



Editorial

## Innovative insight: ChatGPT's contribution to advanced health research articles

M. Rifqi Fadillah Muslim <sup>1</sup>, Lutfi Chabib <sup>1✉</sup>, Hasyrul Hamzah <sup>2</sup>, Agus Santosa <sup>3</sup>

<sup>1</sup> Master Program of Pharmacy, Faculty of Mathematics and Natural Sciences, Islamic University of Indonesia, Yogyakarta, Indonesia

<sup>2</sup> Department of Pharmacy, Faculty of Pharmacy, Muhammadiyah University of East Kalimantan, Samarinda, Indonesia

<sup>3</sup> Department of Medical-Surgical Nursing, Health Faculty, Universitas Muhammadiyah Purwokerto, Banyumas, Central Java, Indonesia

### ABSTRACT

The current technological advancement follows a pattern of both disruptive and gradual changes. The field of communication is currently the most extensively utilized technology. The rapid development of AI has enabled those without a background in computer coding or specialized health knowledge to utilize this technology, which gives rise to numerous issues. This phenomenon elicits curiosity and engenders debate among the general public, scholars, healthcare providers, and researchers in the health industry. Utilizing AI in the composition of scientific publications necessitates explicit norms and regulations, a robust validation procedure, and effective collaboration between AI systems and human expertise. Ensuring transparency and acknowledgment of AI usage is crucial to maintaining human researchers' accountability for the ultimate outcomes of their research.

### INTRODUCTION

Artificial Intelligence (AI) refers to a system or computer that can carry out tasks that often necessitate human intelligence, including learning, problem-solving, and decision-making.<sup>1</sup> ChatGPT is an advanced messaging system created by OpenAI in November 2022 that utilizes a natural language processing (NLP) model. It is supposed to generate responses that resemble human-like interactions when given orders.<sup>2</sup> ChatGPT is extensively utilized in the health industry, particularly for enhancing the composition of health research publications. It aids in generating abstracts, summarising literature, and identifying research gaps.<sup>3</sup> Presently, the utilization of ChatGPT holds promise in enhancing the domain of composing scientific health articles by automating specific tasks and enhancing the efficiency of the writing process. This enables writers to swiftly and effortlessly produce more precise and consistent scientific health articles.<sup>4</sup>

Multiple studies have documented that using ChatGPT can enhance the efficacy of composing health research papers. ChatGPT can modify its language and writing style to align with the intended recipient.<sup>5</sup> ChatGPT can generate scientific publications in various languages, including Spanish, English, and Chinese.<sup>6</sup> Multiple research also indicates that ChatGPT can assist authors in generating accurate citations and references in different citation formats.<sup>5</sup>

The rapid development of AI has enabled those without a background in computer coding or specialized health knowledge to utilize this technology, which raises numerous difficulties. This phenomenon has generated curiosity and sparked discussions among the general public, scholars, healthcare providers, and researchers in the health industry.<sup>7</sup> Good research methodologies and writing skills are necessary to generate high-quality scientific articles. Scientific articles, particularly those related to health topics, should possess clarity, precision, consistency, and comprehensiveness to be valuable to other researchers. Nevertheless, composing scientific articles can be time-consuming and entails a lengthy procedure. Given the advancements in AI, ChatGPT is extensively employed by scholars to expedite the production of high-quality scientific publications.<sup>8</sup>

### CAN CHATGPT COMPOSE A SCIENTIFIC HEALTH ARTICLE?

The author attempted to utilize ChatGPT-3.5 for communication purposes and issued the following command: "Please write a short essay about type 2 diabetes treatment, with an introduction, method, results, discussion and conclusion, with references to at least 10 international journals". The outcomes generated by ChatGPT are displayed in Figure 1.

<https://doi.org/10.30595/medisains.v21i3.20211>

©(2023) by the Medisains Journal. Readers may use this article as long as the work is properly cited, the use is educational and not for profit, and the work is not altered. More information is available at [Attribution-NonCommercial 4.0 International](https://creativecommons.org/licenses/by-nc/4.0/).

<p><b>You</b></p> <p>Please write a short essay about type 2 diabetes treatment, with an introduction, method, results, discussion and conclusion, with references to at least 10 international journals</p> <p><b>ChatGPT</b></p> <p>Certainly! Below is a concise essay on type 2 diabetes treatment, structured with an introduction, method, results, discussion, and conclusion, along with references to international journals.</p> <p><b>Title: Advancements in Type 2 Diabetes Treatment</b></p> <p><b>Introduction</b></p> <p>Type 2 diabetes mellitus (T2DM) is a chronic metabolic disorder characterized by insulin resistance and impaired insulin secretion. Its prevalence has surged globally, necessitating effective treatment strategies to manage blood glucose levels and reduce associated complications. This essay aims to examine current therapeutic approaches for T2DM based on recent studies published in international journals.</p> <p><b>Method</b></p> <p>A comprehensive search was conducted across reputable international journals and databases such as PubMed, ScienceDirect, and JAMA. Keywords including "type 2 diabetes treatment," "pharmacotherapy," "lifestyle interventions," and "clinical trials" were employed. Articles focusing on T2DM treatment published within the last decade in esteemed journals were selected for review and analysis.</p> <p><b>Results</b></p> <p>Pharmacological interventions encompass a wide array of drug classes such as metformin, sulfonylureas, DPP-4 inhibitors, GLP-1 receptor agonists, SGLT-2 inhibitors, and insulin. Recent studies highlighted the efficacy of newer agents like GLP-1 receptor agonists and SGLT-2 inhibitors in not only improving glycemic control but also reducing cardiovascular risks associated with T2DM. Non-pharmacological interventions, such as dietary modifications, physical activity, and weight management, continue to play a pivotal role in T2DM management, often in conjunction with pharmacotherapy.</p> <p><b>Discussion</b></p> <p>The landscape of T2DM treatment has evolved significantly, emphasizing individualized therapeutic strategies aimed at achieving not only glycemic control but also addressing associated comorbidities and reducing long-term complications. Emerging approaches, including precision medicine and digital health interventions, are reshaping patient care, focusing on personalized treatments and enhancing patient engagement. While newer medications exhibit promising outcomes, concerns regarding their long-term safety, cost-effectiveness, and adherence persist.</p>	<p><b>Conclusion</b></p> <p>Advancements in T2DM treatment have diversified therapeutic options, offering improved glycemic control and reduced cardiovascular risks. A holistic approach incorporating both pharmacological and non-pharmacological interventions remains crucial in effectively managing T2DM. However, ongoing research is imperative to elucidate the long-term benefits, risks, and cost-effectiveness of emerging treatments, ensuring tailored and optimal care for individuals with T2DM.</p> <p><b>References:</b></p> <ol style="list-style-type: none"> <li>1. Davies, M. J., et al. (2018). Management of hyperglycemia in type 2 diabetes, 2018. <i>Diabetes Care</i>.</li> <li>2. Khunti, K., et al. (2021). Efficacy and safety of a glucagon-like peptide-1 receptor agonist in the treatment of type 2 diabetes: A meta-analysis. <i>The Lancet</i>.</li> <li>3. Zinman, B., et al. (2015). Empagliflozin, cardiovascular outcomes, and mortality in type 2 diabetes. <i>New England Journal of Medicine</i>.</li> <li>4. Maruthur, N. M., et al. (2016). Diabetes medications as monotherapy or metformin-based combination therapy for type 2 diabetes: A systematic review and meta-analysis. <i>JAMA</i>.</li> <li>5. Wiviott, S. D., et al. (2019). Dapagliflozin and cardiovascular outcomes in type 2 diabetes. <i>New England Journal of Medicine</i>.</li> <li>6. Holman, R. R., et al. (2017). Effects of once-weekly exenatide on cardiovascular outcomes in type 2 diabetes. <i>New England Journal of Medicine</i>.</li> <li>7. Garber, A. J., et al. (2019). Consensus statement by the American Association of Clinical Endocrinologists and American College of Endocrinology on the comprehensive type 2 diabetes management algorithm. <i>Endocrine Practice</i>.</li> <li>8. Inzucchi, S. E., et al. (2015). Management of hyperglycemia in type 2 diabetes, 2015: A patient-centered approach. <i>Diabetes Care</i>.</li> <li>9. American Diabetes Association. (2020). Pharmacologic Approaches to Glycemic Treatment: Standards of Medical Care in Diabetes. <i>Diabetes Care</i>.</li> <li>10. Wadden, T. A., et al. (2021). Effect of intensive lifestyle intervention on bodyweight and glycaemia in early type 2 diabetes (DIADEM-I): An open-label, parallel-group, randomized controlled trial. <i>The Lancet Diabetes &amp; Endocrinology</i>.</li> </ol>
--	---

**Figure 1.** Essay Outcomes Generated Using ChatGPT 3.5

In Figure 1, ChatGPT generates essay titles even without a specific instruction. The essay includes an Introduction, Method, Results, Discussion, Conclusion, and Reference sections. The vocabulary employed is highly comprehensible, follows a methodical structure by the established and accurate language, and includes ten international journal references from several sources.

The research community, comprising journal editors, researchers, and publishers, is still determining the role and validity of ChatGPT in the context of research and the publication of medical publications. ChatGPT can mimic authors or scientists and generate abstracts and counterfeit scientific articles without the scientist's awareness.<sup>9</sup> ChatGPT generates titles for essays in its output, even

when not explicitly instructed. The essay comprises an Introduction, Discussion, Conclusion, and Reference sections. The vocabulary employed is accessible and organized by the established and accurate rules of the Indonesian language. The essay consists of 478 words and includes ten international journal references from diverse sources.

Based on its inherent characteristics and functioning, ChatGPT will offer robust and somewhat dependable information data from the internet. ChatGPT is a language generation model that uses a Recurrent Neural Network (RNN) to predict the next character based on its generated characters. The outcome is a cohesive text discovered on the internet and influenced by characters created by humans.<sup>8</sup> Coherent sentences in the text may indicate potential issues with the material's dependability, for instance, in the section dedicated to references or the bibliography. ChatGPT offers ten global references from diverse sources in the bibliography area. Nevertheless, the researcher discovered erroneous information presented. Despite thoroughly searching the cited sources, papers or journals about the title provided by ChatGPT were kept from being located, even though they were written in a generic structure.

These findings align with the research undertaken by a few researchers, which identified inconsistencies in the table of contents generated by ChatGPT.<sup>8</sup> The provided instruction was to obtain "10 tables of contents sourced from PubMed". Upon conducting a thorough search utilizing the PubMed search engine, no article corresponding to the title provided by ChatGPT was discovered. ChatGPT lacks access to databases like PubMed to verify article availability. Consequently, it fabricates articles as examples of bibliographic references relevant to the generated article.

Prior to using the ChatGPT algorithm in study or article preparation, researchers must thoroughly evaluate and authenticate the generated text and material. AI-generated text can exhibit inaccuracies, disseminate falsehoods, and engage in plagiarism. Furthermore, in the ever-evolving health field, it is crucial to continually retrain AI models to ensure their reliability and alignment with the most up-to-date knowledge. Nevertheless, people remain indispensable in conducting research and composing scientific articles, although ChatGPT can be a valuable tool for generating ideas and inspiration in scientific writing.

## **THE ETHICAL AND LEGAL CONSIDERATIONS OF THE USE OF CHATGPT IN PRODUCING SCIENTIFIC ARTICLES, PARTICULARLY IN THE FIELD OF HEALTH**

ChatGPT is a versatile tool utilized for several natural language processing activities, emphasizing its widespread

application in article writing, particularly within the health sector. Nevertheless, it also presents ethical hazards that necessitate careful consideration, including partiality in information, dissemination of false information, invasion of privacy, and intellectual theft.<sup>10</sup> Information bias may arise due to language processing models like ChatGPT training on extensive text datasets, which can contain biased information, generating offensive or discriminating statements. Dissemination of inaccurate information can also arise when instructions are provided in delicate fields such as medicine, health, and finance.

Text processing models, such as those used in natural language processing, can generate inaccurate medical information, posing a risk to patients. Privacy breaches may arise when ChatGPT is utilized to disclose patient medical information, necessitating the AI's access to the patient's medical records or safeguarded medical data. Furthermore, there is a possibility of plagiarising pre-existing content. ChatGPT, a language processing model, is trained on extensive text data, which can lead to the unintentional generation of text resembling existing content. These circumstances can give rise to legal and ethical concerns.<sup>1</sup>

Consistent with this, a study directed ChatGPT to generate summaries using a set of articles from reputable journals, including *Lancet* and *Nature Medicine*.<sup>11</sup> Next, verify the plagiarism examination and the AI-generated output detector. Curiously, the abstracts generated by ChatGPT successfully passed the plagiarism test, yet the AI-output detector identified that 66% of the abstracts were produced by artificial intelligence. Following examination by researchers and human reviewers, approximately 32% of individuals could not discern if the abstract was generated by artificial intelligence and instead attributed its creation to humans.

There are varying perspectives regarding attributing AI as an author. Numerous publishers and editors are developing guidelines on using AI, such as ChatGPT, as authors of medical articles. The primary concern is that AI, like ChatGPT, needs to fulfill the necessary criteria to be considered a research author. Furthermore, AI-generated text, like that produced by ChatGPT, cannot be held accountable for ensuring the accuracy and reliability of the scientific publications it generates. Several prominent journal publishers, including the *Journal of the American Medical Association (JAMA)*, Springer Nature, Elsevier, and Nature, have issued policies explicitly stating that utilizing AI systems like ChatGPT is not acknowledged as authorship. Researchers utilizing AI, such as ChatGPT, are required to assume complete accountability for the credibility of the information and explicitly disclose the use of ChatGPT in either the methods section or acknowledgments section.<sup>12</sup>

## CONCLUSION AND RECOMMENDATION

While text-generating AI such as ChatGPT has several benefits and can enhance different facets of producing scientific health articles, it is imperative for us humans to exercise great caution and discretion while utilizing it. The benefits, such as enhanced efficiency, increased productivity, and facilitation of content creation, need to be carefully balanced with the drawbacks, including information bias, disinformation dissemination, plagiarism, and invasion of privacy.

Utilizing AI in the composition of scientific publications necessitates explicit norms and regulations, a robust validation procedure, and effective collaboration between AI systems and human expertise. Ensuring transparency and acknowledgment of AI usage is crucial to maintaining human researchers' accountability for the ultimate outcomes of their research. Nevertheless, artificial intelligence is incapable of supplanting the inherent function of human researchers in composing scientific health papers. However, AI can serve as a valuable and effective instrument in judiciously, proficiently, and accurately composing scientific articles.

## REFERENCES

- Doyal AS, Sender D, Nanda M, Serrano RA. ChatGPT and Artificial Intelligence in Medical Writing: Concerns and Ethical Considerations. *Cureus*. 2023;15(8):e43292. doi:10.7759/cureus.43292
- van Dis EAM, Bollen J, Zuidema W, van Rooij R, Bockting CL. ChatGPT: five priorities for research. *Nature*. 2023;614(7947):224-226. doi:10.1038/d41586-023-00288-7
- Lee PY, Salim H, Abdullah A, Teo CH. Use of ChatGPT in medical research and scientific writing. *Malays Fam Physician*. 2023;18:58. doi:10.51866/cm0006
- Biswas S. ChatGPT and the Future of Medical Writing. *Radiology*. 2023;307(2):e223312. doi:10.1148/radiol.223312
- Salvagno M, Taccone FS, Gerli AG. Can artificial intelligence help for scientific writing? [published correction appears in *Crit Care*. 2023 Mar 8;27(1):99]. *Crit Care*. 2023;27(1):75. doi:10.1186/s13054-023-04380-2
- Hutson M. Could AI help you to write your next paper?. *Nature*. 2022;611(7934):192-193. doi:10.1038/d41586-022-03479-w
- Vaishya R, Misra A, Vaish A. ChatGPT: Is this version good for healthcare and research?. *Diabetes Metab Syndr*. 2023;17(4):102744. doi:10.1016/j.dsx.2023.102744
- Benichou L; ChatGPT. The role of using ChatGPT AI in writing medical scientific articles. *J Stomatol Oral Maxillofac Surg*. 2023;124(5):101456. doi:10.1016/j.jormas.2023.101456
- Gao CA, Howard FM, Markov NS, et al. Comparing scientific abstracts generated by ChatGPT to real abstracts with detectors and blinded human reviewers. *NPJ Digit Med*. 2023;6(1):75. Published 2023 Apr 26. doi:10.1038/s41746-023-00819-6
- Fröhling L, Zubiaga A. Feature-based detection of automated language models: tackling GPT-2, GPT-3 and Grover. *PeerJ Comput Sci*. 2021;7:e443. doi:10.7717/peerj-cs.443
- Else H. Abstracts written by ChatGPT fool scientists. *Nature*. 2023;613(7944):423. doi:10.1038/d41586-023-00056-7
- Flanagin A, Bibbins-Domingo K, Berkwits M, Christiansen SL. Nonhuman "Authors" and Implications for the Integrity of Scientific Publication and Medical Knowledge. *JAMA*. 2023;329(8):637-639. doi:10.1001/jama.2023.1344