



## GR Journal of Multidisciplinary Research and Studies

Abbreviate Title- GR J Mul Res Stud

ISSN (Online) – XXXX-XXXX

Published by GR Publishers

Vol. 1 Issue 1 (Jan – Feb) – 2026



# Integrating Artificial Intelligence into Medical Education in Pakistan: Opportunities, Challenges, and Future Directions

Abdus Sami<sup>1</sup>, Momna Elham<sup>2</sup>, Mishaal Eman<sup>3</sup>

<sup>1</sup>Lecturer in Zoology, Department of Chemical & Life Sciences, Qurtuba University of Science & Information Technology, Dera Ismail Khan, Khyber Pakhtunkhwa, Pakistan

<sup>2</sup>B.S. in Zoology, Qurtuba University of Science & Information Technology, Dera Ismail Khan, Khyber Pakhtunkhwa, Pakistan

<sup>3</sup>Department of Physics, Government College No.01, Dera Ismail Khan, Khyber Pakhtunkhwa, Pakistan

Corresponding email: [abdussami@qurtuba.edu.pk](mailto:abdussami@qurtuba.edu.pk)



**Abstract:** In many medical schools around the world, artificial intelligence (AI) is becoming an important part of teaching, but not yet in Pakistan. Right now, AI is only taught in a few schools and universities. This means that many grads are not ready for data-driven professional practice. The disparity is becoming increasingly evident as digital technologies and big data have a more significant role in shaping treatment decisions. Incorporating AI literacy, ethical standards, and robust regulatory monitoring into undergraduate programs will enhance the safety of clinical practice and align medical training in Pakistan with worldwide standards.

**Keywords:** Artificial Intelligence; Medical Education; Ethics; Pakistan

### Article History

Received: 14.02.2026

Accepted: 16.02.2026

Published: 16.02.2026

Artificial intelligence (AI) is transforming medical education globally; nevertheless, several institutions in Pakistan remain slow to adapt. A recent national research revealed that around 25% of health sciences institutions in Pakistan already utilize structured digital learning platforms.<sup>1</sup>In some medical institutions, AI is being used to assess clinical results and guide treatment decisions.<sup>2</sup>Graduates lacking exposure to this training will enter a sector increasingly characterized by data-driven decision-making, yet they will be unable to utilize its tools responsibly or critically. Incorporating AI literacy into undergraduate education is not a novel concept; it is a professional obligation crucial for ensuring safe, ethical, and proficient clinical practice in contemporary medicine.<sup>1</sup>

Many areas of clinical care are already utilizing AI-based solutions. Presently, machine-learning algorithms can detect pathological and radiological abnormalities with a level of accuracy that is on par with,

and sometimes even exceeds, that of human experts in diagnostics.<sup>3</sup>AI-driven decision-support systems currently assist in treatment planning, early sickness detection, and enhancing the precision of risk assessments. This enhances the efficiency of both doctors and nurses while increasing patient safety.<sup>3,4</sup>Recent reviews describe the pace of AI adoption across hospitals as rapid and transformative.<sup>4</sup> As a result, these shifts have altered what is expected of medical competence. Clinicians are now required to understand, assess, and apply algorithm generated information responsibly in day-to-day practice.<sup>2,3</sup> Keeping pace with this transformation is therefore no longer optional for medical education. Without targeted national investment, Pakistan risks becoming a passive consumer of imported technologies rather than building the capacity to evaluate or adapt them for local clinical use.<sup>1,3</sup>

Artificial intelligence is likewise influencing mental-health research and practice. According to a recent

BMC Psychiatry review, models using speech and text features can detect depressive and anxiety disorders with accuracies of roughly 80–90%, while related techniques are being applied to relapse prediction and medication optimisation.<sup>4</sup> Evidence from this and related studies demonstrates that such tools are broadening access to psychiatric care through digital therapeutics and AI-assisted counselling platforms that support continuous, data-driven monitoring of patient progress.<sup>4,5</sup> However, the introduction of these tools brings important ethical concerns, particularly around privacy, consent, and the handling of sensitive mental-health data in low resource settings. The World Health Organization (WHO) has noted that AI tools in healthcare raises ongoing questions around transparency, accountability and the responsible use of data for both clinicians and developers.<sup>5</sup> In Pakistan, exposure to AI within medical training remains limited. National data indicates that relatively few clinicians have received

structured exposure to digital health or AI based systems due to limited institutional support, financial constraints and a shortage of trained faculty.<sup>6</sup> Medical colleges face practical barriers such as weak infrastructure, poor internet access and limited awareness of how AI can be used in teaching. Although some private universities have greater access to resources, they often depend on imported systems that are poorly aligned with the local clinical context.<sup>1,6</sup> Public institutions, by contrast, continue to struggle with the provision of even basic learning platforms.<sup>6</sup> Faculty readiness remains a further constraint, with few educators reporting confidence in teaching digital health skills.<sup>6,7</sup> Without comparable reforms, graduates in Pakistan are likely to remain underprepared for the digital transformation as its role progresses in clinical practice. Reform in Pakistan should begin with curriculum redesign and faculty preparation. Evidence from international settings suggests that introducing AI-related teaching

across the undergraduate years can strengthen core clinical skills as well as improve abilities of students with emerging technologies.<sup>8</sup> Pakistan can adapt these approaches by integrating AI content into existing clinical and research modules, supported by appropriate faculty development.<sup>8</sup> Ethical considerations should be addressed alongside technical instructions during training in line with WHO guidance.<sup>5</sup> Including these principles in the curriculum could help graduates evaluate algorithmic tools more confidently. This would facilitate appropriate application in patient care and allow graduates to take an informed role in the technologies influencing medical practice.<sup>8,9</sup> The growing use of AI in clinical prediction, imaging and targeted treatment has set new expectations for professional competence.<sup>10</sup> Pakistan cannot remain on the margins of this shift. Without structured training in AI, many medical graduates are likely to lack skills required for data centred decision making and contemporary

model of care.<sup>1,6</sup> Strengthening AI literacy at the undergraduate level is therefore essential. Recent analysis suggests that the pace of technological changes is likely to accelerate further. This makes it increasingly important for clinicians to engage with these systems critically and ethically.<sup>5,10</sup> This transformation rests on a strong ethical foundation. Principles of transparency, accountability and fair data use should be central to how AI education is approached.<sup>5</sup> With these safeguards in place, Pakistan can train clinicians who are technologically capable. These clinicians would also remain committed to the values that define high-quality medical care. Ultimately, the integration of AI into medical education reflects wider changes in contemporary medical practice. Ensuring that this shift is guided by clear educational priorities will be central to maintaining professional standards in an increasingly digital clinical environment.

## REFERENCES

1. SHAZIA, F. D., AMMARA, H., & FATIMA, F. M. (2025). Comparison of traditional methods versus digital learning methods among undergraduate medical students in Pakistan. *THE JOURNAL*, 75(02), 232-237.
2. Saraswat, D., Bhattacharya, P., Verma, A., Prasad, V. K., Tanwar, S., Sharma, G., ... & Sharma, R. (2022). Explainable AI for healthcare 5.0: opportunities and challenges. *IEEe Access*, 10, 84486-84517.
3. Reddy, S. (2024). Generative AI in healthcare: an implementation science informed translational path on application, integration and governance. *Implementation Science*, 19(1), 27.
4. Shumate, J. N., Rozenblit, E., Flathers, M., Larrauri, C. A., Hau, C., Xia, W., ... & Torous, J. (2025). Governing AI in mental health: 50-state legislative review. *JMIR Mental Health*, 12, e80739.
5. World Health Organization. (2021). *Ethics and governance of artificial intelligence for health: WHO guidance: executive summary*. World Health Organization.
6. Ahmed Khuwaja, H. M., Maqbool, A., Rahim, K. A., Gul, S., Hanif, S., & Karim, S. (2020). Status of Digital Learning Practices in Health Sciences Education in Pakistan. *Journal of the Pakistan Dental Association*.
7. Salman, M., Mustafa, Z. U., Shehzadi, N., Mallhi, T. H., Asif, N., Khan, Y. H., ... & Hussain, K. (2022). Evaluation of knowledge and practices about administration and regulations of high alert medications among hospital pharmacists in Pakistan: findings and implications. *Current Medical Research and Opinion*, 38(11), 1967-1975.
8. Ahmad, M. N., Abdallah, S. A., Abbasi, S. A., & Abdallah, A. M. (2023). Student perspectives on the integration of artificial intelligence into healthcare services. *Digital Health*, 9, 20552076231174095.

9. Tomraee, S., Hosseini, S. H., Zamani, M., & Sakhaei, S. (2025). Perceptions of Iranian medical students on artificial intelligence in healthcare and curricular integration. *International Journal of Advanced Multidisciplinary Research and Studies*, 5(3), 1107-1117.

10. Letterie, G. (2023). Artificial intelligence and assisted reproductive technologies: 2023. Ready for prime time? Or not. *Fertility and Sterility*, 120(1), 32-37.