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Review Article

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The Application of ChatGPT in Medical Education: Opportunities and Challenges: A Scoping Review

Borhan Badali[1,2*] and Mohammad Jabraily[3]

[1]*Student Research Committee, Tabriz University of Medical Sciences, Iran*

[2]*Department of Health Information Technology, School of Management and Medical Informatics, Tabriz University of Medical Sciences, Iran*

[3]*Associate Professor of Health Information Management, Health Information Technology Department, School of Allied Medical Sciences, Urmia University of Medical Sciences, Iran*

[*]Corresponding Author
Borhan Badali, PhD Student of Health Information Management, School of Management and Medical Informatics, Tabriz University of Medical Sciences, Iran.

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Abstract

ChatGPT is a large language model that has gained significant attention due to its impressive performance on a variety of tasks. ChatGPT can assist medical students in learning and preparing for exams. ChatGPT has the potential to assist with clinical decision-making. ChatGPT can help us in healthcare education, research and practice. In medical education ChatGPT benefits are improving personalized learning, improve clinical reasoning, enhancing basic and diagnostic skills through step by step instructions, providing interactive educational content, providing explanations of the complex subjects and so many other benefits. The adoption of ChatGPT in medical and health science can have promising prospects. The integration of ChatGPT as an example of AI-based LLMs in healthcare education can offer several advantages, however it is essential to consider the possible Limitations associated with this innovative technology.

Keywords: ChatGPT, Artificial Intelligence, Education, Healthcare, Medical Science, Digital Health

1. Introduction

Since ChatGPT was first made publicly available in November 2022, a lot of people have tried it and been amazed by its capabilities [1]. It's safe to say that ChatGPT has created quite a buzz. ChatGPT is a large language model developed by OpenAI. It is a variant of GPT model and is trained on a huge dataset of text to generate human-like responses in natural language understanding and tasks. It can be used well for various tasks such as question answering, language translation, and text summarization [2]. AI has been involved in medicine since as early as the 1950s, when physicians made the first attempts to improve their diagnoses using computer-aided programs [3]. The utilization of ChatGPT in healthcare systems is crucial and imperative due to its ability to enhance precision and accuracy while reducing the time required for various aspects of the system [4]. The potential applications of ChatGPT in the medical field range from identifying potential research topics to assisting professionals in clinical and laboratory diagnosis [5]. ChatGPT is gradually changing medical practice. There are several ChatGPT applications in medicine that can be used in a variety of medical fields, such as clinical, diagnostic, rehabilitative, surgical, and predictive practices. Another critical area of medicine where ChatGPT is making an impact is clinical decision-making and disease diagnosis. ChatGPT technologies can ingest, analysis, and report large volumes of data across different modalities to detect disease and guide clinical decisions. However, its applications in medical education have received limited exploration despite its vast potential. Given the substantial amount of information and concepts that medical students need to grasp, this area is interesting and worthy of exploration [6]. This paper conducted a scoping review of existing literature discussing ChatGPT in the context of medical education, extracts key points regarding the Opportunities and Challenges of ChatGPT in medical education.

2. Method

A literature review was conducted on three bibliographic databases, including PubMed, Web of science, and Google scholar, which were investigated from 2022 through 2025. This review was

performed using a combination of terms, including ChatGPT, Artificial intelligence, education, healthcare, medical science, digital health. The papers which studied ChatGPT interventions and were in the English language were included in the review. In total, 150 articles were extracted from the three databases. First, 102 articles were removed due to duplication. Then, the titles and abstracts of the articles were evaluated and screened according to the inclusion and exclusion criteria. Finally, 10 articles were included for the final review. Figure1 shows a process of selecting articles according to the Preferred Reporting Items for Systematic Reviews and Meta- Analyses (PRISMA) flow diagram.

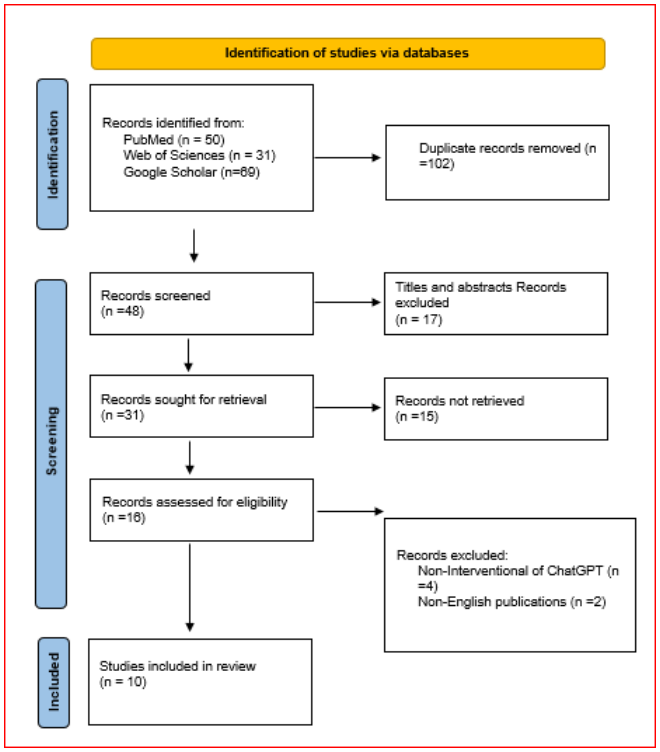

Figure: Flow Diagram of Selecting Studies for the Review

3. Result

3.1. ChatGPT's Role in Medical Education

Although ChatGPT has raised concerns about plagiarism and cheating, it can still be used in various ways to improve the quality of education. Medical education is evolving with the advancement of technology, and artificial intelligence like ChatGPT can play several useful roles.

1. Automatic Scoring: ChatGPT can be used effectively to assess student assignments and analyze sentence structure, vocabulary, grammar, and clarity of the essay. This feature is especially useful for professors who are often overwhelmed by the enormous workload that comes with grading a large number of assignments [7].

2. Teaching Aid: Another use of ChatGPT is its ability to generate exercises, quizzes, and scenarios that can be used in the classroom to aid practice and assessment. Its ability to provide translation, explanation, and summarization can also be used to help students understand complex material [8].

3. Private Learning: ChatGPT can be used to create teaching assistants or Q&A bots that can answer students' questions and also provide feedback on their work. Personal study plans and teaching materials can also be tailored to students' different learning styles and abilities, a task that can be difficult for professors to implement for individual students in a classroom setting [9].

4. Research Assistance: ChatGPT can also be used to assist students in their research by answering questions and providing text summaries. Medical research can be made easier with ChatGPT's ability to assist with text review and data analysis. It can also help medical researchers effectively search the vast amount of information available on the Internet by summarizing relevant articles and identifying key findings [10].

5. Quick Access to Information: ChatGPT can be used to provide accurate and up-to-date information on medical topics. This can include a variety of topics from diseases and their treatments to medical processes and techniques. This capability can be useful for medical students and professionals who need quick access to information or explanations on a topic [11].

6. Create Case Scenarios: ChatGPT can be used to create case studies and scenarios to help practice and improve medical students' diagnostic and treatment planning abilities. This not only helps students develop their clinical reasoning skills, but also prepares them for real-world clinical scenarios [12].

7. Language Translation: ChatGPT's ability to effectively translate language can be used by medical professionals and

educators to help communicate with patients of different languages and nationalities in order to provide the best medical care [13].

3.2. Role of ChatGPT in Clinical Management

ChatGPT can be used in a clinical setting to more easily manage patient data. This can be done in several ways.

1. Documentation: It can be used to help produce clinical notes, summaries, and other documents, which helps save time and reduce the risk of human error.

2. Decision Support: Although the final medical decision should always be made by a healthcare professional, ChatGPT may be used to help provide support and treatment suggestions based on the patient's symptoms and medical history.

3. Communication with Patients: It may be used to generate automated responses to any question's patients may have regarding appointment scheduling as well as medication management [14].

4. Conclusion

ChatGPT may be used as an auxiliary tool in medical education, research and clinical management. However, it cannot be considered as a replacement for human ability and knowledge, as it still faces the limitations that artificial intelligence has. However, we are witnessing a quantum leap in information technology, machine learning and artificial intelligence. At this rate, our approach to medical education and clinical management will transform within a few days. These changes should be viewed with an open mind and accepted so that they can be used well to improve medical education and clinical management.

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