EDITORIAL ARTICLE

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Use of Artificial Intelligence in Biomedical Research

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Artificial intelligence (AI) can be defined as a field of computer science that is capable of performing tasks such as learning, cognition, and critical thinking similar to human beings. AI creates a revolution in medicine (diagnosis, prevention, and management of diseases) and biomedical research [1]. However, major concerns are raised, such as ethical considerations, social, and regulatory systems of its usage [2]. Therefore, the users must be transparent during their use. In biomedical research, AI is significantly enhancing studies through analysis of big data within seconds, comparable diagnosis, through radiological imaging or pathological slides, for human beings, and a greater ability to handle complex data [3, 4]. Besides, it is of value in identifying subtle photo characteristics through deep learning techniques and analyzing suitable references from a vast literature within seconds through natural language processing (NLP) [5]. Moreover, AI tools can be helpful in precise diagnosis, drug discovery, personalized medicine, and monitoring of patients through wearable instruments [6]. Nevertheless, major concerns regarding the scientific integrity and scholarly rigor should be carefully monitored [7]. We present specific obligations for authors (including disclosure requirements and usage limitations), reviewers (encompassing verification duties and confidentiality maintenance), and editors (covering policy development, manuscript screening, and supervisory responsibilities).

Different AI tools can be used by the authors in various stages of the research journey, such as manuscript preparation, design of the study, enhancement of figures or images, dealing with big data and statistical analysis, and editing purposes [8]. Nowadays, these tools are accepted worldwide with clear disclosure from the authors. However, irresponsible behavior is totally prohibited. Although generative AI tools can generate a complete text that looks well-designed, they might contain fatal errors, false or fabricated references, or incorrect interpretations [8]. Therefore, using such text is easily detected and rejected by expert reviewers. In the case of writing a whole manuscript using AI tools without disclosure distorts the authorship criteria and the academic standards [9]. Additionally, using AI tools in the creation of a figure or image without disclosure can lead to scientific misconduct. Current recommendations from the World Association of Medical Editors (https://www.wame.org) and the International Committee of Medical Journal Editors (https://www.icmje.org/) emphasize that authors are fully responsible for all aspects of their research, whether AI tools were used or not. Therefore, AI tools can be used safely for editing purposes, improving figures or images, or searching for suitable references. Generating part or whole text is totally prohibited, as this replaces human authorship. Besides, biomedical journals require a clear disclosure from the authors to indicate which and to what extent, AI tools are used. This disclosure maintains the transparency and trust of the biomedical research.

AI can play a limited supportive role in peer review. It can detect plagiarism, check the references, and perform editing. However, the reviewers must critically assess the manuscript to evaluate its scientific rigor, novelty, ethical considerations, and clinical significance. It is of utmost importance that the reviewers follow the journal instructions regarding their confidentiality and avoid uploading manuscripts to AI systems to prevent breaches of the data (https://www.icmje.org/). The creation of complete reports by reviewers through generative AI tools is strictly prohibited. Minor editing of the reports is permitted by many biomedical journals when it is transparently disclosed to the editors. Therefore, AI tools are only used to assist reviewers, while professionalism and expertise are the main factors in handling the manuscripts [10, 11].

AI tools can be used by the editors to enhance the handling of the manuscripts regarding the detection of plagia-

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rism, identifying any manipulation of the figures or photos, and checking the references for accuracy and formatting [12]. In the presence of advanced algorithms, the editor can find suitable reviewers, detect any conflict of interest, and assess the accuracy of the statistical analysis [13]. Moreover, the AI tools can enhance editorial workflows and strengthen quality control. However, the final decision remains solely with the editor because AI tools may not be able to locate missing important ethical issues and sound methods. After all, AI tools may not be able to locate missing critical ethical issues and sound methods in the research (https://www.icmje.org/). It is of utmost importance that the biomedical editors must adopt a clear policy for the usage of AI tools, give strict observations to the researchers, and preserve confidentiality during the peer reviewing process to enhance the trust as well as maintain the scientific integrity of the journals [11].

Nowadays, there is still no consensus among biomedical journals about the regulations of AI tools usage, while some of them prevent the use of these tools, others agree to the usage of these tools to aid researchers in using AI as a supportive tool in the writing process [14]. As a consequence, continuous meetings of the biomedical editors are critical to establishing precise regulations for the use of AI tools to protect scientific integrity.

In conclusion, AI significantly contributes to medical research by accelerating discoveries and advancing science. Yet, without strict oversight, it can undermine research credibility through plagiarism, fabricated references, or breaches of confidentiality. Responsible and transparent use of AI is therefore essential. Authors should disclose the use of AI within ethical limits, and journals must enforce clear policies. Combined with professional training, these steps are crucial to ensure proper AI use and preserve the integrity of scientific publishing.

ETHICAL DECLARATIONS

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Ethics Approval and Consent to Participate

Not applicable.

Consent for Publication

Not applicable.

Availability of data and material

None.

Competing interests

The authors declare that there is no conflict of interest.

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Use of Artificial Intelligence

Artificial intelligence has been used in a limited manner to correct spelling, grammar, and punctuation, as well as in specific texts for editing.

Authors' Contributions

Both authors made significant, direct, and intellectual contributions to the design, implementation, and writing of this study. The authors have read and approved the final version of the manuscript.

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