ORIGINAL ARTICLE

EXPLORING PERSPECTIVES OF MEDICAL FACULTY AND UNDERGRADUATE MEDICAL STUDENTS ON CHATGPT IN MEDICAL EDUCATION

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ABSTRACT

Background: Considering the fast pace at which AI technologies are developing, there is a great deal to explore in the potential use of ChatGPT and other AI-based tools in medical education. Research on the perspectives and experiences of educators and students using ChatGPT is, however, limited, particularly in Pakistan.

Objectives: To determine whether teachers and students at UCMD university college of Medicine and Dentistry were aware of the potential advantages, perceived drawbacks, issues, and limitations of using ChatGPT in medical education.

Methods: Focused group discussions with medical faculty and students who had varied levels of ChatGPT experience took place as part of a qualitative exploratory study. The main themes and subthemes that emerged from the discussions were identified using a thematic analysis.

Results: Participants highlighted the importance of chatGPT and confirmed that they completely understood its features. The main areas that were investigated in this study were ChatGPT perception and comprehension in which efficient data gathering and summarization, prompt query responses and time savings were acknowledged advantages. The main causes of limits were the likely lack of critical thinking in the presented facts, the ambiguity of the references, the accessibility constraints, the reliance on Chat GPT's output, and the ethical considerations.

Conclusion: This study presents significant understanding regarding the perceptions of medical educators and students employing ChatGPT in the context of medical education. While the advantages of Chat GPT were acknowledged, participants also raised issues and limitations that need more research in order to be successfully included into medical education.

Keyword: ChatGPT, Medical Education, Medical faculty, educational technology, Artificial Intelligence

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INTRODUCTION

Artificial intelligence (AI) is a computer-based technology that was developed as a form of technology to mimic and expand human intelligence and abilities. The widespread usage of AI technology has significantly shifted the healthcare sector towards more effective patient management. As an example, the incorporation of AI in screening approaches, as well as the creation of machine-based procedures such as robotic surgery, have effectively enhanced diagnostic accuracy and treatment while reducing the workload of healthcare professionals.[1-3]

All of these changes in medical practice, as well as hundreds, if not thousands, of potential applications of AI in medical practice, must be supported by adaptations in educational and training programs. The introduction of AI technology in medical education and research would not only benefit patients' treatment but may also improve, if not revolutionize, the medical education system.[4,5] Recently[6-9], educators and academics have been interested in AI's swift involvement in medical education.

ChatGPT, an artificial language model developed by OpenAI that uses processing of natural language to deliver human-like responses to questions, is one of the leading and popular AI-based tools.[10] ChatGPT has the ability to enhance medical education by giving students a simpler and more effective way to acquire knowledge. According to a recent study, 76.7% of respondents believed ChatGPT might have a beneficial impact on the future of healthcare systems.[11] However, little is known regarding the opinions and experiences of professors and ChatGPT students/trainees in the context of Pakistani medical education.

This qualitative study aims to look into the knowledge foundation of new AI chatbots, such as ChatGPT, used in medical education. This research can provide valuable insights into the creation of successful approaches for integrating AI-based tools into medical education in Pakistan and similar medical education systems in the most efficient way by gaining a better understanding of the potential advantages and limitations of ChatGPT.

METHODS

This study was carried out using a focus group technique at the University College of Medicine and Dentistry. Faculty and students from different levels were involved in the study. Purposive sampling was used to choose participants from the College of Medicine. Six medical faculty members (two assistant professors, two associate professors and two professors) and six medical students (one-second year, two third year, two fourth year, and one final year) with varied levels of expertise using ChatGPT were included in the sample. In April 2023, two focus group conversations were held on the Zoom platform, one with faculty members and the other with students, with each group consisting of six individuals.

The focus group discussion took place entirely in English. Each discussion lasted about an hour and was moderated by two of the authors. The discussions were audio-recorded and transcribed word for word to ensure accuracy.

The following issues were taken into account: participants' knowledge of the recently launched ChatGPT, its applications, enablers, and barriers to its implementation into medical education. Probes and additional queries were permitted based on the responses of the participants. After the second interview, the themes had been saturated. Thematic analysis was carried out to analyze the data, which included preconceived issues as well as to allow new themes to develop from the data. The transcripts were analyzed several times to look for patterns and themes in the data. Based on the research questions, a coding system was created and applied to the data using NVivo 12 software (15). The research team selected and refined themes through a series of iterations of coding, examining, and discussing the data until a consensus

was reached. Ethical approval was obtained from the Ethical Review Board from The University College of Medicine and Dentistry.

All participants gave verbal informed consent prior to their participation in the study for recording. Participants were told of the study's objective, the voluntary nature of their participation, and their choice to withdraw at any time. To preserve the participants' identities, anonymous identities were utilized.

RESULTS

The study included six medical faculty members and six medical students with varying levels of familiarity using ChatGPT. The data from the debate was analyzed, and key themes emerged. The theme framework of participants' perceptions of the use of ChatGPT in general and in medical education is depicted in Figure 1.

All participants showed an in-depth knowledge of the concept and purpose of ChatGPT. They all agreed on its fundamental role, with one explaining that ChatGPT engages in similar to human's dialogues and compiles information from multiple sources. One student compared ChatGPT to an "assistant," while another emphasized its importance in successfully executing user input (F1). Furthermore, one participant mentioned that ChatGPT is a precise information database that provides accuracy depending on search queries (S1).

ChatGPT's information sources were discussed with respect to traditional search engines. While the majority of participants were satisfied with the sources, two faculty members also disagreed upon this. One faculty member thought 'ChatGPT was similar to other databases like Google (F2), 'while another believed it distinguished itself from other available data engines(F3).

Figure 1: Thematic framework for the participants' opinions regarding using ChatGPT
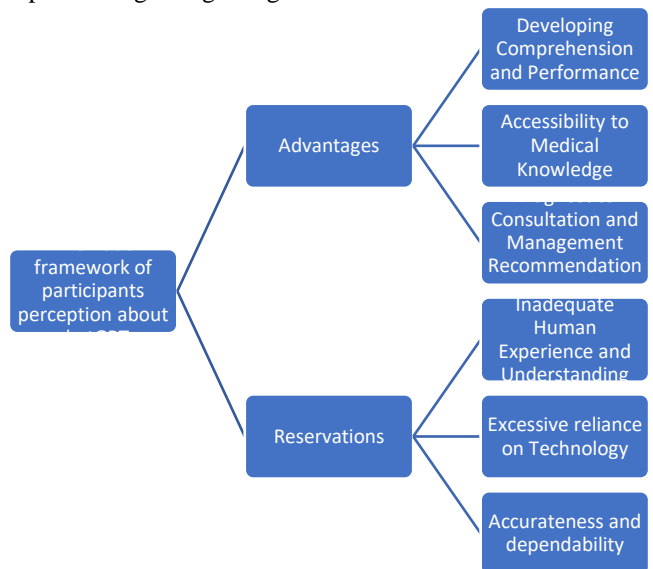
Two themes were emerged from the discussion

Advantages of ChatGPT in Medical Education

Sub-theme 1.1: Accessibility to Medical Knowledge
Most faculty participants believed that searching for information through ChatGPT is more beneficial.

One student said that 'Language models offer students access to an extensive repository of medical information, which can aid in comprehending intricate concepts and case studies' (S4). Another faculty member added that 'ChatGPT's ability to process and synthesize complex medical literature enhances the quality and scope of learning materials'(F4).

Sub-theme 1.2: Developing Comprehension and Performance
One member from faculty added that 'the adaptive nature of ChatGPT enables students to grasp complex medical concepts in a more comprehensible manner (F5). In addition, 'Through interactive discussions and explanations, the model assists in breaking down intricate topics, catering to different learning styles and paces' (F6, S2).

Sub-theme 1.3: Diagnostics Consultation and Management Recommendations
Students were aware of the AI support in clinical sciences and added in a point that 'Language models can function as virtual mentors, guiding students in diagnostic processes and proposing potential treatment options (F6). Student group mentioned that 'These nurtures critical thinking and decision-making skills among medical students, encouraging them to analyze and assess cases from multiple perspectives (S5).

Reservations Regarding the Use of ChatGPT in Medical Education.

Sub-theme 2.1: Accurateness and dependability
Faculty and students both were of the point that one of the primary concerns is the reliability and accuracy of information provided by ChatGPT. A senior faculty person said that 'without proper oversight and validation, the model might offer incorrect or outdated medical information, potentially leading to erroneous learning and practice (F3). Student also added here that reliability should be ensured and proper counter checking should be done at starting point (S3).

Sub-theme 2.2: Inadequate Human Experience and Understanding. One participant noted that 'The absence of human expertise and empathy in language models like ChatGPT can hinder the development of students' interpersonal and communication skills, which are crucial in the medical field' (F6) and student also mentioned these models might not fully understand the emotional or ethical nuances involved in patient interactions (S2).

Sub-theme 2.3: Excessive reliance on Technology
One student confirmed that 'an overreliance on language models could diminish our motivation to engage deeply with the subject matter'(S3). Another faculty member added here 'Relying solely on automated responses might discourage the development of independent research skills and critical thinking, both essential in medical education' (F2). One faculty member confirmed that ChatGPT could be used to recall facts but not for opinions and disputes. "If you use it (ChatGPT) just for recalling, no problem," she said. However, you should not utilize it to draw conclusions" (F3).

The majority of student participants did not use it to gather information. "I don't see it as a search engine," one youngster commented. I don't use it to look up medical information or anything else because I prefer traditional search engines" (S2).

"Because I know exactly where the trustworthy sources are." Then I may confidently accept the information" (S1).

After obtaining input from participants, we prompted them to use keywords to summarize the main benefits and drawbacks of using ChatGPT. We used a free online word cloud generator after correcting misspellings and converting plural phrases to singular versions (with the help of ChatGPT).
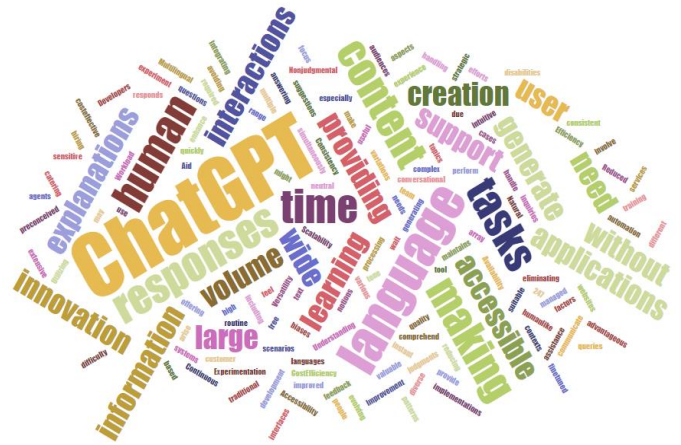

Fig 2A: With keyword, describe Advantages of ChatGPT in Medical Education

Fig 2B: With keywords, reservations regarding the use of ChatGPT in Medical Education

DISCUSSION

Participants viewed ChatGPT as an "assistant" or an incredibly accurate information tool. They had different opinions on how ChatGPT's information sources compared to Google. In study by Mbakwe AB in which authors compared both, experts judged ChatGPT answers generally trustworthy, but some were skeptical. Around 40% thought ChatGPT was superior to Google.[16]

Google searches billions of online pages, ranks them, and displays relevant links to users.[17] ChatGPT, on the other hand, delivers a single solution rapidly based on its search and training from multiple sites, up to late 2021.[18] Some participants in the study perceived ChatGPT and Google as comparable, while others saw ChatGPT as distinct. Its introduction prompted other search engines to develop similar chat systems.

Experts acknowledged that ChatGPT's comments were intelligent but sometimes incomplete or incorrect.

In another study by Pham ST and Sampson PM, Participants appreciated two key advantages of using ChatGPT for medical education. One was how it gathered and summarized information. This was faster than regular search engines. Another advantage was the ability to save time and effort. It could generate exam questions quickly or deliver quick answers. However, while it was beneficial, there were concerns about its limitations in medical education. People claimed it did not think deeply, create new ideas, or verify information. They emphasized the importance of human reasoning and checking in this field.[9,18]

Rahman in his study on AI approaches have mentioned that ChatGPT may be effective in some aspects of medical education, it is essential to be attentive when making decisions for oneself. In this study he also identified the following as potential issues: not being original, having incorrect information, or using unknown sources.[10] Feng s also stated that it is unclear how ChatGPT handles unfavorable stuff, incorrect details, or plagiarism.[19]

According to Abouammoh N, ChatGPT is beneficial for medical learning since it can assist with grading, teaching, research, and learning specifically for you.[20] Rahman also stated that it is beneficial since it personalizes learning and helps you think and solve difficulties.[10] Doctors in training agreed that AI was beneficial to their education, but they were concerned that it might impair their ability to judge patients and perform tasks with their hands.[7] Using ChatGPT in medical learning could help people learn faster, obtain knowledge more rapidly, and save time. However, additional research is needed to determine how AI tools improve medical learning and work. We should examine whether education improves, whether students and teachers are happy, and whether thinking skills improve. It is critical to continue investigating and testing so that tools like ChatGPT can be used effectively in medical learning while also addressing concerns and limitations.

Participants in our study also expressed concerns about ChatGPT, such as having no idea if the sources of information are reliable, not having access to certain critical medical websites or databases, and not entirely believing the information. To address these issues, ChatGPT should explicitly indicate where its information comes from, allow users to verify the accuracy of the information, and provide greater access to various resources. According to another study by Temsha, writers should be cautious when citing references from ChatGPT.[21] In addition, in a study by Koga S, some users also complained about ChatGPT's inability to access some medical websites or databases, making it less effective for medical education. To improve it, the individuals who create ChatGPT might help it leverage more sources and find information more effectively, making it a more useful tool.[22]

To further develop it, the people who design ChatGPT may assist it by employing more sources and obtaining information more effectively, making it a more trustworthy and useful tool.

People's belief in ChatGPT was influenced by what they already knew about the topic as well as their lack of comprehension of how ChatGPT gathers information. It is critical to remember to think carefully and not to believe everything ChatGPT says, especially when it comes to medical learning. Research by Temsha, discovered that ChatGPT sometimes delivered incorrect advice about aesthetic operations. In their study they checked and discovered that ChatGPT was only 50% accurate for general cosmetic surgery and 80% accurate for particular treatments like rhinoplasty and blepharoplasty.[21]

However, a recent analysis showed that ChatGPT could be quite beneficial in medical learning, science research, and medical writing[10]. Another study discovered concerns regarding ChatGPT providing correct antibiotic use guidance. ChatGPT sometimes got the timing of when you should use antibiotics right, but it also got it wrong on when to cease using them or did not mention it at all.[22]

Those involved in the study by Mohammed M, discussed how ChatGPT might be used to help create assessments, improve teaching at the patient's bedside, check exam concerns, and prevent cheating and copying. They stated that teachers should review and update the things ChatGPT creates and that schools should have policies in place to prevent students from misusing ChatGPT. This is significant since in previous research by Nipus MS, ChatGPT performed well on one test but not on others, such as a family medicine test.[23-24] As a result, we must be cautious about the questions it raises.

Participants in the study by Mohammed discussed how ChatGPT could assist students with writing, editing, locating information, and gathering resources for tasks. They advised pupils to double-check and modify ChatGPT's output to fit what is expected at school. Some people were concerned that students would use ChatGPT[24] to cheat on examinations and papers. However, one disadvantage of adopting ChatGPT in medical education is that it may reduce students' creativity and prevent them from thinking critically.

According to a study by Mongarran, ChatGPT can answer simple and more difficult inquiries about germs.[25] Similarly, participants involved in our study emphasized how important it is to be open to new things, such as AI chatbots like ChatGPT. They suggested that we consider how individuals from various backgrounds learn, ensure that the knowledge is correct, and adapt AI to the needs of students and teachers. Schools should aggressively integrate AI tools like ChatGPT in teaching to prepare for the future of medical school. This should include evaluating how well it works, improving it, and remaining focused on vital things like thinking clearly, communicating clearly, and understanding others.[26]

STRENGTHS

This study was effective since it interviewed teachers and students extensively regarding the usage of ChatGPT in medical education. They had important discussions where they spoke a lot and demonstrated several concepts for using ChatGPT in medical school. Certain individuals knew a lot about ChatGPT, while others were completely new to it. This gave us a better understanding of how various people think. The study identified major subjects and subtopics from the dialogues. This will help us learn more about tools like ChatGPT in medical school.

LIMITATIONS

However, there were a few limitations in the research that prevented it from being ideal. The study's sample size was small, with most participants coming from a single medical college. This means that what they said may not be applicable to all college. The study did not collect data to determine how ChatGPT improved learning, satisfaction, or other critical aspects of medical college. Along with what others stated, this could provide us with further critical information. Furthermore, the study solely polled teachers and pupils. They did not consult with other significant people, such as medical college administrators or rule makers. This could imply that we are overlooking key points of view. Another issue is that the study did not include what might happen in the future with ChatGPT. People's

opinions may alter with time. This can alter their perceptions of ChatGPT's positive and negative aspects.

More research in the future should include larger and diverse groups from different educational institutions. We can also conduct numerical experiments to see how ChatGPT influences medical learning in various ways. It is critical to ask leaders and others who establish rules what they believe. This will allow us to better understand how ChatGPT affects medical learning. We should also conduct studies to see how people's ideas and use of ChatGPT evolve over time. This manner, we can understand how it will benefit medical education in the end.

CONCLUSION

This study investigated what Pakistani teachers and students thought about using ChatGPT in medical education. They were largely familiar with ChatGPT and believed it could save time and acquire information. They were concerned, though, about whether the information it provides is accurate and whether users should exercise caution while using it.

They also discussed not knowing where the information came from and not having access to certain medical sources. This study demonstrates the importance of continuing to test and analyse AI tools like ChatGPT in medical learning and dealing with concerns.

Teachers and students ought to maintain reservations and not blindly rely on ChatGPT. As medical learning evolves, integrating AI like ChatGPT can help, but we must do it in a wise and ethical manner.

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