

Generative Artificial Intelligence in Academic Medical Writing

Dear Editor,

As dedicated readers of the *Medical Journal of Babylon*, we find it imperative to illuminate the captivating domain of generative artificial intelligence (GenAI) and its ever-growing impact on academic medical prose. As humanity progresses along the Kardashev scale, GenAI could stand as a milestone on the exponentially advancing path toward the much-debated realm of general AI and artificial superintelligence—a concept intertwined with the notion of technological singularity.^[1] Text-based GenAI technology garnered remarkable attention across various fields and now impacts scholarly publications. By harnessing the capabilities of deep learning algorithms and neural networks, GenAI introduces innovative dimensions to academic medical writing.^[2] Its diverse applications in assisting authors and biomedical researchers offer a range of advantages and disadvantages that warrant meticulous examination. In this discourse, we delve into the constraints and prospects inherent in text-based GenAI.

Although GenAI models represent a relatively recent phenomenon, they produced unprecedented attention and fearful speculations among scholars, media, and the public; for example, concerning ChatGPT (based on GPT-3 model) and other models such as CTRL, GPT-4, GrammarlyGO, T5, and XLNet [Figure 1; Supplementary materials].^[3,4] GenAI brings valuable advantages to biomedical research and academic writing. First, its speed and efficiency aid in drafting manuscripts, abstracts, and complex summaries, which expedites writing, allowing researchers to prioritize tasks. Second, these tools enhance language use, ensuring explicit, coherent content adhering to medical terminology, which is substantially advantageous, especially for non-native English speakers. Finally, GenAI transforms intricate data sets into accessible narratives, catering to policymakers and stakeholders, thus augmenting research impact.^[2]

Integrating GenAI in academic writing brings forth some disadvantages. The foremost issue is the potential loss of

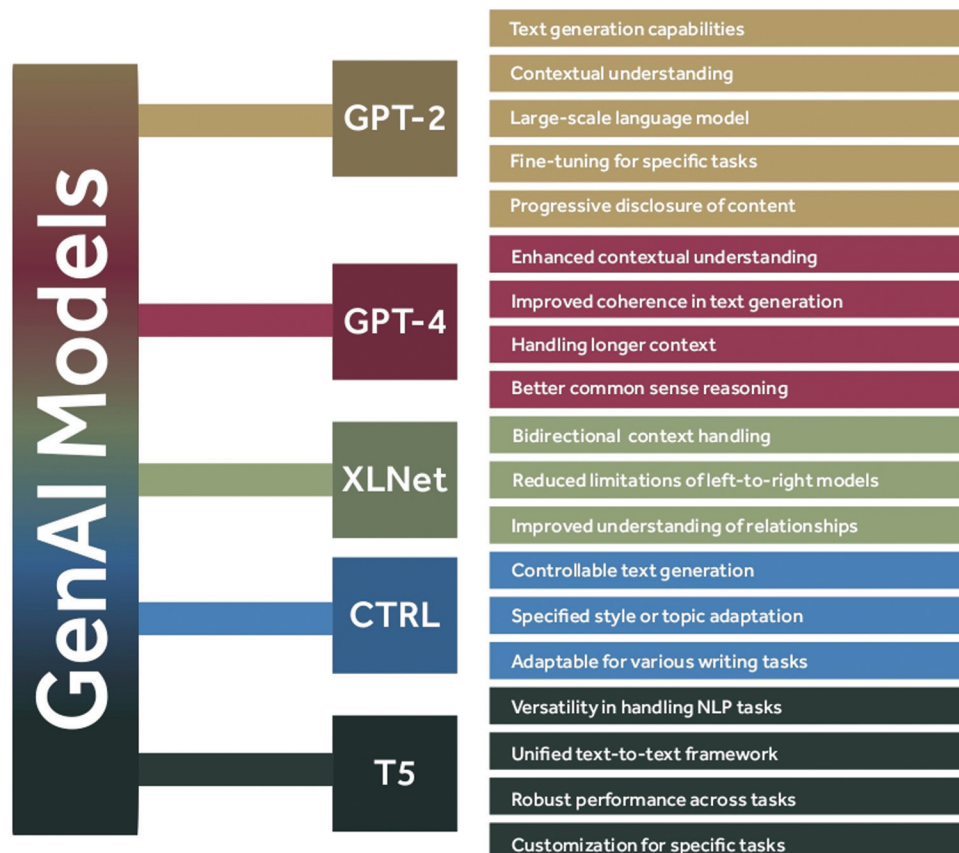


Figure 1: Features of different text-based GenAI models. GenAI: generative artificial intelligence; NLP: natural language processing

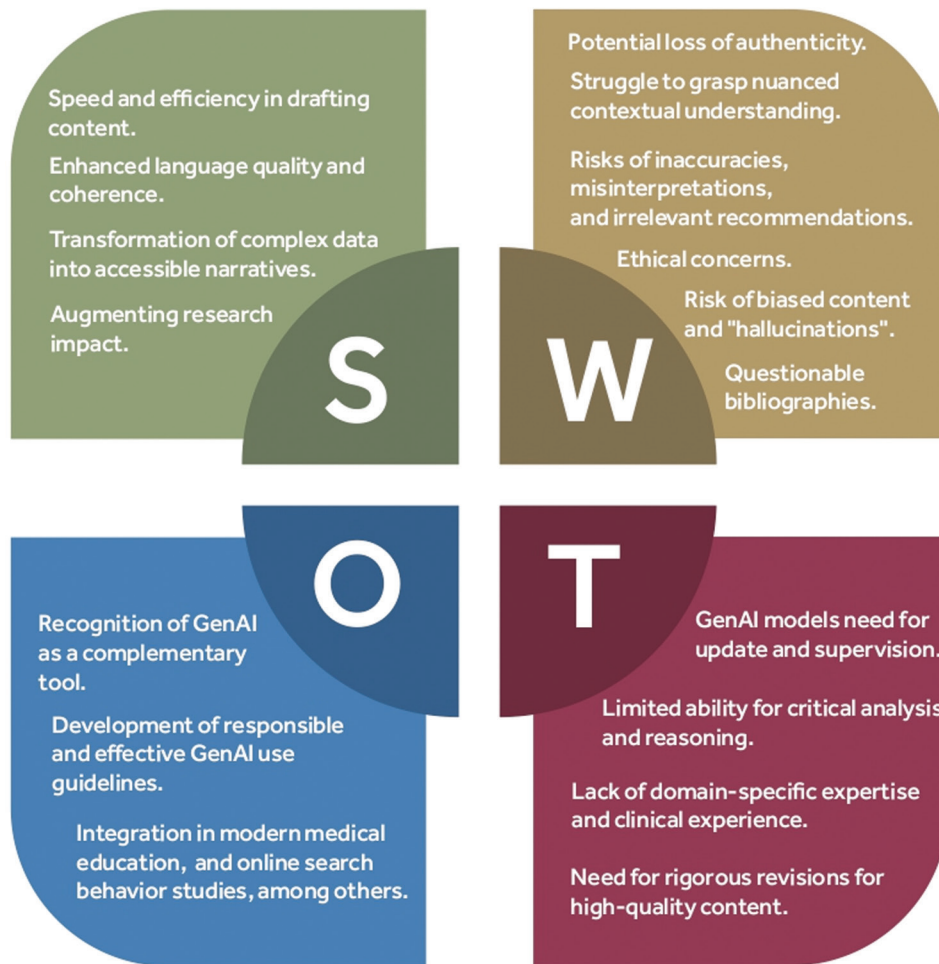


Figure 2: Text-based GenAI's SWOT analysis. GenAI: generative artificial intelligence; SWOT: strengths, weaknesses, opportunities, and threats

authenticity, as it risks diluting the author's distinct voice and perspective. Another downside is GenAI's struggle to comprehend nuanced contextual understanding within biomedical research, resulting in inaccuracies, misinterpretations, or unsuitable recommendations. Ethical concerns also arise concerning proper attribution, plagiarism, and authorship transparency. GenAI might also offer misleading information with questionable bibliographies, known as "hallucinations," thus intensifying bias.^[2,5,6] Nevertheless, newer models (e.g., Scopus AI) promise to overcome such limitations.^[6]

Acknowledging the current limitations of GenAI is crucial. These AI models cannot often discern the subtleties of medical concepts, especially those rooted in deep domain expertise, including clinical experience. Additionally, although they can generate coherent sentences, their output might lack the critical analysis or logical reasoning that characterizes high-quality scholarly work.^[3,5,6] Therefore, the application of GenAI should not be tempered without the understanding that it is a tool to support human creativity and insight rather than a replacement for the intellectual rigor that underpins academic excellence.

Concerning the future potential, a careful approach is paramount. Authors and researchers must recognize GenAI as a tool to complement their expertise, not replace it. Rigorous revisions remain essential for producing high-quality academic content. The medical community in Iraq, aligned with the excellence and innovation principles worldwide, should cautiously embrace GenAI. Collaborative efforts among researchers, AI experts, and journal editors can pave the way for guidelines that ensure this technology's responsible and effective use. Other regulations may emerge for GenAI's involvement in modern medical education and online information search behavior studies.^[7,8] The latter could evolve similarly to infodemiology and infoveillance research based on Google and Baidu search engines.^[8]

In conclusion, integrating text-based GenAI into academic medical writing presents a dynamic landscape of opportunities and threats. Although efficiency and language enhancement advantages are evident, the potential loss of authenticity and ethical concerns cannot be overlooked [Figure 2, Table S1]. By navigating this path thoughtfully and collectively, we can harness the true potential of GenAI in advancing medical knowledge while

preserving the continuity of human creativity and upholding the ethical foundations of academic writing.

Declarations

(1) Figure 1 is adapted from a dendrogram (Supplementary materials) created using ChatGPT. (2) Ahmed Al-Imam participates in the STER Internationalization of Doctoral Schools Program from NAWA Polish National Agency for Academic Exchange No. PPI/STE/2020/1/00014/DEC/02.

Ethical approval

Not applicable.

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Conflicts of interest

The authors declare that there are no conflicts of interest.

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SUPPLEMENTARY MATERIALS

Table S1: Text-based GenAI's SWOT analysis

Pros	Cons	Limitations	Prospects
1. Speed and efficiency in drafting content. 2. Enhanced language quality and coherence. 3. Transformation of complex data into accessible narratives. 4. Augmenting research impact	1. Potential loss of authenticity. 2. Struggle to grasp nuanced contextual understanding. 3. Risks of inaccuracies, misinterpretations, and irrelevant recommendations. 4. Ethical concerns. 5. Risk of biased content and “hallucinations.” 6. Questionable bibliographies.	1. GenAI models need for update and supervision. 2. Limited ability for critical analysis and reasoning. 3. Lack of domain-specific expertise and clinical experience. 4. Need for rigorous revisions for high-quality content.	1. Recognition of GenAI as a complementary tool. 2. Development of responsible and effective GenAI use guidelines. 3. Integration in modern medical education, and online search behavior studies, among others.

GenAI: Generative artificial intelligence; SWOT: Strengths, weaknesses, opportunities, and threats

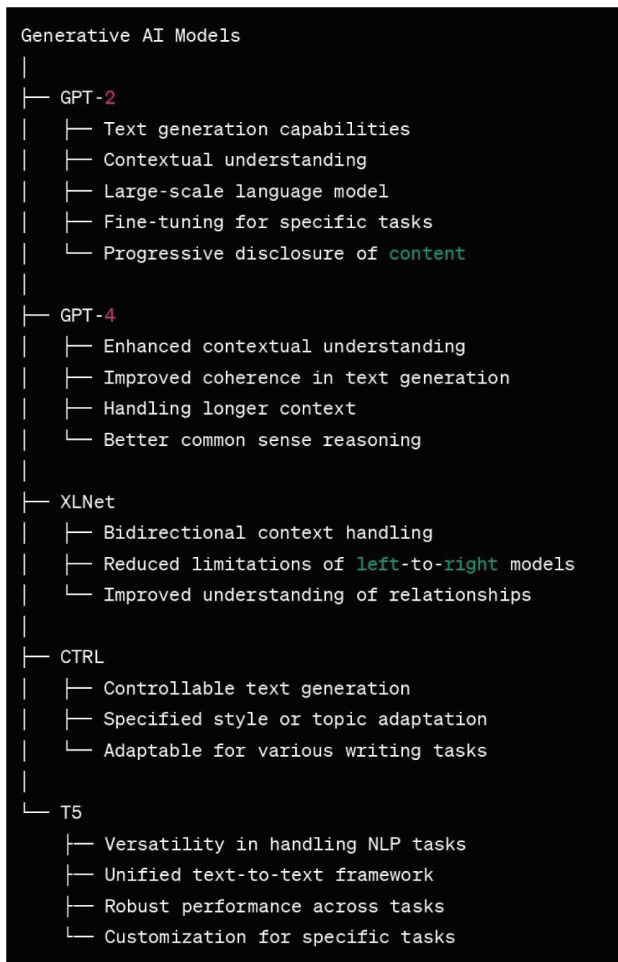


Figure S1: ChatGPT-generated dendrogram concerning the features of different GenAI models GenAI: Generative artificial intelligence; NLP: Natural language processing