





REVIEW

## The importance of human supervision in the use of ChatGPT as a support tool in scientific writing

### La importancia de la supervisión humana en el uso de ChatGPT como herramienta de apoyo en la escritura científica

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#### ABSTRACT

**Introduction:** ChatGPT could support scientific research and writing, allowing researchers to focus on generating results and data analysis. However, it is essential to consider the possible biases and limitations in developing text and the ethical and quality implications in producing scientific knowledge.

**Methods:** there was a scientific search in PubMed and Scopus with the keyword “ChatGPT,” establishing inclusion and exclusion criteria to select ten relevant open-access articles on using ChatGPT in scientific research and writing over the last five years.

**Results:** several authors point out the potential of ChatGPT as a support tool for scientific research and writing and highlight its capability to provide valuable comments and suggestions as well as its use to write a coherent text and to manage references and citations; however, they warn about possible biases and ethical limitations in its use and the need for human supervision. The journal Nature establishes ethical and transparency principles for its use and recommends the exclusion of ChatGPT as an accredited author in a research paper.

**Conclusions:** ChatGPT is a valuable tool in scientific writing, but its use should be regulated to avoid substituting the human experience and guarantee ethical and quality standards. Caution and human supervision are required to ensure the accuracy of results and recognize their use in research papers without conferring any authorship on them.

**Keywords:** Artificial Intelligence; Medical Writing; Data Analysis; Productivity Improvement; Chat GPT.

#### RESUMEN

**Introducción:** ChatGPT podría ser una herramienta de apoyo en la investigación y escritura científica, permitiendo a los investigadores centrarse en la generación de resultados y análisis de datos. Sin embargo, es importante considerar los posibles sesgos y limitaciones en la generación de texto, así como las implicaciones éticas y de calidad en la producción de conocimiento científico.

**Métodos:** se realizó una búsqueda bibliográfica en PubMed y Scopus con la palabra clave “ChatGPT”, estableciendo criterios de inclusión y exclusión para seleccionar 10 artículos relevantes sobre el uso de ChatGPT en investigación y escritura científica en los últimos 5 años y de acceso abierto.

**Resultados:** diversos autores señalan el potencial de ChatGPT como herramienta de apoyo en la investigación y escritura científica, destacando su capacidad para proporcionar comentarios y sugerencias útiles, así como su uso en la elaboración de un texto coherente y la gestión de referencias y citas; sin embargo, se advierte sobre posibles sesgos y limitaciones éticas en su uso y la necesidad de supervisión humana. La revista Nature establece principios éticos y de transparencia para su uso y recomienda la exclusión de ChatGPT como autor acreditado en un trabajo de investigación.

**Conclusiones:** ChatGPT es una herramienta útil en la escritura científica, pero su uso debe ser regulado para evitar la sustitución de la experiencia humana y garantizar estándares éticos y de calidad, y se debe tener precaución y supervisión humana para garantizar la exactitud de los resultados y reconocer su uso en los trabajos de investigación sin atribuirles autoría.

**Palabras clave:** Inteligencia Artificial; Escritura Médica; Análisis de Datos; Mejora de la productividad; Chat GPT.

## INTRODUCTION

The production and dissemination of scientific knowledge is a core activity in the development of research in any field, and the area of health sciences is no exception at all. In this context, wording scientific articles is crucial to disseminate the generated knowledge and communicate the research results. Nevertheless, scientific writing is a complex task requiring specific abilities, methodological expertise, and wording techniques that are not always easy to master. Besides, the research process can be arduous and pose difficulties requiring support tools.<sup>(1,2,3)</sup>

Over the last few years, the progress of natural language technologies has given rise to the development of language-generating systems allowing the creation of text from input data. ChatGPT (Generative Pre-trained Transformer) stands out from them. ChatGPT is an artificial intelligence model developed by OpenAI that has been trained in many texts, and it can generate text autonomously.<sup>(4)</sup>

In this context, the potential of ChatGPT as a support tool for scientific research and writing in the area of Health Sciences has been put forward. This tool could facilitate writing scientific articles, allowing researchers to focus their time and effort on generating results and data analysis instead of on wording a coherent, structured text. Besides, ChatGPT could improve scientific writing quality by providing a guide and model to organize the information and revise and edit the text.

However, though the potential of ChatGPT as a support tool for scientific research and writing seems evident, it is essential to consider the possible biases in the input data and in the generation of text as well as the limitations as regards the understanding and coherence of the generated text.<sup>(5)</sup>

Therefore, this article explores the potential of ChatGPT as a support tool for scientific research and writing, discusses its advantages and disadvantages, and analyzes the possible ethical and quality implications in producing scientific knowledge.

## METHODS

To perform the bibliographic search using ChatGPT as a support tool for scientific research and writing, we used the database of PubMed and Scopus. The keyword we used was "ChatGPT."

Inclusion criteria were established to select the relevant articles, such as their approach to using ChatGPT in scientific research and writing, being either in Spanish or English, having been published over the last five years, and is open access. On the other hand, those studies focusing on other language models or applications outside the scientific sphere were excluded to guarantee the relevance of the studies selected for our analysis.

Finally, ten articles were included for the analysis after applying selection criteria (figure 1).

## RESULTS AND DISCUSSION

The use of ChatGPT as an Artificial Intelligence (AI) valuable tool in scientific writing is mentioned by Salvagno et al.<sup>(6)</sup> They state that its use should be regulated to avoid substituting the human experience since it can provide valuable comments and suggestions. They also point out that it is essential to carefully revise the generated papers to guarantee ethical and quality standards.

The authors predict that, shortly, AI could be trained to draw and understand all the relevant information from electronic medical records, analyze patient data, and provide recommendations for medical interventions. The implementation of these AI systems, together with chatbots, could create an interactive system providing the doctor in charge with immediately made information. This requires that ethical and privacy standards in using medical information on patients be followed to avoid any possible abuse or misuse of information.

Alkaissi et al.<sup>(7)</sup> identify two areas in which it can be helpful in academic writing: creating a linguistically coherent text from the minor dispersed points and managing and organizing references and citations.

Researchers like Macdonald et al.<sup>(8)</sup> affirm that ChatGPT can significantly help researchers create studies, analyses, and wording of scientific articles. Still, caution and human supervision are required throughout all the stages to guarantee the accuracy of results. They warn that its use in writing scientific articles poses ethical problems, such as the possible similitude in the structure of the articles and the question of the co-authorship of ChatGPT in the written papers.

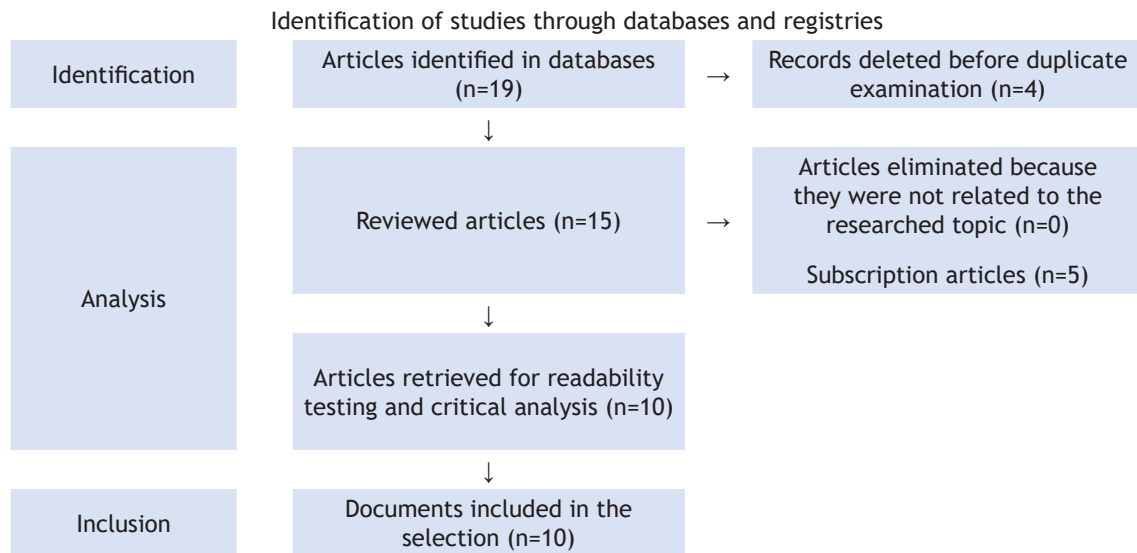


Figure 1. PRISMA flow diagram

A study on the possible uses and limits of ChatGPT in sanitary care was developed by Cascella et al.<sup>(9)</sup> Said study highlighted the use of ChatGPT to word scientific articles, but it warns about the phenomenon of “hallucination” that refers to the capability of ChatGPT to produce answers that sound credible but may be incorrect or make no sense. They conclude by expressing that researchers and professionals can use it efficiently if they clearly understand its capabilities and limitations, avoiding any possible unwanted consequences.

The assessment of AI-generated text was addressed by Anderson et al.<sup>(10)</sup> Though they highlight news like ChatGPT passed the theoretical section of the medical license exam in the United States with neither additional training nor years of study in medicine,<sup>(11)</sup> ChatGPT writes poems and books for children,<sup>(12)</sup> and the fact that Nature informed that four manuscripts in preprint accredit ChatGPT as author;<sup>(13)</sup> there are still problems concerning ethics, equity, and accuracy. The inaccuracies of the bibliographic references so generated stand out. The latter might be because AI feeds on papers with poorly referenced scientific articles.

Regarding authorship, researcher Lee<sup>(14)</sup> states that AI chatbots are not human beings in the current legal system, which means that the text cannot be considered a copyright-protected work. The aforementioned implies that AI cannot be considered the work’s author.

Even though AI chatbots such as ChatGPT can generate original text, they cannot be accountable for their writing, which places them at the same level as a search engine in terms of accountability. Due to this, AI chatbots cannot be considered authors from the ethical perspective of research.

In keeping with the author above, Yeo-Teh et al.<sup>(15)</sup> consider that the use of AI should be declared compulsory, and they should not appear as authors since they do not meet the authorship guidelines in force (such as the authorship criteria widely adopted by ICMJE).<sup>(16)</sup>

For their part, Ali et al.<sup>(17)</sup> states that, though AI is efficient in writing clinical letters (i.e., reports in clinical records, examinations, diagnoses, treatments, and recommendations), the results should continue to be verified by sanitary professionals.

To set in order all that is approaching, the journal Nature puts forward basic rules for using ChatGPT and similar tools.<sup>(18)</sup> The Journal warns that the capability of the chatbot to generate accurate, reliable texts is grounds for concern in the scientific community. That is why recognizing the use of AI and excluding it as an accredited author in research work is recommended. By inspecting the text, you can realize mistakes made by AI and the frequent errors made when citing; shortly, the developers could overcome these problems by training chatbots in specialized scientific texts and using source citation tools.

The concern above springs from the use the users of Nature are making of ChatGPT.<sup>(19)</sup> The Journal carried out a study that showed the different uses the scientific community makes of this tool, where only 20,6 % of the surveyed persons have never used AI (ChatGPT, GPT-3, DALL-E, MidJourney, Stable, Difusión, among others). The interviewed persons declare that these tools were used as follows:

- creative amusement not related to my research;
- contribute ideas on research;
- help write a code;
- help write presentations;
- perform bibliographic revisions;
- help write research manuscripts;
- help create graphs or images;

- help write applications for grants;
- within scientific search engines;
- help write coursework or exams.

### Final considerations

Because of all the above, the scientific community can order the use of ChatGPT to write scientific articles, establishing clear and transparent ethical guidelines that include the need for human supervision in all stages of the process. Its use should be regulated to avoid substituting the human experience and guarantee the accuracy of results.

In addition to applying ChatGPT as a tool for the scientific community, the community of developers formulates the idea of marking the text drafted by that tool to avoid feeding back on the text generated by it and, instead, do so on those texts generated by human intelligence.<sup>(20,21)</sup>

If GPT-3, the name of the current version of ChatGPT, has already brought about a crisis among researchers, authors, editors, and readers where it has been difficult for us to accommodate, soon GPT-4, the next evolution of the pre-trained language model of OpenAI, poses new challenges. For now, it is expected to have an even greater capability to generate text, abstracts, and automatic translations and answer complex questions coherently and accurately, even compared to the previous GPT models. It is believed to have 100 trillion parameters, which is almost 600 times more than GPT-3, and it will also be able to answer prompts of images and videos instead of only working with text.<sup>(22,23)</sup>

## CONCLUSIONS

In conclusion, the ChatGPT tool is helpful in scientific writing because it can provide valuable comments and suggestions and help manage and organize references and citations. Nevertheless, its use should be regulated to avoid substituting the human experience and guarantee ethical and quality standards. Though AI can be trained to draw and understand relevant information in sanitary care and provide recommendations for medical interventions, its limitations and possible unwanted consequences should be considered.

Furthermore, from the ethical viewpoint of research, AI chatbots cannot be considered authors, and their use should be declared compulsory. Despite being able to generate original text, ChatGPT cannot be accountable for its writing, which places it at the same level as a search engine in terms of accountability. Therefore, the authorship guidelines should be adopted to recognize its use in research papers adequately.

Finally, the scientific community increasingly uses AI tools like ChatGPT for diverse purposes, from creating manuscripts to helping manage references and citations. Despite the possible problems regarding ethics and accuracy, caution and human supervision are required throughout all stages to guarantee the accuracy of results and recognize their use in research papers without conferring any authorship on those tools.

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## FINANCING

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## CONFLICT OF INTEREST

None.

## AUTHORSHIP CONTRIBUTION

*Conceptualization:* William Castillo-González.

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*Methodology:* William Castillo-González.

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*Research:* William Castillo-González.

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