

ARTIGO ORIGINAL / ORIGINAL ARTICLE

Evaluating Artificial Intelligence Competency Needs and Priorities Among Medical College Professionals: A Cross-Sectional Analysis

Avaliação das Necessidades e Prioridades de Competência em Inteligência Artificial entre Profissionais de uma Faculdade de Medicina: Uma Análise Transversal

Nazia Nazir ^{1,*} , Shivi Mishra ¹, Rohit Singh ¹

Afiliações

¹ Department of Anesthesiology and Critical Care, Government Institute of Medical Sciences, Greater Noida, India

Keywords

Artificial Intelligence; Attitude of Health Personnel; Health Knowledge, Attitudes, Practice.

Palavras-chave

Atitude do Pessoal de Saúde; Conhecimentos, Atitudes e Prática em Saúde; Inteligência Artificial.

ABSTRACT

Introduction: Artificial intelligence (AI)-based tools are rapidly entering clinical workflows. Understanding clinicians' perceptions, the areas in which they expect AI to be beneficial, desired competency levels, and ethical concerns is essential for planning training initiatives and ensuring safe implementation.

Methods: A cross-sectional, anonymized online survey administered through Google Forms was distributed to healthcare workers at a medical college. Data were collected between 16 and 23 January 2026. The questionnaire explored perceived benefits of AI, current clinical challenges that AI could address, workflow areas that AI could optimize, reasons why clinicians should understand AI, key ethical concerns, desired competency levels, and a measurable outcome that AI training could improve.

Results: Ninety-nine respondents from a wide range of specialties participated: Anesthesiology, General Surgery, General Medicine, Pediatrics, Radiology, Pulmonology. The mean clinical experience was 10.6 years. The most frequently selected potential benefits were earlier disease detection (74/99, 74.7%) and improved diagnostic accuracy (72/99, 72.7%). The workflow areas most commonly identified for AI implementation were optimization of clinical documentation and notes (85/99, 85.9%) and imaging interpretation (65/99, 65.7%). Desired AI competency levels were practical use/safe application of AI tools (46/99, 46.5%), advanced competency (designing and evaluating AI models) (40/99, 40.4%), and basic literacy (13/99, 13.1%). The leading ethical concerns were clinician accountability/liability (41/99, 41.4%), patient safety (31/99, 31.3%), transparency (22/99, 22.2%), bias (16/99, 16.2%), and data confidentiality (15/99, 15.2%).

Conclusion: Clinicians across career stages expect AI to improve early disease detection and diagnostic accuracy and express a strong interest in AI training focused on the safe and accountable use of these technologies.

RESUMO

Introdução: As ferramentas baseadas em inteligência artificial (IA) estão a entrar rapidamente nas rotinas clínicas. É essencial compreender as percepções dos clínicos, as áreas onde esperam benefícios, os níveis de competência desejados e as preocupações éticas para planejar a formação e uma implementação segura.

Métodos: Um inquérito transversal e anónimo do Google foi distribuído a profissionais de saúde de uma faculdade de medicina. Os dados foram recolhidos entre 16 de janeiro de 2026 e 23 de janeiro de 2026 (N = 99 participantes). O questionário abordou os benefícios percebidos da IA, os desafios clínicos atuais que a IA poderia ajudar a resolver, as áreas de fluxo de trabalho que a IA poderia otimizar, as razões pelas quais os clínicos devem compreender a IA, as principais preocupações éticas, o nível de competência desejado e um resultado mensurável que a formação em IA poderia melhorar.

Resultados: Participaram 99 profissionais de uma grande variedade de especialidades (especialidades mais frequentes: Cirurgia Geral 8/99, Microbiologia, Pediatria e Medicina Geral com 5/99 cada). A experiência clínica média foi de 10,6 anos. Os potenciais benefícios mais selecionados foram a deteção precoce de doenças (74/99, 74,7%) e a melhoria da precisão diagnóstica (72/99, 72,7%). Foi documentado o uso de IA na otimização de notas clínicas (85/99, 85,9%) e na interpretação de imagens (65/99, 65,7%). Os níveis de competência desejados em IA foram o uso prático/aplicação segura de ferramentas (46/99, 46,5%), avançado (desenho/avaliação de modelos) (40/99, 40,4%) e literacia básica (13/99, 13,1%). As principais preocupações éticas foram a responsabilização/responsabilidade jurídica do clínico (41/99, 41,4%), a segurança do doente (31/99, 31,3%), a transparência (22/99, 22,2%), o viés (16/99, 16,2%) e a confidencialidade dos dados (15/99, 15,2%).

Conclusão: Os clínicos, independentemente da fase da carreira, esperam que a IA melhore a deteção e a precisão diagnóstica. Além disso, desejam uma formação em IA que enfatize o uso prático seguro e a responsabilidade jurídica.

Autor Correspondente/Corresponding Author*:

Nazia Nazir

Morada: Government Institute of Medical Sciences, Greater Noida 6/15; Type 6; GBU

Campus, Greater Noida. 201310

E-mail: nazunazir@gmail.com

INTRODUCTION

Artificial intelligence (AI) promises to augment many aspects of healthcare, ranging from image interpretation to predictive risk stratification and administrative automation.¹ However, its safe and effective adoption depends on clinician trust, competency, and clarity about ethical and medicolegal responsibilities.² Recently, the National Board of Examinations in Medical Sciences has launched an online course on the use of AI in Healthcare across the country. In this context, we decided to conduct a rapid cross-sectional survey of clinicians at our medical college to capture their expectations, training needs, and ethical concerns about AI in healthcare before the start of the course.

METHODS

Study Design & Setting

Cross-sectional anonymized survey administered via Google Forms to healthcare workers (postgraduate residents, senior residents, faculty and allied clinicians) affiliated with a medical college. The principal investigator is a trainee at the institution; this survey was an internal needs-assessment and educational planning activity.

This study was reviewed and determined to be exempt from Institutional Ethics Committee review under Category 2 of the Common Rule (45 CFR 46.104(d)(2)), as it involved solely anonymous or non-sensitive survey procedures among competent adult healthcare professionals. Participation was completely voluntary, and completion of the electronic questionnaire constituted implicit informed consent. All data were aggregated and managed in compliance with institutional confidentiality protocols; no identifiable patient health information or sensitive institutional performance metrics were evaluated.

Data Collection Period

Data were collected between 16 and 23 January 2026. Responses were exported from Google Forms and constituted the study dataset (**Appendix 1: AI in Healthcare Feedback Form**).

Questionnaire

The form included items on: demographics (specialty and years of clinical experience), multiple-choice items about areas where AI could improve patient care (respondents could select multiple), examples of clinical challenges that AI could address (free text), workflow areas where AI could optimize care, why clinicians (rather than technology vendors) should understand AI (free text), the single key ethical concern the respondent wanted to learn more about, desired level of AI competency (basic literacy, practical use or advanced competency), and one measurable outcome AI training could improve.

Analysis

Responses were exported and analyzed descriptively. For multiple-choice items, counts and percentages were calculated. Free-text answers were reviewed and coded thematically to extract common examples and ethical concerns.

RESULTS

A total of 99 healthcare workers completed the survey (**Appendix 1: AI in Healthcare Feedback Form**). Mean years of clinical experience: 10.6 years (range 1–40).

Respondents represented diverse specialties; the most frequently reported were: Anesthesiology (17.1%), General Surgery (14.1%), General Medicine (14.1%), Pediatrics (13.1%), Radiology (8%), Pulmonology (8%), Microbiology (8.1%), Pathology (6.1%), Pharmacology (6.1%) and ENT (5.1%). The survey explored perceptions regarding potential improvements in patient care, workflow optimization, desired AI competency levels, and career development opportunities associated with AI (**Table 1**). The following top patterns were noted:

- Top clinical benefit: Earlier disease detection (74.7%).
- Top workflow benefit: Documentation/clinical notes (85.9%).
- Most desired competency: Practical AI use (46.5%).
- Top ethical priorities: Patient safety + Clinical accountability (27.3% each).
- Top career motivation: Research and innovation (38.4%)

Ethical concerns identified through thematic analysis of free-text responses are summarized below (respondents could mention more than one concern):

- Clinician accountability/liability: 41/99 (41.4%).
- Patient safety: 31/99 (31.3%).
- Explainability/transparency (need to explain AI decisions to patients): 22/99 (22.2%).
- Bias/fairness: 16/99 (16.2%).
- Data privacy/confidentiality: 15/99 (15.2%).

Concerns regarding de-skilling and overreliance on AI were infrequently reported but were identified in several free-text responses. Such concerns are in line with the broader AI discussions. Healthcare professionals are aware of the disruptive potential of AI in medicine. Some medical specialties, particularly those involved with diagnostics like radiology and pathology, may especially be vulnerable.³⁻⁶

Representative free-text examples (verbatim phrasing was coded into themes):

- “AI can help predict difficult airway.” (anesthesia — example of a clinical challenge).
- “Streamline diagnosis of interstitial lung disease on computed tomography (CT).” (pulmonology — imaging challenge).
- “I want to better understand bias and how datasets affect results.” (ethical concern).
- “Clinicians must learn AI to explain AI-supported decisions to patients and maintain clinical accountability.” (reason for clinician competency).

DISCUSSION

Clinical Impact and Patient Safety

The finding that earlier disease detection (74.7%) and improved diagnostic accuracy (72.7%) were perceived as the principal benefits of AI is consistent with previous literature. Rony et al reported that healthcare workers viewed AI as a valuable tool for enhancing diagnostic performance and supporting clinical decision-making, particularly in data-inten-

Table 1. Questionnaire Responses of Clinicians on Perceptions of Artificial Intelligence Use in Healthcare.

Question	Response Option	
How can AI improve patient care in your specialty?	Improved diagnostic accuracy	72 (72.7)
	Earlier disease detection	74 (74.7)
	Personalized treatment planning	56 (56.6)
	Reduced medical errors	64 (64.6)
	Enhanced clinical decision support	65 (65.7)
Which areas of your workflow could AI optimize?	Documentation/clinical notes	85 (85.9)
	Imaging interpretation	65 (65.7)
	Triage and risk stratification	44 (44.4)
	Administrative tasks	52 (52.5)
	Population health management	47 (47.5)
Desired level of AI competency	Basic literacy (understanding concepts)	13.1%
	Practical use (applying tools safely)	46.5%
	Advanced (designing/evaluating models)	40.4%
Why is it important for clinicians to understand AI?	To evaluate bias and fairness	13.1%
	To ensure patient safety	27.3%
	To maintain clinical accountability	27.3%
	To explain AI-supported decisions to patients	19.2%
	To meet regulatory and ethical standards	13.1%
How does learning AI support your long-term career?	Keeps skills future-ready	37.4%
	Enhances leadership opportunities	6.0%
	Supports research and innovation	38.4%
	Improves collaboration with data/IT teams	18.2%

sive healthcare environments.² Similarly, Topol described AI as a means of augmenting clinical practice through improved pattern recognition and decision support rather than replacing clinicians.⁷ The strong emphasis on patient safety and clinical accountability observed in our survey further suggests that respondents view AI as a supportive technology whose benefits depend on appropriate human oversight.

Workflow Optimization

One of the most notable findings was the overwhelming interest in AI-assisted documentation and clinical notes (85.9%), exceeding interest in imaging interpretation (65.7%). While much of the published literature focuses on diagnostic applications of AI, several authors have highlighted the importance of workflow optimization and administrative efficiency as major drivers of AI adoption. Bajwa *et al* emphasized the potential of AI to streamline healthcare processes and reduce administrative burden, thereby allowing clinicians to devote more time to patient care.⁸ Similarly, Topol argued that automation of routine tasks may be one of the most significant contributions of AI to healthcare systems.⁷

The substantial interest in imaging interpretation observed in our survey is also supported by the literature. Lauritzen *et al* demonstrated that AI-assisted mammography screening reduced radiologist workload while maintaining clinical performance, highlighting the potential value of AI in diagnostic imaging workflows.³ King likewise emphasized the growing role of AI in radiology and its potential to improve efficiency and diagnostic support.⁶

Educational and Professional Development

A particularly important finding was the preference for practical (46.5%) and advanced (40.4%) AI competencies rather than basic literacy alone (13.1%). This suggests that clinicians increasingly recognize the need not only to understand AI concepts but also to evaluate and safely apply AI tools in practice. Previous studies among medical students have similarly reported positive attitudes toward AI education and support for incorporating AI-related competencies into medical curricula. Al Hadithy *et al* found substantial interest among medical students in learning about AI and its clinical applications.¹

Our findings extend those observations to practicing healthcare professionals and suggest that educational programs should move beyond introductory awareness toward practical implementation and critical appraisal skills. Rony *et al* similarly reported that healthcare workers considered AI knowledge important for future clinical practice and professional development.²

Organizational and Ethical Considerations

The most frequently reported ethical concern was clinician accountability and liability (41.4%), followed by patient safety, transparency, bias, and data confidentiality. These findings are highly consistent with the challenges identified by Yu and Kohane, who argued that accountability, explainability, fairness, and governance represent some of the most important barriers to the responsible implementation of AI in medicine.⁹

The importance placed on explainability is also reflected in

the literature on AI acceptance. Clinicians are more likely to trust and adopt AI systems when they understand how recommendations are generated and can communicate those recommendations effectively to patients.⁹ The desire expressed by respondents to understand bias and fairness further supports the view that ethical literacy should form a core component of future AI education programs.

Concerns regarding bias and transparency are particularly relevant in fields where AI is increasingly integrated into clinical workflows. Baxi *et al*⁴ highlighted the importance of validation, transparency, and clinician oversight in digital pathology applications, while York *et al*¹⁰ demonstrated that perceptions of AI-assisted diagnostic technologies are strongly influenced by trust and understanding of the technology.

Implications for Implementation

Taken together, these findings suggest that successful AI implementation requires more than technological capability alone. Respondents identified the need for practical skills, ethical awareness, and organizational governance structures that support safe adoption. Bajwa *et al* emphasized that successful implementation depends on integrating technological innovation with clinical workflows, governance frameworks, and professional training.⁸

The high demand for practical competency observed in the present survey suggests that educational initiatives should prioritize real-world clinical applications, verification of AI outputs, and communication of AI-assisted decisions. At the same time, the substantial proportion of respondents seeking advanced competency indicates a growing interest in clinician participation in the development, evaluation, and governance of AI systems.

Comparison with Patient Perspectives

Interestingly, the concerns expressed by clinicians in the present study appear broadly aligned with those reported among patients. Fritsch *et al* found that patients generally perceived AI positively but emphasized the importance of maintaining human involvement in healthcare decision-making.¹¹ Similarly, our respondents strongly supported clinician accountability and oversight, suggesting that both clinicians and patients view AI as a tool to augment rather than replace professional judgment.

Limitations

This study has several limitations. It was a single-center convenience-sample survey, and the findings may not be generalizable to other institutions or healthcare settings. There is also a risk of self-selection bias, as clinicians with a pre-existing interest in AI may have been more likely to participate. In addition, the thematic coding of free-text responses was conducted post hoc and may not have captured the full range of participant perspectives.

CONCLUSION

Clinicians at the surveyed medical college were generally optimistic about the potential of AI to improve disease detec-

tion, diagnostic accuracy, and workflow efficiency. Respondents prioritized practical AI competency as a prerequisite for safe and effective clinical implementation. The findings suggest that educational initiatives should focus on both practical application and advanced AI competencies, while also addressing concerns related to accountability, patient safety, transparency, and data governance. Such an approach may help clinicians contribute to the responsible and effective integration of AI into healthcare practice.

Acknowledgements

We thank all respondents who completed the survey and contributed their insights through free-text responses. The dataset used for this analysis was derived from the Google Forms survey responses.

CONTRIBUTORSHIP STATEMENT / DECLARAÇÃO DE CONTRIBUIÇÃO

NN: Contributed in manuscript drafting, data extraction, editing.

SM and RS: Contributed to the design of the study and the revision of the manuscript.

All authors approved the final version of the manuscript for publication and assume responsibility for all aspects of the work, ensuring the accuracy and integrity of the data presented.

NN: Contribuiu para a elaboração do manuscrito, a extração de dados e a revisão.

SM e RS: Contribuíram para a concepção do estudo e para a revisão do manuscrito.

Todos os autores aprovaram a versão final do manuscrito para publicação e assumem responsabilidade por todos os aspectos do trabalho, garantindo a exatidão e a integridade dos dados apresentados.

Responsabilidades Éticas

Conflitos de Interesse: Os autores declaram a inexistência de conflitos de interesse na realização do presente trabalho.

Fontes de Financiamento: Não existiram fontes externas de financiamento para a realização deste artigo.

Confidencialidade dos Dados: Os autores declaram ter seguido os protocolos da sua instituição acerca da publicação dos dados de doentes.

Proteção de Pessoas e Animais: Os autores declaram que os procedimentos seguidos estavam de acordo com os regulamentos estabelecidos pela Comissão de Ética responsável e de acordo com a Declaração de Helsínquia revista em 2024 e da Associação Médica Mundial.

Proveniência e Revisão por Pares: Não comissionado; revisão externa por pares.

Ethical Disclosures

Conflicts of Interest: The authors have no conflicts of interest to declare.

Financing Support: This work has not received any contribution, grant or scholarship

Confidentiality of Data: The authors declare that they have followed the protocols of their work center on the publication of patient data.

Protection of Human and Animal Subjects: The authors declare that the procedures followed were in accordance with the regulations of the relevant clinical research ethics committee and those of the Code of Ethics of the World Medical Association (Declaration of Helsinki as revised in 2024).

Provenance and Peer Review: Not commissioned; externally peer-reviewed.

Submissão: 25 de abril, 2026 | Received: 25th of April, 2026

Aceitação: 15 de junho, 2026 | Accepted: 15th of June, 2026

Publicado: 8 de julho, 2026 | Published: 8th of July, 2026

© 2026 Revista SPA. Este é um artigo de acesso aberto sob a licença CC BY-NC 4.0. Reutilização permitida de acordo com CC BY-NC 4.0. Nenhuma reutilização comercial.

© 2026 SPA Journal. This is an open-access article under the CC BY-NC 4.0. Re-use permitted under CC BY-NC 4.0. No commercial re-use.

REFERENCES

1. Al Hadithy ZA, Al Lawati A, Al-Zadjali R, Al Sinawi H. knowledge, attitudes, and perceptions of artificial intelligence in healthcare among medical students at Sultan Qaboos University. *Cureus*. 2023;15:e44887. doi: 10.7759/cureus.44887.
2. Rony K.K, Akter K, Nesa L, Islam M T, Johra F.T, Akter F, et al. Healthcare workers' knowledge and attitudes regarding artificial intelligence adoption in healthcare: A cross-sectional study. *Heliyon*. 2024;10:e40775. doi: 10.1016/j.heliyon.2024.e40775.
3. Lauritzen AD, Rodríguez-Ruiz A, von Euler-Chelpin MC, Lynge E, Vejborg I, Nielsen M, et al. An Artificial Intelligence-based Mammography Screening Protocol for Breast Cancer: Outcome and Radiologist Workload. *Radiology*. 2022;304:41-9. doi: 10.1148/radiol.210948.
4. York T, Jenney H and Jones G. Clinician and computer: a study on patient perceptions of artificial intelligence in skeletal radiography. *BMJ Health Care Inform*. 2020;27:e100233.25
5. Patel S. *Learning Outcomes of Classroom Research*. New Delhi: L' Ordine Nuovo Publication; 2021.
6. King BF Jr. Artificial intelligence and radiology: what will the future hold? *J Am Coll Radiol*. 2018;15:501-3. doi: 10.1016/j.jacr.2017.11.017.
7. Topol EJ. High-performance medicine: the convergence of human and artificial intelligence. *Nat Med*. 2019;25:44–56. doi: 10.1038/s41591-018-0300-7.
8. Bajwa J, Munir U, Nori A, Williams B. Artificial intelligence in healthcare: transforming the practice of medicine. *Future Healthcare J*. 2021;8:e188-e194.
9. Yu KH, Kohane IS. Framing the challenges of artificial intelligence in medicine. *BMJ Qual Saf*. 2019;28:238-241. doi:10.1136/bmjqs-2018-008551
10. Baxi V, Edwards R, Montalto M, Saha S. Digital pathology and artificial intelligence in translational medicine and clinical practice. *Mod Pathol*. 2022;35:23-32. doi:10.1038/s41379-021-00919-2.
11. Fritsch SJ, Blankenheim A, Wahl A, et al. Attitudes and perception of artificial intelligence in healthcare: A cross-sectional survey among patients. *Digital Health*. 2022; 8:205520762211167