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The Use of AI in Medical Writing: Balancing Efficiency and Ethical Responsibility

Yuliana

Correspondence:
yuliana@unud.ac.id

Affiliation:
Anatomy Department, Faculty of Medicine, Universitas Udayana, Indonesia
yuliana@unud.ac.id

Abstract
The use of artificial intelligence (AI) in medical writing offers many benefits, including increased efficiency and productivity. However, researchers and writers must balance these benefits with the need for ethical responsibility. This paper highlights the balance and efficiency of using AI in medical writing. This is a narrative literature review. Journals were searched from PubMed, ScienceDirect, and Google Scholar. Publication date was within 5 years. There were 16 articles after screening by keywords, title, abstract, and full text. Researchers and writers must ensure that AI-generated content is accurate, reliable, and free from bias. Transparency about the use of AI tools should be enclosed. The challenges are misinterpretation and bias. Ethical aspects of using AI in medical writing are tranparency, preventing misinterpretation, reliable, accurate, and free from bias. The efficiency of using AI-assited writing is time management. In conclusion, by balancing efficiency and ethical responsibility, researchers can harness the benefits of AI while maintaining the highest standards of ethics and integrity.

Keywords:
AI; ethical; efficiency; integrity; medical writing

A. INTRODUCTION

The rapid advancement of Artificial-Intelligence (AI) has transformed various aspects of human life, from healthcare and education to finance and transportation. As AI technology continue to evolve, they have become increasingly integral to scientific research, enabling researchers to analyze vast amount of data, identify patterns, and make prediction. However, the growing of reliance on AI in scientific research and medical writing paper raises important questions about the role of AI in knowledge creation, the validity of AI-generated results, and the potential risks associated with AI-driven research.

The integration of Artificial Intelligence (AI) in medical writing has brought about both excitement and concern. While AI-assisted writing tools can enhance efficiency and accuracy, they also raise important ethical questions. One of the primary challenges is ensuring the authenticity and originality of AI-generated content. Medical researchers and writers must be aware of the potential pitfalls of relying too heavily on AI tools, including the risk of plagiarism, bias, and lack of transparency. However, AI can also bring opportunities for improving the quality and consistency of medical writing, particularly in areas such as data analysis and literature review. By understanding the challenges and opportunities of AI-assisted writing, researchers can harness the benefits of AI while maintaining the highest standards of ethics and integrity (Cooperman & Brandão, 2024; Malik et al., 2024; Rahmani et al., 2021).

The use of artificial intelligence (AI) in medical writing offers many benefits, including increased efficiency and productivity. However, researchers and writers must balance these benefits with the need for ethical responsibility. The rapid advancement of artificial intelligence (AI) has revolutionized scientific research, including academic publishing and peer review. AI tools can streamline tasks such as language checks, plagiarism detection, and format compliance, increasing efficiency and accuracy. However, AI's integration raises ethical and methodological

concerns, particularly in peer review, where human expertise is essential for evaluating research novelty and significance (Yoo, 2025).

Some ethical concerns in using AI-assisted writing are ethical concerns, bias and fairness, privacy, surveillance, accountability, and transparency. AI systems can reproduce or amplify societal prejudices if trained on biased data. AI applications might collect user data without consent, potentially creating detailed profiles for tracking or targeted advertising. There area also raised concerns about the interpretability, reproducibility, and validity of AI-generated results (Kimbra, 2025).

Despite these concerns, AI has become an essential tool in scientific research and medical writing. The AI potential in accelarating scientific discovery and innovation is undeniable. As AI continues to evolve, it is essential to examine its role in research and writing, its potential benefits and risks, and the implication for scientific community.

This paper highlights the balance and efficiency of using AI in medical writing.

B. METHODS

This is a narrative literature review. Journals were searched from PubMed, ScienceDirect, and Google Scholar. Publication date was within 5 years. There were 16 articles after screening by keywords, title, abstract, and full text.

C. RESULT & DISCUSSION

AI is a machine or computer system that can replicate human capabilities like learning, reasoning, and self-correction. It can range from simple programs for specific tasks to complex systems with human-like thinking and creativity. Some types of AI are as follows Artificial Narrow Intelligence (Task-focused systems that excel in specific areas but can't solve problems outside their skill sets), Artificial General Intelligence (Systems that operate independently in various fields, helping achieve cognitive tasks humans can do), and Artificial Super Intelligence (Technology that surpasses human performance in every area and outmatches the human mind) (Sharma et al., 2024).

Applications of AI as follows: healthcare (enabling individualized treatment plans, improving diagnostics, and forecasting disease outbreaks), finance (identifying fraudulent activity, evaluating credit risk, and improving trading tactics), writing and research (grammar checkers like Grammarly, language models like Gemini and GPT-4, and tools for literature reviews and summarization), and data analysis (analyzing genomic data, social network data, and medical surveys to uncover relationships and improve insights) (AlSamhori & Alnaimat, 2024):

Some benefits of AI in writing are improved efficiency, enhanced accuracy, and increased productivity. AI can automate redundant tasks such as grammar checking, data analysis, and literature reviews, freeing up researchers to focus on more critical aspects of their work. AI could support literature reviews and produce drafts of articles (AlSamhori & Alnaimat, 2024).

AI can help detect errors and inconsistencies in research papers, improving the overall quality of the work. AI can assist with tasks such as writing and data analysis, allowing researchers to produce more work in less time. Writers might focus on analysis, interpretation, and original thoughts (AlSamhori & Alnaimat, 2024).

Researchers and writers must ensure that AI-generated content is accurate, reliable, and free from bias. Transparency about the use of AI tools should be enclosed. The challenges are misinterpretation and bias. Ethical aspects of using AI in medical writing are tranparency, preventing misinterpretation, reliable, accurate, and free from bias. The efficiency of using AI-assited writing is time management. The ethical and disclosure-based assessmen of common AI usage in academic research is depicted in Figure 1 (Ray, 2023; Yoo, 2025).

AI usage scenario	Disclosure	Ethically	Remarks
1. Generating research hypotheses	Mandatory	Acceptable if disclosed	Considered *substantial and intentional* use
2. Writing portions of the manuscript	Mandatory	Acceptable if disclosed	Directly impacts originality; must be transparent
3. Collecting or analyzing data	Mandatory	Acceptable if disclosed	AI influences core scientific processes
4. Generating figures or tables	Mandatory	Acceptable if disclosed	Affects interpretation and presentation
5. Modifying/synthesizing patient images	Mandatory	Unethical if undisclosed	Serious risk of privacy breach and misrepresentation
6. Citing AI-generated ideas as if original	-	Unethical	Constitutes plagiarism; attribution is mandatory
7. Using AI for grammar correction/sentence refinement	Optional	Acceptable	Provided that human retains content control
8. Restructuring text (e.g., for fluency or clarity)	Optional	Acceptable	No creative authorship; judgment by human remains central
9. Using AI for spell-checking or formatting references	Unnecessary	Acceptable	Routine technical tasks; minimal influence
10. Using AI as a literature search assistant	Unnecessary	Acceptable	Comparable to traditional search engines
11. Using AI to design manuscript structure (outline/framework)	Optional/Mandatory (context)	Acceptable if disclosed	Transparency in Methods section recommended

This table has been adapted and reorganized on the basis of the framework (mandatory, optional, unnecessary) proposed by Resnik and Hosseini.[23]
The examples listed here are illustrative rather than exhaustive, and many more cases are likely to emerge. A future casebook of our own is under consideration, grounded in this framework.
AI = artificial intelligence.

Figure 1. Ethical and disclosure of AI usage in Academic writing and research (Yoo, 2025)

Integrating AI into academic publishing and peer review poses new ethical and methodological challenges, particularly in assessing scientific novelty and quality. While AI can process language and detect patterns, it lacks the deep subject-matter expertise and critical thinking required for complex scientific evaluation. Over-reliance on AI can lead to missed errors and inadequate assessments, highlighting the need for human judgment and critical thinking (Yoo, 2025).

The use of AI in medical writing raises important questions about authorship and accountability. Who should be considered the author of an AI-generated paper? Should AI systems be credited as authors, or should human authors be held accountable for the content generated by AI tools? These questions highlight the need for clear guidelines and policies on AI-assisted writing in medical research. Researchers and writers must be transparent about the use of AI tools and ensure that they are not misrepresenting the role of AI in the writing process. By being open and honest about the use of AI, researchers can maintain the trust and credibility of their work (AlSamhori & Alnaimat, 2024).

The increasing use of AI-generated content in medical publishing raises important ethical implications. One of the key concerns is ensuring that AI-generated content is accurate and reliable. Additionally, researchers and publishers must consider the potential impact of AI-generated content on the peer review process and the dissemination of medical knowledge. By understanding the ethical implications of AI-generated content, researchers and publishers can work together to develop guidelines and best practices for the use of AI in medical publishing (Sharma et al., 2024).

Medical writing in the age of AI should ensure integrity and authenticity. The use of AI in medical writing has the potential to revolutionize the field, but it also raises important questions about integrity and authenticity. Researchers and writers must be aware of the potential pitfalls of AI-generated content, including the risk of plagiarism, bias, and lack of transparency. By taking steps to ensure the integrity and authenticity of AI-generated content, researchers can maintain the trust and credibility of their work. This includes being transparent about the use of AI tools and ensuring that AI-generated content is accurate and reliable (Hutson, 2024; Mei et al., 2025; Sharma et al., 2024).

The increasing use of AI in medical writing raises important questions about authorship and accountability. Should AI systems be credited as authors, or should human authors be held accountable for the content generated by AI tools? Researchers and writers must consider the ethical implications of AI-assisted authorship and develop guidelines and best practices for the use of AI in medical writing. By understanding the ethics of AI-assisted authorship, researchers can ensure that they are using AI tools in a responsible and transparent manner (Doskaliuk et al., 2025; Hutson, 2025).

The increasing use of AI in medical writing has significant implications for authors and editors. One of the key ethical considerations is ensuring that AI-generated content is accurate and reliable. Authors and editors must carefully review and verify AI-generated content to ensure that it meets the highest standards of quality and accuracy. Additionally, authors and editors must

be aware of the potential biases and limitations of AI tools and take steps to mitigate these issues. By understanding the impact of AI on medical writing, authors and editors can work together to ensure that AI-generated content is of the highest quality and integrity (AlSamhori & Alnaimat, 2024).

The use of AI in medical writing raises a range of ethical dilemmas, from issues of authorship and accountability to concerns about bias and accuracy. Current guidelines and best practices provide some guidance on these issues, but there is still a need for further clarification and discussion. Researchers and writers must be aware of the potential risks and benefits of AI-assisted writing and take steps to ensure that they are using AI tools in an ethical and responsible manner. By reviewing current guidelines and best practices, researchers can stay up-to-date on the latest developments in AI-assisted medical writing and ensure that their work meets the highest standards of ethics and integrity as depicted in Figure 2 dan 3 (AlSamhori & Alnaimat, 2024; Doskaliuk et al., 2025; Yoo, 2025).

The limitations of AI in peer review include inability to fully assess novelty and significance of research, potential biases in AI models, lack of transparency and accountability, risk of displacing human judgment and critical thinking. To effectively integrate AI into peer review, it's essential to develop guidelines for responsible AI use, ensure transparency and accountability, monitor and mitigate biases, preserve human judgment and critical thinking. By understanding the benefits and limitations of AI in peer review, we can harness its potential while maintaining the integrity and quality of academic publishing (Doskaliuk et al., 2025)

Suggestions	Reasons	Examples
Clearly define the task, providing sufficient context, constraints, and intended use for the AI's response.	Specific prompts reduce ambiguity, leading to outputs that are more relevant and aligned with the academic context.	"Summarize the peer review process, focusing on ethical concerns like transparency and bias. Limit the response to 150 words." Instead of: "Explain peer review."
Design prompts that request a comprehensive yet concise response, focusing on key arguments, limitations, or methodological insights.	LLMs benefit from being directed to analyze and synthesize rather than merely summarize, fostering academically insightful outputs.	"Evaluate the implications of AI bias in academic peer review and propose strategies to mitigate these issues, supported by examples." Instead of: "Explain AI bias in peer review."
Incorporate reference material or specify sources to guide the AI toward fact-based outputs.	Academic writing requires adherence to reliable data. Including references ensures the output aligns with existing knowledge and prevents misinformation.	"Provide an overview of ethical issues in AI usage in academia, citing examples from widely discussed cases or reliable academic sources." Instead of: "Discuss ethical issues in AI."
Explicitly state what the AI should avoid, such as generating unverifiable data, personal opinions, or confidential content.	This ensures that outputs comply with academic ethics, particularly in cases where sensitive or proprietary information is involved.	"Summarize recent advances in AI in academic publishing, but do not speculate on future trends without evidence." Instead of: "What will AI in academia look like in 50 years?"
Test and refine the prompt repeatedly, adjusting specificity and scope until the desired level of accuracy and depth is achieved.	Refining prompts through feedback ensures that the AI adapts to detailed academic expectations and avoids overgeneralization.	"Summarize AI's role in academia." Revised prompt: "Summarize AI's role in academic peer review, focusing on plagiarism detection and ethical issues."
Avoid prompts that ask AI to make definitive judgments on topics requiring subjective or ethical considerations.	While AI can provide analyses or comparisons, the final evaluation of academic value should remain a human responsibility.	"Discuss ethical concerns around AI in peer review and highlight areas needing further research." Instead of: "Is AI ethical in academic publishing? Provide a yes or no answer."

AI = artificial intelligence, LLM = large language model.

Figure 2. Ethical and practical guidelines for AI prompt design (Doskaliuk et al., 2025)

Table 1. Comparative summary of generative AI policies in major journals and editorial organizations

Journal/Organization	AI use prohibited?	Disclosure required?	Disclosure	AI authorship
ICMJE	No	Yes	Detailed disclosure of AI usage (purpose, extent)	No authorship
WAME	No	Yes	Explicit disclosure; human responsibility emphasized	No authorship
COPE	No	Yes	Transparent disclosure; ethical risk warnings	No authorship
NEJM	No	Yes	Tool name, content generated, use details	No authorship
Lancet	No	Yes	Scope and role of AI specified	No authorship
Nature	No	Yes	Role and scope disclosed in Methods section	No authorship
Science	Effectively Yes	Yes	Tool name, version, prompts disclosed (Methods, Acknowledgments, Cover letter)	No authorship; no AI-generated citations
BMJ	No	Yes	Tool name, purpose, content generated	No authorship
Ann Intern Med	No	Yes	Tool name, purpose, usage details in Cover letter and manuscript	No authorship
JAMA	Yes (for images)	Yes	Tool name, version, prompt, content; structured submission form	No authorship; peer review use restricted
Cell	No	Yes	Transparent disclosure required	No authorship
JKMS	No	Yes	Detailed guidance; flexible policy	No authorship
YMJ / KJR	No	Yes	Follow ICMJE guidelines	No authorship

AI = artificial intelligence, ICMJE = International Committee of Medical Journal Editors, WAME = World Association of Medical Editors, COPE = Committee on Publication Ethics, *NEJM = New England Journal of Medicine*, *BMJ = British Medical Journal*, *JAMA = Journal of the American Medical Association*, *JKMS = Journal of Korean Medical Science*, *YMJ = Yonsei Medical Journal*, *KJR = Korean Journal of Radiology*.

Figure 3. Comparative summary of generative AI policies in some journals and editorial organizations (Yoo, 2025).

The integration of AI in peer review poses risks to data privacy and intellectual property protection, particularly with sensitive and unpublished research data. To mitigate this, robust security protocols are necessary to safeguard information. On the other hand, AI can be a valuable partner in peer review by automating language corrections and consistency checks, detecting potential plagiarism and data manipulation, generating structured review templates, and drafting initial comments as depicted in Figure 4 (AlSamhori & Alnaimat, 2024; Lee et al., 2023).

Ways	Explanation
1. Automated literature review	ChatGPT has been reported to be able to expedite the process of literature reviews by automating the extraction and summarisation of relevant information from a vast array of scientific articles and publications.[2,3]
2. Structured-outline generation	ChatGPT has been shown to be able to serve as a helpful tool for generating structured outlines that guide the flow of scientific writing.[2]
3. Drafting and editing assistance	Reports show that ChatGPT can act as an intelligent assistant during the drafting and editing stages of medical scientific writing. The tool can offer suggestions for improving sentence structures, enhancing clarity and ensuring adherence to scientific writing conventions.[2]
4. Language enhancement and adaptation	ChatGPT can aid in adapting the language and tone of the written work to suit the intended audience.[3] In an article published in *Nature*, ChatGPT was reported to be used to generate scientific papers in a variety of languages, including English, Spanish and Chinese.[4]
5. Citation and reference management	Some literature demonstrates the ability of ChatGPT to assist researchers in generating proper citations and references based on widely accepted citation styles (e.g. APA or MLA).[3]
6. Collaborative writing and peer review	ChatGPT has been reported to be able to facilitate collaboration by serving as an intermediary tool for brainstorming, sharing ideas and reviewing drafts.[3]
7. Table and figure creation	ChatGPT has been shown to be able to aid researchers in developing tables and figures by offering suggestions on formatting, data visualisation techniques and labelling.[3]

Figure Various ways chatGPT in assisting writing process (Lee et al., 2023)

Some challenges and Risks in using AI are over-reliance on AI, academic integrity, bias, and fairness. Relying too heavily on AI can lead to a loss of critical thinking and creative skills. The use of AI-generated content can raise concerns about originality and authenticity. AI models can perpetuate biases if they are not developed and tested properly (Marie Balraj, 2025).

Some guidelines for ethical AI use are transparency and disclosure, also human oversight. Researchers should be transparent about their use of AI tools and disclose their role in the research process. AI should be used to support human judgment, not replace it. AI technologies should be developed and used in ways that uphold moral values, including accountability, transparency, and justice (Liang, 2025; Yu et al., 2024).

To harness AI's potential while maintaining academic integrity, guidelines are needed to ensure AI supports human expertise without replacing it. In academic publishing, AI has shown promise in automating tasks, but its limitations must be acknowledged. By understanding AI's benefits and drawbacks, we can develop practical recommendations for its effective and ethical use in academic processes (Doskaliuk et al., 2025).

CONCLUSION

In conclusion, by balancing efficiency and ethical responsibility, researchers can harness the benefits of AI while maintaining the highest standards of ethics and integrity. researchers can harness the benefits of AI while minimizing its risks and ensuring the integrity of their work. By developing clear guidelines for the AI use in writing, promoting transparency, and foster critical thinking, writers will get the optimal benefits of using AI in medical writing.

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REFERENCES

AlSamhori, Ar. F., & Alnaimat, F. (2024). Artificial intelligence in writing and research: Ethical implications and best practices. *Central Asian Journal of Medical Hypotheses and Ethics*, *5*(4), 259–268. https://doi.org/10.47316/cajmhe.2024.5.4.02

Cooperman, S. R., & Brandão, R. A. (2024). AI assistance with scientific writing: Possibilities, pitfalls, and ethical considerations. *Foot & Ankle Surgery: Techniques, Reports & Cases*, *4*(1), 100350. https://doi.org/10.1016/j.fastrc.2023.100350

Doskaliuk, B., Zimba, O., Yessirkepov, M., Klishch, I., & Yatsyshyn, R. (2025). Artificial Intelligence in Peer Review: Enhancing Efficiency While Preserving Integrity. *Journal of Korean Medical Science*, *40*(7), e92. https://doi.org/10.3346/jkms.2025.40.e92

Hutson, J. (2024). Rethinking Plagiarism in the Era of Generative AI. *Journal of Intelligent Communication*, *3*(2). https://doi.org/10.54963/jic.v3i2.220

Hutson, J. (2025). Human-AI Collaboration in Writing: A Multidimensional Framework for Creative and Intellectual Authorship. *International Journal of Changes in Education*. https://doi.org/10.47852/bonviewIJCE52024908

Kimbra, E. (2025). Considerations for the use of artificial intelligence in the creation of lay summaries of clinical trial results. *Medical Writing*, *34*(2), 74–80.

Lee, P. Y., Salim, H., Abdullah, A., & Teo, C. H. (2023). Use of ChatGPT in medical research and scientific writing. *Malaysian Family Physician*, *18*, 58. https://doi.org/10.51866/cm0006

Liang, M. (2025). Ethical AI in medical text generation: Balancing innovation with privacy in public health. *Frontiers in Public Health*, *13*, 1583507. https://doi.org/10.3389/fpubh.2025.1583507

Malik, M. A., Amjad, A. I., Aslam, S., & Fakhrou, A. (2024). Global insights: ChatGPT's influence on academic and research writing, creativity, and plagiarism policies. *Frontiers in Research Metrics and Analytics*, *9*, 1486832. https://doi.org/10.3389/frma.2024.1486832

Marie Balraj, B. (2025). Exploring the Use of ChatGPT in Academic Writing: A Systematic Literature Review on Undergraduates' Perceptions. *Arab World English Journal*, *1*, 348–357. https://doi.org/10.24093/awej/AI.20

Mei, P., Brewis, D. N., Nwaiwu, F., Sumanathilaka, D., Alva-Manchego, F., & Demaree-Cotton, J. (2025). If ChatGPT can do it, where is my creativity? Generative AI boosts performance but diminishes experience in creative writing. *Computers in Human Behavior: Artificial Humans*, *4*, 100140. https://doi.org/10.1016/j.chbah.2025.100140

Rahmani, A. M., Azhir, E., Ali, S., Mohammadi, M., Ahmed, O. H., Yassin Ghafour, M., Hasan Ahmed, S., & Hosseinzadeh, M. (2021). Artificial intelligence approaches and mechanisms for big data analytics: A systematic study. *PeerJ Computer Science*, *7*, e488. https://doi.org/10.7717/peerj-cs.488

Ray, P. P. (2023). ChatGPT: A comprehensive review on background, applications, key challenges, bias, ethics, limitations and future scope. *Internet of Things and Cyber-Physical Systems*, *3*, 121–154. https://doi.org/10.1016/j.iotcps.2023.04.003

Sharma, A., Rao, P., Ahmed, M. Z., & Chaturvedi, K. (2024). Artificial intelligence in scientific writing: Opportunities and ethical considerations. *International Journal of Research in Medical Sciences*, *13*(1), 532–542. https://doi.org/10.18203/2320-6012.ijrms20244167

Yoo, J. H. (2025). Defining the Boundaries of AI Use in Scientific Writing: A Comparative Review of Editorial Policies. *Journal of Korean Medical Science*, *40*(23), e187. https://doi.org/10.3346/jkms.2025.40.e187

Yu, S., Lee, S.-S., & Hwang, H. (2024). The ethics of using artificial intelligence in medical research. *Kosin Medical Journal*, *39*(4), 229–237. https://doi.org/10.7180/kmj.24.140