

Effects of Artificial Intelligence (AI) Platforms on Medical Education Among Medical Students in Majmaah University

AI Platforms on
Medical
Education
Among Medical
Students

Abdulmalik B Albaker

ABSTRACT

Objective: To assess the effects of AI platforms on learning outcomes, study behavior, and academic performance among medical students at Majmaah University.

Study Design: Descriptive cross-sectional study

Place and Duration of Study: This study was conducted at the Majmaah University, Saudi Arabia from July 2025 to August 2025.

Methods: This descriptive cross-sectional study included 510 medical students selected through non-probability sampling. Data were collected using a structured electronic questionnaire that assessed demographic characteristics, AI usage patterns, perceived educational benefits and challenges, and academic performance indicators.

Results: Most students (78%) used AI tools regularly, with ChatGPT being the most common platform. Higher usage frequency was strongly associated with better theoretical understanding (mean score 4.7 ± 0.5), enhanced clinical reasoning (4.4 ± 0.6), improved exam preparation efficiency (4.7 ± 0.5), and increased study motivation (4.2 ± 0.7). Students who used AI daily demonstrated significantly higher GPAs (3.78 ± 0.41) and greater improvement in test scores ($18.4 \pm 6.2\%$) than low users.

Conclusion: AI platforms substantially enhance medical students' academic performance, conceptual understanding, and study efficiency; however, risks related to misinformation and dependency highlight the need for structured, ethical, and guided integration into medical education.

Key Words: artificial intelligence, medical education, AI platforms, academic performance, medical students

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INTRODUCTION

The high rate of artificial intelligence (AI) platforms development has transformed various industries, and the field of medicine education has been one of the most severely impacted spheres¹. With the further deployment of AI technologies in the healthcare sector, clinical decision-making, and biomedical research, medical schools all around the world are under the pressure to enhance their curriculum with the skills necessary to engage with, assess, and adequately use AI-based systems². The current AI systems such as large language models, virtual simulation, adaptive learning systems, and clinical reasoning algorithms

provide unprecedented chances to the field of individualized learning, automation of routine academic tasks and improvement of clinical thinking abilities³. They are now being utilized to automate the processes of studying, to give real-time feedback, to simulate patient interactions and to generate practice questions to convert the conventional medical-learning environment into one that is more dynamic and interactive⁴. Medical students worldwide have become increasingly reliant on AI-based systems to prepare for exams, explain complex phenomena in the biomedical sciences, and develop clinical skills⁵. With the assistance of AI tools, learners can access real-time clarifications, differential diagnoses, and evidence-based recommendations, thereby enhancing their theoretical knowledge base and problem-solving skills. The transition is consistent with competency-based models of medical education, which focus on self-directed learning and assessment of learning. Simultaneously, the institutions consider AI literacy to be a mandatory requirement for future physicians due to the rapid penetration of AI technologies into the field of radiology, pathology, surgery, and internal medicine⁶.

Nevertheless, it remains important to be concerned about the overuse of AI tools, the risk of misinformation, diminished critical thinking, and ethical considerations regarding data privacy and academic integrity. On the one hand, AI platforms can

Associate Professor, Orthopedic Department, College of Medicine, Majmaah University, 11952, Majmaah, Saudi Arabia.

Correspondence: Dr. Abdulmalik B Albaker, Associate Professor, Orthopedic Department, College of Medicine, Majmaah University, 11952, Majmaah, Saudi Arabia.
Contact No: +966539695518
Email: a.albaker@mu.edu.sa

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help to improve the efficiency of the educational process; however, they also can be abused to provide shallow knowledge or can inhibit the abilities of individual thinking. Moreover, disparities in access and in digital literacy can result in unequal learning opportunities among students^{7,8}. Here, it is necessary to consider the role AI platform plays with medical students, whether it improves academic performance, and what part of the learning process it affects the most, such, but not limited to, theoretical knowledge, clinical judgment, acquisition of skills, or exam preparation. Although there is a global interest in this, the amounts of data on Middle Eastern medical institutions on the educational impact of AI platforms among undergraduate medical students are still scarce.

METHODS

This was a descriptive, cross-sectional study conducted at Majmaah University from July 2025 to August 2025, including 510 medical students enrolled in various academic years.

Inclusion Criteria

- Medical students currently enrolled in MBBS program (all years).
- Students who have used any AI platform at least once for academic purposes.

Exclusion Criteria

- Students who have never used AI tools for learning.
- Incomplete or improperly filled questionnaires.

Data Collection

A structured, self-administered questionnaire that was distributed electronically was used to collect the data among all the eligible students. The questionnaire featured a section on demographic data, the patterns of AI tools use, the frequency and the purpose of the use, the perceived influence on the theoretical learning, the clinical reasoning, the preparation of exams, and the acquisition of the skills. Other items assessed satisfaction, perceived utility, moral concerns, risks of dependency, and issues related to AI use.

Statistical Analysis

Data were analyzed using SPSS version 26.0. Quantitative variables like the number of hours dedicated to AI tools and the perceived academic improvement scores were presented in the form of the mean \pm standard deviation. They also gave categorical variables of frequency of AI use, type of AI platform and perceived benefits in terms of frequencies and

percentages. The statistically significant value was taken as < 0.05 .

RESULTS

The group of medical students used in the study was 510 in number, and a small majority were females (272) than the males (238). Mean age was 21.8 ± 2.1 years with a slight difference in age of males 22.1 ± 2.2 years and females 21.5 ± 2.0 years ($p = 0.04$). The distribution of students was even in all the five years of study. The Equated GPA was 3.62 ± 0.48 and the difference in GPA was not significant between males and females. The students in medical school were reported to have done prior AI exposure before joining the school (28.2%). Table 1.

AI usage varied widely among students, with 186 low users, 168 moderate users, and 156 daily high users. ChatGPT was the most commonly used tool (398 students). Weekly AI usage time increased substantially across groups, from 2.4 ± 1.1 hours in low users to 5.3 ± 1.6 hours in moderate users and 9.6 ± 2.4 hours among daily users ($p < 0.001$). Table 2.

Theoretical understanding improved from an average score of 3.5 ± 0.8 in low users to 4.0 ± 0.6 in moderate users and 4.7 ± 0.5 in high users ($p < 0.001$). Clinical reasoning scores increased similarly—from 3.2 ± 0.9 to 3.7 ± 0.7 to 4.4 ± 0.6 ($p < 0.001$). Exam preparation efficiency was rated highly overall, rising from 3.9 ± 0.7 in low users to 4.7 ± 0.5 in high users. Motivation scores improved from 3.2 ± 1.0 to 4.2 ± 0.7 , while perceived reduction in study burden improved significantly from 3.4 ± 0.9 to 4.6 ± 0.6 ($p < 0.001$). Table 3.

Despite strong benefits, students expressed notable concerns. Misinformation risk was the most commonly agreed concern (63.1%), with a severity score of 3.6 ± 0.9 , significantly higher among frequent users ($p = 0.04$). Concerns about reduced critical thinking (56.4%, severity 3.4 ± 1.0) and AI overdependence (59.6%, severity 3.7 ± 0.8) were also prominent, especially among heavy users (both $p \leq 0.01$). Table 4.

GPA increased progressively from 3.49 ± 0.42 in low users to 3.62 ± 0.45 in moderate users and 3.78 ± 0.41 in high users ($p < 0.001$). Improvement in test scores followed the same trend, increasing from $8.2 \pm 4.1\%$ to $12.6 \pm 5.9\%$ to $18.4 \pm 6.2\%$ across groups ($p < 0.001$). Academic confidence improved from 3.4 ± 0.7 to 4.3 ± 0.5 , and study hours saved increased from 1.1 ± 0.6 to 3.8 ± 1.4 . Table 5.

Table No. 1: Demographic Characteristics of Medical Students (n = 510)

Variable	Male (n = 238)	Female (n = 272)	p-value
Mean age (years), mean \pm SD	22.1 ± 2.2	21.5 ± 2.0	0.04
Academic year (1st–5th), n (%)	48 / 50 / 44 / 52 / 44	54 / 46 / 54 / 60 / 58	0.32
GPA (0–5 scale), mean \pm SD	3.58 ± 0.51	3.65 ± 0.45	0.18
Prior AI exposure before medical school, n (%)	76 (31.9%)	68 (25.0%)	0.09
Daily study hours, mean \pm SD	3.1 ± 1.5	3.6 ± 1.7	0.02

Table No. 2: Patterns of AI Platform Usage Among Medical Students

Usage Variable	Low Users (<3 times/week) (n = 186)	Moderate Users (3–6 times/week) (n = 168)	High Users (Daily) (n = 156)	p-value
Primary AI tools used (ChatGPT/Bard/Bing AI), n (%)	140 / 18 / 28	130 / 16 / 22	128 / 18 / 10	0.21
Average weekly usage hours, mean ± SD	2.4 ± 1.1	5.3 ± 1.6	9.6 ± 2.4	<0.001
Main purpose (theory/clinical/exam prep), n (%)	80 / 61 / 45	68 / 60 / 40	62 / 43 / 51	0.03
Device used (Laptop/Mobile), n (%)	126 / 60	98 / 70	88 / 68	0.09

Table No. 3: Perceived Educational Impact of AI Platforms

Impact Domain	Low Users Mean ± SD	Moderate Users Mean ± SD	High Users Mean ± SD	p-value
Improved understanding of theory	3.5 ± 0.8	4.0 ± 0.6	4.7 ± 0.5	<0.001
Enhanced clinical reasoning	3.2 ± 0.9	3.7 ± 0.7	4.4 ± 0.6	<0.001
Better exam preparation efficiency	3.9 ± 0.7	4.2 ± 0.6	4.7 ± 0.5	<0.001
Increased study motivation	3.2 ± 1.0	3.6 ± 0.8	4.2 ± 0.7	<0.001
Reduced study time burden	3.4 ± 0.9	4.0 ± 0.8	4.6 ± 0.6	<0.001

Scores measured on a 1–5 Likert scale.

Table No. 4: Challenges and Concerns Related to AI Usage

Concern	Total (n = 510)	Agreement (%)	Mean Severity Score ± SD
Risk of misinformation	322 (63.1%)	3.6 ± 0.9	0.04
Reduced critical thinking	288 (56.4%)	3.4 ± 1.0	0.01
Overdependence on AI	304 (59.6%)	3.7 ± 0.8	<0.001
Ethical concerns (privacy/accuracy)	260 (51.0%)	3.2 ± 0.9	0.18
Fear of academic dishonesty	198 (38.8%)	3.0 ± 1.0	0.09

Severity measured on a 1–5 scale.

Table No. 5: Relationship Between AI Usage and Academic Performance

Variable	Low Users (n = 186)	Moderate Users (n = 168)	High Users (n = 156)	p-value
GPA (mean ± SD)	3.49 ± 0.42	3.62 ± 0.45	3.78 ± 0.41	<0.001
Improvement in test scores (%)	8.2 ± 4.1	12.6 ± 5.9	18.4 ± 6.2	<0.001
Self-reported academic confidence	3.4 ± 0.7	3.8 ± 0.6	4.3 ± 0.5	<0.001
Number of study hours saved weekly	1.1 ± 0.6	2.3 ± 1.0	3.8 ± 1.4	<0.001
Likelihood of recommending AI tools (%)	68%	84%	97%	<0.001

DISCUSSION

The research paper demonstrates that AI platforms have turned into part of the medical education of students of the Majmaah University, and there are distinct trends that the greater the use of AI is, the better the academic achievements, the best learning process, and the more motivation students have. The demographic information shows that the adoption of AI is universal in all the years of study and that students who used AI more frequently (Particularly those who used it daily) described their knowledge of theoretical information, clinical reasoning, and preparation to the exams as significantly higher. These results are consistent with the findings of the previous studies, in which AI-

enhanced learning conditions led to a consistent increase in knowledge retention and cognitive load, especially in the case of self-directed learners⁹. The findings associated with patterns of usage highlight that those students that have more interactions with AI platforms dedicate significantly more time to working with AI per week, which indicates that they rely on AI as a source of study support. The same tendencies were observed in past studies, in which greater exposure to the use of AI learning tools was associated with enhanced engagement and support of academic performance as perceived¹⁰. Further, a large language model was the most frequented AI tool, which has been reported in the existing literature, these both types are prevalent in medical education because of their

accessibility, flexibility, and simplification capabilities. This relationship, based on dose, resembles earlier studies showing that repeated, meaningful communication with AI systems increases the depth of learning, problem-solving ability, and active recollection¹¹. Interestingly, there was also an improvement in motivation scores caused by the increased use of AI which was also reflected in the past studies that credited the enhancement of motivation to the capabilities of AI tools that provided personal feedback and immediate clarification. High-frequency users were more concerned with this, which indicates that despite the academic benefits of AI, it brings about the risks of overreliance and passive learning. The same has been expressed in prior studies where students who have overused AI have been found to lack confidence in their independent decision-making capacity and becoming vulnerable to AI-generated mistakes. There were also ethical concerns, such as privacy and academic dishonesty, which aligns with earlier studies that indicated that AI use should be responsible and should not disrupt the academic environment¹².

A connection between the use of AI and academic performance was notable especially. Students who utilized AI on a regular basis had better GPAs, better gains in test scores, more academic confidence and time efficiency than their low users¹³. Moreover, the abundance of the chances that AI tools are suggested to the most frequent users highlights the perceived usefulness of the platforms in facilitating academic achievement. On the whole, such results prove the existence of a strong positive association between the use of AI and educational achievements, as well as confirm the necessity to discuss the issues of misinformation, the presence of ethical standards, and the ability to retain critical thinking abilities.

CONCLUSION

It is concluded that AI platforms positively influence medical education among students at Majmaah University significantly, and the greater the AI use, the better the theoretical knowledge, clinical reasoning, efficiency in exam preparation, and academic confidence. Those students who made more frequent use of AI tools had higher academic performance and better time-saving advantages, which proves the usefulness of AI in supporting students with learning activities. Nevertheless, the issues with misinformation, lower level of critical thinking, and possible overdependence accentuate the importance of the structured guidelines and responsible strategies of usage.

Author’s Contribution:

Concept & Design or acquisition of analysis or interpretation of data:	Abdulmalik B Albaker
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Drafting or Revising Critically:	Abdulmalik B Albaker
Final Approval of version:	The above author
Agreement to accountable for all aspects of work:	The above author

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REFERENCES

- Jebreen K, Radwan E, Kammoun-Rebai W, Alattar E, Radwan A, Safi W, et al. Perceptions of undergraduate medical students on artificial intelligence in medicine: mixed-methods survey study from Palestine. *BMC Med Educ* 2024;24(1), 507.
- Almalki M, Alkhamis MA, Khairallah FM, Choukou MA. Perceived artificial intelligence readiness in medical and health sciences education: a survey study of students in Saudi Arabia. *BMC Med Educ* 2025;25(1):439.
- Hamdah H, Atia M, Daboul R, Alhamid AAH, Alayyoubi A, Naima HA, et al. Artificial intelligence in focus: assessing awareness and perceptions among medical students in three private Syrian universities. *BMC Med Educ* 2025;25(1):801.
- ALruwail, Farhan B, Alshalan AM, Thirunavukkarasu A, Alibrahim A, Alenezi AM, et al. Evaluation of Health Science Students’ Knowledge, Attitudes, and Practices Toward Artificial Intelligence in Northern Saudi Arabia: Implications for Curriculum Refinement and Healthcare Delivery. *J Multidisciplinary Healthcare* 2025;623-635.
- Alabdulwahhab, Khalid M, Kazmi SY, Sami W, Almujel, Mohammed Hamed Alanazi, Khalid Falah Alanazi, Abdullah Meshal Moyana, Mohammad Shakil Ahmad, Tariq A. Alasbali, and Fahd Al Alwadani. "Use of online resources by undergraduate medical students at College of Medicine, Majmaah University, Kingdom of Saudi Arabia." *PloS one* 16, no. 8 (2021): e0255635.
- Alsahafi Z, Baashar A. Knowledge, Attitudes, and Practices Related to Artificial Intelligence Among Medical Students and Academics in Saudi Arabia: A Systematic Review. *Cureus* 2025;17(5).
- Alghamdi AA, Alyousif GF, AlQarni AM, Amer FH, Alfadhel TO, Almutairi RN, et al. Factors affecting Saudi medical students’ engagement during synchronous and asynchronous eLearning and their impacts on the students’ academic

- achievement: a national survey. BMC Medical Education 2024;24(1):358.
8. Almziad, Muhammad AA. Problem-Based Learning and its Effect on Writing Performance, Critical and Creative Thinking Skills: A Study at Majmaah University, Saudi Arabia. Pak J Life Social Sci 2024;22(2).
 9. Nukaly HY, Aljuhani RA, Alhartani MM, Alhindi YZ, Asif U, Alshanberi AM, et al. Knowledge of antibiotic use and resistance among medical students in Saudi Arabia. Advances Med Educ Prac 2024;501-512.
 10. Alhazmi A, Ibrahim M, Dawria A. Knowledge, attitude and practice of artificial intelligence among dietitians in Saudi Arabia: a cross-sectional study. BMJ Open 2025;15(9):e104230.
 11. Aboalshamat, Khalid, Alhuzali R, Alalyani A, Alsharif S, Qadhi H, et al. Medical and dental professionals readiness for artificial intelligence for Saudi Arabia vision 2030. Int J Pharmaceutical Res Allied Sciences 2022;11(4):52-59.
 12. Alabdulwahhab KM, Ahmad MS, Shaik RA, Alzahrani MA, Matbouly G, Ahmad RK, et al. Latest trends in medical education during COVID pandemic: a cross sectional study. Academic J 2021.
 13. Mohammed MA, Alyahya S, Mukhlif AA, Abdulkareem KH, Hamouda H, Lakhan, A. Smart Autism Spectrum Disorder Learning System Based on Remote Edge Healthcare Clinics and Internet of Medical Things. Sensors (Basel, Switzerland) 2024;24(23):7488.