



## Exploring the Potential of Chatbots in Medical Education

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### Dear Editor,

Chatbots are automated conversational programs in artificial intelligence (AI). Not only do they have the potential to simulate conversation, but they also can perform complex tasks by interacting with humans. Therefore, they have been introduced as one of the most promising forms of human-machine interaction. Additionally, chatbots can provide a lot of information concisely anytime and anywhere. Due to these features, chatbots have the potential to be introduced as an innovative tool in medical education and provide a wide range of benefits to medical students (1, 2).

Based on studies conducted so far, one of the key roles of chatbots in medical education is the creation and development of case scenarios. These tools can create complex medical scenarios that enable clinical students to improve their critical thinking and clinical reasoning skills. For example, in a randomized controlled trial study that used a chatbot-based learning module, the results indicated that medical students' clinical reasoning skills improved (3).

In fact, by simulating scenarios, chatbots can provide a safe and low-risk environment to practice diagnosis and treatment skills. Medical students can interact with these tools via text or voice. During the interaction, chatbots, as a valuable learning tool, can provide immediate and timely feedback on medical students' Performance and highlight areas that need improvement. This feature allows students to improve their skills. Recent studies show that a virtual medical case based on a chatbot is as effective as a teacher at teaching high blood pressure to students (4).

Moreover, chatbots are useful tools for practicing communication skills, especially for younger students. Creating a safe environment allows students to gain

self-confidence before facing real patients.

One of the challenges of medical education in the new era is the explosion of information in the field of medical knowledge and the importance of updating the knowledge of medical professionals. One way to overcome this problem is by using chatbots. Using language processing and machine learning, these tools can provide quick access to the latest medical research. This feature can be especially useful for serious diseases such as cancer. It is hoped that these tools will pave the way for evidence-based medicine in the future.

Another benefit of chatbots is facilitating distance learning, which is important during pandemics and crises, including COVID-19. Medical students and teachers can access educational resources, including virtual cases, through online platforms equipped with chatbots. Also, some medical universities use chatbots to support medical students and personalize learning experiences.

Despite the potential benefits of chatbots in medical education, these tools are complementary to traditional methods of medical education and cannot replace human interaction and expertise. One of the limitations of using chatbots is the need for quality educational data. If the data is incomplete, it reduces the predictive power of these tools. Another important challenge is that they may be unable to replicate the complexity of real scenarios, limiting their usefulness. Since chatbots cannot understand the emotional aspect when dealing with patients, they cannot provide a real experience for medical students. However, chatbots can help respond in an empathetic manner.

In conclusion, chatbots have some limitations besides their important benefits in medical education. Paying attention to the advantages of chatbots, including the

possibility of personal, interactive, and comprehensive learning experiences for medical students and improving clinical reasoning skills, along with the limitations, can introduce them as a valuable tool in the perspective of medical education. Increasing teachers' and students' awareness of chatbots as an emerging technology concept can affect teachers' and students' willingness to use them in medical education.

#### Footnotes

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