and provided decision support in nurses' clinical practice, enhancing their protagonism.
The role of artificial intelligence in improving clinical nursing care: a scoping review ⁽¹⁹⁾ .	NG, ZQP; LING, LYJ; CHEW, HSJ; LAU, Y.	Singapore English	2022	The study highlighted the applicability and potential of AI in improving the quality of nursing care through an overview of common use cases and their underlying mechanisms.
Applying artificial intelligence technology to support nursing decision-making: a case study in Taiwan ⁽²⁰⁾ .	LIAO, P.-H.; HSU, P.-T.; Chu, W.; CHU, W.-C.	Taiwan English	2015	This study investigated the use of artificial intelligence to generate nursing diagnoses. The agreement rate between the diagnoses suggested by the information system and those made by nurses reached 87%.

Chart 1 – Cont.

Title	Authors	Country Language	Year of publication	Results
When to err is inhumane: an examination of the influence of artificial intelligence-guided nursing care on patient safety ⁽²¹⁾ .	JOHNSON, EA; DUDDING, KM; CARRINGTON, J.M.	USA English	2023	This article presents an overview of artificial intelligence and its application in healthcare and highlights the implications that affect nursing as a profession, including perspectives on nursing education and training recommendations.
Support to the clinical 21 st -century (clinical) decision support in nursing and allied health care. Developing a health learning system: a grounded design of a theoretical framework ⁽²²⁾ .	VAN VELZEN, M.; DE GRAAF-WAAR, HI; UBERT, T.; VAN DER WILLIGEN, RF; MUILWIJK, L.; SCHMITT, MA; SCHEPER, MC; VAN MEETEREN, N.L.U.	Netherlands English	2023	The paper presents a framework for the development of a Learning Health System (LHS) to provide means for a personalized computer-based clinical decision support system for allied health and/or nursing professionals.
Application of machine learning and its effects on the development of a mobile nursing guidance application for sarcopenia ⁽²³⁾ .	LIAO, P.-H.; HUANG, Y.-J.; HO, C.-S.; CHU, W.	Taiwan English	2022	The app developed in this study improved participants' knowledge and awareness of sarcopenia self-care. The artificial intelligence algorithm positively evaluated the home-use model for predicting high-risk sarcopenia groups.
Improving pressure ulcer prediction in nursing homes with a machine learning algorithm ⁽²⁴⁾ .	CHARON, C.; WUILLEMIN, P.-H.; BELMIN, J.	France English	2023	For pressure injury (PI) risk assessment, the neural network classifier performed much better than the gold standard: the Braden scale, which had low sensitivity and underestimated the risk of PI in a large percentage of residents.

Source: The authors.

reasoning, work organization, and care qualification. Chart 2 below shows a summary of these emerging categories, their connections to the NP, and the studies that support them.

The referred studies cover two main fronts, common to supporting the implementation of the NP: Education and professional training, considering the attitudes of students and the need for training in the use of AI^(13,21, 23); and the Integration of Artificial Intelligence into the work process, with the participation of nurses in the development and use of AI, aiming at the

incorporation of these technologies and their impact on practice^(12,14–20,22, 24).

DISCUSSION

The results of this review clearly highlight the progressive rise of the AI theme in nursing care, particularly Brazil's prominence in knowledge production on the topic, which constitutes a warning sign. Researchers and scholars should be at the forefront of incorporating new technologies into care, playing a key role in guiding

Chart 2 – Emerging categories on the use of Artificial Intelligence in supporting the Nursing Process (NP) and its relationship with the NP stages. Caicó, Rio Grande do Norte, Brazil, 2024.

Studies	Thematic Category	Related NP Stages	AI Contributions
Lee ⁽¹²⁾ ; Gonçalves ⁽¹⁸⁾ .	Documentation and registration support	Evaluation/Evolution	Reduced registration time, automated documentation, and agility in the care flow
Labrague ⁽¹³⁾ ; Silva ⁽¹⁶⁾ ; Liao ⁽²⁰⁾ ; Van Velzen ⁽²²⁾	Support for diagnostic inference	Diagnosis	Generating diagnoses with the support of neural networks, greater accuracy, and clinical support
Hewner ⁽¹⁵⁾ ; Ascari ⁽¹⁷⁾ ; Gonçalves ⁽¹⁸⁾ ; Liao ⁽²³⁾ ; Charon ⁽²⁴⁾ .	Prediction of adverse events	Planning	Early identification of risks such as obesity, sarcopenia, and pressure injuries
Pailaha ⁽¹⁴⁾ ; Ng ⁽¹⁹⁾ ; Johnson ⁽²¹⁾ .	Qualification and personalization of care	Intervention	More individualized data-driven interventions and improved quality of care

Source: The authors.

their applicability assertively and ethically, enhancing nursing professional practice.

Recent studies indicate that digital transformation has directly impacted the practice of the Nursing Process, with emphasis on tools that contribute to patient safety, optimization of care time, and support for clinical judgment^(13,19). The Brazilian literature also appears to be aligned with technological innovations, although with structural challenges that include the need for greater coordination between management, academia, and technology⁽⁴⁾.

Documentation is the foundation of the NP. An organized and well-established work process relies on accurate and effective documentation. When implementing NP in clinical practice, deficient documentation becomes one of the most sensitive issues hindering its effectiveness.

The literature presented in this review points to viable solutions that can be easily incorporated into clinical practice for improving the accuracy of healthcare records. Notable among these are solutions based on speech recognition and machine learning, developed to automate data entry into electronic systems, reducing

the time and effort spent on this activity^(12,18). Optimizing time allows nurses to be more available for direct patient care, in addition to ensuring greater record accuracy and standardizing professional language.

The Assessment and Progression stages stand out as the most sensitive to the need for optimized care records. The reduction in time and effort allows for the documentation of an ever-increasing amount of data, ensuring the accuracy of the information provided. Optimized recording of subjective and objective data is enhanced by the integration of AI, as intelligent tools can organize and cross-reference information from multiple sources. This support contributes to the early identification of clinical changes, increasing the responsiveness of the care team^(12,18).

Regarding the diagnostic stage, Artificial Intelligence has been applied as a tool to support the formulation of nursing diagnoses, especially through artificial neural networks and machine learning algorithms. Studies have demonstrated high accuracy in comparing diagnoses generated by intelligent systems and those performed by experienced nurses, with concordance rates above 85%^(16,20). Artificial Intelligence-based applications have also been proposed to support clinical judgment, using clinical data, vital signs, and electronic medical records. These resources assist in the diagnostic stage of the NP, reducing subjectivity and strengthening the professional's clinical reasoning.

Given these findings, it is important to emphasize that the incorporation of AI into the diagnostic stage should not be understood as a replacement for nurses' diagnostic reasoning, but rather as an enhancement of it. Increased accuracy should be envisioned when AI is incorporated into human reasoning, with a focus on nursing diagnoses that accurately reflect the human responses of the population.

The NP planning stage can be enriched with AI-based tools that enable early prediction of complications such as sepsis, childhood obesity, sarcopenia, and pressure injury^(17,23,24). AI algorithms analyze large volumes of clinical data and identify patterns associated with risks, enabling the early implementation of preventive strategies. In one study, a neural network-based predictive system outperformed the Braden scale in assessing pressure injury risk⁽²⁴⁾.

By incorporating these tools, planned interventions and outcomes can be more effective in meeting the population's care needs. Risk prediction is one of nursing's core functions, and interventions that prevent complications are essential. Therefore, understanding the risk is crucial for focused planning tailored to the needs of the individual, group, family, or community.

Personalizing care is a fundamental guideline of the NP, especially during the implementation stage. Artificial Intelligence has been used to generate care plans tailored to individual patient needs, based on clinical data and treatment response patterns^(14,19,22). This enables more effective interventions and improves clinical outcomes, strengthening evidence-based decision-making. Recent reviews also indicate that integrating AI into personalized care improves the quality of care without compromising the humanization of the care process⁽¹⁹⁾.

The incorporation of AI into each stage of the NP is understood as a qualified support for the effective implementation of this methodology in clinical practice. However, it is important to emphasize the need for professional qualifications as a central factor for the safe and effective implementation of Artificial Intelligence in the NP.

Studies have identified positive attitudes among nursing students regarding the use of Artificial Intelligence, in addition to the perception of the need for technical and ethical preparation for its application in practice^(13,21). The incorporation of content on digital technologies and data science into undergraduate and graduate curricula, as well as into continuing health education, is essential to train professionals capable of acting critically in contexts mediated by Artificial Intelligence^(25,26).

The implementation of Artificial Intelligence in the NP also requires its integration into nursing work processes and routines. Studies have reported experiences in which nurses actively participated in the development of technological solutions, contributing to the construction of tools aligned with the real needs of the practice^(15,18).

Despite the identified potential, the studies also highlighted significant barriers, such as resistance among some staff to adopting new technologies, the need for qualification, especially digital literacy, and the

lack of adequate infrastructure for integrating Artificial Intelligence into healthcare systems. Ethical and regulatory issues, such as data privacy and clinical liability, also need to be mentioned as challenges to the safe incorporation of Artificial Intelligence into the NP^(3,21).

The findings of this review reaffirm that Artificial Intelligence can be a strategic ally in the implementation of the Nursing Process, promoting the reduction of workload, the improvement of decision-making, and of care quality. However, for these advances to translate into real impact, it is necessary to invest in public policies, professional training, technological infrastructure, and ethical regulation. Nursing must lead this debate, ensuring that the use of Artificial Intelligence serves the care and valorization of nursing work.

The limitations of this study include the lack of literature directly linking the use of AI and NP. Another limitation is the heterogeneity of the included studies, with different methodological designs, levels of evidence, and application contexts, which hindered a more robust comparative analysis. There is also a scarcity of clinical trials or experimental studies measuring outcomes related to the use of Artificial Intelligence in the Nursing Process, which limits the generalization of the results and the establishment of more solid practical recommendations.

Future research should evaluate the effectiveness of Artificial Intelligence in clinical practice, its acceptance by nursing professionals, and its real-world impact on care outcomes. Building technological solutions focused on nursing practice can represent an important step forward in strengthening nursing as a science and practice committed to safety, comprehensiveness, and excellence in care.

■ CONCLUSION

It is concluded that Artificial Intelligence has significant potential to strengthen the implementation of the Nursing Process, directly contributing to the qualification of clinical reasoning, the personalization of interventions, the automation of records, and the prediction of adverse events.

Based on the analysis of the 13 included studies, four thematic categories were identified that align with the

stages of the Nursing Process: Support for documentation and recording (Assessment/Evolution), enabled by technologies such as speech recognition systems and automated data extraction algorithms, which reduce the time spent on manual recording and increase the accuracy of the information collected; Support for diagnostic inference (Diagnosis), provided by artificial neural networks and intelligent decision support systems, which identify clinical patterns in large volumes of data and suggest diagnoses with high accuracy, optimizing professional judgment; Prediction of adverse events (Planning), enabled by predictive models based on machine learning, capable of anticipating clinical risks such as sepsis, sarcopenia, or pressure injuries, and guiding early and targeted interventions; Qualification and personalization of care (Intervention), supported by adaptive systems that use clinical data and patient history to suggest individualized care plans, increasing the effectiveness and safety of care.

These resources demonstrate that Artificial Intelligence can act as a strategic ally in overcoming historical barriers to the Nursing Process, such as work overload, lack of time, and the lack of specific technological tools for nursing practice.

However, the effective adoption of these technologies requires permanent investment in continuing education, adequate technological infrastructure, and the development of ethical and regulatory guidelines to guide their responsible use. Artificial Intelligence should not replace nurses' clinical judgment, but rather enhance and qualify it, respecting the fundamental principles of care, the uniqueness of the patient, and professional autonomy. In this scenario, nursing must take a leading role in the debate and development of digital solutions that enhance its practice and strengthen person-centered care.

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■ Availability of data and material

Access to the dataset may be granted upon request to the corresponding author.

■ Authors' contribution

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