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Impact of artificial intelligence on learning outcomes among medical students

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Background: Artificial intelligence (AI) is increasingly becoming integral to medical practice. This study aimed to assess the impact of AI on learning outcomes among medical students and their understanding of its applications in medical education at a tertiary care teaching hospital in India.

Method: After obtaining Institutional Ethics Committee (IEC) approval, a cross-sectional observational study was conducted between January 2025 to March 2025 over two weeks at a tertiary care teaching hospital among 500 Batchelor of Medicine and Batchelor of Surgery (MBBS) students from various academic years. A self- structured, pre-validated questionnaire was used to collect data. Convenience sampling was employed, participation was voluntary with informed consent, and confidentiality was maintained. Data were analysed using SPSS version 27.0, with results expressed as mean ± standard deviation and n (percentage).

Results: The study included 500 MBBS students (mean age 20.8 ± 1.9 years; 62% female, 38% male) from all years of study. Perceptions of AI in medicine included its role in advancing the field (36%), delivering accurate results (28%), providing lifestyle-based preventive recommendations (42%), aiding diagnosis (37%), generating prescriptions (33%), and designing personalized treatments (35%), with fewer seeing it offering emotional support (18%) or replacing psychiatric counselling (15%). Common AI uses were academic learning (37%), assignments (25%), research (21%), diagnosis (19%), treatment exploration (15%), and other purposes (8%).

Conclusion: A significant proportion of medical students acknowledged the potential of AI in advancing the medical field and supporting diagnostic and treatment-related functions, and role in replacing physicians, indicating the need for enhanced awareness, training, and integration strategies to optimize AI adoption in medical education and practice.

Key Words: Artificial intelligence (AI), Medical education, Medical students

تأثير الذكاء الاصطناعي على نتائج التعلم لدى طلاب الطب

الخلفية: أصبح الذكاء الاصطناعي (AI) جزءًا لا يتجزأ من الممارسة الطبية بشكل متزايد. هدفت هذه الدراسة إلى تقييم تأثير الذكاء الاصطناعي على نتائج التعلم بين طلاب الطب وفهمهم لتطبيقاته في التعليم الطبي في مستشفى تعليمي للرعاية الثالثية في الهند.

الطريقة: بعد الحصول على موافقة لجنة الأخلاقيات المؤسسية (IEC)، أجريت دراسة رصدية مقطعية على مدى أسبوعين في مستشفى تعليمي للرعاية الثالثية بين ٥٠٠ طالب في بكالوريوس الطب والجراحة (MBBS) من سنوات دراسية مختلفة. تم استخدام استبيان ذاتي البناء ومُتحقق مسبقًا لجمع البيانات. تم استخدام أخذ العينات الملائمة، وكانت المشاركة طوعية بموافقة مستنيرة، وتم الحفاظ على السرية. تم تحليل البيانات باستخدام برنامج SPSS الإصدار ٢٧,٠، مع التعبير عن النتائج على أنها متوسط ± الانحراف المعياري و n (نسبة مئوية).

النتائج: شملت الدراسة ٥٠٠ طالب في بكالوريوس الطب والجراحة (متوسط العمر ٢٠,٨ ± ١,٩ سنة؛ ٦٢٪ إناث، ٣٨٪ ذكور) من جميع سنوات الدراسة. شملت تصورات الذكاء الاصطناعي في الطب دوره في تطوير المجال الطبي (٣٦٪)، وتقديم نتائج دقيقة (٢٨٪)، وتقديم توصيات وقائية مبنية على نمط الحياة (٤٢٪)، والمساعدة في التشخيص (٣٧٪)، وتوليد الوصفات الطبية (٣٣٪)، وتصميم علاجات شخصية (٣٥٪)، مع قلة ترى أنه يقدم دعمًا عاطفيًا (١٨٪) أو يحل محل الاستشارات النفسية (١٥٪). وكانت الاستخدامات الشائعة للذكاء الاصطناعي هي التعلم الأكاديمي (٣٧٪)، والواجبات (٢٥٪)، والبحث (٢١٪)، والتشخيص (١٩٪)، واستكشاف العلاج (١٥٪)، وأغراض أخرى (٨٪).

الخلاصة: أقرت نسبة كبيرة من طلاب الطب بإمكانيات الذكاء الاصطناعي في تطوير المجال الطبي ودعم الوظائف التشخيصية والعلاجية، ودوره في استبدال الأطباء، مما يشير إلى الحاجة إلى تعزيز الوعي والتدريب واستراتيجيات التكامل لتحسين اعتماد الذكاء الاصطناعي في التعليم والممارسة الطبية.

الكلمات المفتاحية: الذكاء الاصطناعي، التعليم الطبي، طلاب الطب

میڈیکل طلباء میں سیکھنے کے نتائج پر مصنوعی ذہانت کا اثر

پس منظر: مصنوعی ذہانت (AI) تیزی سے طبی مشق کا لازمی جزو بنتی جا رہی ہے۔ اس مطالعہ کا مقصد طبی طلباء کے سیکھنے کے نتائج پر AI کے اثرات کا جائزہ لینا تھا اور ہندوستان کے ایک ترتیری نگہداشت کے تدریسی ہسپتال میں طبی تعلیم میں اس کی درخواستوں کے بارے میں ان کی سمجھ میں۔

طریقہ: ادارہ جاتی اخلاقیات کمیٹی (IEC) کی منظوری حاصل کرنے کے بعد، مختلف تعلیمی سالوں کے ۵۰۰ بیچلر آف میڈیسن اور بیچلر آف سرجری (MBBS) طلباء کے درمیان ایک ترتیری کیئر ٹیچنگ ہسپتال میں دو ہفتوں کے دوران ایک کراس سیکشنل مشاہداتی مطالعہ کیا گیا۔ ڈیٹا اکٹھا کرنے کے لیے ایک خود ساختہ، پہلے سے توثیق شدہ سوالنامہ استعمال کیا گیا تھا۔ سہولت کے نمونے لینے کا استعمال کیا گیا تھا، شرکت باخبر رضامندی کے ساتھ رضاکارانہ تھی، اور رازداری کو برقرار رکھا گیا تھا۔ اعداد و شمار کا تجزیہ SPSS ورژن ۲۷٫۰ کا استعمال کرتے ہوئے کیا گیا، جس کے نتائج کا اظہار اوسط ± معیاری انحراف اور n (فیصد) کے طور پر کیا گیا۔

نتائج: مطالعہ میں ۵۰۰ MBBS طلباء (مطلب عمر ۲۰٫۸ ± ۱٫۹ سال؛ ۶۲٪ خواتین، ۳۸٪ مرد) تمام سالوں کے مطالعے سے شامل تھے۔ طب میں AI کے تصورات میں فیلڈ کو آگے بڑھانے میں اس کا کردار (۳۶٪)، درست نتائج فراہم کرنا (۲۸٪)، طرز زندگی پر مبنی احتیاطی سفارشات (۴۲٪)، معاونت تشخیص (۳۷٪)، نسخے تیار کرنا (۳۳٪)، اور ذاتی نوعیت کے علاج (۳۵٪) کو ڈیزائن کرنا شامل ہے، جس میں بہت کم لوگ اسے جذباتی یا غیر نفسیاتی مدد فراہم کرتے ہیں۔ (۱۵٪)۔ AI کا عام استعمال تعلیمی سیکھنے (۳۷٪)، اسائنمنٹس (۲۵٪)، تحقیق (۲۱٪)، تشخیص (۱۹٪)، علاج کی تلاش (۱۵٪)، اور دیگر مقاصد (۸٪) تھے۔

نتیجہ: طبی طلباء کے ایک نمایاں تناسب نے طبی میدان کو آگے بڑھانے اور تشخیصی اور علاج سے متعلق افعال میں معاونت کرنے میں AI کی صلاحیت کو تسلیم کیا، اور معالجین کی جگہ لینے میں کردار، طبی تعلیم اور مشق میں AI کو اپنانے کو بہتر بنانے کے لیے بیداری، تربیت، اور انضمام کی حکمت عملیوں میں اضافے کی ضرورت کی نشاندہی کی۔

کلیدی الفاظ: مصنوعی ذہانت (AI)، طبی تعلیم، طبی طلباء

تأثیر هوش مصنوعی بر نتایج یادگیری در بین دانشجویان پزشکی

زمینه و هدف: هوش مصنوعی (AI) به طور فزاینده‌ای در حال تبدیل شدن به بخشی جدایی‌ناپذیر از حرفه پزشکی است. این مطالعه با هدف ارزیابی تأثیر هوش مصنوعی بر نتایج یادگیری در بین دانشجویان پزشکی و درک آنها از کاربردهای آن در آموزش پزشکی در یک بیمارستان آموزشی مراقبت‌های عالی در هند انجام شد.

روش: پس از اخذ مجوز کمیته اخلاق نهادی (IEC)، یک مطالعه مشاهده‌ای مقطعی طی دو هفته (بین ژانویه تا مارس ۲۰۲۵) در یک بیمارستان آموزشی مراقبت‌های عالی در بین ۵۰۰ دانشجوی پزشکی و جراحی (MBBS) از سال‌های تحصیلی مختلف انجام شد. برای جمع‌آوری داده‌ها از یک پرسشنامه خودساخته و از پیش اعتبارسنجی شده استفاده شد. نمونه‌گیری به صورت در دسترس انجام شد، مشارکت داوطلبانه با رضایت آگاهانه بود و محرمانگی حفظ شد. داده‌ها با استفاده از نرم‌افزار SPSS نسخه ۰/۲۷ تجزیه و تحلیل شدند و نتایج به صورت میانگین ± انحراف معیار و n (درصد) بیان شدند.

یافته‌ها: این مطالعه شامل ۵۰۰ دانشجوی MBBS (میانگین سنی ۲۰.۸ ± ۱.۹ سال؛ ۶۲ ٪ زن، ۳۸ ٪ مرد) از تمام سال‌های تحصیلی بود. برداشت از هوش مصنوعی در پزشکی شامل نقش آن در پیشرفت این رشته (۳۶٪)، ارائه نتایج دقیق (۲۸٪)، ارائه توصیه‌های پیشگیرانه مبتنی بر سبک زندگی (۴۲٪)، کمک به تشخیص (۳۷٪)، تولید نسخه (۳۳٪) و طراحی درمان‌های شخصی‌سازی‌شده (۳۵٪) بود و تعداد کمتری آن را در ارائه پشتیبانی عاطفی (۱۸٪) یا جایگزینی مشاوره روانپزشکی (۱۵٪) مفید می‌دانستند. کاربردهای رایج هوش مصنوعی شامل یادگیری دانشگاهی (۳۷٪)، تکالیف (۲۵٪)، تحقیق (۲۱٪)، تشخیص (۱۹٪)، کاوش درمان (۱۵٪) و سایر اهداف (۸٪) بود.

نتیجه گیری: بخش قابل توجهی از دانشجویان پزشکی، پتانسیل هوش مصنوعی را در پیشرفت رشته پزشکی و پشتیبانی از عملکردهای تشخیصی و درمانی و نقش آن در جایگزینی پزشکان اذعان کردند که نشان‌دهنده نیاز به افزایش آگاهی، آموزش و استراتژی‌های ادغام برای بهینه‌سازی پذیرش هوش مصنوعی در آموزش و عمل پزشکی است.

واژه های کلیدی: هوش مصنوعی (AI)، آموزش پزشکی، دانشجویان پزشکی

INTRODUCTION

Artificial intelligence (AI) is the capacity of machines to mimic human behaviour (1). It is a group of mathematical models that can learn and analyse large amounts of data in a variety of forms fast and effectively. These models are expressed as algorithms. It can speed up and simplify clinical care, promote public health initiatives, and increase the accuracy and speed of diagnosis, among many other applications in the medical profession (2,3). Although these concepts are relatively new, artificial intelligence is rapidly becoming a new reality in medical practice due to the massive amount of healthcare data being generated and its speedy digitization (4).

The practice of medicine and medical education are changing significantly as human society enters the era of artificial intelligence. AI is quickly changing a number of fields, including medical education and healthcare. In order to improve diagnostic precision, customize patient treatment, and streamline administrative tasks, AI applications including robotics, machine learning, and natural language processing have been used into medical practice more and more (5). AI is rapidly changing a number of industries, including healthcare, by opening up new possibilities for tailored medication, diagnostics, and patient care. AI has the ability to completely transform medical education by enabling complicated decision-making, offering individualized instruction, and improving the preparation of aspiring medical professionals (6).

AI has aided in the treatment of numerous illnesses and decreased a number of medical diagnostic and follow-up errors (7,8). AI has advanced quickly in recent years, from research to application in many medical fields (9). By 2035, the WHO estimates that there will be a shortage of 12.9 million healthcare workers worldwide (10). The burden of chronic diseases, rising healthcare costs, and an aging population are making it more difficult for governments around the world to create and modify healthcare delivery models.

As aspiring healthcare workers, medical students are important participants in this transition. The acceptance and use of AI technology in clinical practice can be strongly impacted by their knowledge of and attitudes regarding AI in medical school. Even though AI is becoming more and more important in healthcare, little is known about how medical students view its application in their coursework. To promote a greater knowledge of the many facets of health care AI, both positive and bad, it is imperative that medical curriculum and educational opportunities for patients, doctors, medical students, health administrators, and other healthcare workers be reviewed (11). Designing successful educational practices that promote AI literacy requires an understanding of their attitudes, awareness, and readiness to integrate AI tools into their learning and future practice.

Hence the purpose of this cross-sectional study is to assess the impact of artificial intelligence on learning outcomes among medical students and comprehension of the application of AI in medical education at a tertiary care teaching hospital. This study may provide important insights into how medical curriculum might be modified to successfully integrate AI concepts and prepare students for the future of medicine in an AI-driven world by evaluating their understanding, perceptions, and perceived hurdles or facilitators.

METHODS

Study Design and Setting

After obtaining IEC approval, descriptive cross-sectional study conducted among undergraduate medical students to assess their knowledge, perception, and practice regarding artificial intelligence (AI) in the field of medicine in a tertiary care teaching hospital from January 2025 to March 2025.

Study Population

A total of 500 undergraduate medical students were included. The sample size was determined based on feasibility and adequate representation across different years of study. Students currently enrolled in the MBBS program who consented to participate were included. Incomplete responses and postgraduate students were excluded. Before each participant completed the questionnaire, they were informed of the study's objective and were asked for their informed consent. All participants' information was kept private. Data was gathered over a two-week period. A systematic questionnaire created specifically for this study was used to gather data. The questionnaire was pilot-tested among 30 students (not included in final analysis) to ensure clarity and content validity. Cronbach's alpha coefficient of 0.81 indicated good internal consistency.

Study Tool

A self- structured, pre-validated questionnaire was used. The tool consisted of four sections: Age, gender, year of study, and previous exposure to AI are among the demographics. Questions evaluating students' attitudes toward the use and teaching of AI in medical education, as well as their perceptions of the technology's role in medical education, its advantages, difficulties, and potential effects on future careers, are also included. Multiple-choice and true/false questions test students' knowledge of AI, machine learning, deep learning, natural language processing, and predictive analytics, as well as factors influencing their attitudes and comprehension of AI.

Statistical Analysis

Data were coded and entered into Microsoft Excel and analysed using SPSS version 27. Descriptive

statistics (frequency, percentage, mean ± SD) were used to summarize demographic variables and KAP responses. Inferential statistics, including Chi-square tests, were applied to assess associations between demographic factors and KAP scores. A p-value of <0.05 was considered statistically significant.

RESULTS

A total of 500 students participated in the study. The majority of students (170; 34%) were aged between 24–25 years, followed by 22–23 years (150; 30%), and 20–21 years (110; 22%). Only 70 students (14%) were aged above 25 years. Out of 500 participants, 290 (58%) were females and 210 (42%) were males, indicating a moderately higher representation of female students in this study.

A considerable proportion of students (180; 36%) agreed that AI is essential for advancing the medical field, while nearly half (240; 48%) remained neutral. Table 1 summarizes the perceptions of students towards AI in healthcare. When asked about AI's clinical reliability, 140 students (28%) believed AI delivers accurate results, whereas 275 (55%) were undecided. Notably, 210 students (42%) agreed that AI could assist in providing lifestyle-based preventive recommendations by replacing physicians. Similarly, 185 students (37%) agreed AI could support diagnostic decision-making, while 165 (33%) agreed it could generate patient-specific prescriptions.

Interestingly, perceptions diverged on AI's role in treatment personalization: 175 students (35%) agreed, 165 (33%) disagreed, and 160 (32%) were neutral. Emotional and psychological roles of AI were largely dismissed, with 300 students (60%) disagreeing that AI could provide emotional support similar to a physician, and 305 (61%) rejecting the idea of AI substituting psychiatric counselling. On the other hand, 200 students (40%) believed AI could track patient adherence effectively, suggesting selective optimism toward AI's supportive but not substitutive role. Table 2 highlights the reported practices of AI among medical students.

The most common use was for academic learning (185; 37%), followed by preparing assignments (125; 25%) and research projects (105; 21%). A smaller number of students reported using AI for clinical purposes, including assisting in diagnosis (95; 19%) and exploring treatment options (75; 15%). A minority of students (40; 8%) used AI for other medical purposes such as exploring alternative treatment methods. These findings suggest that while AI is increasingly integrated into academic and research domains, its application in direct clinical decision-making remains relatively limited among undergraduates.

DISCUSSION

This cross-sectional study was conducted among 500 undergraduate medical students to assess their knowledge, perception, and practice regarding artificial intelligence (AI) in the field of medicine. The responses provided a comprehensive understanding of how future healthcare professionals view the integration of AI into clinical

Table 1. Perceptions Regarding the Role of Artificial Intelligence (AI) in Medicine

	Statements	Agree	Neutral	Disagree
Q1	AI is essential in advancing the medical field.	180 (36%)	240 (48%)	80 (16%)
Q2	AI delivers reliable and accurate clinical results.	140 (28%)	275 (55%)	85 (17%)
Q3	AI can assist in providing lifestyle-based preventive recommendations by replacing physicians (e.g., diet, exercise).	210 (42%)	160 (32%)	130 (26%)
Q4	AI has the potential to support diagnostic decision-making based on patient data by replacing physicians.	185 (37%)	190 (38%)	125 (25%)
Q5	AI can help in generating patient-specific prescriptions by replacing physicians by replacing physicians.	165 (33%)	190 (38%)	145 (29%)
Q6	AI can aid in designing personalized treatment strategies for individual patients by replacing physicians.	175 (35%)	160 (32%)	165 (33%)
Q7	AI is capable of offering emotional support similar to a physician.	90 (18%)	110 (22%)	300 (60%)
Q8	AI can effectively track and ensure patient adherence to medication and lifestyle modifications by replacing physicians.	200 (40%)	160 (32%)	140 (28%)
Q9	AI can serve as a substitute for psychiatric counselling provided by physicians.	75 (15%)	120 (24%)	305 (61%)

Table 2. Distribution of purpose of AI use by MBBS students	
Purpose	**Number (Percentage) of Respondents**
Academic Learning (e.g., studying)	185 (37.0%)
Completing Academic Assignments	125 (25.0%)
Conducting Research Projects	105 (21.0%)
Assisting in Medical Diagnosis	95 (19.0%)
Exploring Treatment Options and Modalities	75 (15.0%)
Others (different treatment methods)	40 (8.0%)
Total	500 (100%)

practice, education, and research.

Among the total participants, the highest proportion of students (170; 34%) were aged between 24–25 years. Furthermore, 290 participants (58%) were female, suggesting a moderately higher representation of women in the study population, which reflects the growing gender diversity in medical education. For instance, a study conducted in Syria reported that 70% of medical students had heard of AI technologies (2), while a study in Pakistan revealed that 68% of respondents were familiar with AI (13). Similarly, an Indian study reported that 62.5% of students had some awareness of AI applications (14). These results reflect a growing global trend where younger generations of medical professionals are increasingly exposed to AI concepts, either through their academic curricula, media, or digital tools.

A significant proportion of students are aware of AI in general, a smaller but meaningful percentage understand its relevance to clinical practice. This awareness is notably higher than what has been reported in some international studies. For example, a study by Swed S et al. found that only 23.7% of participants were aware of AI's role in healthcare. Similarly, a study in Pakistan showed that only 27.3% of doctors and 19.4% of medical students knew about its application in clinical scenarios (13). In stark contrast, a multicentric study conducted in the United Kingdom found that 80% of medical students believed that AI would play a vital and transformative role in the future of healthcare delivery (15). This optimism is mirrored by a French study, where 86% of paediatricians expressed support for the integration of AI tools into paediatric care settings (16). Moreover, a global online survey found that 68.4% of medical students believed that knowledge of AI is essential and should be formally included in medical training (17). Adding further evidence, a systematic review among healthcare students showed that 76% held a positive attitude towards AI in clinical settings (18). Additionally, another review analyzing physician and student perspectives found that in 5 out of 8 included studies, more than 65% of respondents reported awareness of AI's clinical potential (19).

The perception of AI's role in modern medicine varied among participants. In this study, 180 students (36%) believed that AI is essential in medical practice, signifying a growing acceptance of AI's supportive capabilities in diagnostics, therapeutics, and patient care. Interestingly, 210 students (42%) expressed the belief that AI could replace some of the physician's roles, particularly in tasks such as creating personalized treatment plans or providing psychiatric support. These findings are in line with a study by Swed S et al., in which 45.7% of students strongly agreed and 41.7% had a positive attitude regarding the necessity of AI in the medical field (4). A web-based survey of surgeons found that 61.5% considered AI helpful for education and training, 59.5% for perioperative decision-making, and 53% saw its utility in improving surgical vision during emergency procedures (20). In a survey by Ahmed Z et al., 76.7% of students advocated for the inclusion of AI in the medical curriculum, while 78.3% emphasized its role in radiology, 59.8% in pathology, and 57.2% during the COVID-19 pandemic (13). Similarly, Jindal A et al. reported that 89.1% of Indian students expressed optimism regarding the future of AI in medicine (14). The UK multicentric study further revealed that 89% of students believed AI literacy would be advantageous to their medical careers, and 78% supported integrating AI training into undergraduate medical education (15). However, not all perceptions were positive. In a study from Nepal, more than 49% of students agreed or strongly agreed that AI might lead to a reduction in physician employment opportunities (21). In another study by Civaner MM et al., 58.6% of participants felt that AI might devalue the medical profession, 45.5% believed it could undermine trust, and 42.7% worried about a negative impact on doctor–patient relationships (22).

Further, French paediatricians expressed concerns about ethical and privacy risks, with 50% citing AI as a threat to data security and 35% seeing it as a risk to human ethics in clinical care. Similarly, in the study by Perrier E et al., 39% of respondents feared losing their clinical skills, and 6% feared that AI could eventually result in job displacement (16). A systematic review by Chen M et al. found that while 77% of respondents were optimistic about clinical AI, 68% disagreed with the notion that AI

could replace doctors, instead viewing it as a tool to support clinical decision-making rather than act autonomously (19).

Regarding practical application, a majority of the students—185 (37%)—reported using AI tools primarily for studying and academic learning. 125 students (25%) utilized AI for assignment preparation, and 105 (21%) applied AI in research work. Other notable applications included diagnosis (95; 19%) and exploring treatment options (75; 15%). These figures highlight that AI is already being integrated into the academic workflow of students, even if not yet widely adopted for clinical decision-making. In contrast, a study across 19 UK medical schools reported that only 45 out of 484 students had received any formal instruction in AI, suggesting a gap between interest and institutional support (15).

Similarly, De Simone B et al. reported that while 25% of surgeons were trained in robotic systems, only 9.5% were currently practicing with these tools (20). In Swed S. et al.'s study, residents and assistant professors were found to be 2.37 and 4.42 times more likely, respectively, to have hands-on experience with AI tools compared to medical students (12). In Perrier E et al.'s findings, those who received formal training in AI demonstrated significantly better knowledge and were more likely to have practical exposure to AI in medical settings (16). Finally, a comprehensive systematic review of 60 studies revealed that actual usage rates of AI among healthcare students ranged from only 10% to 30%, reflecting a substantial gap between awareness and real-world practice (19).

LIMITATIONS

The limitations of our study where it limited to a single institution, reducing the generalizability of results to wider medical student populations. Although efforts were made to compare results with international studies, variations in sample characteristics, academic curricula, and exposure to AI technologies across countries may affect the comparability of results.

CONCLUSION

Although a considerable proportion of medical students recognize the potential of artificial intelligence in advancing the medical field, supporting diagnostic decision-making, generating patient-specific prescriptions, and aiding in the design of personalized treatment strategies, a substantial number of students remain neutral or express skepticism about its reliability, accuracy, and ability to replace physicians in providing lifestyle-based recommendations, emotional support, or psychiatric counselling. These findings highlight that, while AI is viewed as a valuable tool in academic learning, research, and certain clinical applications, there is still hesitation in fully embracing it as a substitute for human physicians, underscoring the importance of increasing awareness, providing targeted training, and developing clear guidelines for its safe and effective integration into medical education and healthcare practice.

Ethical Considerations

Ethical issues including plagiarism, informed consent, misconduct, data fabrication and/or falsification, double publication and/or submission, redundancy, etc. have been completely observed by the authors. Consent was obtained from all the participants. The study was approved by the Ethics committee of TMCH (No.12/ECR/634/Inst/TN2020/RR20). We extend our appreciation to the participants who responded to our study questions. We acknowledge that we have not used any AI tools or technologies to prepare this manuscript.

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