Are Future Physicians Ready for Artificial Intelligence? Insights from Medical Students' Perspectives

Effat Abbasi Montazeri[1], Javad Zarei [2], **Bahareh Ghavami Hoseinpour[3,4,5]** , Amir Bahadori [6]

1.Department of Microbiology, Faculty of Medicine, Ahvaz Jundishapur University of Medical Sciences, Ahvaz, Iran.
2.Department of Health Information Technology, School of Allied Medical Sciences , Ahvaz Jundishapur University of Medical Sciences. Ahvaz, Iran.
3.Educational Technology, Vice-Chancellorship for Education, Ahvaz Jundishapur University of Medical Sciences, Ahvaz, Iran.
4.Ph.D. candidate of E-learning in Medical Sciences, Department of E-Learning in Medical Sciences ,Virtual School, Center of Excellence in E-Learning, Shiraz University of Medical Sciences, Shiraz, Iran.
5.Student Research Committee, Shiraz University of Medical Science, Shiraz, Iran.
6.Student Research Committee, Ahvaz Jundishapur University of Medical Sciences. Ahvaz, Iran.

Background

Artificial intelligence (AI) is rapidly transforming healthcare by enhancing diagnostic accuracy, enabling personalized treatments, and improving patient outcomes. Medical students, as future healthcare providers and primary AI users, require adequate knowledge and readiness to integrate AI effectively in clinical practice. Despite growing global interest, little is known about the preparedness of medical students in Iran to adopt AI technologies.

Methods

A descriptive cross-sectional survey was conducted during the second semester of the 2024–2025 academic year at Ahvaz Jundishapur University of Medical Sciences. Using convenience-based purposive sampling, 321 medical students were recruited through online announcements and in-person invitations. The minimum required sample size was estimated at 316 using a single-population proportion formula with finite population correction. Data were collected in person and through Google Forms using a previously validated 22-item AI Readiness Scale covering four domains: cognitive readiness (8 items), competency (8 items), vision (3 items), and ethics (3 items). Responses were recorded on a five-point Likert scale. Data were analyzed using SPSS version 26. Normality was assessed using the Kolmogorov–Smirnov test. One-sample t-tests or Wilcoxon signed-rank tests were used, as appropriate, to compare domain scores with the neutral midpoint of 3. Correlation analyses were performed to examine relationships among the four domains. Statistical significance was set at $p<0.05$.

Result

Participants demonstrated moderate cognitive readiness (mean=3.03), indicating an average theoretical understanding of AI. Competency in AI application scored significantly above average (mean=3.44, $p<0.001$), reflecting confidence in practical use, particularly with digital health tools. The vision toward AI in medicine was positive (mean=3.31, $p<0.001$), although varied among students. Ethical awareness scored highest (mean=3.69, $p<0.001$), indicating strong sensitivity to AI's ethical challenges. Significant positive correlations were found among all domains ($r=0.44$ to 0.73, $p<0.01$), with the strongest between cognition and competency. Despite general optimism, gaps remain in technical knowledge and regulatory understanding.

Conclusion

Medical students in this cohort demonstrate encouraging readiness to engage with AI, particularly in practical and ethical domains; however, foundational knowledge and technical literacy need to be strengthened. The findings underscore the urgent need to integrate interdisciplinary AI education, hands-on training, and legal-ethical instruction into medical curricula. These initiatives are essential to prepare future healthcare professionals for effective and responsible AI integration, ultimately enhancing the quality of patient care.

Email : ***Bahareghavami7@gmail.com***

References

1) Alowais SA, Alghamdi SS, Alsuhebany N, Alqahtani T, Alshaya AI, Almohareb SN, Aldairem A, Alrashed M, Bin Saleh K, Badreldin HA, Al Yami MS. Revolutionizing healthcare: the role of artificial intelligence in clinical practice. BMC medical education. 2023 Sep 22;23(1):689. https://doi.org/10.1186/s12909-023-04698-z
2) Paranjape K, Schinkel M, Panday RN, Car J, Nanayakkara P. Introducing artificial intelligence training in medical education. JMIR medical education. 2019 Dec 3;5(2):e16048. https://doi.org/10.2196/16048
3) Ejaz H, McGrath H, Wong BL, Guise A, Vercauteren T, Shapey J. Artificial intelligence and medical education: A global mixed-methods study of medical students' perspectives. Digital Health. 2022 May;8:20552076221089099. https://doi.org/10.1177/20552076221089099
4) Maaß L, Grab-Kroll C, Koerner J, Öchsner W, Schön M, Messerer DA, Böckers TM, Böckers A. Artificial Intelligence and ChatGPT in Medical Education: A Cross-Sectional Questionnaire on students' Competence. Journal of CME. 2025 Dec 31;14(1):2437293. https://doi.org/10.1080/28338073.2024.243729
5) Xuan PY, Fahumida F, Ismath M, Al Nazir Hussain MI, Jayathilake NT, Khobragade S, Soe HH, Moe S, Htay N, Nu M. Readiness Towards Artificial Intelligence Among Undergraduate Medical Students in Malaysia. Education in Medicine Journal. 2023 Jun 1;15(2). https://doi.org/10.21315/eimj2023.15.2.4