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Limitations of Using Generative Artificial Intelligence in Writing Scientific Articles: Use of Fake Citations and Tendency Towards Western Texts

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The editorial in the September issue of this year was dedicated to the journal's approach regarding the use of generative artificial intelligence (AI) tools in writing manuscripts. We noted at that time that while these tools offer positive attributes, they also possess numerous limitations. Indeed, it now seems that the limitations of using AI in writing medical articles are so significant that one must employ these tools with the utmost caution.

In the mentioned editorial, we addressed one of these limitations: if one asks a generative AI tool to write sections of a paper, such as the introduction, it may generate sources that do not exist (1). These "fake" citations are considered a byproduct of AI "hallucinations" (2).

Hua and colleagues requested both older and newer versions of a generative AI tool to produce scientific abstracts, along with ten references, for clinical research questions across seven ophthalmology subspecialties. They demonstrated that 33% of the references generated by the initial version and 29% of those generated by the updated version were fake sources created by the AI (3). Since the use of fake sources causes irreparable damage to the foundations of science, researchers—especially early-career researchers—must use these tools with a full awareness of these limitations (1).

Furthermore, Cohen and Moher pointed to another limitation of generative AI tools in scientific writing. They noted that generative AI tools are designed to produce text by utilizing Large Language Models (LLMs). For this purpose, and to operate optimally, LLMs are trained on vast datasets consisting of diverse textual content and billions of parameters (4).

Although the precise training data sources for most LLMs are either unreported or unknown, there is a strong probability that the majority are disproportionately in English and produced by institutions in high-income Western countries. Historically, institutions in Eastern and low-income countries have either not produced such data or have produced it with lower quality. Consequently, the texts currently generated by AI tools largely reflect the conditions and requirements of high-income Western countries, a factor that can further exacerbate existing disparities in this field (4).

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