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Use of ChatGPT by medical students in their teaching - learning process

Uso de ChatGPT por estudiantes de medicina en su proceso de enseñanza - aprendizaje

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ABSTRACT

Introduction: today, medical education faces significant challenges, including the need to keep up to date with a vast volume of information and the pressure to develop effective clinical skills in a dynamic environment. In this context, technological tools such as ChatGPT emerge as valuable resources that can complement the teaching-learning process.

Objective: to characterize the use of ChatGPT by medical students at Faculty No.2 of the University of Medical Sciences of Santiago de Cuba.

Method: an observational, descriptive and cross-sectional study was carried out in the period from May to July 2024 in medical students belonging to Faculty No.2 of the University of Medical Sciences of Santiago de Cuba. The study population consisted of 1975 medical students enrolled at the institution in the regular day course and 310 students were selected through simple random sampling.

Results: ChatGPT can be used as a complementary tool that facilitates the teaching, learning, development and evaluation experience of medical education for students, teachers and/or designers of academic programs.

Conclusions: the use of ChatGPT by medical students represents an innovative addition to their educational process, offering resources that can enrich their academic and professional training, as long as it is used in an informed and ethical manner.

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RESUMEN

Introducción: en la actualidad, la educación médica enfrenta desafíos significativos, incluyendo la necesidad de mantenerse al día con un vasto volumen de información y la presión de desarrollar habilidades clínicas efectivas en un entorno dinámico. En este contexto, herramientas tecnológicas como ChatGPT emergen como recursos valiosos que pueden complementar el proceso de enseñanza-aprendizaje.

Objetivo: caracterizar el uso de ChatGPT por los estudiantes de la carrera de medicina de la Facultad No.2 de la Universidad de Ciencias Médicas de Santiago de Cuba.

Métodos: se realizó un estudio observacional, descriptivo y transversal en el período de mayo a julio de 2024 en los estudiantes de medicina pertenecientes a la Facultad No.2 de la Universidad de Ciencias Médicas de Santiago de Cuba. La población del estudio la constituyeron los 1975 estudiantes de medicina matriculados en la institución en el curso regular diurno y se seleccionaron 310 estudiantes a través del muestreo aleatorio simple.

Resultados: ChatGPT puede ser utilizado como una herramienta complementaria que facilite la experiencia de enseñanza, aprendizaje, desarrollo y evaluación de la educación médica para estudiantes, docentes y/o diseñadores de programas académicos.

Conclusiones: el uso de ChatGPT por estudiantes de medicina representa una innovadora adición a su proceso educativo, ofreciendo recursos que pueden enriquecer su formación académica y profesional, siempre que se utilice de manera informada y ética.

INTRODUCTION

Nowadays, one of the most recurrent activities for humanity is the use of Information and Communication Technologies (ICTs). Its daily use has allowed us to break down barriers of time and space, facilitating worldwide connections between individuals and institutions. Its purposes are multiple and include recreational, work-related, informative, communicative and commercial actions, among others.[1]

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Teaching through the use of the Internet has proven its effectiveness in medical education. This distance learning modality has been adopted in multiple educational institutions for its advantages as instructional material, simulators, communications (web conferences), e-portfolios, evaluations and evidence-based medicine.[2]

Currently, medical education faces significant challenges, including the need to keep up with a vast volume of information and the pressure to develop effective clinical skills in a dynamic environment. In this context, technological tools such as ChatGPT emerge as valuable resources that can complement the teaching-learning process.[3]

ChatGPT, an artificial intelligence-based language model, offers medical students the opportunity to access accurate and relevant information quickly and efficiently. Its ability to generate coherent responses to complex questions allows students to delve deeper into medical topics, clarify difficult concepts, and explore hypothetical clinical cases.[4] In addition, ChatGPT can facilitate study and review by creating summaries, quizzes, and support materials that are tailored to each student's individual needs. This not only optimizes study time, but also promotes more active and personalized learning.[5]

However, it is essential that students use this tool with a critical approach. Verifying information and consulting with reliable academic sources are essential to ensure the quality of learning. Likewise, responsible use of ChatGPT implies recognizing its limitations and understanding that it does not replace human interaction or consultation with experienced professionals.[6]

Due to the current importance of the use of ICTs and specifically ChatGPT in Cuban medical education, our objective is to characterize the use of ChatGPT by medical students at Faculty No. 2 of the University of Medical Sciences of Santiago de Cuba.

METHOD

An observational, descriptive, and cross-sectional study was conducted from May to July 2024 among medical students belonging to Faculty No. 2 of the University of Medical Sciences of Santiago

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de Cuba.

The study population consisted of the 1,975 medical students enrolled in the institution in the regular daytime course and 310 students were selected through simple random sampling.

The following variables were used in the study: distribution of students according to the frequency with which they use ChatGPT (never, rarely, sometimes, frequently, always); distribution of students according to the main purpose of using ChatGPT (solving academic doubts, exam preparation, research on specific topics, writing papers or reports, others); distribution of students according to the usefulness they attribute to ChatGPT (very useful, useful, neutral, not very useful, not at all useful); distribution of students according to the degree of satisfaction with the use of ChatGPT (very satisfied, satisfied, neutral, dissatisfied, very dissatisfied); Comparison of the information obtained from ChatGPT with other sources of information such as books, articles and teachers (much better, better, the same, worse, much worse).

After a detailed review of the available bibliography, an instrument was designed to be applied to the students who participated in the study to collect the data.

The survey was designed taking into account the proposal made by Pérez Abreu et al.,[7] in which variables such as the distribution of students according to their knowledge of the use of ICTs; the evaluation of knowledge on searching, managing and processing information; the distribution of the population according to the use of information and communication technologies in teaching activities are considered.

The survey was validated through an instrument by 2 professionals with doctorate degrees in medical sciences and master's degrees in sciences, linked to information and communication technology, who positively expressed that the survey developed has the methodological and scientific elements necessary to be applied in the study.

The data were processed in a digital database created with Microsoft Excel 2016 Office Suite on a Samsung laptop. During the research, informed consent was requested from all subjects and ethical standards regarding non-maleficence and respect for their autonomy were applied.

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RESULTS

Regarding the distribution of students according to the frequency with which they use ChatGPT, those who use it frequently predominated, accounting for 32.9% of those who participated in the study, while 4.8% never use it (**Table 1**).

Table 1: Distribution of students according to the frequency with which they use ChatGPT. Faculty No. 2 of the University of Medical Sciences, Santiago de Cuba, 2024.

Frequency of using ChatGPT	No	%
Never	15	4,8
Rarely	40	12,9
Sometimes	64	20,6
Frequently	102	32,9
Always	89	28,7
Total	**310**	**100**

Source: Database prepared.

Regarding the distribution of students according to the main purpose of using ChatGPT, 37.9% use it to resolve academic doubts. On the other hand, 26.4% use it to develop research related to specific topics. 8.4% use ChatGPT for other information-searching purposes (**Table 2**).

Table 2: Distribution of students according to the main purpose of using ChatGPT.

Main purpose of using ChatGPT	No.	%
Resolving academic doubts	112	37,9
Exam preparation	16	5,4
Research on specific topics	78	26,4
Writing papers or reports	64	21,6
Others	25	8,4
Total	**295**	**100**

Source: Database prepared.

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In correspondence with the distribution of students according to the usefulness they attribute to ChatGPT, we have that 38.7% consider it very useful, while 3.5% say it is not useful at all (**Table 3**).

Table 3: Distribution of students according to the usefulness they attribute to ChatGPT.

Utility attributed to ChatGPT	No.	%
Very useful	120	38,7
Useful	114	36,7
Neutral	42	13,54
Not very useful	23	7,4
Nothing useful	11	3,5
Total	**310**	**100**

Source: *Database prepared.*

According to the distribution of students according to the degree of satisfaction with the use of ChatGPT, we have that 53.8% are satisfied with its benefits, unlike 20% who are dissatisfied (**Table 4**).

Table 4: Distribution of students according to the degree of satisfaction with the use of ChatGPT

Level of satisfaction with the use of ChatGPT	No.	%
Very satisfied	41	13,8
Satisfied	159	53,8
Neutral	20	6,7
Dissatisfied	59	20
Very dissatisfied	16	5,4
Total	**295**	**100**

Source: *Database prepared.*

According to the comparison between the information obtained from ChatGPT and other sources of information such as books, articles and teachers, 64.7% consider that the information from ChatGPT has the same quality as that from the literature used in the study of the degree and other sources.

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On the other hand, 5.4% consider that the information obtained from ChatGPT is much worse (**table 5**).

Table 5: Comparison between the information obtained from ChatGPT and other sources of information

Comparison of information obtained from ChatGPT with other sources of information	No.	%
Far better	22	7,4
Better	36	12,2
Equal	189	64,7
Worse	32	10,8
Much Worse	16	5,4
Total	295	100

Source: *Database prepared.*

DISCUSSION

According to Pérez Abreu et al.,[7] ICTs are very important tools for constant teaching and learning at all times in the lives of health professionals; they allow access to updated information on the knowledge of the different medical specialties and scientific research from all over the world.

The introduction of ICTs in the University of Medical Sciences has led to a process of developing virtual study variants that includes educational portals for all years of the degree, classroom platforms and virtual courses, audiovisual materials, compendiums of event reports, multimedia of subjects and degrees related to health training.[8]

There are many applications worldwide to develop responsible and quality teaching using the benefits of these technologies. The creation of multimedia, online courses, databases and reference materials have been developed to maintain continuing education for health personnel in all regions.[9]

According to Rivera Rosas [8], ChatGPT can be used as a complementary tool that facilitates the

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teaching, learning, development and evaluation experience of medical education for students, teachers and/or designers of academic programs. While Vega Jiménez and authors [9] assert that educational evaluation needs to be reconsidered as a result of ChatGPT. The authors consider that, taking into account the results of our research, the use of ChatGPT constitutes a fundamental tool in current times, marked by the technological prominence in the ways of teaching medicine.

In our opinion, the use of ChatGPT raises important ethical considerations, such as academic integrity and data privacy, which must be carefully managed to avoid plagiarism and protect sensitive information. In this sense, it is essential that educational institutions integrate the use of ChatGPT into their curricula in a structured manner, providing guidance on its proper application and promoting a balanced approach that combines technology with traditional teaching methods.

The accelerated evolution of artificial intelligence (AI) and technology impose a challenge that focuses on redefining the understanding of originality in the digital aspect. AI cannot be declared an impediment to medical education in our country. Medical/health teachers and students must be aware of the progress of AI and value the adoption of the advantages that it can offer in the learning and education of medical students.[9,10]

Training future generations of doctors is essential, but not without first understanding the environment where they will perform as professionals in a fundamental sector in all societies. Integrative education entails the creation of a health system where medical students, teachers and those who benefit from health services work together. This teaching takes place in an environment where technological innovations and information explosions predominate.[11,12]

In research carried out in higher education by Ordóñez Azuara et al.,[3] and Diego Olite et al.,[13] the evidence suggests the positive impact of ICTs in promoting learning efficiency. In modern times, the position they occupy in the medical curriculum is already being considered, and the need to have a body of teachers trained in the use of computer resources must be taken into account. This includes the use of reference databases, electronic medical records and access to clinical and educational material on the Internet.[14-17]

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The use of ChatGPT in scientific medical writing is also promising, offering advantages such as improving the writing of scientific articles, analyzing and synthesizing large amounts of information, correcting grammatical and spelling errors, translating, reviewing and editing manuscripts. Shortly after the launch of ChatGPT, publications appeared in which this tool was cited as an author; however, these chatbots are not a legal entity and therefore cannot meet the authorship requirement to take personal responsibility for the content of an article.[18]

The authors consider that the use of ChatGPT by medical students in their teaching-learning process represents a significant innovation in the way medical information is accessed and processed. In a field where the volume of knowledge is overwhelming and the ability to retain critical information is essential, ChatGPT offers an accessible and flexible solution that can complement traditional education. This AI model allows students to ask questions about complex concepts, receive detailed explanations, and obtain summaries of medical literature, facilitating deeper and more personalized learning.

The scientific community quickly raised its voice on this issue, recognizing the advantages, but also the risks involved in using this tool in scientific writing. Plagiarism is a possibility; since ChatGPT's performance in medical writing is efficient, scientific summaries can be produced that have a quality similar to that of a human.[19]

ChatGPT is an AI model designed for conversations. Its implementation in the resolution of clinical dilemmas opens up new possibilities and allows doctors to pose clinical cases and obtain answers in real time. It is also useful in the differential diagnosis process, although it is important to take into account both biases and hallucinations.[20]

According to the authors of the present study, the possibility of interacting with an AI without fear of being judged can foster intellectual curiosity, encouraging students to explore topics that they might not address in a conventional teaching environment. However, this use is not without its challenges; the accuracy of information provided by ChatGPT can vary, and its lack of clinical context means that it cannot replace the practical experience and critical judgment that are developed through interaction with and ongoing care of patients. Furthermore, over-reliance on technological

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tools can pose risks to the development of critical skills needed in medical practice.

Current challenges for ChatGPT in healthcare include safeguarding the privacy of personal medical information, inaccuracy of responses particularly to complex medical questions, training bias, reliance on technology, and risk of harm to patients from the use of incorrect information. The outlook for the future is that it will continue to improve in terms of the information it interprets and the accuracy of responses. The integration of ChatGPT and electronic medical record data will help to practice personalized medicine with security standards, allowing for a more fluid exchange of information between physician and patients.[20,21]

It is essential to maximize the potential of ChatGPT as an educational tool without compromising the quality of medical training or the ethical principles that govern this noble profession. Ultimately, the use of ChatGPT by medical students could transform the educational landscape, offering new opportunities for active and collaborative learning, provided it is used with discernment and responsibility.

CONCLUSIONS

The use of ChatGPT by medical students represents an innovative addition to their educational process, offering resources that can enrich their academic and professional training, provided it is used in an informed and ethical manner. The use of ChatGPT encourages the development of critical thinking, as students must evaluate the information provided, contrast it with academic sources, and apply an analytical approach to their learning.

DECLARATION OF CONFLICT OF INTEREST

The authors declare that they have no conflict of interest in the conduct of the research.

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