The ability of Chat-GPT in paraphrasing texts and reducing plagiarism

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Abstract

Background: The introduction of Chat-GPT by OpenAI has garnered significant attention.

Objective: Due to the increasing popularity of ChatGPT in medical research, several studies are needed to identify its pros and cons. In this study, we aim to assess ChatGPT's real ability to paraphrase and reduce plagiarism by imputing different texts and prompts and assessing the plagiarism rate of the rephrased texts provided.

Methods: Three texts of varying lengths were presented to Chat-GPT. Chat-GPT was then instructed to paraphrase the provided text using five different prompts. In the subsequent stage of the study, the text was divided into separate paragraphs, and Chat-GPT was requested to paraphrase each paragraph individually. Lastly, in the third stage, Chat-GPT was asked to paraphrase the texts it had previously generated.

Results: The average plagiarism rate in the texts generated by Chat-GPT was 45%. Chat-GPT exhibited a substantial reduction in text plagiarism for the provided texts (MD= -0.51, 95%CI: -0.54, -0.48, P<0.001). Furthermore, when comparing the second attempt with the initial attempt, a significant decrease in plagiarism rate was observed (MD= -0.06, 95%CI: -0.08, -0.03, P<0.001). The number of paragraphs in the texts demonstrated a noteworthy association with the percentage of plagiarism, with texts consisting of a single paragraph exhibiting the lowest plagiarism rate (P <0.001).

Conclusions: While Chat-GPT has shown to significantly reduce plagiarism in texts, it is important to note that the resulting plagiarism rates of the provided texts may still be considered high, which may not meet the acceptance criteria of most scientific journals. Therefore, medical writers and professionals should carefully consider this issue when utilizing Chat-GPT for paraphrasing their texts. There are a couple of strategies authors can employ to improve the paraphrasing efficacy of Chat-GPT. Presenting the texts in a single-paragraph format and repeating the requesting procedure with Chat-GPT. By considering these strategies and being mindful of the potential limitations, authors can strive to improve the paraphrasing efficacy of Chat-GPT and address the challenge of high plagiarism rates associated with its outputs.

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The ability of Chat-GPT in paraphrasing texts and reducing plagiarism

Abstract

Background: The introduction of Chat-GPT by OpenAI has garnered significant attention. Among its capabilities, paraphrasing stands out; however, our study aimed to investigate the satisfactory levels of plagiarism in the paraphrased text produced by this chatbot.

Methods: Three texts of varying lengths were presented to Chat-GPT. Chat-GPT was then instructed to paraphrase the provided texts using five different prompts. In the subsequent stage of the study, the texts were divided into separate paragraphs, and Chat-GPT was requested to paraphrase each paragraph individually. Lastly, in the third stage, Chat-GPT was asked to paraphrase the texts it had previously generated.

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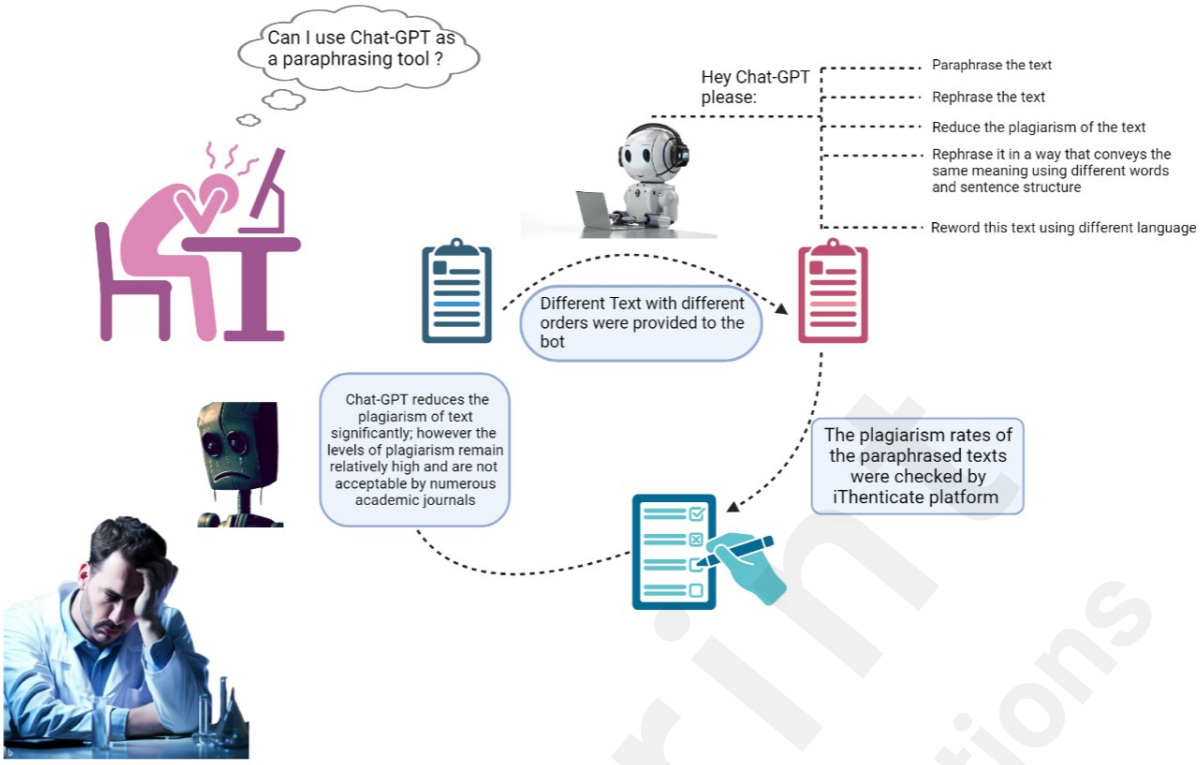
Conclusion: Although Chat-GPT demonstrates a notable reduction of plagiarism within texts, the existing levels of plagiarism remain relatively high. This underscores a crucial caution for researchers when incorporating this chatbot into their work.

Keywords: Chat-GPT, Artificial intelligence, Paraphrasing, Text generation, Prompts, Academic journals



Graphical abstract

Introduction

Plagiarism, the act of presenting someone else's work or ideas as one's own, stands as a prevalent and recurrent form of misconduct within the realms of research and publication [1]. The diverse manifestations of plagiarism can often create confusion due to the various terminologies associated with it. Verbatim plagiarism, mosaic plagiarism, loose plagiarism, duplicate publication, augmented publication, salami-sliced publication, image plagiarism, accidental plagiarism, and self-plagiarism are among the prominent types that have been identified [2-6].

To mitigate the occurrence of such misconduct, researchers often employ online plagiarism checkers, which scan existing literature on the internet and provide reports on unintentional plagiarism. Additionally, numerous journals have integrated plagiarism checkers as part of their submission process, wherein every manuscript undergoes scrutiny to identify similarity rates [7]. These measures not only act as deterrents but also aid in upholding the standards of academic integrity and ensuring

originality in scholarly publications.

In recent times, artificial intelligence (AI) has gained significant popularity across a wide range of individuals, including researchers and professionals. Among the various applications of AI, chatbots have emerged as a notable development, utilizing AI and natural language processing (NLP) techniques to generate human-like responses to user queries [8].

One prominent example of chatbots is ChatGPT, which utilizes advanced models such as Generative Pre-Trained Transformer (GPT) 3.5 and 4. ChatGPT has garnered substantial attention and widespread adoption, amassing over one million users across diverse fields in its first week of launch [9, 10]. This surge in popularity reflects the growing recognition and utilization of AI-powered chatbots in various domains.

ChatGPT offers a multitude of applications and advantages. Firstly, it excels in generating formally structured text, ensuring coherence and organization in its responses. Secondly, ChatGPT exhibits an extensive and eloquent vocabulary, enhancing the quality and fluency of its generated content. Additionally, it can be utilized as a rapid search engine, swiftly retrieving relevant information. Furthermore, it possesses the ability to search and analyze available literature, aiding researchers and professionals in their work. In the field of medical education, ChatGPT proves valuable by providing educational resources and facilitating interactive learning experiences. Moreover, it can serve as a conversational agent, engaging in meaningful and interactive conversations with users[10].

Importantly, the text produced by ChatGPT may sometimes bypass conventional plagiarism checks due to its unique generation process which is a rising ethical concern [10]. Earlier many researchers were reporting ChatGPT as co-authors in papers but the majority of journals promptly updated their policies to forbid this practice as ChatGPT cannot be held accountable for the generated content [11]. Moreover, in several instances, ChatGPT hallucinates and produces inaccurate and incorrect information which can be dangerous in the realm of academic publishing [12].

Due to the increasing popularity of ChatGPT in medical research, several studies are needed to

identify its pros and cons, especially in the field of medical education. In this study, we aim to assess ChatGPT's real ability to paraphrase and reduce plagiarism by imputing different texts and prompts and assessing the plagiarism rate of the rephrased texts provided.

Materials and methods

Selection of Texts

To assess the plagiarism rates and the rephrasing capabilities of ChatGPT (version 3.5), three texts were selected for the study. These texts varied in length to provide a comprehensive evaluation of the model's performance. Text 1 consisted of 319 words, text 2 comprised 613 words, and text 3 encompassed 1148 words. The texts used in this study were selected from one of our previously published medical papers in a medical journal [13].

Instructions given to ChatGPT

For each selected text, five distinct prompts were given to ChatGPT to rephrase the texts. These instructions were designed to test different aspects of rephrasing and reducing plagiarism. The prompts were as follows:

"Paraphrase the text"

"Rephrase the text"

"Reduce the plagiarism of the text"

"Rephrase it in a way that conveys the same meaning using different words and sentence structure"

"Reword this text using different language"

Subdivision of Texts

To further evaluate the effectiveness of ChatGPT in rephrasing and reducing plagiarism, the original texts were subdivided into multiple paragraphs. Specifically, texts one, two, and three were provided to ChatGPT in one and three paragraphs, one, three, and five paragraphs, three, five, and seven paragraphs, respectively. All the texts with different paragraph numbers were subjected to the same five rephrasing orders. This approach allowed for a comparison of the paraphrased texts with

different paragraph sections within the same content.

Second try of paraphrasing

To assess the influence of multiple rephrasing iterations, the texts generated by ChatGPT were once again incorporated into the system in the same sequence as before. Subsequently, the plagiarism rates of the texts were analyzed using the Ithenticate platform, a tool commonly employed for such evaluations in academic settings [14]. This process enabled the measurement and comparison of potential similarities between the original texts and their rephrased counterparts, shedding light on the extent of originality achieved through the rephrasing iterations.

Data Analysis

The data analysis for this study was conducted using SPSS version 19. The data distribution was assessed utilizing the Shapiro-Wilk test. To compare the plagiarism rates of the texts, a paired t-test analysis was utilized. This statistical test allowed us to examine whether there were significant differences in plagiarism rates between the original texts and the paraphrased texts generated by Chat-GPT. Additionally, to assess the potential impact of different prompts on plagiarism rates, a one-way ANOVA was employed. This analysis aimed to determine if there were statistically significant differences in plagiarism rates across the various prompts given to Chat-GPT. A significance level of $P < 0.05$ was adopted to determine statistical significance. The acceptable level of plagiarism was set at 25%, a standard embraced by scientific journals. Any plagiarism rate surpassing this threshold was considered unsatisfactory [14-18].

Results

A total number of 90 texts were provided by Chat-GPT. General information on plagiarism rates is provided in Table 1. The mean plagiarism rate of texts was 0.45±0.10. the mean plagiarism rate for the first try and second try were 0.48±0.09 and 0.42±0.09 respectively.

Table 1: Mean plagiarism rates of the texts provided by Chat-GPT

Variable		Number	Plagiarism rates checked by Ithenticate (Mean ± SD)
Total		90	0.45±0.10
Chat-GPT tries	First try	45	0.48±0.09
	Second try	45	0.42±0.09
Texts in the first try	Text 1	10	0.48±0.16
	Text 2	15	0.47±0.05
	Text 3	20	0.49±0.07
Texts in the second try	Text 1	10	0.46±0.13
	Text 2	15	0.40±0.05
	Text 3	20	0.42±0.10
Paragraphs	One paragraph	30	0.40±0.12
	Three paragraphs	30	0.50±0.07
	Five paragraphs	20	0.44±0.05
	Seven paragraphs	10	0.48±0.04
Orders given to Chat-GPT	Please paraphrase the text	18	0.45±0.10
	Please rephrase the text	18	0.48±0.06
	Please reduce the plagiarism of the text	18	0.44±0.10
	Please rephrase it in a way that conveys the same meaning using different words and sentence structure	18	0.41±0.12
	Please reword this text using different language	18	0.48±0.08

The potency of ChatGPT in reducing plagiarism

Based on the results of our study, Chat-GPT demonstrated an ability to significantly reduce plagiarism in texts right from the first attempt (mean difference [MD] = -0.51, 95% confidence interval [CI]: -0.54, -0.48, P < 0.001). Moreover, our research revealed that even further improvements were achieved with the second attempt, as it yielded a significantly lower plagiarism rate compared to the initial try (MD = -0.06, 95% CI: -0.08, -0.03, P < 0.001).

The results also showed a correlation between the number of paragraphs within a text and the plagiarism rate. Our findings indicate that texts comprised of a single paragraph exhibited the lowest plagiarism rates, and this relationship was statistically significant (p < 0.001). However, when analyzing the five different orders of the texts, we found no significant difference in terms of their plagiarism rates (P = 0.187).

Furthermore, our study did not identify any statistically significant distinctions among the plagiarism rates of text 1, text 2, and text 3 (P = 0.556), suggesting that Chat-GPT's effectiveness remained consistent across these particular texts.

Correlation between texts lengths and plagiarism rates

We assessed the correlation between the word count of the texts provided by Chat-GPT and their

plagiarism rates. Although longer texts appeared to have higher plagiarism rates, the correlation was not significant (r=0.2, P=0.059) (Figure1).

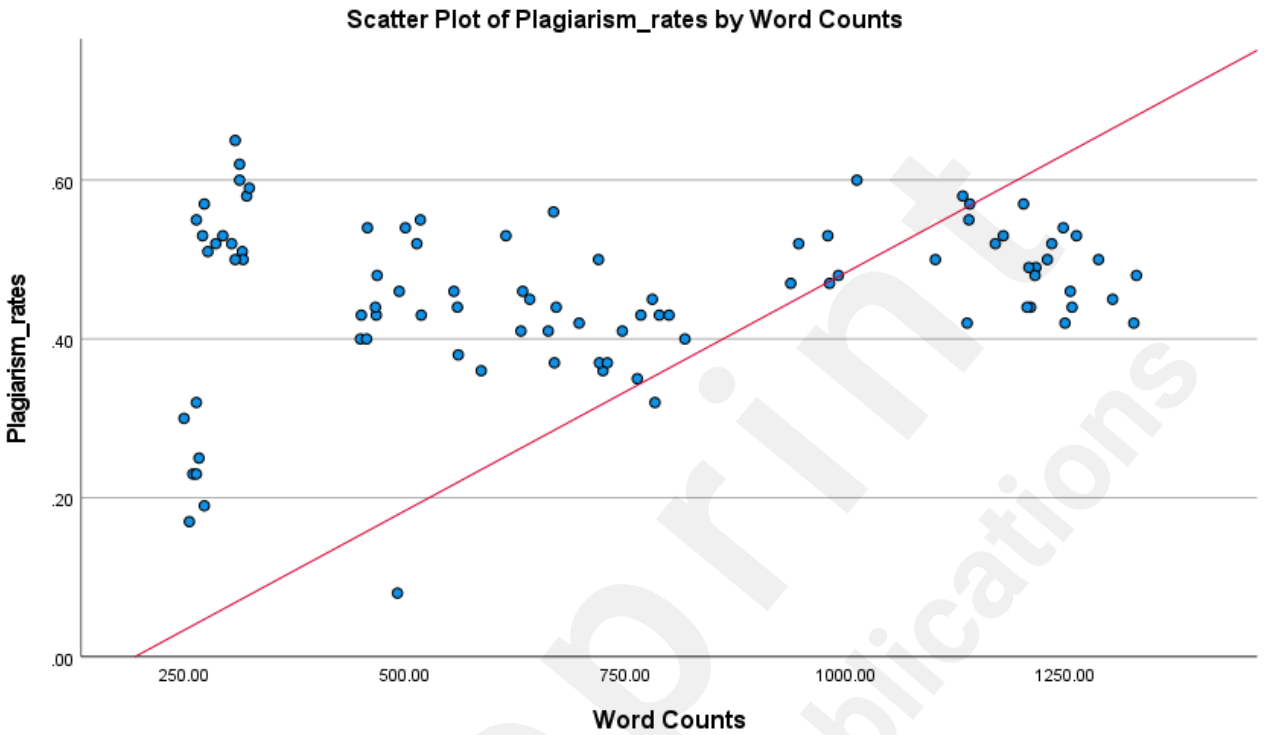


Figure 1: The correlation between word count of the texts and their corresponding plagiarism.

Discussion

The findings of our study shed light on the levels of plagiarism in the paraphrased text generated by Chat-GPT, an advanced chatbot developed by OpenAI. The results indicate that while Chat-GPT has the capability to paraphrase the text, there are notable concerns regarding the satisfactory levels of plagiarism in the generated output.

The average plagiarism rate observed in the texts generated by Chat-GPT was found to be 45%. This suggests that nearly half of the content produced by the chatbot is similar to the original source material, raising concerns about the authenticity and originality of the paraphrased text. These findings highlight the need for caution when relying on Chat-GPT for generating plagiarism-free content.

Interestingly, our study revealed that Chat-GPT exhibited a substantial reduction in text plagiarism when provided with explicit instructions to paraphrase or reduce plagiarism. This indicates that the chatbot is responsive to such prompts and can generate content with reduced plagiarism when specifically instructed to do so. However, it is important to note that even with explicit instructions, the plagiarism rate remained relatively high, emphasizing the limitations of the current system.

We also observed a significant decrease in plagiarism rate between the initial and second attempts of paraphrasing. This suggests that Chat-GPT has the ability to learn and improve its paraphrasing capabilities over multiple iterations. However, the reduction in plagiarism was modest, indicating that further refinements are necessary to achieve satisfactory levels of originality in the generated output.

An interesting finding from our study was the association between the number of paragraphs in the texts and the percentage of plagiarism. Texts consisting of a single paragraph demonstrated the lowest plagiarism rate. This suggests that presenting the source texts within a single coherent unit allows Chat-GPT to better understand and paraphrase the content effectively. Dividing the text into separate paragraphs may lead to fragmented understanding and potentially contribute to higher levels of plagiarism.

It is worth noting that the prompts used in our study did not yield significant differences in the levels of plagiarism. This indicates that the specific prompt provided to Chat-GPT does not significantly influence its paraphrasing capability. In addition, this outcome might be the consequence of the bot's strong ability to understand our true intentions when issuing commands, or it might be because our command words were brief or similar to one another. However, further investigation into the effect of different prompts and their impact on plagiarism is warranted to explore this aspect in more detail.

ChatGPT has a wide range of applications that can be effectively utilized. Numerous articles have discussed the utilization of ChatGPT in composing scientific literature, with a particular study illustrating its capability to generate formal research articles. The researchers observed that the

language used is articulate, adopts a conventional tone, and offers a pleasant reading experience [19]. ChatGPT has the potential to serve as a search engine that directly responds to queries, eliminating the need to navigate to external sites for information. This streamlines the process of writing research papers, reducing the time spent by authors on the often-arduous task of searching for articles and applying various selection criteria. This, in turn, allows authors to dedicate more time to their actual research work and methodology [20].

Moreover, articles created by ChatGPT seem to elude traditional plagiarism detection methods. In a research study, the chatbot was tasked with generating 50 medical research abstracts using a subset of articles. The resulting articles underwent examination by plagiarism detection software, an AI-output detector, and a panel of medical researchers, who were tasked with identifying any artificially-generated abstracts. The findings revealed that abstracts generated by ChatGPT seamlessly passed through the plagiarism detection software, registering a median originality score of 100%, indicating the absence of detected plagiarism. In contrast, the AI-output checker only identified 66% of the generated abstracts [21].

While ChatGPT and other AI tools hold promise in various applications, their deployment in medical writing raises ethical and legal considerations. These concerns encompass potential violations of copyright laws, medico-legal complexities, and the risk of inaccuracies or biases in the generated content. It is crucial to recognize and confront the limitations and challenges linked to the use of AI in medical writing [20, 22, 23].

Limitations and future suggestions

The sample size utilized in our study was relatively small, and as a result, we recommend that future investigations incorporate larger sample sizes to enhance the robustness of the findings. It is worth noting that our study was conducted using Chat-GPT version 3.5, which is a publicly available version at the time of our research. Unfortunately, we did not have access to Chat-GPT version 4, preventing us from evaluating the efficacy of this updated version in terms of paraphrasing

capabilities.

It is essential to acknowledge that our study exclusively focused on providing medical content to Chat-GPT. We encourage other researchers to explore the impact of utilizing different content types on the efficacy of Chat-GPT. This would allow for a comprehensive understanding of whether the effectiveness of Chat-GPT is influenced by the specific domain or topic of the content it receives. Conducting such investigations will provide valuable insights into the generalizability and adaptability of Chat-GPT across various subject matters.

Moreover, a recognized limitation of Chat-GPT is its tendency to produce inconsistent results with the same prompts [24]. To relatively address this challenge, we employed a comprehensive approach. Each prompt was provided with nine texts, varying paragraph structures (Text 1 with one paragraph, Text 1 with three paragraphs, Text 2 with one paragraph, Text 2 with three paragraphs, Text 2 with five paragraphs, Text 3 with one paragraph, Text 3 with three paragraphs, Text 3 with five paragraphs, Text 3 with seven paragraphs). Furthermore, we requested chat-GPT to paraphrase each of these texts twice using the same prompt. We then calculated the mean plagiarism rates for both the first and second attempts, along with the overall mean plagiarism rate for each prompt (Table 1).

Nevertheless, we recommend that future studies take this limitation into account and explore additional measures to enhance the robustness of assessments. Specifically, researchers may consider providing chat-GPT with a greater number of texts exhibiting different paragraph structures and incorporating a higher frequency of repetitions in the paraphrasing process.

We employed similar prompts and provided them to Chat-GPT. We recommend that future studies adopt a broader range of prompts to assess Chat-GPT's performance across different input variations. This approach allows for a more comprehensive evaluation and facilitates the identification of optimal prompts to minimize the plagiarism rates.

An important consideration with Chat-GPT lies in the potential for hallucination and biases, particularly in the generation of medical content[25]. In our study, two independent researchers

evaluated the content provided by Chat-GPT, comparing it with the original texts. However, we acknowledge that the texts used in our assessment may not have been sufficiently complex. To address this limitation, we recommend that future studies incorporate both simple and more intricate texts to thoroughly evaluate the biases that Chat-GPT may introduce during the paraphrasing of medical content. This approach will provide a more nuanced understanding of the model's performance.

Conclusion

While Chat-GPT has shown to significantly reduce plagiarism in texts, it is important to note that the resulting plagiarism rates of the provided texts may still be considered high, which may not meet the acceptance criteria of most scientific journals. Therefore, medical writers and professionals should carefully consider this issue when utilizing Chat-GPT for paraphrasing their texts. There are a couple of strategies authors can employ to improve the paraphrasing efficacy of Chat-GPT. Presenting the texts in a single-paragraph format and repeating the requesting procedure with Chat-GPT. By considering these strategies and being mindful of the potential limitations, authors can strive to improve the paraphrasing efficacy of Chat-GPT and address the challenge of high plagiarism rates associated with its outputs.

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Authors contribution:

Conceptualization: E.A-S, A.B and S.H. Data curation: E.A-S and A.A. Formal analysis: S.H, and E.A-S. Methodology: E.A-S and A.B. Writing–original draft: MH. K, and T.D. Editing: All authors.

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This study does not require an ethical approval.

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Informed consent:

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Declaration of competing interest:

N/A.

Data availability:

The datasets used and/or analyzed during the current study are accessible from the corresponding author on reasonable request.

References

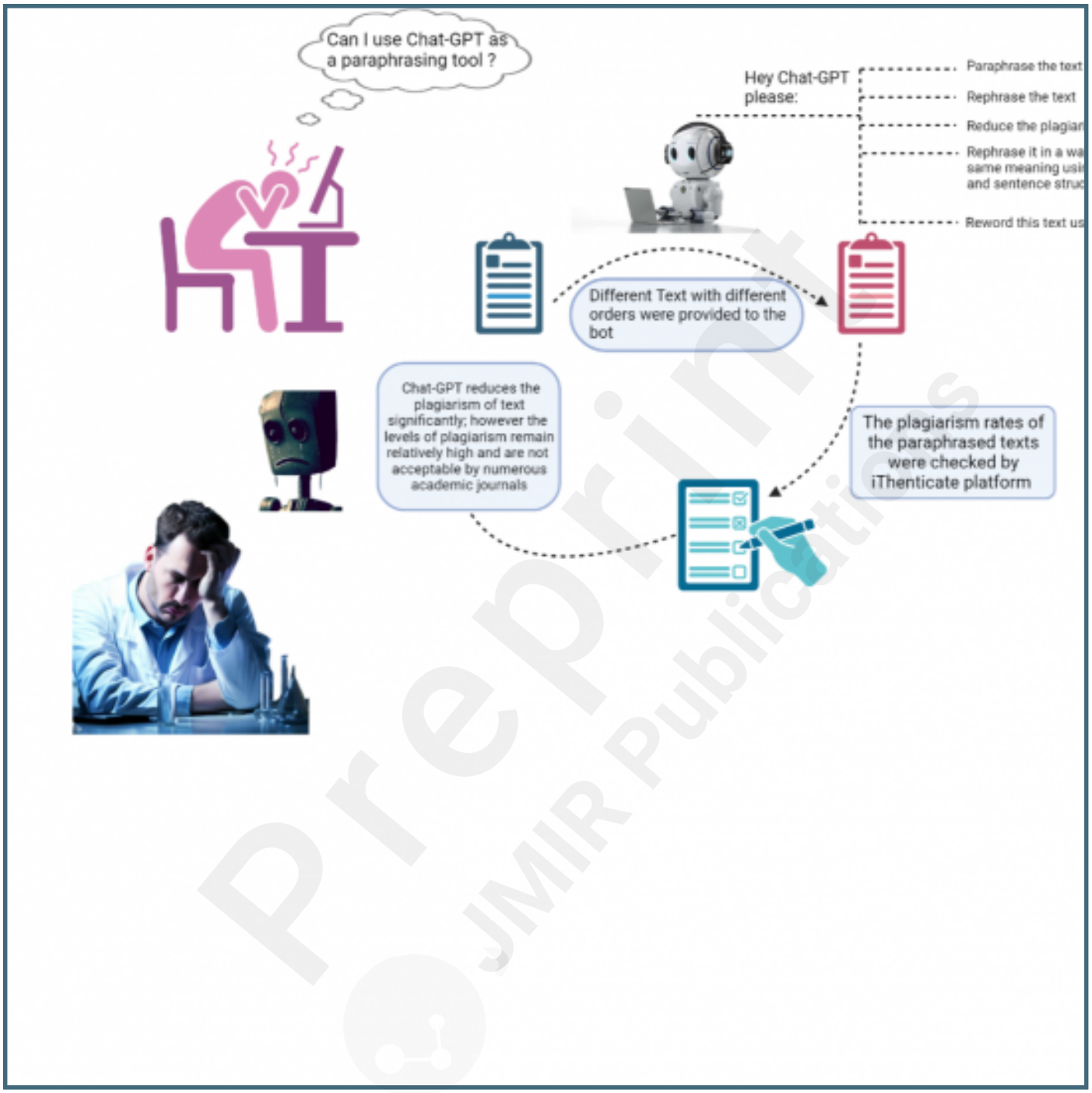
1. Zimba O, Gasparyan A. Plagiarism detection and prevention: a primer for researchers. Reumatologia/Rheumatology. 2021;59(3):132-7.
2. Helgesson G, Eriksson S. Plagiarism in research. Medicine, Health Care and Philosophy. 2015;18:91-101.
3. Resnik DB, Dinse GE. Scientific retractions and corrections related to misconduct findings. Journal of medical ethics. 2013;39(1):46-50.
4. Chaddah P. Not all plagiarism requires a retraction. Nature. 2014;511(7508):127-.
5. Heitman E, Litewka S, editors. International perspectives on plagiarism and considerations for teaching international trainees. Urologic Oncology: Seminars and Original Investigations; 2011: Elsevier.
6. Agrawal R. Plagiarism. Indian Journal of Pathology and Microbiology. 2020;63(2):175.
7. Masic I, Begic E, Dobraca A, editors. Plagiarism detection by online solutions. ICIMTH; 2017.
8. Gupta A, Hathwar D, Vijayakumar A. Introduction to AI chatbots. International Journal of Engineering Research and Technology. 2020;9(7):255-8.
9. Kirmani AR. Artificial intelligence-enabled science poetry. ACS Energy Letters. 2022;8(1):574-6.
10. Dave T, Athaluri SA, Singh S. ChatGPT in medicine: an overview of its applications, advantages, limitations, future prospects, and ethical considerations. Frontiers in Artificial Intelligence. 2023;6:1169595.
11. Biswas S. ChatGPT and the future of medical writing. Radiological Society of North America; 2023. p. e223312.
12. Athaluri SA, Manthena SV, Kesapragada VKM, Yarlagadda V, Dave T, Duddumpudi RTS. Exploring the boundaries of reality: investigating the phenomenon of artificial intelligence hallucination in scientific writing through ChatGPT references. Cureus. 2023;15(4).
13. Amini-Salehi E, Hassanipour S, Joukar F, Daryagasht AA, Khosousi M-J, Aleali MS, et al. Risk Factors of Non-alcoholic Fatty Liver Disease in the Iranian Adult Population: A Systematic Review and Meta-analysis. Hepatitis Monthly. 2023;23(1).
14. Habibzadeh F. The Acceptable Text Similarity Level in Manuscripts Submitted to Scientific Journals. J Korean Med Sci. 2023 Aug 7;38(31):e240. PMID: 37550808. doi: 10.3346/jkms.2023.38.e240.

15. Memon AR. Similarity and Plagiarism in Scholarly Journal Submissions: Bringing Clarity to the Concept for Authors, Reviewers and Editors. J Korean Med Sci. 2020 Jul 13;35(27):e217. PMID: 32657084. doi: 10.3346/jkms.2020.35.e217.
16. Memon AR, Mavrinac M. Knowledge, Attitudes, and Practices of Plagiarism as Reported by Participants Completing the AuthorAID MOOC on Research Writing. Sci Eng Ethics. 2020 Apr;26(2):1067-88. PMID: 32067186. doi: 10.1007/s11948-020-00198-1.
17. Mahian O, Treutwein M, Estellé P, Wongwises S, Wen D, Lorenzini G, et al. Measurement of similarity in academic contexts. Publications. 2017;5(3):18.
18. Peh WC, Arokiasamy J. Plagiarism: a joint statement from the Singapore Medical Journal and the Medical Journal of Malaysia. Med J Malaysia. 2008 Dec;63(5):354-5. PMID: 19803289.
19. Gordijn B, Have Ht. ChatGPT: evolution or revolution? Medicine, Health Care and Philosophy. 2023;26(1):1-2.
20. Dave T, Athaluri SA, Singh S. ChatGPT in medicine: an overview of its applications, advantages, limitations, future prospects, and ethical considerations. Front Artif Intell. 2023;6:1169595. PMID: 37215063. doi: 10.3389/frai.2023.1169595.
21. Else H. Abstracts written by ChatGPT fool scientists. Nature. 2023 Jan;613(7944):423. PMID: 36635510. doi: 10.1038/d41586-023-00056-7.
22. Homolak J. Opportunities and risks of ChatGPT in medicine, science, and academic publishing: a modern Promethean dilemma. Croat Med J. 2023 Feb 28;64(1):1-3. PMID: 36864812. doi: 10.3325/cmj.2023.64.1.
23. Ho WLJ, Koussayer B, Sujka J. ChatGPT: Friend or foe in medical writing? An example of how ChatGPT can be utilized in writing case reports. Surgery in Practice and Science. 2023 2023/09/01/;14:100185. doi: https://doi.org/10.1016/j.sipas.2023.100185.
24. Zhu L, Mou W, Yang T, Chen R. ChatGPT can pass the AHA exams: Open-ended questions outperform multiple-choice format. Resuscitation. 2023 Jul;188:109783. PMID: 37349064. doi: 10.1016/j.resuscitation.2023.109783.
25. Yang R, Marrese-Taylor E, Ke Y, Cheng L, Chen Q, Li I. Integrating UMLS Knowledge into Large Language Models for Medical Question Answering. arXiv e-prints. 2023:arXiv: 2310.02778.

Supplementary Files

Figures

Graphical abstract.



The correlation between word count of the texts and their corresponding plagiarism.