REVIEW

Implications of using conversational robots (chatbots) in uro-oncology

A patient and physician perspective

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ABSTRACT

Chatbots, or conversational robots, have become a strategy or support tool for urologic patient care, diagnostic communication, and treatment. With regard to patients, studies have shown that chatbots can answer medical questions with similar percentages of acceptability as urologists. In addition, they can contribute to patient education, allowing them to ask questions that do not arise during medical consultation. They have also proven to be good tools for health promotion and disease prevention. These benefits can also serve doctors, as robots can support medical consultation and the reading of medical records, making patient care more efficient; however, there are several limitations, including the accuracy of bot-generated answers and the acceptability that urologists give to this type of tool.

INTRODUCTION

Artificial intelligence (AI) has changed how we acquire, analyze, and transmit information.[1] Currently, there are various forms of AI, but one of the most discussed, used, and promoted is the so-called chatbot or intelligent bot; this is defined as a set of programs that can hold a conversation with a person using a series of algorithms that allow the construction of complex answers through the introduction of data or specific questions.[2,3] By 2023, at least 100 million people worldwide will be using chatbots for a variety of purposes: entertainment, travel assistance, timely information retrieval, transcription, and education.[4,5] Several studies have even evaluated the effectiveness and benefits of implementing this type of program in education, customer service, and even in research.[6]

The application possibilities and benefits proposed by chatbots in medical consultation and as a support for with patients with questions about their disease are high. Ayers et al compared the answers from a chatbot with those offered by general practitioners to patients consulting about their disease. They found that 78.6% of patients preferred the chatbot response because they felt that the AI response had more empathy and quality, especially in patients with terminal diseases or poor prognoses.[7] Similar results have been identified in other studies, such as that of Goodman et al, where a group of general practitioners and recently graduated specialists evalu-

ated the answers generated by chatbots on medical knowledge, consultation, identification of clinical signs and symptoms, and found almost perfect answers, with scores of 5.5/6.0.[8] Chatbots have proven helpful in medical education as well, especially in prostate cancer patients. Allen et al demonstrated that using chatbots as information and communication channels in African American prostate cancer patients contributed significantly to their knowledge of their disease, improved their treatment decisions, and made them more responsive to their treating urologist.[9]

Chi et al found that the application of conversational AI systems has benefited physicians in the review of medical records, as it reduces the time it takes to do so by 18% and allows the identification of critical processes within the history much faster,[10] increasing the chances of a more effective diagnosis or treatment, a greater concentration of resources, and reduction of errors or omission of data that may occur in some cases, especially in patients who are unable to communicate.

Urologic cancers account for 13% of all cancer cases worldwide, with an estimated 2.6 million cases by 2022, surpassing breast cancer, for which incidence is 2.3 million cases.[11,12] Therefore, the workload is high for the health system and the multidisciplinary team of professionals who treat these conditions.

We aimed to review the benefits and limitations of applying conversational robots in uro-oncology consultation, focusing on medical, patient, and caregiver perspectives, well as some uro-oncology education.

USE OF CHATBOTS IN UROLOGY

Patient resource

Chatbots have proven to be an excellent tool to support patients, as they can be available 24 hours a day, help identify signs and symptoms, and understand precautions about medication.[13]

The main benefits of chatbots have been identified in the area of patient education; chatbots can contribute to the transmission of accurate medical information according to the questions that the patient asks. For example. Kobori et al demonstrated that chatbots can help patients to identify if they have signs and symptoms of a sexually transmitted disease, motivating them to visit their doctor in 97.7% of cases, thus becoming diagnostic support, especially in the younger population.[14]

Cancer education has been one of the areas in which the implementation of chatbots has had the most significant impact in urology, as it offers remote, easily accessible support. The bots can be programmed to answer questions about treatment, and surgical procedures, allowing patients to take control of their health and contribute positively to the discussions about their cancer.[15] Studies, such as the one by Allen et al, have shown that most (62%) patients find the application very good, stating that it significantly increased their general knowledge of their disease, clarified many doubts about the treatment they were receiving, increased by 86% the confidence and expertise with which they make decisions about their treatment, and allows them to have more constructive discussions with their urologist.[9]

Owens et al evaluated the usefulness of conversation simulation software in African American patients diagnosed with prostate cancer, finding that this type of application stimulates the confidence of patients to ask questions and make decisions by 67%.[16] The versatility and programming possibilities of these systems make their applications in the context of the management support of an oncologic patient very broad (Figure 1).[15]

Chatbots have also been shown to be helpful in other urologic problems, such as urolithiasis. Goldenthal et al demonstrated that the use of chatbots in patients who had undergone ureteroscopy made patients feel comfortable identifying non-urgent situations.[17] Kim et al evaluated the usefulness of conversational AI in women who frequently suffer from interstitial cystitis, finding that this type of application improves patients' self-efficacy, making them feel more confident in receiving information from their treating physician.[18]

Health promotion

Another benefit of chatbots is health promotion. Studies, such as that by Aggarwal et al, found that the programming of chatbots for the acquisition of healthy habits reduced smoking in 4.27% of participants in a short period, and also allowed greater adherence to medications due to its ability to answer patient questions around the clock.[19] Studies, such as that by Musheyev et al, found that conversational AI can accurately answer (in a range of 4/5) the typical questions asked by patients and families, becoming an alternative implementation to help combat the misinformation that can be found in conventional media.[20]

Support for doctors and medical trainees

For physicians chatbots can help identify critical elements in medical records, improving decision-making and contributing to improving efficiency and consultation time. Kim et al demonstrated that the use of

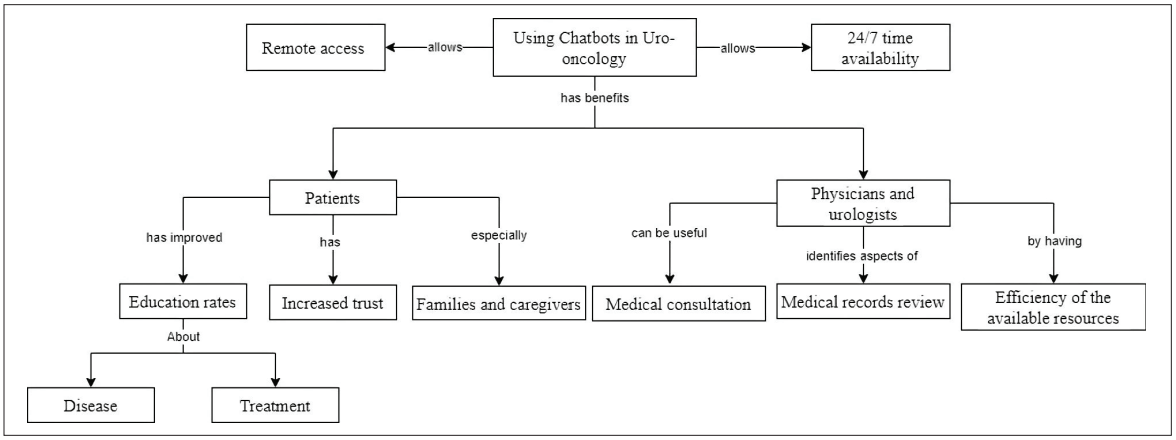

Figure 1. Mind map of the main aspects and benefits of chatbots in uro-oncology.

chatbots in medical consultations can streamline the diagnosis and medical interview process for ambulatory patients with urologic problems, improving the throughput rates of hospitals, clinics, and urology residents, and allowing for more accurate diagnosis in a shorter amount of time.[21] Reviewing the medical records of oncology patients represents one of the main challenges for treaters due to their complexity and length. Chi et al found that the application of chatbots as support for the review of medical records allows the identification of critical aspects of history faster, is more efficient, and reduces the review time by 18%.[10]

The degree of acceptability by doctors of this type of support tool is high and was most popular during the COVID-19 pandemic; a study by Linares et al found that 66% of doctors have a lot of enthusiasm and interest in the application of AI.[22] Chatbots have also impacted clinical research by supporting data analysis, identifying patterns, helping to characterize patients, and extracting data for research processes.[23]

Urological education

Education has been one of the areas most influenced by chatbots. Currently, the training and practice opportunities offered by AI are many, and the possibility of recreating practice scenarios that allow evaluation, study, and review for students is unlimited.[24] Particularly in surgical specialties, AI has become a training tool for residents. Gómez et al found that the use of AI in surgical training improves students' ability to make complex decisions and understand complex surgeries and improves results, efficiency, and performance.[25]

It is essential to clarify that chatbots are a support tool and not definitive elements in the training and education of urology students. The teacher-student or specialist-resident interaction is one of the primary keys to guaranteeing efficient academic training.[23]

Limitations of the use of chatbots urology

It is essential to mention that limitations and negative consequences have been found regarding implementing chatbots, particularly in uro-oncology. Zhang et al have shown that chatbots, or language models, have a high risk of answering some questions with ambiguity, bias, incomplete answers, or omitting information that may be relevant.[26] Furthermore, May et al have shown that different types of chatbots have different response accuracy, so it is essential to continuously supervises their implementation.[27]

Another element to consider is the low acceptability of the use of chatbots, such as ChatGPT, in urological practice. Eppler et al have shown that <47% of urologists use ChatGPT in their daily academic activities, and <20% use it for their clinical activities. More than half (62%) believe there are ethical limitations to using ChatGPT, especially as support in research.[28]

There are many discussions about the effects of using ChatGPT in education, including the possibility of a decrease in critical thinking or the development of surgical skills. Studies have shown that the use of simulation has a positive effect on students, and a study by Zawiah et al did not find significant differences in the skills of students who use ChatGPT and those who do not.[29]

For patients, it is essential to consider some limitations, such as accessibility and digital literacy. In 2019, 27% of U.S. inhabitants do not have access to quality

internet, and 20% do not have a smartphone, which would limit their possibility of accessing these types of tools to support their health.[30] The lack of connectivity represents an enormous challenge to implementation.

CONCLUSIONS

AI technology has become a strategy with both clinical and teaching applications. If used cautiously, it can be used as a resource for patients, to promote good health and joint clinical decision-making, and to support and educate healthcare professionals.

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