

# Impact of ChatGPT on Medical Research Article Writing and Publication

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THE EMERGENCE OF ARTIFICIAL INTELLIGENCE (AI) and natural language processing has revolutionised various aspects of human life, including the field of medical research article writing.<sup>1</sup> One such AI tool, ChatGPT, has garnered attention for its potential to reshape how medical professionals approach research and writing.<sup>2</sup> Writing a high-quality article requires a blend of precision, clarity and scientific rigor. The integration of ChatGPT into research article writing showcases a dynamic interplay between technological advancement and scientific craftsmanship. While it accelerates content generation and facilitates certain aspects of the writing process, its use must be tempered with judicious oversight and adherence to established research and writing standards. The future promises a collaborative partnership between AI and human expertise, elevating the quality and impact of medical articles in an increasingly AI-augmented era.<sup>3</sup>

In the annals of technological advancement, AI stands as one of the most remarkable achievements. It refers to the development of computer systems that can perform tasks typically requiring human intelligence. These tasks encompass problem-solving, learning from experience, comprehending natural language, recognising patterns and making decisions.<sup>3,4</sup> Coupled with innovations such as ChatGPT, AI has ushered in a new era of medical possibilities. ChatGPT is a specific instance of AI that falls under the category of Natural Language Processing (NLP). It is a language model developed by OpenAI, based on the GPT-3.5 architecture, and designed for generating human-like text based on the input it receives. ChatGPT can understand and respond to text input in a conversational manner, making it useful for a wide range of applications, from answering questions to providing explanations and even simulating human-like conversation.<sup>5</sup> In this article, we will like to discuss the use of ChatGPT in various stages of article writing, the potential advantages and disadvantages of ChatGPT and provide a recommendation regarding its usage in medical research article writing.

## UTILISING CHATGPT IN VARIOUS STAGES OF ARTICLE WRITING

With the advent of AI technology, ChatGPT has emerged as a valuable tool that can be strategically employed in various phases of medical research article composition.<sup>3,6</sup> ChatGPT can assist medical professionals and researchers in drafting well-structured and informative articles. It can aid medical writers by suggesting potential topics based on current trends, recent research, emerging challenges or existing knowledge gaps. Its language generation capabilities can be utilised to outline article's structure. (For example, the author can type 'Give me an outline regarding a review article on the use of anticoagulation in COVID-19'.) When structuring the article, it can help generate engaging introductions, outlines and subheadings. During the writing phase, ChatGPT can offer insights, explanations, and context for complex medical concepts. (For example, the author can type 'Discuss about the pathogenesis of coagulation abnormalities in COVID-19'.) It can aid in generating content for each section, providing a baseline that can be refined with personal expertise and specialised knowledge. It can assist in gathering preliminary information on specific aspects of the topic.<sup>7</sup> It may be used to explore key terms, definitions and general overviews. However, the information should always be corroborated with reputable medical sources for accuracy and relevance.<sup>6,8</sup> ChatGPT can be used to identify potential factual errors or discrepancies in the article. It can help to flag sections that require closer examination, ensuring the article maintains a high level of accuracy. It can also play a role in conducting a brief literature review. An overview of the recent studies, advancements or discussions related to the topic can also be obtained from it. While ChatGPT's responses can provide initial insights, they should always be supplemented with in-depth searches in established medical databases. ChatGPT can offer suggestions for summarising key points and reiterating the article's significance. (For example, the author can search 'Provide me a few key points regarding the use of

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anticoagulation in COVID-19.) It can help in refining language, ultimately leading to improved readability and understanding for a wider audience.<sup>9</sup> It can also help to provide closure by encapsulating the main takeaways in a concise and impactful manner. While ChatGPT can be a valuable tool, it should complement rather than replace human expertise.

#### POTENTIAL MISUSE OF CHATGPT

While AI, particularly ChatGPT, holds promise in streamlining the writing process, there are inherent risks of misuse that need to be addressed.<sup>6</sup> Relying solely on ChatGPT for article topic ideas can limit originality and depth.<sup>10</sup> It might generate ideas based on popular trends rather than addressing genuine medical gaps. Authors must exercise their expertise to choose topics that contribute meaningfully to the field. Its predefined structure suggestions might lead to a one-size-fits-all approach, ignoring the unique requirements of each medical article. ChatGPT may generate content that lacks critical analysis, essential for review articles to evaluate existing literature accurately.<sup>11,12</sup> For example, while preparing a review article on the 'Use of anticoagulation in COVID-19', ChatGPT may provide a few details about coagulation abnormalities in COVID-19 and use of anticoagulation; but the recommendation of anticoagulation in COVID-19 needs a thorough idea about the existing guidelines, critical analysis and clinical judgement from the authors. It might miss recent or lesser-known studies, leading to biased conclusions. ChatGPT cannot perform experiments or data collection, hindering the creation of original research articles; moreover, accurate interpretation of complex data may be beyond its capabilities. It cannot efficiently search and filter through vast amounts of data to create comprehensive systematic reviews, and again the automated nature of it can introduce biases in data selection and synthesis. ChatGPT is often unable to effectively capture the unique nuances of individual case reports, risking misinterpretation. Patient privacy and ethical considerations require human judgment, which ChatGPT lacks.<sup>13</sup> Plagiarism can be a concern when using it to generate content. ChatGPT can generate text based on the input it receives and it does not automatically cite sources. If not carefully used, the generated text may look very similar to existing medical literature; authors should edit the text thoroughly and manually add the appropriate citations.

#### CHATGPT USE IN MEDICAL RESEARCH ARTICLE WRITING: DO'S AND DON'TS

While ChatGPT can provide information, it's important

to remember that its responses are based on existing data and might not always be up-to-date or entirely accurate.<sup>14</sup> It doesn't independently verify information, so it's crucial for users to fact-check and consult reliable sources before incorporating content into medical articles.<sup>15,16</sup> ChatGPT's knowledge is derived from a diverse range of internet sources available up until its knowledge cutoff in September 2021.<sup>17</sup> Use ChatGPT as a starting point to gather preliminary information, but always cross-reference its output with reputable medical literature. It doesn't specifically reference trusted medical databases such as PubMed (National Library of Medicine, Maryland, USA), so there is a possibility that not all its information is peer-reviewed or sourced from reputable medical journals. ChatGPT's responses might require verification using trusted medical databases, peer-reviewed journals, and authoritative sources. These sources provide well-researched, peer-reviewed and evidence-based information that can corroborate or supplement the insights gained from ChatGPT. AI tools help improve grammar, style, and language coherence, resulting in articles that are more polished and easier to read.<sup>15</sup> AI-assisted articles might be more competitive due to their efficiency, potentially overshadowing non-AI-generated articles during the review process. AI-augmented articles might align more closely with reviewer expectations, potentially receiving more positive reviews compared to articles written without AI assistance. With diligent skill development, collaboration and a commitment to maintaining the highest standards of quality, non-AI users can still continue to make meaningful contributions to the field of medical research and publication.<sup>18</sup>

Authors should treat ChatGPT as a supplementary tool rather than a primary information source. Authors should engage in discussions with colleagues, mentors and experts in the field. Sharing insights and perspectives can enrich the thought process and promote more profound thinking. Overreliance on ChatGPT's ready-made information can indeed compromise the quality of medical articles. In-depth analysis, original thought and critical evaluation are essential aspects that contribute to the credibility and significance of medical writing.<sup>19</sup>

As we look to the future, the incorporation of AI tools such as ChatGPT in the creation of medical research articles is expected to keep evolving. This evolution has the potential to make medical research more effective, encourage collaboration and make it more accessible. Ultimately, it will drive progress in the field and bring benefits to both researchers and the wider community.<sup>20</sup> In the coming years, with the correct training and question-asking techniques,

ChatGPT can be put to use in various ways. This includes designing experiments, composing research proposals, performing peer reviews and even aiding in editorial decisions. AI tools such as ChatGPT have extensive access to information and the speed to handle tasks efficiently. As a result, they are likely to become the preferred tools for researchers and editors who are under time constraints and are judged on their ability to generate content swiftly.<sup>21</sup>

## Conclusion

While ChatGPT can assist medical writers by generating initial drafts and suggesting content, it is unlikely to replace the human brain entirely. It can serve as a helpful tool when used in conjunction with human expertise and validated medical sources, but its limitations must be acknowledged and managed effectively. Medical writing demands critical thinking and an in-depth understanding of complex medical concepts that ChatGPT cannot replicate. The ethical responsibility to ensure the veracity, quality and authenticity of medical articles ultimately rests on the shoulders of the authors. ChatGPT, when used judiciously, can be an indispensable tool in the medical research article writing process. Its ability to generate text and offer suggestions can streamline the drafting phase. However, medical writers must approach it with caution, treating it as an aid rather than a sole source. Incorporating human expertise, thorough fact-checking and reliance on validated medical sources remain paramount to ensuring the accuracy and credibility of medical articles. By striking the right balance, writers can harness the power of ChatGPT to elevate their medical writing while upholding the standards of accuracy and reliability.

## AUTHORS' CONTRIBUTION

AC prepared the manuscript with adequate planning and execution. SD and AC contributed to review of literature and critical revision of content. Both authors are accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved. Both authors approved the final version of the manuscript.

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