Understanding Healthcare Students' Perceptions, Beliefs, and Attitudes Toward AI-powered Language Models: Charting the Course for AI in Healthcare Education in the Americas

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Abstract

Background: ChatGPT was not intended for use in healthcare, but it has potential benefits that depend on end-user understanding and acceptability, which is where healthcare students become crucial and there is still a limited amount of research.

Objective: We aim to understand healthcare students' ChatGPT perceptions, ethical considerations, use, and attitudes.

Methods: A cross-sectional survey of medical, nursing, dentistry, nutrition, and laboratory science students across the Americas was undertaken from May to June 2023. Descriptive analysis, Chi-square, and ANOVA for statistical significance across categories were used. Multiple linear regression models examined the effect of perception scores on attitude variables. All models were adjusted for gender, institution type, major, and country. STATA 18.0 performed all analyses.

Results: Of 2661 healthcare students, 43% were unaware of ChatGPT. The average score of knowledge was "minimal" (mean 2.03±1.19). Most respondents regarded ChatGPT as neither ethical nor unethical. Most participants "somewhat agree" that ChatGPT (i) benefits healthcare settings, (ii) provides trustworthy data, (iii) is a helpful tool for clinical and educational medical information access, and (iv) makes the work easier. 7/10 people use it for homework. Higher knowledge and ethical scores raise

the chance of considering ChatGPT as a trustworthy healthcare information source by up to 30 times. Higher ethical consideration perception ratings increase the likelihood of considering ChatGPT as positive (coefficient=0.265), beneficial for medical issues, and useful for medical literature (0.274 and 0.261, respectively). All results were significant.

Conclusions: Over 40% of American healthcare students were unaware of ChatGPT, despite its extensive use in the health field. Our data reveal ChatGPT's positive attitudes and desire to learn more. Medical educators must explore how chatbots may be included in undergraduate healthcare education programs. Clinical Trial: N/A

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Title: Understanding Healthcare Students' Perceptions, Beliefs, and Attitudes Toward AI-powered Language Models: A cross-sectional study in the Americas.

Abstract

Background: ChatGPT was not intended for use in healthcare, but it has potential benefits that depend on end-user understanding and acceptability, which is where healthcare students become crucial and there is still a limited amount of research.

Objective: The primary aim of our study is to assess the frequency of ChatGPT usage, the perceived level of knowledge, the perceived risks associated with its use, and the ethical issues, as well as attitudes towards the use of ChatGPT in the context of education in the field of health. Additionally, we aimed to examine if there were differences across groups based on demographic variables. The second part of the study aims to assess the association between the frequency of usage, the perceived knowledge level, the risk perception level, and the perception of ethics level as predictor factors for participants' attitudes towards the use of ChatGPT. Methods: A cross-sectional survey was conducted from May to June 2023, encompassing students studying medicine, nursing, dentistry, nutrition, and laboratory science across the Americas. The study employed descriptive analysis, Chi-square, and ANOVA to assess statistical significance across different categories. The study utilized several ordinal logistic regression models to analyze the impact of predictor factors (frequency of usage, perception of knowledge, perception of risk, and ethics perception scores) on attitude variables as the dependent variable. The models were adjusted for gender, institution type, major, and country. STATA 18.0 conducted all the analyses.

Results: Of 2661 healthcare students, 43% were unaware of ChatGPT. The average score of knowledge was "minimal” (median 2·00 IQR 2·00) Most respondents regarded ChatGPT as neither ethical nor unethical. Most participants "somewhat agree" that ChatGPT (i) benefits healthcare settings, (ii) provides trustworthy data, (iii) is a helpful tool for clinical and educational medical information access, and (iv) makes the work easier. 7/10 people use it for homework. As the perceived knowledge of ChatGPT increases, there is a stronger tendency towards having a favorable attitude towards ChatGPT. Higher ethical consideration perception ratings increase the likelihood of considering ChatGPT as a source of trustworthy healthcare information (OR=1·620), beneficial in medical issues (OR=1·495), and useful for medical literature (OR=1·494). All results were P<·001

Conclusions: Over 40% of American healthcare students were unaware of ChatGPT, despite its extensive use in the health field. Our data reveal ChatGPT's positive attitudes and desire to learn more. Medical educators must explore how chatbots may be included in undergraduate healthcare education programs.

Keywords: Artificial Intelligence, ChatGPT, Education, Healthcare, Students.

Introduction

Artificial intelligence (AI) and machine learning technologies have transformed various sectors of contemporary society, including health care [1]. Among these developments, AI-powered large language models (LLMs) like OpenAI's ChatGPT have shown significant promise in revolutionizing numerous aspects of healthcare services [2]. Chat Generative Pre-Trained Transformer (ChatGPT) is a variation of OpenAI's language model that generates human-like writing in a conversational situation [3].

As of January 2023, the population using ChatGPT exceeded 100 million individuals [4]. While ChatGPT was not originally intended for application in healthcare settings, it is possible that some of these users comprise students and/or healthcare practitioners [5]. Consequently, the insights derived from their interactions with ChatGPT may offer valuable information in patient communication, information management, electronic health records, diagnostics, decision-making assistance, and potentially therapeutic interventions [6].

LLMs have shown to be beneficial to healthcare provision [7]. ChatGPT has demonstrated strong, human-level performance supporting decision-making, data management, and patient education in as many specialties such as (internal medicine, surgery, oncology, etc.)[8,9]. The upcoming generations of health professionals consist of students who undergo training in conditions plenty of with easily accessible technology resources [10]. Some students may assume roles as directors of health institutes, while others may engage in research or work as healthcare professionals. Nevertheless, it is crucial to recognize that the quality of education received will directly impact the caliber of professionals in the future. Consequently, it is imperative to understand the interests that occupy their thoughts concerning the utilization of tools such as LLM. This comprehension is essential in determining how these tools can either enhance or fail to enhance their academic and educational competencies, as well as their soon-after professional application [11].

In light of this, the primary aim of our study is to assess the frequency of ChatGPT usage, the perceived level of knowledge, the perceived risks associated with its use, and the ethical issues, as well as attitudes towards the use of ChatGPT in the context of healthcare education. The second part of the study aims to assess the association between the frequency of usage, the perceived knowledge level, the risk perception level, and the perception of ethics level as predictor factors for participants' attitudes towards the use of ChatGPT.

Methods

Design

This study employed a cross-sectional survey among students of healthcare-related college programs across America to assess their perceptions, attitude, patterns of use and further learning toward ChatGPT. The study was conducted from May to June 2023 across all participating countries.

Sample size calculation

The sample size for this manuscript was calculated using the formula: n = [EDFF*Np(1-p)]/ [(d2/Z21-α/2*(N-1)+p*(1-p)]. Accounting for a population size of 1,000,000 individuals, a hypothetical frequency of 50% with a 5% margin of error, and a confidence level of 99.99%, the calculated sample size was 1512.

Recruitment

Our study focused on individuals over the age of 18 years, enrolled in diverse healthcare-related college programs such as medicine, nursing, dentistry, nutrition/dietetics, and medical laboratory science. Through a convenience sampling method, we gathered responses from 2661 participants. We adopted a multifaceted recruitment approach to ensure a varied sample of healthcare students. We reached out to potential participants through emails, student networks, social media, on-campus events, academic institutions, and student associations.

We expanded our sample by including universities across the Americas, specifically in Argentina, Mexico, Colombia, Chile, and Ecuador. By disseminating study links to these institutions, we achieved a diverse representation of healthcare students from different countries and fields.

Bias

To minimize potential biases, we adopted a comprehensive recruitment strategy, targeting a wide range of universities across the Americas, hence reducing selection bias. Response bias was mitigated by conducting anonymous surveys, encouraging honest responses from the participants. Additionally, to limit information bias, the survey questions were designed to be straightforward and utilized standardized Likert scale responses.

Questionnaire

The questionnaire was developed following Passmore et al. [12] and Eysenbach [13] recommendations. A steering committee composed by four experts and heads from four specialized centers worldwide, reviewed the literature and developed the survey items which integrated all constructs to be assessed: The first section of the survey gathered the demographics and medical education of the participants. The second section of the survey aimed to assess the students' perceptions, attitudes, patterns of use, and further learning regarding ChatGPT.

The perception domain was further categorized into knowledge, ethics, and beliefs of perceived risk subdomains. The subdomain of self-perceived knowledge was assessed on a 5-point Likert item

ranging from 1 (no knowledge) to 5 (superior knowledge). The scale of self-perception of knowledge about ChatGPT was recategorized as follows:

(i) "No knowledge": This category includes participants who either answered "No" to the question "Have you heard of ChatGPT before?" or selected "No Knowledge" in response to the question "How would you rate your knowledge of ChatGPT and its applications in healthcare?"

(ii) "Minimal knowledge": Participants falling into this category include those who answered with options such as "Minimal" or "Basic knowledge" on the Likert item.

(iii) "Adequate knowledge": This category encompasses participants who selected options such as "adequate" or "superior" knowledge on the Likert item.

The ethical perception subdomain featured three items, which respondents were asked to score on a 5-point Likert item ranging from 1 (Totally unethical) to 5 (Totally ethical). The Beliefs of perceived risk subdomain had three items, which respondents were asked to score on a 5-point Likert item [1 (strongly disagree) to 5 (strongly agree)]. The attitude domain included five statements reflecting evaluations and opinions about ChatGPT. On a 5-point Likert item, respondents were asked to score these statements [1 (strongly disagree) to 5 (strongly agree)]. The domain of further learning consisted of four questions inquiring as to whether they wanted to learn more about ChatGPT. Respondents were asked to choose the resources or educational materials they believed would be the most beneficial in learning about ChatGPT and its potential applications in health care. Those who did not want to learn more about ChatGPT were requested to explain their reasons.

Two questions assessed the "Pattern of Use" domain, the frequency of usage using a 5-point Likert item ranging from 1 (less than once a month) to 5 (more than once a day), and the applications of ChatGPT in healthcare settings with a choice of eight alternatives.

The questionnaire is described in **Supplemental file S1.** A pilot study was performed by the steering committee with colleagues and a sample of twenty students. After drafting the survey, it was distributed to the study population in May and June 2023. The survey was translated into English and Spanish.

Ethical Considerations

Ethical approval was obtained from the Comité de Ética en Investigación en Seres Humanos (CEISH) from Ecuador, with approval number HCK-CEISH-2022-006. All participants provided informed consent to participate in the study. They were informed about the purpose of the research, their rights as participants, and the voluntary nature of their participation. We ensured the privacy and confidentiality of participant data throughout the study. The survey responses were anonymized, and no personally identifiable information was collected. No compensation was provided to

participants for their involvement in the study. It is important to note that the approval obtained from CEISH in Ecuador was deemed sufficient to expand recruitment to all Latin American countries included in the study. This decision was made based on the similarity of ethical standards and regulations across these countries, as well as the collaborative nature of the research conducted within the region.

Variables

Demographic Variables

The demographic variables selected for this study are pivotal for examining the diversity of healthcare students' attitudes towards using ChatGPT. They are used in both the descriptive (for sample composition purposes) and the regression tables (as control variables). Each variable is thoughtfully coded to capture the nuanced differences among survey participants, facilitating a detailed analysis of their responses.

Age was recorded as a continuous variable. This allowed for precise analysis of trends across different age groups, helping to identify if younger students are more adept and receptive to AI technologies like ChatGPT compared to their older counterparts[14].

Gender was categorized into several groups: male, female, non-binary/third gender, prefer not to say, and other. This categorization ensured that the study could address and respect the diversity of gender identities. It allowed for an analysis of whether perceptions of ChatGPT vary significantly across different gender groups, which could indicate targeted approaches for technology integration based on gender-specific preferences or concerns[15].

Type of university was divided into public and private. This classification helped investigate whether the institutional context influences students' familiarity with and attitudes towards ChatGPT. Differences in resources, exposure to technology, and educational priorities between public and private universities might contribute to distinct attitudes observed among the students from these institutions [16].

Region was split into Central America and South America. By distinguishing between these two regions, the study can explore regional differences that might affect students' acceptance and use of AI technologies. Such differences could stem from varying levels of technology integration in healthcare education, regional cultural attitudes towards technology, and economic factors [17].

Major field of study was specified as medicine, nursing, nutrition, dentistry, therapist, psychologist, pharmacologist, and other. This detailed categorization allows the study to determine if students in

certain fields are more likely to perceive ChatGPT as a beneficial tool [18]. For instance, fields requiring up-to-date information and quick data retrieval might show higher appreciation for AI assistance compared to fields that are more focused on personal patient interactions [19].

Outcome Variables

The outcomes of this study focus on healthcare students' attitudes towards using ChatGPT, quantified through a series of statements. These statements are designed to capture various dimensions of the perceived utility and reliability of ChatGPT in healthcare contexts. Each outcome variable is measured using Likert items, ranging from "strongly disagree" to "strongly agree" to have a granular view of respondents' attitudes and, through detailed statistical analysis, to assess trends and influences on these perceptions.

Specifically, the outcomes assessed are:

1. "I think that ChatGPT makes my job easier." This statement evaluates the perceived practical utility of ChatGPT in simplifying tasks within healthcare settings.
2. "ChatGPT can be beneficial in healthcare settings." This assesses broader benefits, looking at whether students believe ChatGPT can positively impact healthcare environments.
3. "ChatGPT provides trustworthy healthcare information or guidance." This statement measures trust in the accuracy and reliability of the information provided by ChatGPT.
4. "ChatGPT is a useful tool when I need to search for information on specific medical questions." This evaluates the usefulness of ChatGPT as a resource for specific, actionable medical inquiries.
5. "ChatGPT is a useful tool when I need to search for medical literature." This outcome explores the utility of ChatGPT in aiding with academic and professional research within medical fields.

Focusing on these specific attitudes towards using ChatGPT helps to understand how healthcare students perceive the integration of AI into their practices. The statements target various dimensions of AI's role—from enhancing efficiency and providing reliable information to aiding in academic research—highlighting areas where ChatGPT could be particularly impactful or face resistance. This nuanced approach not only sheds light on current acceptance levels but also pinpoints areas where further education or system improvements might increase trust and utility in AI applications within healthcare environments.

Exposure (Predictor) Variables

In this study, several key predictor variables are utilized to explore the factors influencing healthcare students' attitudes toward using ChatGPT. These predictors include knowledge of ChatGPT,

perceptions of risk, ethical considerations, and the frequency of use of ChatGPT. A detailed overview of each predictor is presented below:

1. Knowledge about ChatGPT

For the regression model, this predictor measures the participants' self-reported knowledge about ChatGPT, assessing their understanding of its functionalities and potential applications in healthcare. It is quantified using a 5-point Likert scale ranging from 1 (no knowledge) to 5 (superior knowledge). Understanding of ChatGPT's functionalities and potential applications is crucial, as it directly influences how students perceive its utility and limitations[20]. Higher levels of knowledge might correlate with more positive attitudes as students are better able to appreciate the benefits and manage the limitations of AI in healthcare [21].

2. Beliefs of Perceived Risk

This variable is a composite score derived from the median of the agreement on a 5-point scale to three specific statements assessing perceived risks associated with AI:

"I think my job could be replaced in the future because of AI."

"In the future, ChatGPT (or some similar technology) will play an even more important role in my job."

"Using AI like ChatGPT in clinical practice raises ethical concerns."

Perceptions of risk are vital to consider because they shape how students weigh the advantages against the potential drawbacks of using AI technologies [22]. Concerns about job security, the increasing role of AI in healthcare, and ethical implications could negatively influence their attitudes towards ChatGPT, making it essential to analyze how these perceptions impact their overall acceptance [23].

3. Ethics

Ethical considerations are quantified through the median of responses to the agreement (from totally ethical to totally unethical) on a five-point scale to these three questions that address ethical concerns about using AI in healthcare:

"Revising the language of a scientific manuscript?"

"Writing text in a scientific manuscript?"

"The sole source of information for the clinical practice?"

Ethical considerations are paramount in the adoption of any new technology, especially in sensitive fields like healthcare. Evaluating how students perceive the ethical dimensions of using ChatGPT for

tasks such as manuscript writing or as a clinical information source can provide insights into the ethical acceptability of AI tools in professional healthcare practices [24].

4. Frequency of Use

The frequency of use is directly measured by asking participants how often they use ChatGPT, with options on a 5-point Likert scale ranging from 1 (less than once a month) to 5 (more than once a day).Frequency of use is indicative of both familiarity and dependency on the technology. Regular use of ChatGPT might suggest greater comfort and perceived utility, possibly leading to more favorable attitudes[25]. Conversely, infrequent use might indicate skepticism or perceived inadequacies in the technology's ability to meet professional needs [26].

Statistical analysis

Descriptive Analysis

In the descriptive analysis, we examined the demographic information and survey responses of the participants. This part of the analysis, which is reported in Tables 1 and 2, comprised two main components. First, the demographic characteristics of the participants were assessed and stratified according to the participants' self-rated knowledge of AI (Table 1). These categories of knowledge included "No knowledge," "Minimal Knowledge," and "Adequate Knowledge." Demographic variables, such as age, gender, type of university (public vs private), region, and major, were analyzed across these knowledge strata. Statistical significance for differences across the knowledge categories was tested using a Chi-Square test for categorical variables and an Analysis of Variance (ANOVA) for continuous variables, with a p-value of less than 0.05 indicating statistical significance.

In the second part of the descriptive analysis, given the ordinal nature of the variables we assessed the range, median and interquartile range of scores for each item in the survey (Table 2). The survey items were grouped into three primary domains: Perception, Ethics, and Attitudes, with the domain of Perception further divided into two subdomains, Knowledge, and Beliefs of Perceived risk. In addition, the frequency of use of ChatGPT for various tasks was analyzed. Each item was assessed on a Likert item ranging from 1 to 5, apart from the usage tasks, which were reported as percentages. The total median scores for each domain and subdomain were calculated and included in the report. This analysis helped to provide a clear picture of the participants' perceptions, ethical considerations, attitudes, and usage habits related to ChatGPT.

Regression Analysis

Our analysis of the impact of perception scores on attitude variables involved the use of multiple ordinal logistic regression models, presented in Table 3. Each model evaluated the attitudes of

healthcare students toward the use of ChatGPT, with individual attitude statements serving as dependent variables. These statements included perceptions of ChatGPT in terms of its ease of use, its utility in healthcare settings, the trustworthiness of its health information, its usefulness in finding answers to specific medical questions, and its helpfulness in searching for medical literature.

For each attitude statement, three perception subdomains were considered as independent variables: Knowledge, Beliefs of Risk, and Ethical considerations. The coefficient, standard error, t-value, and p-value were calculated for each perception subdomain, under each attitude statement. All models were adjusted for control variables including sex, whether the institution attended is private or public, the major field of study, and the country of the student. All analyses were carried out employing STATA 18·0.

Missing data

Although our web-based survey, which required complete responses, effectively eliminated the need to handle missing data, the self-selecting nature of online surveys could introduce some bias. Participants more comfortable with or having better access to technology might be overrepresented. However, the completeness of the dataset ensured the accuracy of our analysis and robustness of the findings.

Sensitivity analyses

In the analytical procedure, we employed a set of 20 ordinal logistic regression models. Importantly, standard errors were clustered by country to account for potential intra-country correlations. The proportional odds assumption, pivotal for the conventional interpretation of ordinal logistic regression, was violated in half of these models (10 out of 20). This breach was primarily attributed to the coefficient of the main predictor in the affected models.

To address this violation and to offer a more fitting statistical representation, we utilized the Partial Proportional Odds Model (PPOM) for instances where the main predictor was unconstrained. Even after this adjustment, our results suggested that the interpretation did not differ significantly from models where every coefficient was constrained, even when faced with assumption violations. Due to this slight difference in interpretation and in the interest of consistency, we chose to present the outcomes of all models using ordinal logit with all constraints.

For further refinement of our analysis and to account for potential clustering effects, we introduced random-intercept and slope models. In this setup, schools were treated as nested entities within countries. This multilevel modeling approach produced results that differed only minimally from our initial models, underscoring the reliability of our findings.

Results

Demographic Information

The study included 2661 healthcare students in total. The majority were female (66·3%), in dentistry (55·1%), in South America (91·8%), and in private universities (69%), as indicated in Table 1. The average age was 21.65 years (SD= 3·42). **Supplemental file S2** provides a full overview of the sample's demographics.

Perception of knowledge, beliefs on perceived risks, and ethics

Among all participants, 42·9% did not know about ChatGPT. Male students knew significantly more about ChatGPT than women (68·3% vs. 51·4%). Most of the group of participants who had adequate knowledge of ChatGPT were from South America. With the exception of medicine and therapy, the majority of healthcare-related students were unaware of ChatGPT. (Table 1).

Table 2 presents findings from our survey assessing participants across multiple domains related to their perception, attitudes, and use of AI, with a particular focus on ChatGPT. In the "Perception" domain, participants were queried about their knowledge, providing scores that ranged from 1 to 5. They reported a median score of 2·00, which implies a minimal knowledge of ChatGPT. Delving into beliefs about the perceived risk linked with AI, respondents “somewhat agree” that using ChatGPT raises potential ethical concerns, and that AI will play a more important role in their jobs in the future.

Moving to the "Ethics" domain, participants considered “neither ethical nor unethical” the use of ChatGPT for writing text within a scientific manuscript and considering ChatGPT as the sole information source for clinical practice. In terms of "Attitudes" towards ChatGPT, the median was 4·00 among all statements, showing the majority of participants “somewhat agree” with the advantages and utility of ChatGPT in healthcare contexts.

The "Use" domain had respondents spotlight the frequency with which they engaged ChatGPT, reporting a median of 2·00 (once a month) on a 1 to 5 scale, with an IQR of 2·00. For distinct tasks, the majority of participants used ChatGPT for homework support (71%), research writing (42%) and medical/healthcare education (23%).

Further learning regarding ChatGPT.

Of the participants willing to learn more about ChatGPT, 68% of students wanted to learn about the applications of ChatGPT in particular cases of medical practice, followed by homework support, and understanding the benefits and limits of ChatGPT (Figure 1). Less than 30% were interested in learning about "data privacy and security measures" and "ethical considerations". Participants found that the most interesting educational materials for learning more about this topic were: research articles and case studies (69·16%), interactive demos or hand on experience (48·91%), workshops or

conferences (45·52%), and webinars or online courses (36·37%).

The main reasons for the 16·5% of participants who did not want to learn more about ChatGPT were: lack of time (46·37%), preference to consult with peers, mentors, and teachers (23·19%), not enough knowledge about these technologies (18·5%), and lack of relevance to their medical specialty (12·6%), see Figure 2.

Association between perception (knowledge, belief, ethics) and frequency of use and attitude

The ordinal logistic regression analysis (Table 3) illustrates the relationship between predictors such as knowledge, beliefs about risks, ethics, frequency of use, age, gender, institutional type, and professional background, and their impact on healthcare professionals' perceptions of ChatGPT's utility.

An enhanced understanding of ChatGPT consistently showed a positive correlation with more favorable views across all outcomes. For instance, as knowledge increased, the odds of believing that ChatGPT makes one's job easier went up, with odds ratios ranging from 1·259 (95% CI: 1·047 - 1·513) to 1·468 (95% CI: 1·289 - 1·672). This trend persisted across other perceptions, such as ChatGPT's potential benefits in healthcare settings and its trustworthiness in providing healthcare information.

Beliefs about risk followed a distinctive pattern. Those with heightened risk beliefs felt that ChatGPT makes job easier, could play a beneficial role in healthcare settings including obtaining information on medical questions and as a tool for searching medical literature, evidenced by odds ratio of 2·040, 1·106, 1·179 and 1·138 respectively. This finding suggests that recognizing potential risks doesn’t negate belief in the tool's utility. Ethical considerations played a significant role. Students with higher ethical concerns perceived ChatGPT's potential in healthcare more favorably. The odds ratios for these associations were notable, especially in the context of trustworthiness and specific medical queries (OR 1·620, 95% CI: 1·498-1·752).

Frequency of ChatGPT usage was a significant determinant. Regular users were more optimistic about its utility, evident across all outcomes such as its benefits in healthcare with an OR 1·540 (95% CI: 1·420-1·670) and its efficacy in searching for medical information (OR 1·438, 95% CI: 1·311-1·577).

Age influenced perceptions. Older individuals generally had a higher odds ratio across the outcome variables, suggesting a more positive perception of ChatGPT's utility in their profession. Gender-based analysis revealed that females, compared to males, were generally more likely to believe that ChatGPT can aid in their job. However, perceptions varied when it came to broader benefits in healthcare and other outcomes. Those identifying as non-binary or third gender, or those who

preferred not to specify their gender, showcased diverse perceptions, sometimes differing from both males and females.

Institutional type and major background played roles. Individuals from private institutions compared to their public institution counterparts had varied perceptions. Students from nursing and nutrition exhibited unique outlooks on ChatGPT, highlighting the influence of professional background on shaping perceptions.

Discussion

The aim of this study was to determine the perception, attitudes, and uses of ChatGPT among healthcare students, as well as their willingness to learn more about it. Given that chatbots powered by artificial intelligence are widely accepted by students [27], our findings provide critical insights into the possibilities for integrating them into undergraduate healthcare teaching programs. More than half of the participants knew about ChatGPT, according to our data, with male students being more knowledgeable than female students. In May 2023, the Pew Research Center released the findings of an online study, which showed that, compared to our results (42·9%), 33% of young people had never heard of ChatGPT. The majority of participants felt they knew little to nothing about ChatGPT [28]. According to Buabbas' study, 84% of Kuwaiti medical students did not have any training on the use of AI [29]. It is worth noting that more than 80% of our participants indicated an interest in learning more about ChatGPT's healthcare applications, with time restrictions being the primary barrier for 40% of them.

Despite the widespread use of AI chatbots like ChatGPT for self-diagnosing illnesses (up to 78%) [30], and the recognition of the value and user-friendliness of the information they provide, health career students in the Americas maintain a neutral stance on whether ChatGPT will replace their jobs. They neither agree nor disagree with the notion. This aligns with the findings from Buabbas et al. [29] and Moldt et al. [31], where 78·7% and 83% of participants, respectively, expressed skepticism about AI eventually replacing the roles of physicians in the future.

Only 23% of our students reported using AI for medical/healthcare education and training, but more than 70% said they used it for homework support. Although some colleges prohibit the use of ChatGPT and consider it plagiarism [32], teachers are investigating its utility during learning. For example, Mullen's students used ChatGPT to improve the quality of an essay in English (their non-native language), and the participants felt that the experience left them better equipped to produce future academic output without the use of these tools [33].

Our study revealed that healthcare students displayed positive attitudes and acceptance toward ChatGPT and that the majority were willing to learn more about it, similar to Buabbas' [29] and

Moldt's [31] study. Although we did not inquire about the specific version of ChatGPT employed by participants, and since ChatGPT's primary function is not for using as a web searching engine, it is evident that within the context of higher education, particularly in the field of health, there has been a significant increase in the adoption of disruptive technologies [34], including ChatGPT, as both formal or informal tools for enhancing skills and achieve educational objectives [35].

Respondents perceived ChatGPT as a valuable tool in healthcare settings, highlighting its usefulness in providing information on specific medical questions and facilitating access to relevant literature. Interestingly, the attitudes toward ChatGPT appeared to be influenced by the participants' self-perceived knowledge about the chatbot. Those who had a better understanding of ChatGPT tended to perceive ChatGPT as providing trustworthy healthcare information or guidance. Notably, participants' willingness to use ChatGPT in the setting of health care is heavily influenced by the level of trust they have in the system [6]. Interestingly, we found a significant association between increased perceived risk scores and the attitude statement "ChatGPT provides trustworthy healthcare information or guidance." Establishing trust is crucial to ensuring the responsible and effective utilization of ChatGPT, thereby maximizing its benefits while mitigating any associated risks.

Indeed, the study has revealed that users’ attitudes toward ChatGPT are positively influenced by the frequency of use. Individuals who use more frequently ChatGPT, increase the possibilities to believe that ChatGPT makes their job easier, and find it beneficial in healthcare settings, as well as a useful tool for searching specific medical questions and medical literature. Despite students being somewhat concerned about the perceived risk of the ethical implication of using ChatGPT, they are still using it once a month, especially for homework support, research writing support, medical/healthcare education and training, and mental health support. Our study differs with previous research, and Firaina et al. found that most respondents preferred frequent usage of ChatGPT [36].

In spite of the many changes that have occurred in medicine over the last few decades, medical education is still largely based on traditional teaching methods [37,38]. The release of ChatGPT caused concerns and debates in health care due to ethical issues, misinformation, misuse, and challenges in practice and academic writing. Concerns include the quality and dependability of medical information, the chatbot model's transparency, the ethics of user information, and potential biases in the ChatGPT algorithms [35]. While several studies have demonstrated ChatGPT's ability to answer medical questions [39–42], many correct answers have been deemed as inadequate [39,40].

Limitations

Our study has several limitations that must be considered when interpreting the results. First, our sampling strategy did not capture all healthcare students from the Americas. Despite our efforts to include universities across the Americas, we encountered a limited recruitment response from Central America. This low number may limit the representativeness of our findings for these specific regions. As a result, the findings from Central America should be considered as preliminary and require validation through larger-scale research conducted in the aforementioned regions. Second, the study was cross-sectional in nature, and therefore, we cannot establish causality between perceptions, beliefs, ethics, and attitudes. Longitudinal studies are needed to determine the temporal relationship between these variables. Third, although during the course of the study there were two available versions of ChatGPT: 3·5 and 4·0, the participants were not specifically queried on their usage of either version. However, given their status as students, it can be reasonably deduced that they predominantly utilize the free version rather than the premium version. The disparities between the two versions lie mostly in the payment requirement associated with version 4·0. It has been said that this particular version offers enhanced safety measures, more valuable responses, and a heightened comprehension of the contextual nuances pertaining to the posed queries. Based on the aforementioned findings, certain worries emerge regarding the potential utilization of ChatGPT by students inside their educational institutions, although in an informal manner, despite the absence of official integration of ChatGPT as an explicitly disruptive technological tool within their educational system, or maybe, academic institutions are incorporating this technology within their instructional settings. At present, there remain unanswered inquiries pertaining to the subject matter. However, these discoveries indicate potential gaps in knowledge, warranting an assessment of whether the acquired information satisfies the minimum criteria for quality in the field of health and possesses genuine value in terms of gathering competent professionals in the near term.

Conclusions

The current debate revolves around the potential advantages and disadvantages of incorporating ChatGPT and other large language models in the teaching and learning process. The age of artificial intelligence has arrived. It is important to be aware of how it may be used and misused. Research in healthcare education looks bright in the future due to the essential integrity that drives the vast majority of researchers. A medical educator must remain current with the rapid advancements in technology and consider how they are affecting their teaching practices, curriculum development, and evaluation techniques.

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Author Contributions:

ICO, KRV, JCGB: Conceptualization, Funding acquisition, Methodology, Resources, Project administration, Supervision, Validation, Writing – original draft, Writing – review & editing

ICO, KRV, MFH, MFO: Data curation, Formal analysis, Software, Supervision, Validation, Writing – original draft, Writing – review & editing.

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Table 1. Demographic information (n=2661)

Variables	No knowledge 42·92% (1142)	Minimal Knowledge 21·72% (578)	Adequate Knowledge 35·36% (941)	P value	Total
Age	22·01 (3·41)	21·45 (3·81)	21·34 (3·12)	P<·001	21·34 (3·12)
Gender					
Male	31·66% (277)	23·20% (203)	45·14% (395)	P<·001	45·14% (395)
Female	48·61% (858)	21·02% (371)	30·37% (536)		30·37% (536)
Non-binary / third gender	25·00% (2)	25·00% (2)	50·00% (4)		50·00% (4)
Prefer not to say	20·00% (2)	20·00% (2)	60·00% (6)		60·00% (6)
Other	100·00% (3)	0·00% (0)	0·00% (0)		0·00% (0)
Type of University					
Public	48·18% (397)	21·24% (175)	30·58% (252)	P<·001	30·58% (252)
Private	40·56% (745)	21·94% (403)	37·51% (689)		37·51% (689)
Region					
Central America	52·21% (116)	19·72% (43)	27·06% (59)	0·004	27·06% (59)
South America	42·00% (1026)	21·90% (535)	36·10% (882)		36·10% (882)
Major					
Medicine	23·85% (212)	25·08% (223)	51·07% (454)	P<·001	51·07% (454)
Nursing	73·47% (36)	8·16% (4)	18·37% (9)		18·37% (9)
Nutrition	41·38% (24)	22·41% (13)	36·21% (21)		36·21% (21)
Dentistry	53·00% (777)	19·51% (286)	27·49% (403)		27·49% (403)
Therapist	40·91% (18)	15·91% (7)	43·18% (19)		43·18% (19)
Psychologist	42·22% (19)	42·22% (19)	15·56% (7)		15·56% (7)
Pharmacologist	86·67% (13)	6·67% (1)	6·67% (1)		6·67% (1)
Other	45·26% (43)	26·32% (25)	28·42% (27)		28·42% (27)

Note: For numerical data, results are displayed as "Mean (Standard Deviation)". For categorical data, they are presented as "Percentage (Count)".

Table 2. Range, medians and IQR of domains of survey.

Item	Range	Median	IQR
Perception			
Knowledge	1-5	2·00	2·00
Beliefs of Perceived risk			
"I think my job could be replaced in the future because of AI."	1-5	3·00	3.00

		"In the future, ChatGPT (or some similar technology) will play an even more important role in my job".	1-5	4·00	1·00
		“Using AI like ChatGPT in clinical practice raises ethical concerns."	1-5	4·00	1·00
		Total median score	1-5	3·28	1·05
	Ethics				
		Revising the language of a scientific manuscript?	1-5	2·00	2·00
		Writing text in a scientific manuscript?	1-5	3·00	1.00
		The sole source of information for the clinical practice?	1-5	3·00	2.00
		Total median score	1-5	2·61	1·00
Attitudes					
		I think that ChatGPT makes my job easier.	1-5	4·00	1·04
		ChatGPT can be beneficial in healthcare settings.	1-5	4·00	2·00
		ChatGPT provides trustworthy healthcare information or guidance.	1-5	4·00	1·00
		ChatGPT is a useful tool when I need to search for information on specific medical questions.	1-5	4·00	2·00
		ChatGPT is a useful tool when I need to search for medical literature.	1-5	4·00	2·00
		Total median score	1-5	3·89	0·91
Use					
		Frequency of use	1-5	2·00	2·00
		Item	Range	Percentage (%)	
		Electronic health record documentation	0-1	11	-
		Patient triage	0-1	7	-
		Medical/Healthcare education and training	0-1	23	-
		Clinical decision support	0-1	8	-
		Mental health support	0-1	14	-
		Health communication	0-1	11	-
		Research writing support	0-1	42	-
		Homework support	0-1·	71	-

Table 3. Estimates from ordinal logistic regression models estimating the effect of perception scores on attitude variables.

	Predictor: Knowledge					Predictor: Beliefs of Risk				
VARIABLES / OUTCOMES	I think that ChatGPT makes my job easier.	ChatGPT can be beneficial in healthcare settings.	ChatGPT provides trustworthy healthcare information or guidance.	ChatGPT is a useful tool when I need to search for information on specific medical questions.	ChatGPT is a useful tool when I need to search for medical literature.	I think that ChatGPT makes my job easier.	ChatGPT can be beneficial in healthcare settings.	ChatGPT provides trustworthy healthcare information or guidance.	ChatGPT is a useful tool when I need to search for information on specific medical questions.	ChatGPT is a useful tool when I need to search for medical literature.
Knowledge (1-5)	1·259** 1·047 - 1·513	1·468*** 1·289 - 1·672	1·480*** 1·357 - 1·614	1·448*** 1·400 - 1·498	1·298*** 1·134 - 1·486					
Beliefs of Risk Median (1-5)						2·040*** 1·765 - 2·358	1·106** 1·031 - 1·186	1·062* 1·013 - 1·113	1·179*** 1·110 - 1·255	1·138*** 1·076 - 1·203
Age in Years	1·032** 1·010 - 1·054	1·036*** 1·014 - 1·058	1·018 0·993 - 1·044	1·028* 1·004 - 1·053	1·043*** 1·024 - 1·063	1·033* 1·006 - 1·059	1·049*** 1·029 - 1·069	1·015* 1·003 - 1·027	1·042*** 1·025 - 1·060	1·041** 1·012 - 1·071
Female (Reference=Male)	1·163*** 1·118 - 1·209	0·712*** 0·696 - 0·729	0·823** 0·745 - 0·909	0·863* 0·782 - 0·953	0·895 0·783 - 1·024	1·072 0·977 - 1·176	0·678*** 0·636 - 0·722	0·822** 0·710 - 0·950	0·809 0·651 - 1·005	0·818* 0·695 - 0·961
Non-binary / third gender (Reference=Male)	0·471*** 0·456 - 0·486	1·662*** 1·548 - 1·784	0·916 0·843 - 0·995	0·509*** 0·492 - 0·527	0·921* 0·865 - 0·981	0·313*** 0·289 - 0·339	2·648*** 2·552 - 2·748	1·104 0·997 - 1·224	0·526*** 0·471 - 0·586	1·900*** 1·800 - 2·006
Prefer not to say (Reference=Male)	0·384*** 0·367 - 0·402	0·438*** 0·424 - 0·452	0·953 0·876 - 1·036	0·657*** 0·631 - 0·684	1·291*** 1·150 - 1·450	0·482*** 0·426 - 0·544	0·461*** 0·439 - 0·485	1·310*** 1·202 - 1·428	0·557*** 0·508 - 0·611	0·913* 0·850 - 0·980
Private institution (Reference = Public)	0·917	1·009	1·095	1·237***	1·348***	0·939	1·283**	1·206	1·608***	1·402**

	0·791 - 1·063	0·917 - 1·111	0·911 - 1·316	1·096 - 1·396	1·104 - 1·646	0·768 - 1·148	1·074 - 1·534	0·984 - 1·478	1·328 - 1·946	1·105 - 1·779
Nursing (Reference=Medicine)	1·519*** 1·322 - 1·745	0·956* 0·921 - 0·992	1·705*** 1·595 - 1·822	1·867*** 1·784 - 1·954	3·552*** 2·516 - 5·015	1·973*** 1·855 - 2·098	0·485*** 0·470 - 0·501	0·559*** 0·543 - 0·575	1·486*** 1·436 - 1·537	3·909*** 3·525 - 4·336
Nutrition (Reference=Medicine)	0·879*** 0·843 - 0·917	0·437*** 0·432 - 0·442	0·340*** 0·335 - 0·345	0·503*** 0·495 - 0·511	1·287*** 1·238 - 1·338	0·676*** 0·629 - 0·726	0·271*** 0·257 - 0·287	0·175*** 0·168 - 0·182	0·336*** 0·312 - 0·362	1·401*** 1·264 - 1·553
Dentistry (Reference=Medicine)	0·884 0·785 - 0·996	0·949* 0·909 - 0·990	1·275*** 1·210 - 1·344	0·922*** 0·884 - 0·961	1·113*** 1·052 - 1·178	0·957 0·810 - 1·131	1·031 0·939 - 1·133	1·197*** 1·139 - 1·257	0·923* 0·863 - 0·987	1·235*** 1·115 - 1·366
Therapy (Reference=Medicine)	0·861 0·470 - 1·578	0·938 0·878 - 1·002	1·712*** 1·412 - 2·075	1·551*** 1·054 - 2·282	1·292** 1·029 - 1·622	1·020 0·729 - 1·428	0·868 0·710 - 1·060	1·776* 1·032 - 3·056	1·317*** 1·212 - 1·432	0·948 0·703 - 1·279
Psychologist (Reference=Medicine)	0·848 0·666 - 1·079	0·223*** 0·198 - 0·252	0·428** 0·338 - 0·541	0·413*** 0·356 - 0·480	0·642 0·467 - 0·882	0·675* 0·477 - 0·955	0·116*** 0·069 - 0·195	0·450 0·155 - 1·307	0·325*** 0·176 - 0·599	1·064 0·778 - 1·456
Pharmacologist (Reference=Medicine)	0·0912*** 0·090 - 0·092	1·946*** 1·692 - 2·238	5·509*** 1·706 - 17·787	2·603*** 1·974 - 3·432	1·368*** 1·103 - 1·697	0·236*** 0·198 - 0·281	1·703*** 1·429 - 2·028	4·976*** 4·039 - 6·135	2·740*** 2·177 - 3·449	1·506*** 1·324 - 1·711
Other	1·513*** 1·168 - 1·960	1·073 0·832 - 1·384	1·667*** 1·428 - 1·946	1·196* 0·972 - 1·472	1·261 0·877 - 1·812	1·307* 1·005 - 1·699	1·337 0·790 - 2·261	1·751*** 1·565 - 1·958	1·166 0·802 - 1·696	1·329 0·730 - 2·418
/cut1	0·245*** 0·223 - 0·269	0·0945*** 0·091 - 0·098	0·181*** 0·170 - 0·193	0·142*** 0·136 - 0·149	0·203*** 0·178 - 0·232	0·966 0·694 - 1·344	0·0246*** 0·017 - 0·035	0·0537*** 0·038 - 0·076	0·0749*** 0·027 - 0·209	0·100*** 0·040 - 0·254
/cut2	0·688 0·527 - 0·898	0·336*** 0·294 - 0·384	0·764 0·593 - 0·984	0·479*** 0·408 - 0·562	0·710 0·469 - 1·076	3·060*** 2·266 - 4·133	0·151*** 0·116 - 0·198	0·282*** 0·197 - 0·404	0·370** 0·194 - 0·705	0·492 0·221 - 1·095
/cut3	2·505*** 0·964 - 6·507	1·704** 0·879 - 3·305	2·997*** 1·086 - 8·272	1·845** 0·936 - 3·635	2·772*** 0·613 - 12·538	12·66*** 9·459 - 16·945	0·857 0·657 - 1·119	0·952 0·727 - 1·245	1·234 0·733 - 2·077	1·868 0·873 - 3·995

/cut4	16·42*** 0·036 - 7565·397	9·010*** 0·235 - 345·812	19·50*** 0·044 - 8571·641	11·36*** 0·221 - 583·882	14·13*** 0·006 - 33909·829	96·46*** 72·024 - 129·153	5·061*** 3·721 - 6·883	6·823*** 5·038 - 9·235	9·192*** 4·894 - 17·271	9·435*** 4·865 - 18·302
Observations	863	1,513	1,507	1,501	1,490	861	860	856	854	849
Robust standard errors in parentheses *** P<·001, ** P<·01, * P<·05										

Table 3. Estimates from ordinal logistic regression models estimating the effect of perception scores on attitude variables (continuation)

	Predictor: Ethics					Predictor: Frequency of Use				
VARIABLES / OUTCOMES	I think that ChatGPT makes my job easier.	ChatGPT can be beneficial in healthcare settings.	ChatGPT provides trustworthy healthcare information or guidance.	ChatGPT is a useful tool when I need to search for information on specific medical questions.	ChatGPT is a useful tool when I need to search for medical literature.	I think that ChatGPT makes my job easier.	ChatGPT can be beneficial in healthcare settings.	ChatGPT provides trustworthy healthcare information or guidance.	ChatGPT is a useful tool when I need to search for information on specific medical questions.	ChatGPT is a useful tool when I need to search for medical literature.
Ethics Median (1-5)	1·439*** 1·376 - 1·505	1·495*** 1·452 - 1·539	1·620*** 1·498 - 1·752	1·476*** 1·430 - 1·523	1·494*** 1·426 - 1·564					
ChatGPT Frequency (1-5)						1·320*** 1·199 - 1·454	1·540*** 1·420 - 1·670	1·365*** 1·321 - 1·410	1·438*** 1·311 - 1·577	1·396*** 1·302 - 1·497
Age in Years	1·030**	1·035**	1·015	1·029	1·043***	1·035***	1·061***	1·022	1·051***	1·046***

	1·011 - 1·049	1·010 - 1·060	0·982 - 1·049	0·999 - 1·060	1·021 - 1·065	1·014 - 1·057	1·036 - 1·087	0·993 - 1·051	1·034 - 1·068	1·022 - 1·071
Female (Reference=Male)	1·105* 1·018 - 1·198	0·682*** 0·648 - 0·718	0·782** 0·670 - 0·912	0·827* 0·711 - 0·961	0·870 0·742 - 1·019	1·230*** 1·114 - 1·358	0·797*** 0·768 - 0·827	0·939 0·816 - 1·080	0·952 0·752 - 1·204	0·955 0·805 - 1·132
Non-binary / third gender (Reference=Male)	0·599*** 0·568 - 0·631	1·984*** 1·902 - 2·071	1·223*** 1·155 - 1·294	0·685*** 0·621 - 0·755	1·110** 1·041 - 1·183	0·380*** 0·369 - 0·392	2·174*** 1·780 - 2·655	0·892 0·791 - 1·005	0·334*** 0·326 - 0·342	1·583*** 1·406 - 1·782
Prefer not to say (Reference=Male)	0·499*** 0·438 - 0·567	0·387*** 0·358 - 0·418	0·822*** 0·739 - 0·913	0·588*** 0·547 - 0·631	1·141** 1·036 - 1·257	0·369*** 0·357 - 0·381	0·469*** 0·454 - 0·484	1·246*** 1·099 - 1·412	0·492*** 0·473 - 0·511	0·833*** 0·778 - 0·892
Private institution (Reference = Public)	0·951 0·791 - 1·142	1·077 0·956 - 1·213	1·197*** 1·091 - 1·313	1·311*** 1·247 - 1·379	1·438*** 1·261 - 1·639	0·937 0·803 - 1·094	1·257** 1·011 - 1·563	1·181* 0·974 - 1·432	1·563*** 1·286 - 1·900	1·403*** 1·087 - 1·810
Nursing (Reference=Medicine)	1·662*** 1·602 - 1·726	1·006 0·986 - 1·027	1·713*** 1·589 - 1·846	2·084*** 2·042 - 2·125	3·732*** 3·504 - 3·971	1·425*** 1·351 - 1·503	0·350*** 0·340 - 0·360	0·458*** 0·448 - 0·468	1·237*** 1·192 - 1·284	3·504*** 2·496 - 4·918
Nutrition (Reference=Medicine)	0·867*** 0·824 - 0·913	0·392*** 0·376 - 0·408	0·307*** 0·291 - 0·323	0·459*** 0·445 - 0·472	1·218*** 1·177 - 1·260	0·901*** 0·858 - 0·947	0·307*** 0·303 - 0·311	0·187*** 0·185 - 0·189	0·378*** 0·371 - 0·385	1·545*** 1·354 - 1·763
Dentistry (Reference=Medicine)	0·838* 0·712 - 0·987	0·844*** 0·799 - 0·893	1·152*** 1·095 - 1·213	0·842*** 0·799 - 0·887	1·028 0·980 - 1·078	0·992 0·857 - 1·149	1·258*** 1·088 - 1·455	1·358*** 1·227 - 1·503	1·036 0·972 - 1·104	1·412*** 1·261 - 1·581
Therapy (Reference=Medicine)	0·815 0·536 - 1·240	0·968 0·757 - 1·239	1·895*** 1·539 - 2·335	1·552*** 1·467 - 1·642	1·348 0·960 - 1·893	0·925 0·582 - 1·469	0·906 0·715 - 1·148	1·820*** 1·001 - 3·309	1·292 0·876 - 1·905	0·947 0·830 - 1·081
Psychologist (Reference=Medicine)	0·819 0·596 - 1·126	0·197*** 0·112 - 0·345	0·404* 0·173 - 0·941	0·397*** 0·287 - 0·548	0·651 0·325 - 1·303	0·818 0·628 - 1·066	0·142*** 0·134 - 0·151	0·519 0·302 - 0·893	0·375*** 0·306 - 0·459	1·265 0·924 - 1·731
Pharmacologist	0·0920**	2·064***	6·336***	2·787***	1·545***	0·0774***	2·121***	4·864***	2·125***	1·196**

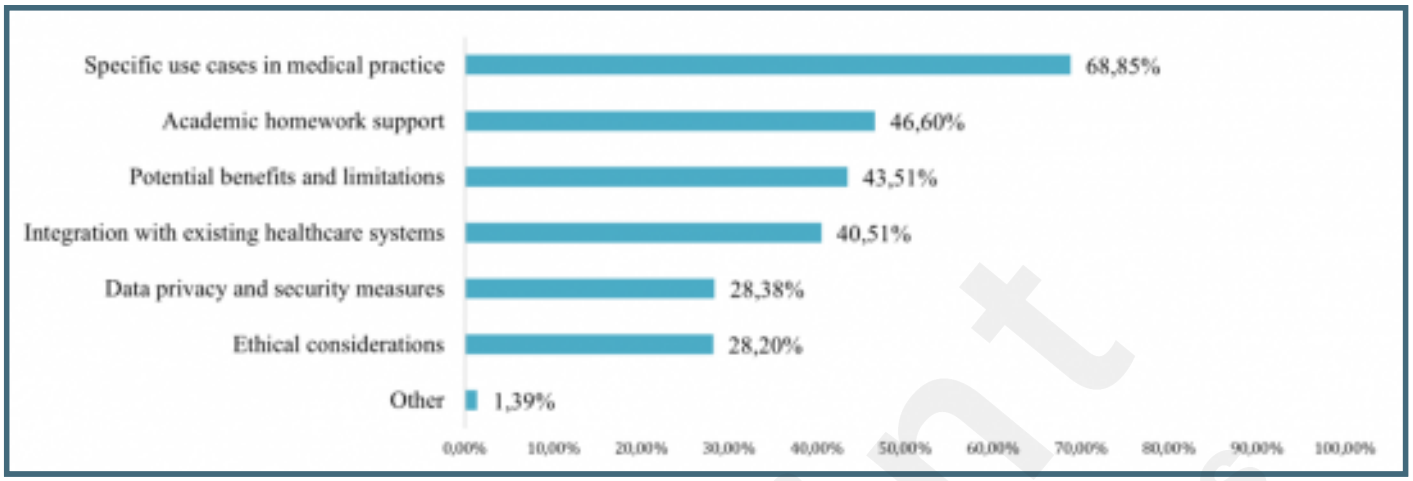
(Reference=Medicine)	*									
	0·084 - 0·101	1·929 - 2·210	5·501 - 7·294	2·492 - 3·117	1·397 - 1·709	0·077 - 0·078	1·631 - 2·758	1·748 - 13·531	1·456 - 3·102	1·018 - 1·405
Other	1·394***	0·886	1·450***	1·012	1·085	1·493***	1·434	1·866***	1·276	1·432
	1·221 - 1·590	0·707 - 1·111	1·287 - 1·636	0·851 - 1·203	0·824 - 1·428	1·291 - 1·727	0·772 - 2·664	1·191 - 2·923	0·931 - 1·749	0·713 - 2·877
/cut1	0·280***	0·0852***	0·187***	0·134***	0·265***	0·259***	0·145***	0·115***	0·130***	0·178***
	0·187 - 0·418	0·047 - 0·153	0·085 - 0·408	0·091 - 0·198	0·183 - 0·384	0·228 - 0·294	0·135 - 0·156	0·110 - 0·120	0·116 - 0·146	0·151 - 0·210
/cut2	0·797	0·305***	0·807	0·457***	0·941	0·726	0·909	0·612*	0·645	0·881
	0·559 - 1·137	0·155 - 0·602	0·382 - 1·709	0·288 - 0·725	0·642 - 1·379	0·528 - 0·997	0·653 - 1·266	0·464 - 0·807	0·444 - 0·938	0·445 - 1·746
/cut3	2·980***	1·549	3·221**	1·761*	3·744***	2·677***	5·434***	2·119***	2·176**	3·425**
	2·090 - 4·250	0·817 - 2·939	1·576 - 6·580	1·027 - 3·019	2·487 - 5·635	0·815 - 8·797	0·553 - 53·412	0·839 - 5·355	0·787 - 6·018	0·254 - 46·156
/cut4	20·14***	8·187***	21·32***	10·79***	19·60***	18·23***	35·59***	15·94***	17·24***	18·22***
	13·437 - 30·175	4·554 - 14·717	10·848 - 41·888	6·527 - 17·832	12·642 - 30·387	0·002 - 164263·740	0·000 - 431675496·970	0·040 - 6402·678	0·001 - 441561·358	0·000 - 5099024·943
Observations	863	1,513	1,507	1,501	1,490	863	861	860	858	853

Robust standard errors in parentheses
*** P<·001, ** P<·01, * P<·05

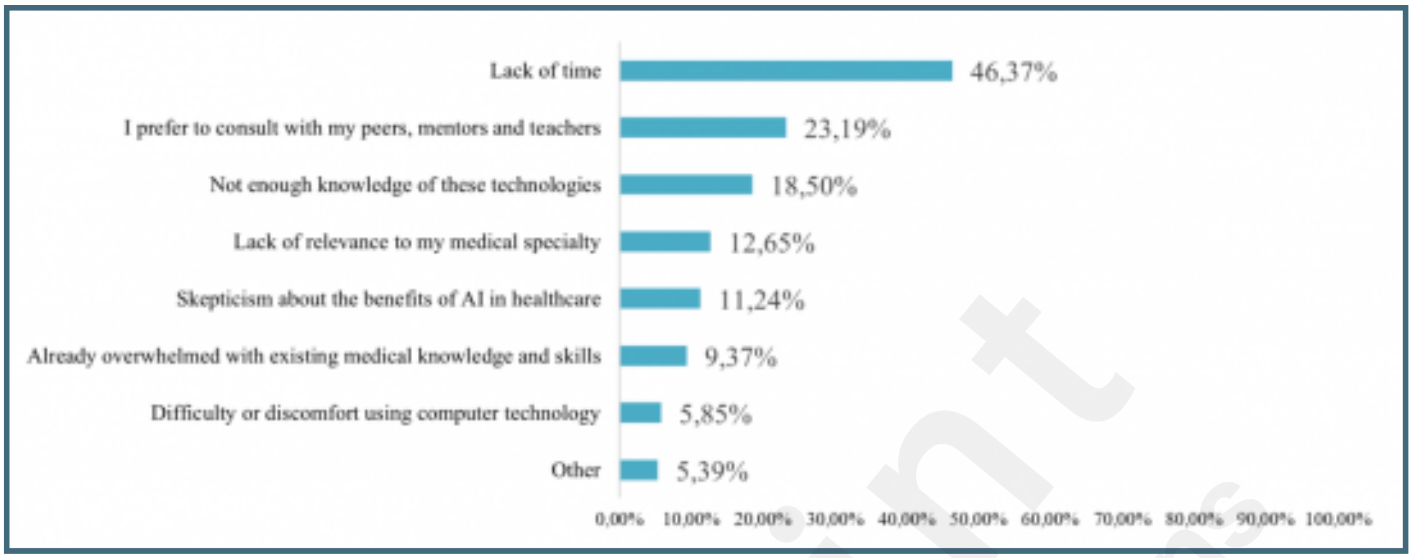
Supplementary Files

Figures

Further learning domain showing aspects of ChatGPT and its applications in health care that students are more interested in learning about.



Reasons for lack of interest in learning more about ChatGPT and its potential applications in health care.



Multimedia Appendixes

Supplemental file S1.
URL: http://asset.jmir.pub/assets/9d42de738f51da03a579f3dc3353e719.docx

Supplemental file S2.
URL: http://asset.jmir.pub/assets/17fc25bdcfbc1e53f2398dcd88421dc1.docx