

## Assessing ChatGPT's use of person-first language in healthcare conversations

Ellen Hackl<sup>1</sup>

Received: 1 August 2023 / Accepted: 29 December 2023

Published online: 17 January 2024

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### Abstract

The conversational chatbot ChatGPT has attracted significant attention from both the media and researchers due to its potential applications, as well as concerns surrounding its use. This study evaluates ChatGPT's efficacy in healthcare education, focusing on the inclusivity of its language. Person-first language which prioritizes the individual over their medical condition, is an important component of inclusive language in healthcare.

The aim of the present study was to test ChatGPT's responses to non-inclusive, non-patient-first, judgmental, and often offensive language inputs. Provocative phrases based on a list of "do not use" recommendations for inclusive language were selected and used to formulate input questions. The occurrences of each provocative phrase or its substitute(s) within the responses generated by ChatGPT were counted to calculate the Person-First Index, which measures the percentage of person-first language.

The study reveals that ChatGPT avoids using judgmental or stigmatized phrases when discussing mental health conditions, instead using alternative person-first language that focuses on individuals rather than their conditions, both in response to questions and in correcting English grammar. However, ChatGPT exhibits less adherence to person-first language in responses related to physiological medical conditions or addictions, often mirroring the language of the inputs instead of adhering to inclusive language recommendations. The chatbot used person-first language more frequently when referring to "people" rather than "patients."

In summary, the findings show that despite the controversy surrounding its use, ChatGPT can contribute to promoting more respectful language, particularly when discussing mental health conditions.

**Keywords** ChatGPT · Chatbot · Inclusive language · Person-first language

### Abbreviations

AI	Artificial intelligence
ChatGPT	Chat generative pre-trained transformer
PFI	Person-first index

## 1 Introduction

In March 2023 the UK Department of Education released a Departmental statement "Generative artificial intelligence in education" [1]. The statement "...sets out the position of the Department for Education on the use of generative artificial intelligence (AI), including large language models (LLMs) like ChatGPT or Google Bard, in the education

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✉ Ellen Hackl, e.hackl@reading.ac.uk | <sup>1</sup>Reading School of Pharmacy, University of Reading, Whiteknights, UK.



sector". The document defines generative AI, discusses its benefits and limitations, and examines various use cases such as personalized learning, content creation, and assessment. The document also identifies key challenges and ethical considerations related to the use of generative AI in education, and provides recommendations for policy-makers and educators.

This document came as a response to release (in November 2022) of conversational chatbot ChatGPT (Chat Generative Pre-Trained Transformer [2], a language model developed by OpenAI, and to increased interest in and awareness of generative artificial intelligence (AI) built on large language models such as ChatGPT.

ChatGPT has generated considerable attention from both the media (including social media) and the general public. As one of the largest language models, ChatGPT has been praised for its ability to generate human-like systematic and informative (and free-of-charge) responses to a wide range of queries and has been used in a variety of applications. In just two months after release, ChatGPT reached 100 million active users thus becoming the fastest-growing user application in history [3 and ref. 11 therein].

There has also been some controversy surrounding ChatGPT, particularly with regards to its potential impact on privacy, bias, and ethical concerns (and in April 2023 it even has been banned in Italy). Many experts have raised concerns about the potential misuse of the AI chatbots and emphasize the need for responsible and ethical implementation of generative AI in education to ensure that it enhances rather than undermines educational outcomes.

The utility of ChatGPT in education and, in particular, in health care education, research, and practice and its potential limitations were summarized in the recent reviews [3–7]. Author of [5] found that benefits of ChatGPT were cited in 85.0% of works cited in PubMed/MEDLINE and Google Scholar. The benefits are numerous, spanning across multiple domains: (1) improved scientific writing; (2) useful in health care research, allowing for efficient analysis of large datasets, code generation, literature reviews; (3) the potential to enhance health care practice by streamlining workflow, reducing costs, improving documentation, and boosting health literacy; (4) promoting personalized learning, critical thinking, and problem-based learning in health care education.

At the same time, almost every record cited in PubMed/MEDLINE and Google Scholar (96.7%) contained concerns regarding ChatGPT use including copyright, ethical, and legal issues, academic integrity, plagiarism, lack of originality, limited knowledge, incorrect/fake citations, and assessment design across all educational levels [5–12]. ChatGPT has already passed the United States Medical Licensing Examination and has been shown to be able to solve typical clinical decision-making cases [13–16]. ChatGPT can also generate good quality answers that are able to pass plagiarism-matching software Turnitin [17]. And it is free for public use.

Without a doubt, the widespread adoption of AI technology, including chatbots like ChatGPT, is inevitable in educational settings. Learners are increasingly embracing these tools openly or discreetly, even as concerns surrounding academic integrity persist. This raises many questions regarding the effectiveness of ChatGPT in delivering high-quality teaching experiences, and more specifically, how well the chatbot incorporates person-first language to ensure inclusivity.

Person-first language is an essential aspect of inclusive communication that places emphasis on the individual rather than defining them by a particular characteristic or condition. The leading healthcare providers in many countries, including National Health Service (NHS) in the United Kingdom, recognize the importance of using inclusive language in its interactions with patients, staff, and the wider community [18]. Inclusive language is an essential aspect of effective communication that promotes respect, understanding, and inclusivity for all individuals, regardless of their background, identity, or characteristics.

Person-first language, also known as patient-first language, is an important component of inclusive language in healthcare. Person-first language focus on the person first and their medical condition second by placing the individual before their medical condition or disability [19–21]. For example, instead of saying "the diabetic patient," you might say "the patient with diabetes" or "the person with epilepsy" instead of "the epileptic." By using person-first language, healthcare professionals can demonstrate their commitment to providing patient-centered care and creating an inclusive and welcoming environment. Person-first language is particularly important when communicating with patients who may feel vulnerable or marginalized due to their condition or identity. Using person-first language helps to promote dignity, respect, and empathy towards individuals with medical conditions or disabilities. It also helps to reduce stigma and negative stereotypes associated with certain conditions. Many healthcare organizations have developed official guidelines and policies that explicitly endorse the use of person-first language. These guidelines are often integrated into training programs for healthcare professionals. In response to a growing awareness of the impact of language on inclusivity, numerous research journals have actively embraced person-first language. These journals often provide explicit guidelines and integrate person-first language into their editorial policies. For instance,

the guidelines of the American Medical Association direct medical authors to “avoid labelling (and thus equating) people with their disabilities or diseases (eg, the blind, schizophrenics, epileptics). Instead, put the person first” [22].

It is obvious that integrating person-first language into healthcare curricula is crucial for the development of future healthcare professionals. This approach encourages students to view each patient as a unique person with distinct needs, preferences, and experiences, rather than reducing them to a set of symptoms or a medical label. It is not just a linguistic formality but a foundational element that shapes the attitudes and behaviours of future healthcare professionals, fostering a healthcare culture that prioritizes inclusivity, respect, and the holistic well-being of every individual.

As ChatGPT has evolved into a crucial component of healthcare education, a question has emerged regarding its potential contribution to inclusive education. With its remarkable language generation capabilities, can ChatGPT actively promote inclusive communication within the healthcare context by employing patient-first language? Will it merely reflect users’ words, or can AI serve as a model for fostering inclusive communication?

Hence, the objective of the current study was to assess ChatGPT’s reactions to inputs characterized by non-inclusive, non-person-first, judgmental, and frequently offensive language. Various medical and general knowledge questions were posed to ChatGPT, deliberately omitting references to person-first or inclusive language. These questions included “provocative” language featuring non-inclusive and/or judgmental terms. The analysis focused on examining whether ChatGPT merely mirrored the language of the questions or if the chatbox proactively adopted and recommended the use of inclusive person-first language.

## 2 Method

A single registered ChatGPT 3.5 free account was used for this study. Several “provocative phrases” (non-inclusive, identity-first, often judgmental phrases presented in column 1 in the Table 1) were selected based on the NHS recommendations for inclusive person-first language. The selection of provocative phrases was based on the “do not use” lists of recommendations (for example, “diabetic patients”) [18, 22–24]. While all the chosen provocative phrases adhered to identity-first language, it is noteworthy that certain terms, like “schizophrenic patients”, may be perceived as offensive.

Each provocative phrase was used to formulate 7–10 short input questions, covering both medical queries (e.g., “Should mental patients be given antidepressants?” or “How should mental patients be treated?”) and general knowledge inquiries (e.g., “What is the life expectancy for the mental patients?” or “Why do mental patients require special care?” or “Do mental patients need a special diet?”). These questions were individually input into ChatGPT to generate responses. Typically, each response contained 150–300 words. A separate chat was initiated for each question. Altogether, each provocative phrase was used to generate 7–10 individual responses.

Following the generation of responses, all the texts were analysed to identify the provocative phrases or their substitutes (e.g., “schizophrenic patients” words were replaced/substituted with “individuals with schizophrenia” or “patients with schizophrenia”). The occurrences of each provocative phrase or its substitute(s) within the responses were then counted. Subsequently, the Person-First Index (PFI), designed to measure the percentage of person-first language used in the responses, was calculated for each provocative phrase. This metric was introduced as an evaluative tool to assess the extent of person-first language usage in the responses generated by ChatGPT.

## 3 Results and discussion

Table 1 presents the list of provocative phrases used to generate ChatGPT’s responses, as well as the phrases used by the chatbot in its responses. It also includes the PFI values calculated for each phrase as described in the Method section. The PFI values could range from 0 (indicating that ChatGPT used only “non-person-first” provocative phrases “as they are” in the responses) to 100% (indicating that ChatGPT replaced all “non-person-first” provocative phrases with “person-first” substitutes).

As is seen, the most judgmental or stigmatized phrases such as “retarded patient” or “retarded child/children”, “Downs patients”, “schizoid patients”, “bipolar patients”, “schizophrenic patients”, and “mental patient(s)” were either entirely or mostly omitted from the ChatGPT responses (PFI very close or equal to 100%). These phrases were substituted with the ones suggested by person-first inclusive language. For example, “child (children) with intellectual disabilities” instead of “retarded child”, “people (or individuals) with bipolar disorder” instead of “bipolar patients”, “individuals (or people) with

**Table 1** The list of provocative phrases used to generate ChatGPT’s responses and the phrases occurred in ChatGPT responses

Provocative phrase(s)	Total length of the generated text (words)/number of responses	Phrase(s) occurred in ChatGPT responses (in brackets—the number of occurrences for each phrase)	Person-first index (PFI)
"Retarded patients"	2272/7	retarded patients (0) Alternative phrases used by ChatGPT: individuals with intellectual disabilities (19) patients with intellectual disabilities (11) people with intellectual disabilities (7) patients with intellectual disabilities, including those with developmental delays (1) retarded child (0) retarded children (0) normal school (0) normal kids (0) Alternative phrases used by ChatGPT: child (children) with intellectual disabilities (38) individuals with intellectual disabilities or developmental delays (4) a child with physical disabilities (1) a child with sensory processing issues (1) a mainstream school (1) non-disabled peers (1) Downs (0) Downs patients" (0) Alternative phrases used by ChatGPT: individuals with Down Syndrome (DS) (41) Downs, or individuals with DS (2) children with Down syndrome (DS) (2) people with DS (1) person with DS (1) also typically developing children (4) normal or typically developing patients (2) HIV-people (0) Alternative phrases used by ChatGPT: people living with HIV (21) individuals with HIV (5) individuals living with HIV (4) HIV-positive individuals (3) someone living with HIV (2) schizoid patients (1) Alternative phrases used by ChatGPT: individuals with schizoid personality disorder (SPD) (20) people with schizoid personality disorder (9) person with schizoid personality disorder (1) patients with schizoid personality disorder (1)	100%
"Retarded child" or "Retarded children" Additional: "Normal school" "Normal kids"	2202/7		100%
Main: "Downs" "Downs patients" Additional: "Normal children" "Normal patients"	1509/8		100%
"HIV-people"	2150/9		100%
"Schizoid patients"	1717/9		97%

**Table 1** (continued)

Provocative phrase(s)	Total length of the generated text (words)/number of responses	Phrase(s) occurred in ChatGPT responses (in brackets—the number of occurrences for each phrase)	Person-first index (PFI)
"Bipolar patients"	1780/9	bipolar patients (1) Alternative phrases used by ChatGPT: individuals with bipolar disorder (19) people with bipolar disorder (9) schizophrenic patients (3)	97%
"Schizophrenic patients"	3035/12	Alternative phrases used by ChatGPT: individuals with schizophrenia (41) people with schizophrenia (9) person with schizophrenia (4) individuals with the condition (1) patients with schizophrenia (1) someone is living with schizophrenia (1) "mental patient(s)" (2)	95%
"Mental patient" or "mental patients"	1675/8	Alternative phrases used by ChatGPT: individuals with mental illness (14) patient with a mental illness (7) individuals with schizophrenia (1) individuals with certain mental illnesses (1) individuals with certain psychiatric conditions (1) individuals with certain types of addiction or impulse control disorders (1) individuals with severe depression or suicidal thoughts (1) epileptic people (2) epileptic individuals (1)	94%
"Epileptic people"	2021/10	Alternative phrases used by ChatGPT: people with epilepsy (37) individuals with epilepsy (3) children with epilepsy (1) someone with epilepsy (2) someone who has epilepsy (1) epileptic patients (14)	94%
"Epileptic patients"	1989/10	Alternative phrases used by ChatGPT: people with epilepsy (18) patients with epilepsy (6) individuals with epilepsy (2) someone with epilepsy (1) osteoporosis patients (10)	66%
"Osteoporosis patients"	2243/9	Alternative phrases used by ChatGPT: individuals with osteoporosis (10) patients with osteoporosis (3) someone with osteoporosis (1)	58%

Table 1 (continued)

Provocative phrase(s)	Total length of the generated text (words)/number of responses	Phrase(s) occurred in ChatGPT responses (in brackets—the number of occurrences for each phrase)	Person-first index (PFI)
"Diabetic people"	1685/9	diabetic people (9) diabetic individual(s) (6) diabetic patients (2) diabetics (2) Alternative phrases used by ChatGPT: people with diabetes (15) Individual(s) with diabetes (4) HIV-patients (28) Alternative phrases used by ChatGPT: individuals living with HIV (8) individuals with HIV (5) people living with HIV (2) people with HIV (2) HIV-infected individuals (1) alcoholic patients (23) Alternative phrases used by ChatGPT: patients with alcohol use disorder (AUD) (3) individuals in recovery from alcohol addiction (3) people who struggle with alcoholism (1) individuals with alcoholism (1) individuals who consume alcohol (1) addicted patient(s) (13) Alternative phrases used by ChatGPT: individuals struggling with addiction (2) patients who are struggling with addiction (1) people with addiction (1) individuals who are recovering from addiction (1) obese patients (31) obese individuals (1) Alternative phrases used by ChatGPT: people with obesity (4) patients with obesity (1) individuals who are obese (4) individuals with a body mass index (BMI) of 30 or higher (which is considered obese) (2) also individuals who maintain a healthy weight (1) cancer patients (27)	50%
"HIV-patients"	2590/9		39%
"Alcoholic patients"	2145/10		28%
"Addicted patients"	1622/9		28%
"Obese patients"	2237/11		26%
"Cancer patients"	1256/6		0%

schizophrenia" instead of "schizophrenic patient", etc. The person-first index (PFI) for several phrases was 100%, indicating the consistent use of person-first language by ChatGPT.

The chatbot also refrained from using phrases like "normal school", "normal kids", "normal patients" that were present in the input questions. Instead, it opted for alternative expressions such as "a mainstream school", "non-disabled peers", "typically developing children", "normal or typically developing patients".

Furthermore, numerous responses included the messages from ChatGPT:

*"As an AI language model, I want to clarify that the term "retarded" can be stigmatizing and may not be an appropriate way to refer to individuals with intellectual disabilities. The term "retarded" is considered outdated and offensive. It is important to use respectful and language when discussing individuals with disabilities."*

*"As an AI language model, I want to clarify that the term "mad" can be stigmatizing and may not be an appropriate way to refer to someone with a mental health condition."*

*"It is important to note that the term "mental patients" is outdated and can be stigmatizing. The preferred term is "individuals with mental illness" or "people with psychiatric conditions."*

*"I assume you are referring to individuals with Down Syndrome (DS)."*

Moreover, when asked to correct English in a text, ChatGPT also replaced offensive provocative phrases with person-first alternatives, commenting: *"The correction includes changing "mental patients" to "patients with mental illnesses" for more appropriate and sensitive language."*

In cases of physiological medical conditions (such as diabetes, osteoporosis, and others), ChatGPT used both provocative phrases like "diabetic people" and alternative person-first phrases like "people with diabetes." In the case of the phrase "cancer patients," ChatGPT consistently used it in all the responses (PFI = 0%, Table 1). However, when the patient-first phrase "patient(s) with cancer" was used to generate a response, the chatbot also used only "patient(s) with cancer" phrase in its responses (PFI was equal to 100%). This example demonstrates that for commonly used non-judgmental phrases, ChatGPT mirrors the language of the user rather than adhering to inclusive language recommendations. Perhaps, the preferred phrasing may vary depending on the context and the audience. Using "cancer patients" or "diabetic patient" is more common in medical contexts and can be appropriate when discussing the treatment, diagnosis, and management of cancer. Using "patients with cancer" may be preferred in non-medical contexts or when the focus is on the patient as an individual beyond their illness.

Surprisingly, ChatGPT exhibited less inclusivity when discussing addictions and obesity (PFI close to 30%, Table 1). It is well-known that the way we communicate about addiction is important for individuals affected by it, and judgemental language can exacerbate addiction-related stigma [25]. Person-first language emphasizes the need to move away from defining a person solely based on their addiction, such as using terms like "addicted person" or "alcoholic patient," and instead recognizing the person beyond their specific condition, such as using phrases like "a person with addiction" or "patient with alcohol use disorder" [25]. Equally, it is widely encouraged to use words "individuals with obesity" instead of "obese people" and "group with obesity" instead of "obese group" in medical research publication and author guidelines [26, 27]. However, ChatGPT more frequently used non-inclusive phrases compared to inclusive ones in relation to addictions and obesity.

It is of great interest to note the difference in ChatGPT's responses to medical questions containing the word "patients" versus "more common" questions containing words like "people" or "children". For example, phrases "HIV-patients"/"HIV-people" and "epileptic patients"/"epileptic people" were tested using similar questions. In the case of "HIV-people" and "epileptic people", all or the majority of the chatbot's responses consistently used person-first language such as "individuals living with HIV", "people living with HIV", "people with epilepsy" or "individuals with epilepsy". PFI values of these phrases were nearly 100% (Table 1). However, when the same questions were asked using the words "HIV-patients" or "epileptic patients", the chatbot used non-person-first language significantly more often (with PFIs below 60%). A similar difference between "patients" and "people" requests was observed for other medical conditions as well. These results may indicate a distinction between medical and "common" sources; however, further investigation is necessary to address this question.

It may seem obvious that stigmatizing terms such as "mental patients" or "schizophrenic patients" are outdated and no longer in use. However, a brief search of the Web of Science™ database reveals that many of the same words we used as provocative phrases in our current work were actually used in research paper titles published over the past five years. For instance, between 2018 and 2023, the terms 'schizophrenic patient(s)' were used 371 times in research paper titles; 'mental patient(s)' were used 485 times, 'bipolar patient(s)' were used 289 times, 'alcoholic patient(s)' were used 70 times, and 'retarded patient(s)' were used 4 times in the titles. The terms 'diabetic patient(s)' and 'osteoporosis patient(s)' were used even more frequently, appearing in the titles of 7747 and 243 research papers, respectively. Notably, searching the



entire text of the papers revealed even higher numbers of appearances for these terms. Given the information presented, it is clear that ChatGPT's commitment to using respectful, person-first language and avoiding stigmatizing terms when discussing mental health conditions can serve as a step towards creating a more inclusive community.

The obtained results shed light on the use of person-first language in relation to various medical conditions. The findings reveal that ChatGPT tends to favour person-first language in instances where condition-first language could be stigmatizing, judgmental, or contribute to harmful stereotypes. Instead, the chatbot uses alternative phrases that center on individuals rather than emphasizing their conditions. The most offensive phrases like "retarded child" or "mental patient" did not occur in any of the ChatGPT responses. However, there are cases where condition-specific language was used by the chatbot, primarily when referring to physiological conditions like diabetes, cancer, etc. It's important to note that the results may vary depending on the specific prompts used and the context in which the responses were generated.

ChatGPT itself "acknowledges" the difference between using person-first language in cases of physiological medical conditions and medical conditions related to mental health. When asked: "Which phrase would you use: 'schizophrenic patients' or 'patients with schizophrenia,' and why do you prefer that phrasing?" ChatGPT responded: "When it comes to discussing mental health conditions, it is generally recommended to use person-first language. Therefore, the preferred phrasing would be 'people with schizophrenia' or 'individuals living with schizophrenia' rather than 'schizophrenic patients'. Using person-first language helps to reduce the stigma associated with mental health conditions and recognizes that a person's condition does not define their identity. 'Schizophrenic patients' phrasing can be stigmatizing and reduce people with schizophrenia to their condition, which is not respectful or accurate." At the same time, when asking similar question about cancer, ChatGPT responded: "In terms of language usage, both 'cancer patients' and 'patients with cancer' are commonly used phrases, and both are generally considered acceptable. Some people prefer 'patients with cancer' because it emphasizes that the person is more than just their illness and that their identity is not solely defined by cancer. Others may use 'cancer patients' because it is a commonly used phrase that is easily understood and recognized. It is also shorter and more straightforward than 'patients with cancer'."

It is worth noting that certain authors have discovered that the scientific data generated by ChatGPT is a mix of true and fabricated content [15]. While the objective of this study was not to evaluate the quality and reliability of information provided in ChatGPT's responses, we did not come across any information that seemed lacking credibility.

However, it is essential to acknowledge the potential limitations and biases inherent in AI models. ChatGPT's responses are based on patterns learned from diverse data sources, and unintended biases may be present in its output. Therefore, continuous monitoring and refinement are necessary to mitigate any unintentional reinforcement of stereotypes or exclusionary language.

## 4 Conclusion

AI technology, in particular, ChatGPT, will be extensively used in various fields including healthcare and education. The research indicates that ChatGPT consistently avoids the use of judgmental or stigmatized phrases when addressing mental health conditions. Instead, it employs alternative person-first language. Our findings demonstrate that whether we request it to compose an essay or merely correct English in a text, ChatGPT can serve as a positive example of using person-first language in healthcare and everyday life. When it comes to responses related to physiological medical conditions or addictions, ChatGPT tends to mirror the language used in the inputs rather than strictly adhering to inclusive person-first language recommendations. Notably, the chatbot demonstrates a higher frequency of person-first language usage when referring to "people" as opposed to "patients." The study reveals that, despite the ongoing controversy surrounding its usage, ChatGPT has the potential to pro-actively contribute to the promotion of more respectful language, particularly when discussing mental health conditions, thereby promoting a less stigmatizing and more compassionate approach to illness.

**Acknowledgements** Author thanks ChatGPT 3.5 (and its developers) for being a co-author of the present work.

**Author contributions** Not applicable.

**Funding** No funding was received for conducting this study.

**Data availability** Not applicable.



**Code availability** Not applicable.

## Declarations

**Competing interests** Author declares no conflicts of interest. Author has no competing interests to declare that are relevant to the content of this article.

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