Cogitare Enfermagem

REVIEW

Artificial Intelligence applied to nursing in Brazil: bibliometric analysis of theses and dissertations

HIGHLIGHTS

1. The production of theses and dissertations on the topic is incipient.
2. There is a need to expand research on AI in postgraduate nursing programs.
3. AI can improve nursing care, teaching, management, and research.
4. This technology must be integrated into the multiple dimensions of professional practice.

Artur Porto da Penha[1]
Matheus Moraes Silva[2]
Alacoque Lorenzini Erdmann[2]

ABSTRACT

Objective: To analyze the Brazilian scientific production of theses and dissertations on the application of Artificial Intelligence in Nursing. **Method:** A bibliometric, document-based study conducted in the Catalog of Theses and Dissertations of the Coordination for the Improvement of Higher Education Personnel between April and May 2025, using the descriptors "Artificial Intelligence" and "Nursing". Descriptive statistics, Zipf's Law, and co-occurrence analysis were used. **Results:** Nineteen productions were identified, nine dissertations (47.4%) and 10 theses (52.6%). The most commonly used Artificial Intelligence techniques were machine learning and deep learning. Regarding the Nursing work process, care and management were the main focuses of application. **Conclusion:** The production of theses and dissertations on Artificial Intelligence applied to Nursing is still incipient. There is a need to expand research on the subject to all dimensions of professional practice.

DESCRIPTORS: Artificial Intelligence; Nursing Research; Education, Nursing, Graduate; Scientific Publication Indicators; Bibliometrics.

HOW TO REFERENCE THIS ARTICLE:
da Penha AP, Silva MM, Erdmann AL. Artificial Intelligence applied to nursing in Brazil: bibliometric analysis of theses and dissertations. Cogitare Enferm [Internet]. 2025 [cited "insert year, month and day"];30:e99578en. Available from: https://doi.org/10.1590/ce.v30i.99578en

[1]Universidade Federal de Santa Catarina, Departamento de Enfermagem, Florianópolis, SC, Brasil.
[2]Universidade Federal de Santa Catarina, Programa de Pós-Graduação em Enfermagem, Florianópolis, SC, Brasil.

INTRODUCTION

Artificial Intelligence (AI) is a broad term that refers to the development of computer systems capable of replicating human cognitive functions, such as learning, reasoning, communication, and decision-making[1]. This field encompasses several approaches, including machine learning, deep learning, and natural language processing, and is established as a field undergoing constant growth and innovation[2].

In recent years, research and development of AI-based technologies in healthcare have expanded exponentially, demonstrating promising potential for nursing[3]. This technology has transformed multiple aspects of the nursing profession, influencing education, clinical practice, management, and research[4-7].

AI applications have contributed to improving the accuracy of clinical diagnoses, the effectiveness of therapeutic interventions, and the ability to continuously monitor patients, enabling early and accurate detection of health conditions, supporting the development of individualized care strategies, and promoting better clinical outcomes. Furthermore, AI technologies have optimized Nursing workflows, improved resource allocation, and streamlined administrative activities[8].

Given the strategic role of stricto sensu graduate programs in advancing science, it is crucial to understand how Brazilian academic literature has addressed AI in Nursing. To date, no survey has been identified in Brazil that analyzes aspects such as the geographic distribution of this literature, the most productive institutions, the most widely used AI techniques, and the contexts in which they are applied in Nursing.

In this sense, mapping and analyzing this literature has the potential to contribute to the state of the art and provide insights for future research in the field. Therefore, this study aimed to analyze Brazilian scientific literature on theses and dissertations that address the application of AI in Nursing.

METHODS

This is a bibliometric study with a descriptive, documentary-based approach, conducted according to the Preferred Reporting Items for Bibliometric Analysis (PRIBA) guidelines[9]. Bibliometric analysis is a method for mapping trends, identifying gaps, and guiding future research[10,11].

Data collection was conducted between April and May 2025 from the Catalog of Theses and the *Coordenação de Aperfeiçoamento de Pessoal de Nível Superior* (Coordination for the Improvement of Higher Education Personnel - CAPES), accessed through the Sucupira Platform. This database was chosen due to its broad coverage and the availability of research reports developed in Brazil's Graduate Programs (PPGs).

The search strategy used a combination of the descriptors "Artificial Intelligence" and "Nursing", with the Boolean operator "AND", after prior testing indicated greater relevance in retrieving literature related to the topic. Theses and dissertations from any area of a stricto sensu graduate program were included, as long as they addressed the direct application of AI in Nursing, or were developed in Nursing Graduate Programs, even with indirect application. As an inclusion criterion, these works must contain the term "nursing" in at least one of the following fields: title, abstract, or descriptors. These works were

evaluated for thematic relevance and alignment with the study focus. Furthermore, only works with public access to the full text were considered, since the analysis required reading the entire work. It should be noted that no time frame was established, aiming to broaden the selection of studies.

The initial screening was based on the reading of titles and abstracts, conducted independently by two researchers. Discrepancies were resolved by a third reviewer, who assisted in the final selection of studies that comprised the sample. The selected papers underwent a comprehensive reading, with variables extracted using a protocol developed by the researchers. This protocol included: title, objective, author, advisor, type of thesis (dissertation or thesis), year of defense, educational institution, region of Brazil, program name, type of program (academic or professional), area of concentration, AI technique employed, nursing work process (education/teaching, management, assistance or research), degree of application in Nursing (direct or indirect), type of study, and descriptors.

The data were organized in Microsoft Excel® spreadsheets and subjected to descriptive statistical analysis using Jasp software (0.19.3). Zipf's Law was used to assess the frequency of descriptors[12]. For the concurrency analysis, Visualizing Scientific Landscapes (VOSviewer®) software, version 1.6.19, was used. This software allows visualization of the frequency of terms and their connections, where the thickness of the lines represents the strength of the relationship between the analyzed terms, considering a minimum frequency of two occurrences to identify clusters[13].

It is important to note that this type of study does not require approval from a Research Ethics Committee, as it exclusively uses secondary data available in the public domain. It is important to emphasize, however, that the copyright of the analyzed works was respected.

RESULTS

At the time of data collection, the CAPES Catalog of Theses and Dissertations contained 1,682,513 research reports covering various fields of knowledge. Applying the defined search strategy, 50 reports related to the topic were identified. After reading the titles and abstracts, 31 reports were excluded for not meeting the eligibility criteria, resulting in 19 studies included in the final sample. The selected studies were published between 2009 and 2024, with nine dissertations (47.4%) and 10 theses (52.6%).

When grouped by region, it was observed that the South Region had seven studies (36.8%), followed by the Southeast and Northeast Regions, with five each (26.3%). The North and Central-West Regions had less representation, with one study each (5.3%). Nursing was the most common area of concentration among stricto sensu graduate programs that conducted research on AI applied to nursing (n=12; 63.17%) (Table 1). In terms of the type of program, 15 were academic (78.95%) and four were professional (21.05%). Regarding the authors' educational background, 14 (73.7%) had a degree in Nursing, and five (26.3%) had a degree in other fields.

The most commonly used AI techniques were machine learning (26.32%) and deep learning (21.05%). Regarding the nursing work process, care (42.11%) and management (36.84%) were the main application focuses. Of the total studies analyzed, 52.63% had direct application in Nursing (Table 1).

Table 1. Characterization of productions according to area of concentration, AI technique, work process, and application in Nursing. Brazil, 2025

Variable	n†	(%)‡
Program Concentration Area		
Nursing	12	(63.17)
Computer Science	2	(10.53)
Electrical Engineering	1	(5.26)
Pulmonary Science	1	(5.26)
Bioethics, Applied Ethics, and Public Health	1	(5.26)
Teaching Human, Social, and Natural Sciences	1	(5.26)
Health Education	1	(5.26)
Artificial Intelligence Technique		
Machine Learning	5	(26.32)
Deep Learning	4	(21.05)
Natural Language Processing	2	(10.53)
Expert System	1	(5.26)
Not clarified	4	(21.05)
Not applicable	3	(15.79)
Nursing Work Process		
Care	8	(42.11)
Management	7	(36.84)
Education/Teaching	1	(5.26)
Not specified	3	(15.79)
Application in Nursing		
Direct	10	(52.63)
Indirect	9	(47.37)

Note: † = Absolute frequency; ‡ = Percentage frequency.

Source: Prepared by the authors based on data from the Catalog of Theses and Dissertations of the Coordination for the Improvement of Higher Education Personnel (2025).

Table 2 shows that the most common type of study was methodological (47.37%). Seventeen educational institutions conducted research on the topic, with the Universidade Federal de Santa Catarina (UFSC) and the Universidade Federal de Rio Grande do Sul (UFRGS) standing out, with two studies each (Table 2).

Table 2. Characterization of scientific productions of theses and dissertations according to the type of study and educational institution. Brazil, 2025

(continue)

Variable	n†	(%)‡
Type of Study		
Methodological Study	9	(47.37)
Quantitative	6	(31.58)
Exploratory	2	(10.53)
Theoretical Study	1	(5.26)
Not Specified	1	(5.26)

Table 2. Characterization of scientific productions of theses and dissertations according to the type of study and educational institution. Brazil, 2025

(conclusion)

Variable	n†	(%)‡
Educational Institution		
Universidade Federal de Santa Catarina	2	(10.53)
Universidade Federal do Rio Grande do Sul	2	(10.53)
Universidade Federal de Pelotas	1	(5.26)
Universidade de São Paulo	1	(5.26)
Universidade do Estado do Amazonas	1	(5.26)
Universidade Estadual de Londrina	1	(5.26)
Universidade Estadual do Ceará	1	(5.26)
Universidade Federal de Juiz de Fora	1	(5.26)
Universidade Federal de Pernambuco	1	(5.26)
Universidade Federal de Sergipe	1	(5.26)
Universidade Federal do Estado do Rio de Janeiro	1	(5.26)
Universidade Federal do Piauí	1	(5.26)
Universidade Federal do Rio de Janeiro	1	(5.26)
Universidade Federal do Rio Grande do Norte.	1	(5.26)
Universidade Federal Fluminense	1	(5.26)
Universidade Tecnológica Federal do Paraná	1	(5.26)
Faculdade de Medicina de Marília	1	(5.26)

Note: † = Absolute frequency; ‡ = Percentage frequency.
Source: Prepared by the authors based on data from the Catalog of Theses and Dissertations of the Coordination for the Improvement of Higher Education Personnel (2025).

The defense of academic productions was concentrated from 2021 onwards, as shown in Figure 1.

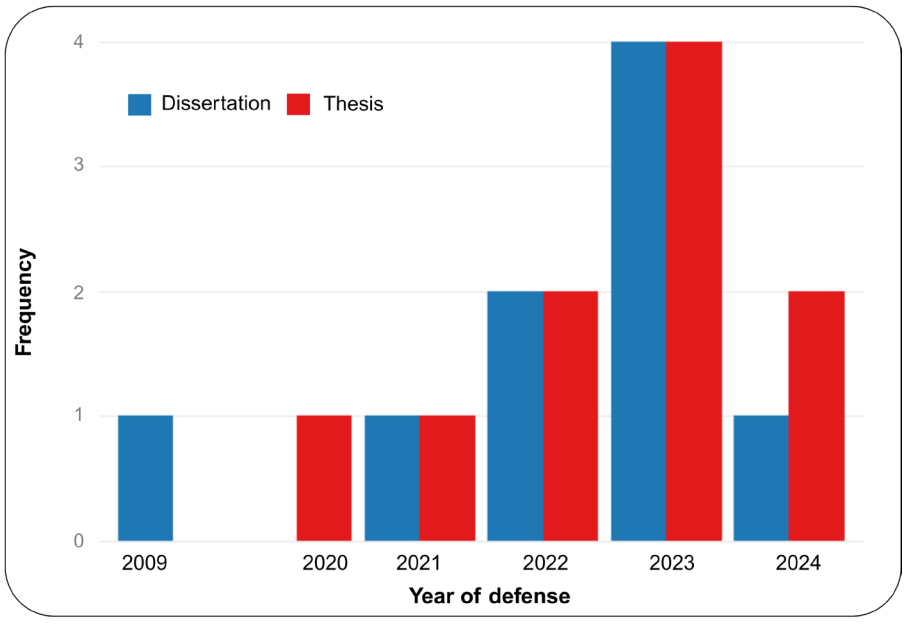

Figure 1. Distribution of theses and dissertations by year of defense. Brazil, 2025.
Source: Prepared by the authors (2025).

Regarding the descriptors, 61 distinct ones were identified, totaling 91 occurrences. Based on Zipf's Law, the terms were distributed into three zones, according to the observed frequency: trivial, interesting, and noise, as shown in Table 3.

Table 3. Distribution of descriptors according to Zipf's Law by zone. Brazil, 2025

	Zipf's Law		
Zone	**Total descriptors**	**Total frequency**	**(%)**
Trivial	3	25	(27.47)
Interest	6	14	(15.38)
Noise	52	52	(57.14)
Total	61	91	(100)

Source: Prepared by the authors (2025).

The co-occurrence analysis of the descriptors highlighted "Artificial Intelligence" (n=12) and "Nursing" (n=8) as the most frequent and central terms, which presented a strong connection between them. Other relevant descriptors included "machine learning" (n=5), "workload" (n=3), "nursing informatics" (n=3), and "electronic health records" (n=2), which indicated different areas of application of AI in nursing research (Figure 2).

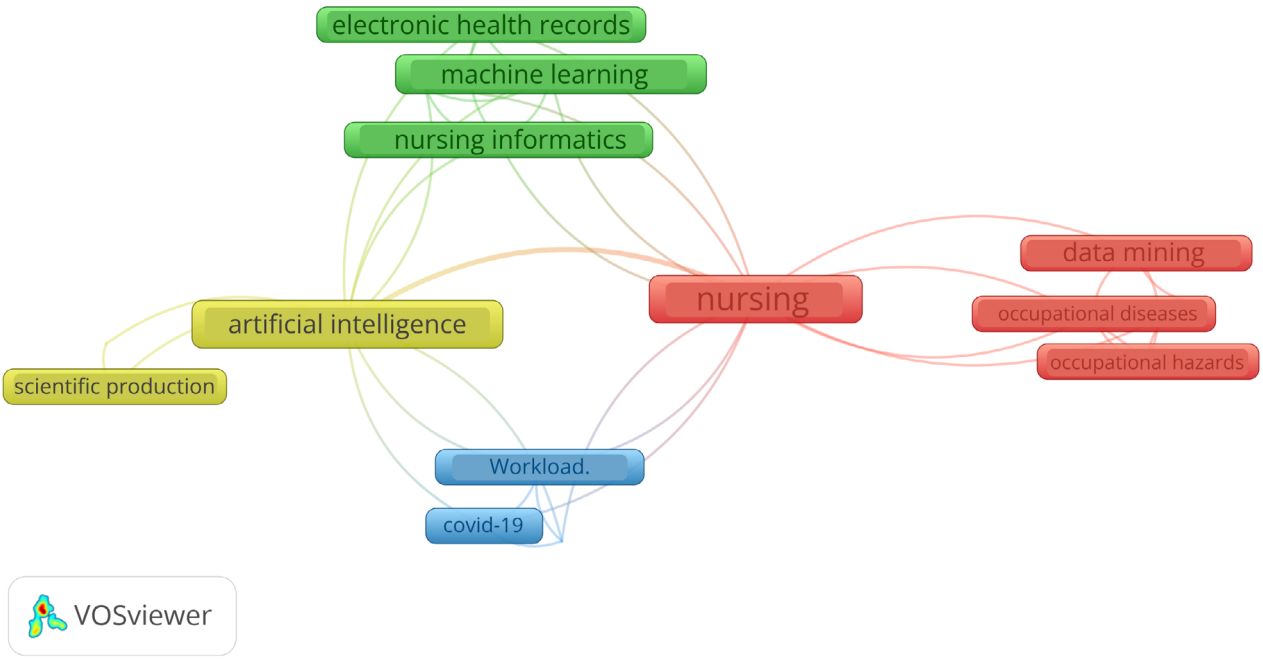

Figure 2. Co-occurrence network of descriptors of scientific production on AI in Nursing (2009-2024). Brazil, 2025.

Source: Prepared by the authors (2025).

Given the extent and detail of the information, the complete summary of the productions included in this study, organized by region, title, author, advisor, year of defense, type of work, educational institution and program area, presence of funding and application in Nursing (direct or indirect), is available for consultation on the international platform Open Science Framework (OSF), under identifier no. 10.17605/OSF.IO/N27FR (https://doi.org/10.17605/OSF.IO/N27FR).

DISCUSSION

This study found that research on AI applied directly or indirectly to Nursing was developed in *stricto sensu* graduate programs in the field itself, concentrated in the South, Southeast, and Northeast Regions. A bibliometric study that analyzed the overall national scientific production on AI in Brazil also identified these regions as the most productive[14]. According to official data, the Southeast, South, and Northeast Regions concentrate the largest number of stricto sensu graduate programs, including in Nursing[15], which may help explain the production observed in these locations.

Furthermore, the Southeast and South Regions concentrate the largest share of the country's technological and innovation infrastructure, housing, respectively, 48.7% and 13.6% of public scientific and technological institutions, as well as 42.7% and 29.3% of private institutions[16]. This scenario offers better conditions for the development of AI-based research and innovation. However, the application of this technology in Nursing also depends on the interest of researchers in the field and the definition of priorities in research agendas, factors that can both limit and favor its incorporation into the disciplinary field.

The centralization of scientific production in the South and Southeast Regions reflects, in part, historical inequalities in the distribution of stricto sensu graduate programs and funding in the country. These regions concentrate a large portion of the programs, the highest rated by CAPES, which favors fundraising and the strengthening of research networks. This disparity is rooted in a social, political, and economic model that has historically favored the South and Southeast, industrial hubs and decision-making centers, while other regions, especially the North, face greater structural challenges. These asymmetries have repercussions on the uneven evolution of Brazilian graduate education[17], particularly in the field of Nursing.

It was found that some of the included studies originated in graduate programs linked to other fields of knowledge. Reviews indicate that the application of AI in Nursing has benefited from methods and technologies from fields such as Computer Science, Engineering, and Information Science[18,19]. This interdisciplinary nature highlights the need for integration between technical and clinical knowledge to develop solutions applicable to professional practice, in addition to highlighting the importance of interprofessional teams in advancing research in the field.

The advancement of AI technologies in Nursing tends to drive changes in education, promoting greater collaboration between nurses and professionals in fields such as Information Technology, Robotics, and Programming, to integrate technological competencies into professional training[20]. One study highlighted that this collaboration has the potential to fill skills gaps in professional practice and, at the same time, support the development of new emerging roles in the field of digital health[21], such as clinical data scientists, medical software engineers, and digital health specialists, enabling nurses to explore and fulfill these new roles[19].

Machine learning and deep learning were the most widely used AI techniques in the studies analyzed. This result is in line with trends observed in the international literature, which indicate that these techniques are widely used in the context of Nursing, especially in applications related to fall prevention, clinical decision support, and patient monitoring[18,22-23].

Machine learning enables the processing of large volumes of clinical data and offers predictive support in healthcare practice. Deep learning, on the other hand,

refers to the use of artificial neural networks to identify and classify data patterns, being applied to improve nursing care through faster and more accurate diagnoses, more efficient physiological monitoring, and fall predictions[18,24]. However, techniques such as natural language processing and expert systems were little explored in the studies analyzed, despite their potential for application in various nursing contexts, including teaching, clinical practice, management, and the prediction of adverse events.

The analysis of the productions in this study demonstrated a predominant focus on the application of AI in nursing in the areas of care and management. This pattern was also identified in previous studies, which identified these two areas as the main fields of application of AI in nursing practice[25-26]. However, a low frequency of studies focused on the application of AI in education and research contexts was observed. The theses and dissertations analyzed addressed, in the healthcare field, topics related to risk classification, clinical decision support, intensive care, monitoring, and wound management. In the management field, the studies addressed workload, staffing, and the organization of health services. The educational dimension was identified in only one study, focusing on the use of chatbots in teaching. These data highlighted a field that remains underexplored in several areas of nursing, highlighting the need to foster new research that considers underexplored contexts.

The predominance of the methodological design identified in this research follows the trend noted in other analyses of scientific literature in Nursing, in which this type of study stands out as one of the most frequent in the development of technologies applied to professional practice[27]. Methodological studies enable research into the collection and organization of data, with a view to constructing, validating, and evaluating instruments, following rigorous methodological precepts, and producing reliable tools applicable to different contexts and areas of knowledge[28]. This method requires conducting literature reviews as an initial step, which allows mapping the state of the art on the topic and guides the development of innovative solutions in a well-founded way, aligned with the specific needs of nursing.

The analysis of Zipf's Law revealed that a few descriptors occurred with high frequency, while most had low frequency, demonstrating an inversely proportional pattern. Among the most frequently used, "Artificial Intelligence" and "Nursing" stood out, confirming the centrality of scientific literature focused on the application of AI in the field of nursing.

AI offers ample opportunities to improve nursing practice, particularly in enhancing the quality of care, optimizing processes, and supporting clinical decision-making. However, its effective implementation requires addressing ethical, legal, and operational challenges, ranging from the need for data governance policies and clear regulations to the ongoing training of professionals in the safe and responsible use of these technologies[29]. In this context, it is essential to expand scientific production in the field through research that critically explores both the benefits and challenges of integrating AI into nursing in an ethical and responsible manner.

Nursing schools play a strategic role in training professionals capable of using AI ethically, critically, and responsibly. The inclusion of this topic in curricula should encompass everything from theoretical foundations to practical experience with AI-based systems, preparing future nurses to integrate these technologies into healthcare, management, and education without compromising clinical judgment and professional safety[30].

Given the strategic importance of stricto sensu graduate programs in scientific production and the consolidation of research agendas in Brazil, it is essential that Nursing

programs incorporate AI into their curricula, research lines, and training processes in a structured manner. Improving this inclusion can strengthen the academic foundation of the field, expanding Nursing's ability to respond to the contemporary challenges of technological innovation in health and to position itself more actively in digital health ecosystems.

This study has some limitations. First, although the CAPES Catalog of Theses and Dissertations is a comprehensive database, it is possible that some academic works were not yet available at the time of data collection, given the institutional deadlines for indexing on the platform. Second, despite the use of the main descriptors related to the topic, it is possible that studies that employed synonyms or distinct terminologies were not retrieved. Finally, only works with public access to the full text were included in the analysis, as some authors, graduate programs, or institutions chose to restrict the dissertations and theses from being published. Therefore, works unavailable in full were excluded, as the lack of full text made their evaluation impossible.

CONCLUSION

This study's findings revealed that Brazilian theses and dissertations on the application of AI in nursing are still incipient. This represents a broad and promising field of research, whose exploration is essential for integrating AI into the various dimensions of nursing professional practice. Most of the studies identified focus on care and management, with emphasis on machine learning and deep learning techniques. However, there is a dearth of research focused on education and scientific production, in addition to the limited use of approaches such as natural language processing and expert systems, which highlights gaps to be addressed in future research.

Furthermore, it is necessary to incorporate emerging technologies, such as generative AI, exemplified by ChatGPT (Chat Generative Pretrained Transformer), into research agendas, intending to assess their impacts, benefits, and limitations in teaching, research, and clinical practice. The development of experimental, quasi-experimental, and longitudinal studies aimed at analyzing the effects of AI in different professional practice contexts is also recommended.

To enable these advances, public policies should encourage the creation of specific calls for proposals to fund research projects on AI in Nursing. Such initiatives can strengthen the work of researchers, consolidate lines of research across different institutions, and expand scientific production across all regions of the country. At the same time, these investments contribute to the training of master's and doctoral graduates capable of working at the interface between Nursing and emerging digital technologies. AI is not a passing trend, but a structural dimension of the future of Nursing. Preparing professionals for this new reality is, therefore, a critical and urgent task.

FUNDING

This study was conducted with support from *Coordenação de Aperfeiçoamento de Pessoal de Nível Superior* (CAPES) Funding Code 001.

REFERENCES

1. Collins C, Dennehy D, Conboy K, Mikalef P. Artificial intelligence in information systems research: a systematic literature review and research agenda. Int J Inf Manag [Internet]. 2021 [cited 2025 May 7];60:102383. Available from: https://doi.org/10.1016/j.ijinfomgt.2021.102383

2. Xu Y, Liu X, Cao X, Huang C, Liu E, Qian S, et al. Artificial intelligence: a powerful paradigm for scientific research. Innovation [Internet]. 2021 [cited 2025 May 7];2(4):100179. Available from: https://doi.org/10.1016/j.xinn.2021.100179

3. von Gerich H, Moen H, Block LJ, Chu CH, DeForest H, Hobensack M, et al. Artificial intelligence-based technologies in nursing: a scoping literature review of the evidence. Int J Nurs Stud [Internet]. 2022 [cited 2025 May 7];127:104153. Available from: https://doi.org/10.1016/j.ijnurstu.2021.104153

4. De Gagne JC. The state of artificial intelligence in nursing education: past, present, and future directions. Int J Environ Res Public Health [Internet]. 2023 [cited 2025 May 5];20(6):4884. Available from: https://doi.org/10.3390/ijerph20064884

5. Qaladi O, Alshammari M, Almalki AA. Artificial intelligence (AI) in nursing administration: challenges and opportunities. PLoS One [Internet]. 2025 [cited 2025 May 5];20(4):e0319588. Available from: https://doi.org/10.1371/journal.pone.0319588

6. Gosak L, Pruinelli L, Topaz M, Štiglic G. The ChatGPT effect and transforming nursing education with generative AI: discussion paper. Nurse Educ Pract [Internet]. 2024 [cited 2025 May 5];75:103888. Available from: https://doi.org/10.1016/j.nepr.2024.103888

7. Robert N. How artificial intelligence is changing nursing. Nurs Manag [Internet]. 2019 [cited 2025 May 5];50(9):30-39. Available from: https://doi.org/10.1097/01.numa.0000578988.56622.21

8. Hassanein S, El Arab RA, Abdrbo A, Abu-Mahfouz MS, Gaballah MKF, Seweid MM, et al. Artificial intelligence in nursing: an integrative review of clinical and operational impacts. Front Digit Health [Internet]. 2025 [cited 2025 May 6];7:1552372. Available from: https://doi.org/10.3389/fdgth.2025.1552372

9. Koo M, Lin SC. An analysis of reporting practices in the top 100 cited health and medicine-related bibliometric studies from 2019 to 2021 based on a proposed guidelines. Heliyon [Internet]. 2023 [cited 2025 May 6];9(6):e17642. Available from: https://doi.org/10.1016/j.heliyon.2023.e16780

10. Hicks D, Wouters P, Waltman L, Rijcke S, Rafols I. Bibliometrics: the Leiden Manifesto for research metrics. Nature [Internet]. 2015 [cited 2025 May 6];520:429-31. Available from: https://doi.org/10.1038/520429a

11. Wan Y, Shen J, Ouyang J, Dong P, Hong Y, Liang L, et al. Corrigendum: bibliometric and visual analysis of neutrophil extracellular traps from 2004 to 2022. Front Immunol [Internet]. 2022 [cited 2025 May 6];13:1098082. Available from: https://doi.org/10.3389/fimmu.2022.1098082

12. Cassiano AN, Silva CJA, Nogueira ILA, Elias TMN, Teixeira E, de Menezes RMP. Validation of educational technologies: bibliometric study in nursing theses and dissertations. Rev Enferm Cent-Oeste Min [Internet]. 2020 [cited 2025 May 6];10:e3900. Available from: https://doi.org/10.19175/recom.v10i0.3900

13. van Eck NJ, Waltman L. VOSviewer manual. Leiden: Universiteit Leiden; 2020. 53 p.

14. Ramos-Carvalho P, Gouveia FC, Ramos MG. Inteligência Artificial: análise bibliométrica de pesquisas acadêmicas, currículos lattes e grupos de pesquisa do conselho nacional de desenvolvimento científico e tecnológico. Inf Inf [Internet]. 2022 [cited 2025 May 8];27(3):55-85. Available from: https://doi.org/10.5433/1981-8920.2022v27n3p55

15. Plataforma Sucupiura [Internet]. Brasília, DF: Coordenação de Aperfeiçoamento de Pessoal de Nível Superior; 2025 [cited 2025 May 6]. Observatório da pós-graduação no Brasi;[about 1 screen]. Available from: https://sucupira-v2.capes.gov.br/painel

16. Ministério da Ciência, Tecnologia e Inovação (BR). Política de propriedade intelectual das instituições científicas, tecnológicas e de inovação do Brasil: relatório FORMICT ano-base 2023 [Internet]. Brasília, DF: Ministério da Ciência, Tecnologia e Inovação; 2024 [cited 2025 May 6]. 71 p. Available from: https://www.gov.br/mcti/pt-br/acompanhe-o-mcti/propriedade-intelectual-e-transferencia-de-tecnologia/arquivos/relatorio-formict-2024_ano-base-2023.pdf/view

17. Guimarães AR, Brito CS, dos Santos JAB. Expansão e financiamento da pós-graduação e desigualdade regional no Brasil (2002-2018). Práxis Educ [Internet]. 2020 [cited 2025 May 5];16(41):47-71. Available from: https://doi.org/10.22481/praxisedu.v16i41.7244

18. Ng ZQP, Ling LYJ, Chew HSJ, Lau Y. The role of artificial intelligence in enhancing clinical nursing care: a scoping review. J Nurs Manag [Internet]. 2022 [cited 2025 May 5];30(8):3654-3674. Available from: https://doi.org/10.1111/jonm.13425

19. Buchanan C, Howitt ML, Wilson R, Booth RG, Risling T, Bamford M. Predicted influences of artificial intelligence on nursing education: scoping review. JMIR Nurs [Internet]. 2021 [cited 2025 May 5];4(1):e23933. Available from: https://doi.org/10.2196/23933

20. Tanioka T, Yasuhara Y, Dino MJS, Kai Y, Locsin RC, Schoenhofer SO. Disruptive engagements with technologies, robotics, and caring. Nurs Adm Q [Internet]. 2019 [cited 2025 May 7];43(4):313-321. Available from: https://doi.org/10.1097/naq.0000000000000365

21 Health Education England (HEE). Preparing the healthcare workforce to deliver the digital future: Interim Report [Internet]. London: HEE; 2018 Jun [cited 2025 May 7]. 46 p. Available from: https://www.hee.nhs.uk/sites/default/files/documents/Topol%20Review%20interim%20report_0.pdf

22. Seibert K, Domhoff D, Bruch D, Schulte-Althoff M, Fürstenau D, Biessmann F, et al. Application scenarios for artificial intelligence in nursing care: rapid review. J Med Internet Res [Internet]. 2021 [cited 2025 May 7];23(11):e26522. Available from: https://doi.org/10.2196/26522

23. Porcellato E, Lanera C, Ocagli H, Danielis M. Exploring applications of artificial intelligence in critical care nursing: a systematic review. Nurs Rep [Internet]. 2025 [cited 2025 May 5];15(2):55. Available from: https://doi.org/10.3390/nursrep15020055

24. Goodfellow I, Bengio Y, Courville A. Deep learning (adaptive computation and machine learning series). Cambridge (MA): MIT Press; 2016. 801 p.

25. Valencia-Contrera MA, Rivera-Rojas F, Villa-Velasquez J, Cancino-Jiménez D. Use of artificial intelligence in nursing. LatIA [Internet]. 2024 [cited 2025 May 5];2:92. Available from: https://doi.org/10.62486/latia202492

26. Nashwan AJ, Cabrega JA, Othman MI, Khedr MA, Osman YM, El‐Ashry AM, et al. The evolving role of nursing informatics in the era of artificial intelligence. Int Nurs Rev [Internet]. 2025 [cited 2025 May 7];72(1):e13084. Available from: https://doi.org/10.1111/inr.13084

27. de Lima FC, Sagica TP, Souza JLM, Prado ML, de Santana ME, Peixoto IVP, et al. Profile of scientific production on nursing technology construction, validity and application: a bibliometric study. Rev Bras Enferm [Internet]. 2024 [cited 2025 May 7];77(3):e20230452. Available from: https://doi.org/10.1590/0034-7167-2023-0452pt

28. de Sabino LMM, Ferreira ÁMV, Mendes ERR, Joventino ES, Gubert FA, da Penha JC, et al. Validation of primer for promoting maternal self-efficacy in preventing childhood diarrhea. Rev Bras Enferm [Internet]. 2018 [cited 2025 May 7];71(Suppl 3):1412-9. Available from: https://doi.org/10.1590/0034-7167-2017-0341

29. Rony MKK, Das A, Khalil MI, Peu UR, Mondal B, Alam MS, et al. The role of artificial intelligence in nursing care: an umbrella review. Nurs Inq [Internet]. 2025 [cited 2025 May 7];32(2):e70023. Available from: https://doi.org/10.1111/nin.70023

30. Vitorino LM, Yoshinari Júnior GH. Artificial intelligence as an ally in Brazilian nursing: challenges, opportunities and professional responsibility. Rev Bras Enferm [Internet]. 2023 [cited 2025 May 7];76(3):e760301. Available from: https://doi.org/10.1590/0034-7167.2023760301pt

Received: 08/05/2025
Approved: 18/08/2025
Associate editor: Dr. Nuno Damácio de Carvalho Félix

Corresponding author:
Matheus Moraes Silva
Universidade Federal de Santa Catarina
UFSC - Campus Universitário - Trindade, Florianópolis - SC, 88040-900
E-mail: matheusmorais1980@gmail.com

Role of Authors:
Substantial contributions to the conception or design of the work; or the acquisition, analysis, or interpretation of data for the work - **da Penha AP, Silva MM, Erdmann AL.** Drafting the work or revising it critically for important intellectual content - **da Penha AP, Silva MM, Erdmann AL.** Agreement to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved - **da Penha AP, Silva MM, Erdmann AL.** All authors approved the final version of the text.

Conflicts of interest:
The authors have no conflicts of interest to declare.

Data availability:
The authors declare that all data are fully available within the article.

ISSN 2176-9133

This work is licensed under a *Creative Commons Attribution 4.0 International License*.