



APPLICATIONS OF CHATGPT IN ORAL HEALTHCARE: A CURRENT AND BRIEF OVERVIEW

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ABSTRACT

ChatGPT is an open-AI model, a third version of Generative pretraining transformer (GPT) which was launched in November 2022 based on Reinforcement Learning from Human Feedback. Since its advent, its use in various aspects of daily activities such as healthcare, research, education, etc. are in the area under research. ChatGPT is a fast-growing application due to its wide variety of usage, however, has a lot of concerns regarding regulatory, ethical, and privacy issues. Since the data has been taken from large amounts of human-generated text/information, its accuracy has also been a point of concern. The current article provides an overview of the possible use and concerns of ChatGPT in oral health care.

KEYWORDS : ChatGPT, Public and preventive health care, diagnostic sciences, forensics**1. INTRODUCTION**

ChatGPT is a large open-AI language model (LLM) [1] using supervised learning as well as reinforced learning [2, 3] that generates human-like text responses to the users in the form of a text conversation.

In 2015, the researchers from Stanford and Berkeley described the diffusion algorithm that has an ability to be used for text-to-image analysis. [4] The first Chatbot was released by Microsoft, named as, "Tay Chatbot" in 2016, however, it was quickly become offline. [4] ChatGPT3 was first released in a small group of users in June 2020, however, in Nov. 2022, it was released for the public. [4]

With the advent of the third model, a new GPT4 has also been launched which has the ability to learn from Images and medical notes. GPT-4 was trained on available information that was available on the internet, and when it was given test questions from the United States Medical Licensure Examination (USMLE), it answers correctly more than 90% of the time. [5] ChatGPT has a lot of promising futures in education, healthcare, research, and other fields, however, it is biased internet information is a crucial concern. The current article focuses on the use of such great technology in oral healthcare.

2. Potential applications in preventive and public healthcare

In the aspect of preventive and public healthcare, ChatGPT has a promising role in awareness and educating the community about maintaining good oral health. [6,7] In community health, it can cause awareness among the population about public health issues, promote the strategies for disease prevention, and dissipate information regarding public health services and the community programs that can reduce the risk factors of diseases in the community, in the early screening and diagnosis. [8]

In Healthcare, it acts like a digital twin. A digital twin is a digital representation of a system or an object that mimics its behavior and features, especially its performance. [9] When this is used in conjunction with the healthcare facilities, with the trained personnel, it can improve the healthcare outcomes by decreasing the medical risk errors and optimizing the

patient care pathway. [9] Nonetheless, due to its real-time support its use in remote patient monitoring and telemedicine is at par. [9]

3. Potential applications in Research

Chat GPT has a lot of potential in the research. One of the major advantages is in creating a population-based database of varied ethnicity, genetic, and lifestyle models where it can be further used in any research trial. However, the data generated from ChatGPT is not ethical but plagiarized. [10] Since research includes solving a scientific question, it needs a human mind in creating an original null hypothesis, aim, methodology, interpret results, create a discussion and make conclusions.

4. Potential applications in Oral and Maxillofacial Surgery

Balel Y in 2023 [11] conducted a study to evaluate the use of information generated by ChatGPT in oral and maxillofacial surgery for patients and on the technical aspect by covering topics on Implants, impacted teeth, TMJ, and Orthognathic surgeries. The answers were compared with a group of 33 surgeons who participated in the study. They found no significant difference between the two. This study highlights that the use of such a tool is beneficial, however, also emphasizes, that it can be a supplemental tool in adjunct with the trained personnel. More Research and wider group research, and topics are needed to prove the role of this technology in Oral and Maxillofacial Surgery.

5. Probable Implications in Forensics and Diagnostic Sciences

With the advent of ChatGPT4 which has the ability to learn from images, it appears to have a lot of potential in the field of Diagnostic Sciences and forensics. This technology may have the ability to provide the differential diagnosis, and possibly final diagnosis with the help of medical records, and other clinical findings, however, its accuracy is an issue, as it may miss any key finding. With the image recognition ability, it may identify the pathologies on the radiographic images, clinical images, and pathological slides at an early stage which can be a great adjunct in improving the healthcare of the patient under a trained professional, however, this can be a new area of research.

Since ChatGPT4 has the ability to recognize images, it may become a tool for forensic anthropology and identifying anatomical structures and their growth, and size based on the age, gender, and ethnicity of a population, making it a great tool in forensics, however, again the accuracy of this tool will be questionable when used by untrained personnel.

4. DISCUSSION

ChatGPT, in the recent times has been widely researched and has become a promising means in an area of research, education, healthcare and various other fields of science and technology. [12] This revolution can be designated as a paradigm shift in these aforementioned areas. [13]

The biggest advantage of ChatGPT is its increase in healthcare education, and practices among public health by increasing knowledge among the patients. The biggest limitation was its reduced accuracy and unreliable information. It also highlights the issues such as ethical concerns, copyright issues/plagiarism, along with legal and regulatory issues. The strength of this system lies when used in association with proper health care trained professionals and not by bypassing expert professional advice. The ChatGPT has an ability to streamline the clinical workflow that can be cost effective and has an ability to increase the efficiency in health care delivery. [2, 14, 15]

Larger researches are required to weigh the usage and impact of LLMs to foster the growth of the oral health care settings, academia, and research and before its adoption in the real-world setting. [16, 17]

5. CONCLUSIONS

The ChatGPT has the potential to reform the healthcare system, however, its unsupervised application and risk of infodemics may prove to be more harmful than beneficial. There is a requirement for constructive regulatory mechanisms for its usage for the most positive impact on the health care system, however, a complete dependency on this system is questionable.

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