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ORIGINAL ARTICLE

Prevalence and associated factors of ChatGPT use in medical education and clinical practice

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ABSTRACT

Background: Healthcare education has witnessed significant transformations, with artificial intelligence (AI) playing an increasing role in medical imaging, diagnostics, and decision-making. ChatGPT, an AI-powered language model, is gaining popularity among medical students and physicians. However, excessive reliance on such tools may impact critical thinking and reduce dependence on professional judgment. Our objectives are to determine the prevalence of ChatGPT use among medical students and senior doctors in educational and clinical settings. To explore factors associated with its use, including its perceived impact on academic performance, decision-making, and information reliability.

Methods: This cross sectional study includes four medical institutions in Peshawar, Khyber Pakhtunkhwa, Pakistan: Northwest School of Medicine, Pak International Medical College, Rehman Medical College, and Khyber Girl Medical College, and two dental colleges: Sardar Begum Dental College and Rehman College of Dentistry. It included 370 participants (176 males and 194 females). The participants were selected using a non-probability sampling technique.

Results: ChatGPT use was widespread among students and doctors. However, there was no significant association between its use and academic performance ($p>0.05$). Fifth-year students showed a positive association with using ChatGPT for self-diagnosis ($p<0.05$). Fourth-year students reported it as a reliable source of information ($p<0.01$), while second-year students strongly favored it as a reputable source ($p<0.001$). Practitioners generally disagreed with these views.

Conclusion: ChatGPT is increasingly used in medical education and practice. While it offers support in learning and decision-making, overdependence may hinder critical thinking. It should be viewed as a complementary tool, not a replacement, for expert medical judgment.

Keywords: Artificial Intelligence, ChatGPT, Clinical Practice, Medical Education, Medical Students

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Introduction

One of the catalysts in healthcare settings to be considered is known as Artificial intelligence (AI) (1). Health care system will progress by the use of AI tools and different technologies and this will also help to facilitate the patient at its best. (2) ChatGPT is really dependent on the input data which you are giving to it; they can never generate anything from its side without the input data. (3). According to the results of one studies conducted in United States the

claimed that AI is gaining popularity regarding self diagnosis (4).

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Remarkably, the researchers from the Yale University School of Medicine wrote that ChatGPT can generate questions like those in the United States Medical Licensing Exam (5). The more powerful AI behind the ChatGPT is now being used in which a user simply put his or her mobile camera towards the object and the mobile will tell the user that which object is placed in front of him or her and this technology will help a lot to the blind or visually impaired persons. (6) Although ChatGPT is more advanced but not yet it is reliable for medicine. AI will give you only the surface reading of any problem it lack deeper thinking and cognitive ability. (7) A study from Taiwan claimed that many faults have been identified about advising of medication by ChatGPT itself. (8) The use of ChatGPT in medical education is so effective as it decreases the load of work and assignments, but has a negative effect of decreasing technical thinking .(9) According to one study of Pakistan they reported that about 60% of the final year student were willing to use ChatGPT in their education career.(10)

The aim of this study is to find the prevalence of ChatGPT use in medical students during their medical education and also the factors that were associated with the use of this AI.

Methods

The study design was cross sectional and the study setting includes the following institutes of Peshawar: Northwest School Of Medicine, Rehman Medical College, Rehman College of Dentistry, Pak International Medical College, Sardar Begum Dental College, Khyber Girls Medical college and all other known hospitals of Peshawar
The study duration was from 16th Feb to 25th of Sep 2024. The ethical approval was taken from ethical committee of Northwest School of Medicine Peshawar via letter number 136/RC/NWSM/2024. For the calculation of sample size we have used the standardized formula from the WHO website and by taking all the constant terms according to modern technique i.e. 95% confidence interval and 5% percent confidence limit and the prevalence of use of ChatGPT from the previous literature we get the value of 370. The study included medical and dental students, as well as practitioners, while individuals unwilling to participate were excluded.

Data was collected using a questionnaire consisting of two sections: demographic information (age, gender, academic year, and professional status) and prevalence of ChatGPT adoption (patterns of use, purpose, perceived benefits, and concerns regarding its impact on education and clinical practice).The questionnaire was developed after reviewing relevant literature on ChatGPT adoption (3). To ensure validity, it was reviewed by a panel of three senior faculty members (two from medical education and one from behavioral sciences) for face and content validation. A pilot study was conducted on 25 participants (excluded from the final sample), and necessary modifications were made to improve clarity and reliability.

The Institutional Review Board and Ethical Committee of Alliance Healthcare Private Ltd. has granted ethical approval for this

study under reference number: 136/RC/NWSM/2024, Date: 10/6/2024. Consent was obtained from all eligible participants. A non-probability convenience sampling technique was used due to practical limitations in reaching all eligible participants across institutions.

Data was entered into SPSS version 25. Frequency and percentages was calculated. Chi-square test was applied to assess associations between variables, with frequencies and percentages reported for demographic factors.

Results

The study consists of 370 participants, with a response rate of 100%. The demographic data reveal a nearly equal gender distribution among the 370 participants, with 47.6% being male and 52.4% female. Most of the respondents were second-year students (28.9%), followed by first-year (16.8%) and third-year students (15.9%), while the least represented groups included fifth-year students (5.7%) and Practitioners (7.0%). In terms of field of study, most participants were MBBS students (58.4%), followed by BDS students (22.7%), with fewer respondents identified as doctors (11.9%) and specialists (7.0%). The highest number of participants was from Northwest School of Medicine (32.2%), followed by Rehman Medical College (15.4%) and Rehman College of Dentistry (11.9%), while the lowest representation came from Pakistan Institute of Medical Sciences and Lady Reading Hospital (0.5% each).

Table 1: Sociodemographic Features of the Sample

Variables	Categories	Frequency/Percentage
Gender	Male	176 (47.6%)
	Female	194 (52.4%)
Year of Study	1st year	62 (16.8%)
	2nd year	107 (28.9%)
	3rd year	59 (15.9%)
	4th year	51 (13.8%)
	5th year	21 (5.7%)
	TMO	44 (11.9%)
	Practitioners	26 (7.0%)
MBBS	216 (58.4)	
Field of study Institute	BDS	84 (22.7%)
	Doctors	44 (11.9%)
	Specialist	26 (7.0%)
	NWSM	119 (32.2%)
	RMC	57 (15.4%)
	PIMC	40 (10.8%)
	RCD	44 (11.9%)
	SBDC	40 (10.8%)
	NWGH	32 (8.6%)
	RMI	12 (3.2%)
	HMC	10 (2.7%)
	KTH	12 (3.2%)
	PIMS	2 (0.5%)
	LRH	2 (0.5%)

The chi-square analysis highlights significant associations between both the year of study and the field of study with perceptions of ChatGPT. The results indicate that students at different academic levels perceive the importance of ChatGPT in academic success differently ($p < 0.001$) with an effect size of (0.191), with variations also observed in its use for self-diagnosis ($p = 0.010$), with an effect size of (0.171) reliability as an information source ($p < 0.003$), with an effect size of (0.179), and recommendations for academic duty ($p = 0.025$) with an effect size of (0.163). Similarly, the field of study significantly influences perceptions of ChatGPT, as seen in its importance for academic success ($p = 0.009$), with an effect size of (0.155), usage for self-diagnosis ($p < 0.001$), with an effect size of (0.253) and recommendation for reliable source of information reliability ($p < 0.001$), with an effect size (0.240), usage for academic duty ($p<0.001$), with an effect size of (0.180). These findings suggest that students at different academic levels and from various fields of study have distinct views on the role of ChatGPT in medicine, indicating its diverse influence on learning and professional use

TABLE 2: Association of Year and Field of Study with Perceptions of ChatGPT.

Variable	Perceptions about GPT	Chi-Square P Value	Effect Size Cramer's V
Year of Study	Importance of ChatGPT in academic success	<0.001	0.191
	Use of ChatGPT for self-diagnosis purposes	0.010	0.171
	ChatGPT is a reliable reference for information.	<0.003	0.179
	Chat GPT as a recommendation for academic duty	0.025	0.163
Field of Study	Importance of ChatGPT in academic success	0.009	0.155
	Use of ChatGPT for self-diagnosis purposes	<0.001	0.253
	Chat GPT as a reliable source of information	<0.001	0.240
	Chat GPT as a recommendation for academic duty	<0.001	0.180

Discussion

Our study results underscores the different point of views of different students and practitioners about the role of ChatGPT in medical education and clinical practices, they were disagreed about the point that ChatGPT enhances cognitive ability and critical thinking of individuals. However according to students perception ChatGPT can foster the critical thinking and these findings aligns with the findings which are suggesting that active engagement of medical students with ChatGPT could play a role as an indicator of cortical thinking and cognitive ability skills (1).

Despite of many limitations in our study, ChatGPT can also has a positive correlation with of its perception as the most reliable academic resource and this is further explained by the point that ChatGPT could also make MCQs and all other exam stuff and assignments (5). ChatGPT has the high acceptance rate among the students (11) and this is also reflected in our study. As ChatGPT is world widely recognized but still other AIs are also present that will help a lot than this and will suggest a need for broader adoption (12).

The nature of the ChatGPT is another a key finding it was noted by the individuals that AI can also provide information about the fractures and clinical care but it was failed to provide detailed explanation on X-ray

findings (13). This point support our results that ChatGPT will provide us only surface level knowledge but not the full deeper diagnosis.

One of the most important and critical issue raised in our study that if students are more dependent on the use of AI it will affect their cognitive ability and will lessen their critical thinking skills so they will fail in their lives where they need to work based on their experiences and cognitive ability (14). Our findings also support this concern by concluding in their descriptive that 65% of all the participants were agreed that over dependence can lead to lessen the skilled ability of an individual.

To further contextualize our results, we draw one study more that tell us that AI like ChatGPT could do administrative tasks so much easily and readily in different clinical settings (15). In the same way professionals highlighted the point that including the AI in medical curricula is important so that the doctors and professional may aware of the clinical advancements and technologies (16).

According to another view, many questions has been raised about the use of AI in healthcare settings, that it may be dangerous to patients health and may be unethical as these website may leak the patients data(17). One another systemic review found that by use of AI we can enhance the accuracy and precision of diagnosis but that depend upon the data quality in which they were trained (18).

In the end the strength of ChatGPT to make a connection in healthcare access especially in low resource settings. These finding suggests that AI tools Like ChatGPT can provide us advice, but not so much deeply diagnosis in those areas which were far away from advanced healthcare settings and it prove to be valuable and useful tool there in resource limited settings. (19)

Our study has several limitations which are: time constraints, and also we are unable to visits all the healthcare settings of KPK and Pakistan so that our findings become more generalized by making it multiregional. So smaller area of our methodology may affect the generalizability of our study. So further studies are also required to make these results more genralizable and in balanced proportion.

Conclusions

In conclusion, while ChatGPT holds promise as a supplementary tool in medicine, its limitations and potential risks cannot be overlooked. Differences in students and practitioners' perceptions highlight the need for balanced AI use to improve essential skill development.

Data Availability: The study's data can be obtained from the corresponding author upon request.

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All the authors agree to take responsibility for every facet of the work, making sure that any concerns about its integrity or veracity are thoroughly examined and addressed.