EDITORIAL

Navigating The Horizon of Artificial Intelligence (AI) in Medical Education and Clinical Research: Unveiling Foreseeable Issues

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In the last two decades, technological advances have significantly affected the way we conduct research. Not too far back, the process of conducting research involved physically visiting libraries, performing literature searches, and locating the appropriate references. Writing a research article was a tedious job using a word processor, with days and months dedicated to the organization of references. Things changed with the advent of reference managers and easily available information on different databases available on the internet. With this came the risk of plagiarism, which was well detected by applications such as Turnitin. However, in the last year or so, Artificial Intelligence (AI) has revolutionized the way we approach the process of writing a research article. Chatbots can write complete articles. Applications based on AI can generate references, rephrase content, and refine research article writing. However, this facility has to be used with caution. There are multiple issues that can affect the quality of research and hence its implication on medical education and clinical management. The various concerns stemming from the AI-driven revolution in research article writing are data bias and impact on quality control, lack of transparency, ethical considerations, issues related to reproducibility and rigor, resource constraints, security concerns, publication bias and limitations in creativity and innovation.

The algorithms used in AI for natural language processing have limitations. They use datasets that may have limited information on a particular subject. Also widely used chatbots, like ChatGPT's dataset extends only till 2021, hence producing literature search that will be outdated by 2 years. Shortly after ChatGPT was launched, multiple research papers were published with the chatbot as the first or co-

author. However, the World Association of Medical Editors made it explicit that chatbots are not eligible to be granted authorship rights. There are many ethical concerns in research related to ChatGPT. This includes but is not limited to consent, data breach, taking credit for AI's work and lack of human creativity. It is also crucial to recognize that AI-driven research often lacks rigor and quality checks. This is especially the case for qualitative research, where quality assurance is achieved through ensuring the quality parameters such as credibility, dependability, confirmability, transferability, and reflexivity.

Another issue to consider is the impact on the neutrality of articles as the algorithms could potentially derive conclusions from datasets that are biased in a particular direction. Deep neural networks are considered as 'black boxes' of AI because of their complex nature leading to concerns about transparency as to how AI driven algorithms arrive at a conclusion. This should be of concern to the researchers who should understand the way deep neural networks work to draw conclusions.

We consistently witness the mushrooming of AI-powered applications that can generate academic text. Subsequently, other AI applications have the capability to rephrase this text, and some applications can even locate references for this content. It is very difficult to ascertain the authenticity and transparency of these applications. These applications have the ability to generate a complete research paper, based on the data set available to them. Such research which is not reliable can cause havoc in the management of patients.

While writing a research paper, one of the main concerns is the security of the data submitted to these applications. Data leak is a big potential issue in using these applications, as they are vulnerable to data breaches.

At present, when conducting and publishing research, a rigorous and robust methodology is employed. This process cultivates various skills in researchers including the ability to generate research ideas, identifying research gaps, defining problems, and generating engaging hooks. It also

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involves understanding different research methodologies conducting data analysis and effectively reporting the results of the study. This stimulates higher cognitive functions that foster creativity and innovation. Relying solely on AI applications is bound to impact these abilities.

Addressing these challenges and crucial issues is a current necessity. All relevant stakeholders including researchers, policy makers, educational and research institutions and publishers must address these concerns by formulating policies that maintain a balance between the utilization of AI and the processes of conducting and publishing research. To ensure this , researchers, policy makers and publishers should be trained in the ethics of AI, data management, and model interpretation, so they can make informed decisions.

In summary, while AI holds immense potential to aid and facilitate research writing, it is important that we acknowledge these anticipated challenges, as AI revolutionizes the research process. This will help us prevent the potential issues which may impact the quality of research. By adressing these issues proactively, we can harness the full potential of AI in research while upholding the principles of scientific integrity and ethics. This is the key to truly unlocking the potential of AI that significantly advances human knowledge and understanding.

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DATA SHARING STATMENT
The data that support the findings of this study are available from the corresponding author upon request.

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