

## BRIEF COMMUNICATION

### Use of artificial intelligence in nursing

### Uso de la inteligencia artificial en enfermería

Miguel Valencia-Contrera<sup>1</sup>  , Flérica Rivera-Rojas<sup>2</sup> , Jenifer Villa-Velasquez<sup>3</sup> , Daniella Cancino-Jiménez<sup>1</sup> 

<sup>1</sup>Universidad Andrés Bello, Facultad de Enfermería. Santiago, Chile.

<sup>2</sup>Universidad Católica del Maule, Departamento de Enfermería. Curicó, Chile.

<sup>3</sup>Universidad Austral de Chile, Escuela de Enfermería. Puerto Montt, Chile.

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Corresponding author: Miguel Valencia-Contrera 

#### ABSTRACT

**Introduction:** Artificial Intelligence (AI) encompasses technologies such as machine learning and neural networks, with applications across various fields. The World Health Organization recognizes its potential to enhance healthcare, yet emphasizes the need to address ethical considerations in its implementation. In nursing, AI has the potential to increase autonomy and efficiency in care, though its use remains limited and poorly understood within the profession.

**Objective:** to analyze the use of AI in nursing by evaluating its impact on care functions, administrative tasks, educational activities, and research.

**Method:** a literature review was conducted, including original articles, reviews, and bibliometric studies. The research focused on AI applications across the four primary functions of nursing.

**Results:** AI has demonstrated benefits in predictive analytics and improving patient care efficiency, as well as in administrative management and patient classification. In education, generative AI facilitates the development of educational materials, although it presents risks of bias. In research, AI serves as an assistant in data search and analysis, despite facing ethical and methodological challenges.

**Conclusions:** AI has the potential to significantly transform nursing practice, enhancing both the quality and efficiency of care. However, its integration necessitates careful management to address its limitations and ensure a positive impact in the field.

**Keywords:** Artificial Intelligence; Nursing; Nursing Informatics; Nursing Research.

#### RESUMEN

**Introducción:** la inteligencia artificial (IA) abarca tecnologías como el aprendizaje automático y las redes neuronales, con aplicaciones en diversos campos. La OMS reconoce su potencial para mejorar la atención en salud, pero enfatiza la necesidad de considerar la ética en su implementación. En enfermería, la IA puede aumentar la autonomía y eficiencia en la atención, aunque su uso sigue siendo limitado y mal comprendido dentro de la profesión.

**Objetivo:** analizar el uso de la IA en enfermería, evaluando su impacto en las funciones asistenciales, administrativas, educativas e investigativas.

**Método:** se realizó un análisis de literatura que incluyó artículos originales, revisiones y estudios bibliométricos. La investigación se centró en las aplicaciones de la IA en las cuatro funciones principales de la enfermería.

**Resultados:** la IA ha mostrado beneficios en el análisis predictivo y la mejora de la eficiencia en la atención al paciente, así como en la gestión administrativa y la clasificación de pacientes. En educación, la IA generativa

facilita el desarrollo de material educativo, aunque presenta riesgos de sesgo. En investigación, la IA actúa como asistente en la búsqueda y análisis de datos, aunque enfrenta desafíos éticos y metodológicos.

**Conclusiones:** la IA tiene el potencial de transformar significativamente la práctica de la enfermería, mejorando la calidad y eficiencia de la atención. Sin embargo, su integración requiere una gestión cuidadosa para abordar sus limitaciones y garantizar su impacto positivo en el campo.

**Palabras clave:** Inteligencia Artificial; Enfermería; Informática Aplicada a la Enfermería; Investigación en Enfermería.

## INTRODUCTION

The term “artificial intelligence” (AI) refers to “multiple technologies that can augment human activities in the form of machine learning, to process and learn from raw data and deep learning, to stimulate decision making using complex artificial neural networks.”<sup>(1)</sup> Thus, AIs encompass machine learning, decision trees, and neural networks, whose applications have become increasingly complex and, in conceptual terms, more mathematical.<sup>(2)</sup>

According to the World Health Organization (WHO),<sup>(3)</sup> AI constitutes an opportunity to improve health care; however, it must be centered on ethics and human rights at the time of its conception, deployment, and use. In the case of nursing, it has been described that the potential of AI to provide greater autonomy for patients and professionals in care processes and improve workflows and efficiency in terms of time, materials, and human resources.<sup>(4)</sup>

Reviews in the area have affirmed that the application of AIs by nurses has focused mainly on clinical practice in patient care and, to a lesser degree, on administration and education.<sup>(5)</sup> Likewise, hospitals have been the most prominent study environment; most research in the area has used machine learning algorithms, and the application goals of AIs focus on image and signal processing with activity and health tracking, monitoring or classification, followed by care coordination and communication, as well as fall detection.<sup>(6)</sup>

Despite the relevance and potential of AIs, studies have reported little knowledge of the area by nurses, undermining its use; Abuzaid et al.<sup>(7)</sup> conducted a survey where they concluded that there is a lack of understanding of the principles of AI throughout the nursing profession;<sup>(7)</sup> highlighting the need for more education in the area for its proper application. Based on the above, the present article was conceived with the objective of analyzing the use of artificial intelligence in nursing.

## METHOD

An analytical article whose guiding question was: What is the use of artificial intelligence in nursing? To answer this question, original articles, review studies, and bibliometric studies in the area were included, and these were analyzed from the critical view of the authors. The AI applications were structured by considering the four nursing functions: care, education, administration, and research.<sup>(8)</sup>

## DEVELOPMENT

### *Assistance function*

Regarding the nursing care function, AI has been used mainly in predictive analytics, which uses different machine learning methods; its authors have categorized it as working as intended or showing potential. However, few studies have addressed the relationship between technological functionality and end-user perception.<sup>(9)</sup>

Nursing professionals record a significant amount of data, which can be used to train AI tools; its benefits have been described in general practice as well as in specialized care such as oncology nursing, which has the potential to transform and improve nursing practice and patient outcomes, from cancer prevention and detection to treatment, survivorship, and end-of-life care.<sup>(10)</sup> On the other hand, the potential of AI in telehealth interventions has been described as efficient and promising and could be an effective method of delivering nursing care.<sup>(11)</sup>

The usefulness of AI in risk identification, such as readmission risk, has been highlighted; its potential in health assessment has also been described, for example, in the assessment of dermatological conditions. However, the use of AI is not without limitations; for example, in the case of the use of ChatGPT for the development of nursing care plans, significant errors and limitations have been identified.<sup>(12)</sup>

### *Management function*

Regarding the nursing management function, the role of AI applications in the improvement of nursing management, as well as safety management, quality management, team communication, and international collaboration, has been highlighted.<sup>(13)</sup> Consistent with Dong et al.<sup>(14)</sup>, who conclude in their study that emergency

nursing management systems with visual AI based on medical information search can be beneficial in clinical work.

On the other hand, the benefits of AI in patient classification have been documented, for example, in stratification according to the severity of their illness and care needs, as well as in improvements in medical record management and overall improvements in service quality.<sup>(12)</sup>

#### *Educational role*

In relation to the educational function of nursing, generative AI has been highlighted as a great ally in the generation of education plans, bases for the development of attractive learning material, and collaboration in the feedback of evaluations;<sup>(15)</sup> however, it is important to consider the associated biases, since many times AI does not manifest the response mechanisms, which forces professionals to be responsible in its use, the nursing professional is still responsible for evaluating the progress of students and patients in terms of education.

On the other hand, it is important to consider that there is a self-perception of the nursing profession regarding the education of the nursing professionals themselves about AI; this is supported by the results of the study by Abuzaid *et al.*<sup>(7)</sup>, pointed out that 75% of all respondents agreed that the nursing curriculum should include some basic knowledge about AI.

#### *Research function*

Regarding the research function in nursing, Yasin *et al.*<sup>(16)</sup> highlight benefits, challenges, and opportunities; among the benefits are the role of AI as a research assistant, data search and analysis; among the challenges are the ethical and legal concerns of its use, methodological issues, and equitable access; while among the opportunities are identified ethical-legal frameworks, methodological improvements, and interdisciplinary and collaborative research.

Due to the relevance of AI, Luo *et al.*<sup>(17)</sup>, in their bibliometric study on research and thematic trends in artificial intelligence in nursing education, project through predictive models a trend toward an increase in the number of annual articles in the area.

### **CONCLUSIONS**

The present study provided answers to the proposed objective by analyzing the use of AI in nursing. AI is significantly transforming nursing practice, showing a remarkable impact on its various functions: care, administrative, educational, and research. The use of AI in nursing promises to improve the quality and efficiency of care, but its integration must be carefully managed to address its limitations and ensure its positive contribution to the field.

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## CONFLICT OF INTEREST

No conflict of interest.

## AUTHORSHIP CONTRIBUTION

*Conceptualization:* Miguel Valencia-Contrera.

*Data Curation:* Miguel Valencia-Contrera, Flérida Rivera-Rojas, Jenifer Villa-Velasquez, Daniella Cancino-Jiménez.

*Formal analysis:* Miguel Valencia-Contrera, Flérida Rivera-Rojas, Jenifer Villa-Velasquez, Daniella Cancino-Jiménez.

*Research:* Miguel Valencia-Contrera, Flérida Rivera-Rojas, Jenifer Villa-Velasquez, Daniella Cancino-Jiménez.

*Methodology:* Miguel Valencia-Contrera.

*Project administration:* Miguel Valencia-Contrera.

*Resources:* Miguel Valencia-Contrera.

*Software:* Miguel Valencia-Contrera.

*Supervision:* Miguel Valencia-Contrera.

*Validation:* Miguel Valencia-Contrera, Flérída Rivera-Rojas, Jenifer Villa-Velasquez, Daniella Cancino-Jiménez.

*Visualization:* Miguel Valencia-Contrera, Flérída Rivera-Rojas, Jenifer Villa-Velasquez, Daniella Cancino-Jiménez.

*Original draft-writing:* Miguel Valencia-Contrera, Flérída Rivera-Rojas, Jenifer Villa-Velasquez, Daniella Cancino-Jiménez.

*Writing-revising and editing:* Miguel Valencia-Contrera, Flérída Rivera-Rojas, Jenifer Villa-Velasquez, Daniella Cancino-Jiménez.