

COFFEE



LECTURE

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The Risks of Using ChatGPT to Co-Write Your Scientific Paper



Dr Sampoorna Rappaz
Research Support Services
Medical Library

Thursday
27.04.2023
13:00, Zoom

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ChatGPT is a conversational-AI tool

- **ChatGPT** stands for **Chatbot Generative Pretrained Transformer**
- Released by OpenAI in November 2022
- What's gone into it?
 - “Black box” algorithms and unknown training data
 - Data set limited to September 2021: **Not up to date**
 - Open access text: **articles behind paywalls?**
- How do you use it? **Prompt engineering**
 - Your inputs, feedback, comments are extremely valuable to OpenAI (& Microsoft)
- What does it produce?
 - Generic, coherent, grammatical text
 - “Hallucinations”



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Is your data secure?

No!

Any information you share is no longer confidential

ChatGPT



How we collect data

-  Conversations may be reviewed by our AI trainers to improve our systems.
-  Please don't share any sensitive information in your conversations.

[Back](#) [Next](#)

ChatGPT

This is a free research preview.

-  Our goal is to get external feedback in order to improve our systems and make them safer.
-  While we have safeguards in place, the system may occasionally generate incorrect or misleading information and produce offensive or biased content. It is not intended to give advice.

[Next](#)



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Using GPT-4 (ChatGPT Plus) for scientific writing

GPT-4 is OpenAI's most advanced system, producing safer and more useful responses

[Try on ChatGPT Plus ↗](#) [Join API waitlist](#)


“[GPT-4 is] 40% more likely to produce factual responses than GPT-3.5 on our internal evaluations”



Can ChatGPT be used for literature search?

Model: GPT-4

SA You are a medical information specialist. Use reliable sources of medical information to summarise the use of cannabis in managing side effects related to chemotherapy.

 Cannabis, also known as marijuana, has been increasingly recognized for its potential in managing side effects related to chemotherapy. The active compounds in cannabis, called cannabinoids, include delta-9-tetrahydrocannabinol (THC) and cannabidiol (CBD). Both THC and CBD have shown promise in alleviating symptoms associated with chemotherapy, such as nausea, vomiting, and pain.

1. Nausea and vomiting: Chemotherapy-induced nausea and vomiting (CINV) is a common and distressing side effect of cancer treatment. The American Society of Clinical Oncology (ASCO) and the National Comprehensive Cancer Network (NCCN) recommend the use of cannabinoids, such as dronabinol (synthetic THC) and nabilone (a synthetic cannabinoid), as an alternative or additional option to standard antiemetic drugs for patients who do not respond well to conventional medications (ASCO, 2017; NCCN, 2021).
2. Pain management: Cancer-related pain can be difficult to manage, especially in patients with advanced cancer or those who have developed a tolerance to opioids. Some studies have shown that cannabis and cannabinoids can help alleviate cancer-related pain by working on the body's endocannabinoid system. A systematic review published in the Journal of Pain and Symptom Management (2017) found that cannabis-based medicines may be effective in reducing chronic cancer pain compared to placebo.

3. Appetite stimulation: Chemotherapy can lead to a decreased appetite and weight loss in cancer patients. Dronabinol and nabilone, both synthetic cannabinoids, have been approved by the US Food and Drug Administration (FDA) for the treatment of anorexia and weight loss in patients with AIDS. While not specifically approved for cancer patients, these medications may also help stimulate appetite in those undergoing chemotherapy.
4. Anxiety and sleep: Some patients undergoing chemotherapy may experience anxiety and sleep disturbances. CBD, a non-psychoactive cannabinoid, has been shown to have anxiolytic and sleep-enhancing properties in some studies, potentially benefiting patients who struggle with these symptoms during treatment.

It is essential to consult a healthcare professional before using cannabis for managing chemotherapy side effects, as there can be contraindications. Additionally, cannabis products are not standardized, and the quality and potency can vary greatly. Patients should only use cannabis products obtained from a reliable source and under the guidance of a healthcare provider.

Speculation

No reference

No reference



Can ChatGPT be used for literature search?

SA Provide references for the works cited in the generated summary

Here are the references for the works cited in the generated summary:

1. American Society of Clinical Oncology (ASCO). (2017). Antiemetics: ASCO Clinical Practice Guideline Update. Journal of Clinical Oncology, 35(28), 3240-3261. <https://ascopubs.org/doi/full/10.1200/JCO.2017.74.4789>
2. National Comprehensive Cancer Network (NCCN). (2021). NCCN Clinical Practice Guidelines in Oncology: Antiemesis. Version 1.2021. https://www.nccn.org/professionals/physician_gls/pdf/antiemesis.pdf
3. Whiting, P. F., Wolff, R. F., Deshpande, S., Di Nisio, M., Duffy, S., Hernandez, A. V., ... & Kleijnen, J. (2015). Cannabinoids for medical use: A systematic review and meta-analysis. JAMA, 313(24), 2456-2473. <https://jamanetwork.com/journals/jama/article-abstract/2338251>
4. Fallon, M. T., Albert Lux, E., McQuade, R., Rossetti, S., Sanchez, R., & Sun, W. (2017). Sativex oromucosal spray as adjunctive therapy in advanced cancer patients with chronic pain unalleviated by optimized opioid therapy: two double-blind, randomized, placebo-controlled phase 3 studies. British Journal of Pain, 11(3), 119-133. <https://journals.sagepub.com/doi/full/10.1177/2049463717710042>

Please note that some of the information provided in the summary may have come from a synthesis of multiple sources or the general knowledge in the field.

- Misinterpreted the treatment guidelines (refs #1 and #2)
- Refs #3 and #4 not cited in the summary
- Refs #3 and #4 contradict summary
- Citation in text “hallucinated”
- US-centric sources listed
- Recent evidence does not support summary



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Can ChatGPT be used for literature search?

No!

- Text contains factual errors
- Sources not up to date
- Not efficient

Advice:

- Interact with your literature: understand the discourse and context, evaluate the knowledge gap, develop arguments
 - Essential for writing the narrative sections of the paper
 - Networking and communicating as academics (think beyond publishing)



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Can ChatGPT be used to revise a draft?

Introduction section



nutrients



Review

Composition of Gut Microbiota in Children with Autism Spectrum Disorder: A Systematic Review and Meta-Analysis

Lucía Iglesias-Vázquez ¹, Georgette Van Ginkel Riba ², Victoria Arija ¹ and Josefa Canals ^{2,*}

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Received: 25 February 2020; Accepted: 16 March 2020; Published: 17 March 2020



Problems with the Introduction

- Problems at the section level:
 - What's the focus of the paper? ASD? GI problems? Gut microbiota imbalance?
- Problems at the paragraph level:
 - No topic sentences
 - 1 paragraph with 3 topics that need to be dealt with separately
 - Haphazard organization
- Problems at the sentence level:
 - Difficult to follow due to bad structure



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Can ChatGPT be used to revise a draft?

Introduction section

Prompt: You are an expert scientific writer and editor. I give you the Introduction section of a scientific paper. You will copyedit it and rewrite it according to the AMA Style Guide. Make it concise, clear, grammatically correct, readable, logical, and suitable for the Introduction section of a scientific article. Here's the text for you to rewrite:

SA You are an expert scientific writer and editor. I give you the Introduction section of a scientific paper. You will copyedit it and rewrite it according to the AMA Style Guide. Make it concise, clear, grammatically correct, readable, logical, and suitable for the Introduction section of a scientific article. Here's the text for you to rewrite:

Autism spectrum disorder (ASD) is a chronic neurodevelopmental disorder of early onset and heterogeneous etiology [1]. The prevalence of ASD has been steadily increasing in recent years, which may to some extent be due to greater awareness of the disease on the part of health and education professionals, the increased availability of diagnoses, and changes in diagnostic criteria. However, the recently identified interaction between some environmental factors and ASD also helps us to understand this increase in prevalence [2,3]. Estimates report a prevalence of ASD of between 0.6% and 1.7% in children and adolescents, representing a serious public health problem. It has also been observed that males are up to 4 times more likely than females to be diagnosed with ASD [4–6].

According to the Diagnostic and Statistical Manual of Mental Disorders (5th ed.; DSM-5) [7], affected individuals have persistent deficiencies in social communication and interaction and are characterized by restrictive and repetitive behavior patterns, interests, or activities. In addition to these main symptoms, people with ASD tend to suffer from comorbidities such as intellectual disability, gastrointestinal (GI) problems, and eating and sleeping disorders [8–10]. Regarding the GI problems (i.e., constipation, abdominal pain, diarrhea, gas, and vomiting), prevalence of these ranges from 9% to 90% in people with ASD, which is a much higher rate than in neurotypical individuals [9]. Some studies have even observed an association between the GI symptoms and the severity of the clinical manifestations of the ASD, which means that the autistic symptomatology would be more frequent and severe in children with comorbid GI problems than in those without [9,11,12]. As far as the concept of the "gut–brain microbiota axis" is concerned, current scientific advances postulate that the gut microbiota plays a role in brain development and function through the endocrine, immune, and nervous systems [13]. Therefore alterations in the gut microbiota could trigger not only some of the GI symptoms that autistic children suffer from but also some of their neuropsychiatric symptoms [13,14]. In an attempt to clarify the role of gut microbiota in the appearance and development of ASD, some clinical studies have observed that autistic subjects, as opposed to neurotypical subjects, suffer from dysbiosis regarding both the type and abundance of gut bacteria [15–19]. No differences in the bacterial profile were found in other case–control studies including ASD and neurotypical siblings [20,21]. Despite its controversial results, a previous meta-analysis [22] suggested there was an association between ASD and alterations in microbiota composition, thereby highlighting the need for additional cohort studies aimed at evaluating this association. On the basis of these findings, a more thorough evaluation of the intestinal microbiota would be expected to help individualize microbiological interventions, and this could serve as a complementary treatment for ASD. Indeed, some clinical trials and animal studies have reported changes in neurological function, behavior, and comorbid symptoms of autistic children after rebalancing the composition of the gut microbiota through the use of antibiotics, prebiotics, and probiotics or the transplanting of fecal microbiota [22–25].

Given that the previous meta-analysis [22] was out-of-date at the time of publication and included a limited number of studies, the aim of the present systematic review and meta-analysis is to update current findings about the composition of gut microbiota in children and adolescents with ASD. The differences between the gut microbiota of children with ASD and their neurotypical counter parts are also studied. In view of the emergence of new therapies based on the modulation of gut microbiota, characterizing the individual gut bacterial profile could help improve nutritional interventions and provide a better quality of life for subjects with ASD.

Introduction



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Can ChatGPT be used to revise a draft?

Introduction section



Autism spectrum disorder (ASD) is a complex neurodevelopmental disorder with early onset and diverse etiology[1]. The prevalence of ASD has steadily risen, potentially due to increased awareness, diagnostic accessibility, and evolving criteria. Recent research has also linked environmental factors to ASD, helping explain this surge in prevalence[2,3]. ASD affects 0.6%-1.7% of children and adolescents, constituting a significant public health issue, with males up to 4 times more likely to be diagnosed than females[4-6].

The Diagnostic and Statistical Manual of Mental Disorders (5th ed.; DSM-5)[7] identifies persistent deficits in social communication and interaction, along with restrictive, repetitive behavior patterns, interests, or activities in affected individuals. ASD is also associated with comorbidities such as intellectual disability, gastrointestinal (GI) issues, and eating and sleeping disorders[8-10]. GI symptoms, including constipation, abdominal pain, diarrhea, gas, and vomiting, are more prevalent in people with ASD (9%-90%) compared to neurotypical individuals[9]. Studies suggest a correlation between GI symptoms and ASD severity[9,11,12].

Current research posits that the gut microbiota influences brain development and function via the endocrine, immune, and nervous systems, forming the "gut-brain microbiota axis" [13]. Alterations in gut microbiota could contribute to both GI and neuropsychiatric symptoms in autistic children[13,14]. Some clinical studies have found dysbiosis in the type and abundance of gut bacteria in autistic subjects compared to neurotypical controls[15-19], while others have not[20,21]. A previous meta-analysis[22] indicated an association between ASD and microbiota composition, emphasizing the need for further cohort studies.

Evaluating intestinal microbiota may inform personalized microbiological interventions as complementary treatments for ASD. Some clinical trials and animal studies have reported improvements in neurological function, behavior, and comorbid symptoms after modulating gut microbiota composition using antibiotics, prebiotics, probiotics, or fecal microbiota transplantation[22-25].

This systematic review and meta-analysis aims to update current knowledge on gut microbiota composition in children and adolescents with ASD and compare it to neurotypical peers. By characterizing individual gut bacterial profiles, we may enhance nutritional interventions and improve quality of life for those with ASD.



Can ChatGPT be used to revise a draft?

Introduction section

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ChatGPT Plus version is still difficult to read

Readability influencer	Original	ChatGPT Plus
Overall readability	Poor	Poor
Words	612	350
Sentences	19	16
Paragraphs	3	5
Adverbs	1	2
Use of passive voice	6	1
Complex phrases	7	1
Hard-to-read sentences	1	1
Very hard-to-read sentences	17	13

95%

88%

Data from Hemingway Editor. Available at <https://hemingwayapp.com/>



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Introduction section

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ChatGPT Plus version is not better prose

Characteristic	Original	ChatGPT Plus	Outcome
Be-verbs	3% 😊	1% 😊	Little better
Zombie nouns	7% 😞	9% 🤡	Bad made worse
Prepositions	17% 😐	13% 😊	Better
Ad-words (adverbs, adjectives)	7% 😊	10% 😞	Good made bad
It, this, that, there	2% 😊	1% 😊	Similar

Data from Writer's Diet Test. Available at <https://writersdiet.com/writing-test/>



compared to neurotypical individuals[9]. Studies suggest a correlation between GI symptoms and ASD severity[9,11,12].

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Can ChatGPT be used to revise a draft?

Yes, but mostly no

- ChatGPT is good for cosmetic changes, but barely
- It cannot automatically address the bigger issues:
 - Focused point of view: message of the paper, setting up the context
 - Logical organization and internal structure of paragraphs
 - Consistent, concrete, and inclusive terminology
- First-time writers will first need to be trained in scientific writing to be able to judge the quality of the output
- Experienced writers will need to learn how to coach ChatGPT
- Meticulous editing will still be required



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Can ChatGPT be listed as an author?

No!

- **ChatGPT cannot fulfill all the International Committee of Medical Journal Editors (ICMJE) authorship criteria**
- **World Association of Medical Editors (WAME)** recommendations: Authors must take full responsibility for all the content (provenance, attribution, accuracy, completeness)
- **Committee on Publication Ethics (COPE)** position statement: AI tools are non-legal entities; they cannot attest to a conflict of interest, cannot understand copyright or licensing
- **Journal-specific guidelines:**
 - **Science:** Text from generative-AI CANNOT be used. Other outputs only with permission from editors.
 - **Springer-Nature:** Include details in the Methods section or suitable alternative section
 - **Taylor & Francis:** AI tools must be acknowledged and documented
 - **Elsevier:** AI tools should only be used to improve readability and language; their use should be disclosed in the manuscript
 - **JAMA Network:** Include a description of the content that was created or edited and the name of the language model or tool, version and extension numbers, and manufacturer, in the Acknowledgements or Methods section (as appropriate)



u^b Have a 'disclosure mindset'



- **Authors should specify:**

1. **who used the system,**
2. **the time and date of the use,**
3. **the prompt(s) used to generate the text,**
4. **the sections(s) containing the text; and/or**
5. **ideas in the paper resulting from NLP use**

- Submit generated text as supplementary material
- Include disclosure statement, eg in Methods

“In writing this manuscript, S.R. used OpenAI Chatbot [*GPT mode*] on 27th of March 2023 at 1:21pm CEST. The following prompt was used to write the Introduction: ‘Write a 300-word piece about the use of cannabis in managing side effects of chemotherapy.’ The generated text was copied verbatim and is submitted as supplementary material.”

AI-detection software available and under development



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Remember...

Informed User • Intelligent User • Cautious User

- As an author, you are responsible and accountable for EVERYTHING
 - ChatGPT makes up stuff, even GPT-4
 - Fact-checking takes a lot of time
 - Content is shallow (no insight, original interpretation)
 - Human (expert) editing is still needed
 - Take careful notes and disclose use when publishing
- Writing is hard but the best way to learn your subject
- You are sharing information with an opaque, for-profit company

Microsoft lays off an ethical AI team as it doubles down on OpenAI

Rebecca Bellan @rebeccabellan / 2:26 AM GMT+1 • March 14, 2023

 Comment



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Resource: authorship guidelines

- ICMJE authorship criteria: <https://www.icmje.org/recommendations/browse/roles-and-responsibilities/defining-the-role-of-authors-and-contributors.html>
- WAME recommendations: <https://wame.org/page3.php?id=106>
- COPE position statement: <https://publicationethics.org/cope-position-statements/ai-author>
- Journal-specific guidelines
 - Science: <https://www.science.org/content/page/science-journals-editorial-policies>
 - Springer-Nature: <https://www.nature.com/nature/for-authors/initial-submission>
 - Taylor & Francis: <https://newsroom.taylorandfrancisgroup.com/taylor-francis-clarifies-the-responsible-use-of-ai-tools-in-academic-content-creation/>
 - Elsevier: <https://www.elsevier.com/about/policies/publishing-ethics>
 - Search for “AI tools FAQs” on Elsevier’s website, <https://www.elsevier.com/>
 - JAMA Network: Updates reported in an editorial, <https://jamanetwork.com/journals/jama/fullarticle/2801170>



Thanks



**for your
attention**

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Slides and Screencast

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Questions & Discussion

Please get in touch

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