KMANPUB | Health Nexus Vol. 3 No. 3 (2025): 1-9

Article history:
Received 19 April 2025
Revised 14 June 2025
Accepted 25 June 2025
Published online 01 July 2025

Exploring the Factors Influencing AI Integration in Clinical Diagnostic Decision-Making

Seyed Amir. Saadati[1*], James. Ma[2]

[1] Student Doctor of Physical Therapy (DPT), Department of Family Medicine and Community Health, Faculty of Physical Therapy, University of Minnesota Twin Cities Medical School, Minnesota, USA
[2] Rehabilitation Department, York Rehab Clinic, Toronto, Canada

*** Corresponding author email address**: saada@umn.edi

A r t i c l e I n f o

Article type:
Original Research

How to cite this article:
Saadati, S.A., & Ma, J. (2025). Exploring the Factors Influencing AI Integration in Clinical Diagnostic Decision-Making. *Health Nexus, 3*(3), 1-9.
https://doi.org/10.61838/kman.hn.3.3.12

A B S T R A C T

This study aimed to explore the key factors influencing the integration of artificial intelligence (AI) into clinical diagnostic decision-making from the perspective of healthcare professionals. This research employed a qualitative design based on semi-structured interviews with 23 healthcare professionals in Canada, including physicians, radiologists, clinical informaticians, nurse practitioners, and administrators. Participants were selected through purposive sampling to ensure diverse perspectives, and data collection continued until theoretical saturation was achieved. Interviews were transcribed verbatim and analyzed thematically using NVivo software, with codes and themes developed iteratively through inductive analysis and constant comparison. Four major themes emerged from the data: (1) technological infrastructure and readiness, (2) human and professional factors, (3) organizational culture and leadership, and (4) perceived value and impact of AI. Participants reported that outdated systems, poor interoperability, and insufficient technical support limited integration. Attitudes toward AI varied, with concerns about trust, autonomy, and training gaps. Organizational barriers included lack of leadership strategy and unclear implementation policies. While AI was recognized for enhancing diagnostic accuracy and efficiency, concerns about alert fatigue, liability, and ethical issues were prevalent. Patient trust, professional identity, and collaborative workflows also influenced AI adoption outcomes. Integrating AI into clinical diagnostics is a complex, multidimensional process shaped by technological, professional, organizational, and ethical factors. Beyond technical improvements, successful implementation requires a holistic, sociotechnical approach that addresses infrastructure, education, workflow design, and patient-clinician communication. Institutional strategies should prioritize clinician engagement, interdisciplinary collaboration, and transparent governance to foster responsible and effective AI adoption in healthcare settings.

Keywords: *Artificial intelligence, Clinical decision-making, Diagnostic medicine, Healthcare professionals, Qualitative study, Sociotechnical factors, Canada, Thematic analysis, Medical ethics, AI implementation barriers.*

1. Introduction

The integration of artificial intelligence (AI) into clinical diagnostic decision-making has emerged as a major area of innovation and inquiry in modern healthcare systems. As diagnostic accuracy remains a cornerstone of effective medical intervention, AI technologies—ranging from machine learning algorithms to neural networks and natural language processing—promise to assist healthcare professionals by enhancing speed, consistency, and precision in identifying medical conditions across a variety of specialties (1, 2). In particular, AI-enabled systems are being deployed to detect anomalies in radiographic imaging, predict disease progression, and triage patient cases based on risk stratification (3, 4). However, while the technological capabilities of AI continue to advance rapidly, the rate of adoption and effective integration into everyday diagnostic workflows remains inconsistent and complex.

Recent scholarly discourse suggests that successful AI integration is not solely a technological challenge but also a sociotechnical one, shaped by a multitude of interdependent factors such as clinician attitudes, data governance, organizational culture, and ethical frameworks (5, 6). For instance, while AI is capable of outperforming humans in specific diagnostic tasks, such as classifying dermatological conditions or identifying abnormalities in radiographs, it still requires clinical oversight, contextual reasoning, and ethical accountability to be fully trusted and deployed at scale (4, 7). These complexities are compounded by the opaque nature of some AI systems—often referred to as "black boxes"—which generate skepticism among clinicians who demand interpretability and transparency in diagnostic decisions (8, 9).

As healthcare delivery becomes increasingly digitized, AI integration also intersects with broader shifts in health data infrastructure, electronic health records (EHRs), and real-time analytics (10, 11). Yet, technical readiness alone does not guarantee clinical uptake. A recent study found that even in facilities equipped with cutting-edge AI tools, clinician reluctance, regulatory ambiguity, and workflow misalignment remain significant barriers to utilization (2). Moreover, cross-disciplinary tensions between IT professionals, data scientists, and clinical practitioners often hinder the development of shared implementation strategies (12). These organizational dynamics demand a more nuanced, empirically grounded understanding of what facilitates or inhibits AI's role in diagnostic processes.

One important contextual layer is the readiness of clinicians themselves to work alongside AI systems. Despite increasing exposure to AI tools, many healthcare professionals still lack formal training in AI literacy, leading to mistrust, misinterpretation, or underutilization of algorithmic outputs (8, 13). Medical education, though evolving, has yet to institutionalize comprehensive training on how AI fits within clinical reasoning frameworks. A shift from purely technical competency to what scholars term "augmented intelligence" requires clinicians to not only use but also critically evaluate the outputs of AI tools in the diagnostic process (9, 14). In this sense, clinician engagement with AI is not a passive process but an interpretive act shaped by professional identity, ethics, and the imperative to do no harm.

Ethical and regulatory issues also loom large in the discourse on AI diagnostics. Questions of liability, accountability, and fairness are central to clinicians' hesitations in adopting AI systems (5, 15). When diagnostic errors occur, it remains legally ambiguous whether blame lies with the developer, the institution, or the clinician. This ambiguity fuels cautious engagement, particularly in high-stakes domains like oncology or emergency medicine. Moreover, bias in AI models—whether due to non-representative training data or flawed design—can disproportionately impact minority and underserved populations, exacerbating existing health disparities (16, 17). Thus, efforts to improve AI fairness must extend beyond algorithm optimization to include policy interventions, ethical auditing, and inclusive data practices (11, 18).

From a clinical operations standpoint, the integration of AI into diagnostic pathways often clashes with existing workflows. Many clinicians report that AI systems are not seamlessly interoperable with EHRs or hospital IT platforms, creating inefficiencies rather than alleviating them (1, 19). The promise of AI to reduce cognitive load and administrative burden is frequently undermined by poor user interfaces, alert fatigue, and duplicative processes that require clinicians to manually verify or override algorithmic suggestions (20, 21). This not only limits the practical utility of AI but can also erode clinicians' trust in the technology. Additionally, the perceived threat to clinical autonomy—

where AI recommendations may be interpreted as undermining professional judgment—further complicates adoption (6, 8).

Interdisciplinary collaboration has been proposed as a key enabler of AI integration. However, collaboration between clinicians, developers, and hospital leadership is often lacking or fragmented (3, 10). For AI to be contextually meaningful, developers must have a deep understanding of diagnostic reasoning, while clinicians must provide continuous feedback to refine AI tools in real-world settings. This co-development model—where AI is not merely inserted into existing systems but evolves through iterative human–machine interaction—has shown promise in several pilot studies (7, 22). Still, such models require institutional support, funding, and shared metrics of success, none of which are guaranteed in resource-constrained settings.

Patient perspectives also play a growing role in shaping the success of AI integration. Although some patients appreciate the speed and accuracy of AI-assisted diagnoses, others express concern about depersonalization, loss of face-to-face interaction, or lack of informed consent in the use of automated tools (9, 13). A recent analysis found that trust in AI diagnostics increases when patients perceive the technology as augmenting rather than replacing physician expertise (12). Thus, transparency in how AI contributes to decision-making and clinician communication of its role can meaningfully affect patient engagement and satisfaction. Efforts to integrate AI must therefore consider not only clinical and technical factors but also the socio-emotional dimensions of care delivery (18, 19).

As AI technologies continue to evolve, the field is witnessing a diversification of applications across specialties. From fetal medicine to dermatology, emergency triage to pathology, AI is being embedded in increasingly diverse clinical settings (20, 21, 23). Yet this breadth of application also reveals a lack of standardized protocols or governance mechanisms. What works in one department may not translate to another due to differing workflows, patient populations, and technological readiness (2, 24). This fragmentation necessitates more context-specific studies that explore the determinants of AI integration in particular diagnostic environments rather than assuming uniform pathways of adoption.

Against this backdrop, this study aims to qualitatively explore the factors influencing the integration of AI into clinical diagnostic decision-making from the perspective of healthcare professionals.

2. Methods and Materials

2.1. Study Design and Participants

This study employed a qualitative research design grounded in an interpretive paradigm to explore the factors influencing the integration of artificial intelligence (AI) in clinical diagnostic decision-making. The approach was chosen to gain an in-depth understanding of participants' lived experiences, perceptions, and contextual realities within clinical settings. The study was conducted in Canada and targeted healthcare professionals directly involved in diagnostic processes across a variety of clinical disciplines.

Participants were selected using purposive sampling to ensure diverse perspectives from clinicians with varying degrees of exposure to AI technologies. Inclusion criteria included active involvement in diagnostic decision-making, familiarity with or experience in working with AI-based tools, and at least three years of clinical practice. A total of 23 participants were interviewed, including physicians, diagnostic radiologists, clinical informaticians, and healthcare administrators. The sample size was determined based on the principle of theoretical saturation, which was reached when no new themes emerged from the data.

2.2. Data Collection

Data were collected through semi-structured, in-depth interviews conducted either face-to-face or via secure video conferencing platforms, depending on participant preference and geographical convenience. An interview guide was developed based on the literature and expert consultation and included open-ended questions exploring perceptions of AI utility, barriers and facilitators to AI adoption, ethical considerations, and institutional readiness.

Each interview lasted between 45 and 75 minutes and was audio-recorded with the participants' informed consent. Field notes were also taken during and immediately after the interviews to capture contextual details and non-verbal cues. All interviews were transcribed verbatim for analysis.

Health Nexus
E-ISSN: 2981-2569

2.3. *Data Analysis*

Thematic analysis was conducted to identify, analyze, and report patterns within the data. Data management and coding were facilitated using NVivo software (version 14). An initial coding framework was developed inductively from the first set of transcripts and iteratively refined throughout the analysis process. Codes were grouped into broader themes and sub-themes through constant comparison, ensuring alignment with the research questions and emerging insights.

Two researchers independently coded a subset of transcripts to enhance the reliability of the findings. Discrepancies were discussed and resolved through consensus. Reflexive journaling and regular peer debriefings were employed to ensure analytical rigor and minimize researcher bias throughout the study.

3. Findings and Results

A total of 23 participants took part in the study, all of whom were healthcare professionals based in Canada with direct or supervisory roles in clinical diagnostic decision-making. The sample included 10 physicians (43.5%), 4 diagnostic radiologists (17.4%), 3 clinical informaticians (13.0%), 3 nurse practitioners (13.0%), and 3 healthcare administrators (13.0%). Participants varied in terms of years of professional experience: 6 had between 3–5 years of experience (26.1%), 9 had 6–10 years (39.1%), and 8 had over 10 years of experience (34.8%). Gender distribution was relatively balanced, with 12 female participants (52.2%) and 11 male participants (47.8%). Regarding age, participants ranged from 29 to 61 years, with the majority (n=14, 60.9%) falling in the 35–50 age bracket. All participants reported at least some familiarity with artificial intelligence tools in clinical contexts, and 18 (78.3%) had used or piloted such tools in their daily diagnostic practice.

Table 1

Themes, Subthemes, and Concepts on AI Integration in Clinical Diagnostic Decision-Making

Category (Theme)	Subcategory (Subtheme)	Concepts (Open Codes)
1. Technological Infrastructure and Readiness	System Compatibility	Lack of EHR-AI integration, outdated hospital systems, need for interface standardization
	Data Quality and Accessibility	Incomplete records, fragmented databases, manual data entry burden
	Technical Support Availability	Limited IT staffing, delayed maintenance, low AI literacy among support teams
	Interoperability Issues	Vendor lock-in, data silos, difficulty in system scaling
	Security and Data Privacy	HIPAA concerns, fear of breach, lack of clear AI governance protocols
	Investment in Digital Tools	Budget constraints, long procurement cycles, undervaluation of AI tools
	Infrastructure Scalability	Legacy system limitations, insufficient cloud storage, high adaptation cost
2. Human and Professional Factors	Clinician Attitudes Toward AI	Fear of replacement, curiosity, cautious optimism, distrust of black-box systems
	Experience and Training	Lack of formal AI training, hands-on exposure, generational gaps, continuing education
	Perceived Threat to Expertise	Devaluation of clinical judgment, deskilling concerns, resistance to automation
	Professional Identity and Ethics	Duty to care, ethical responsibility, preservation of human touch
	Collaboration Between Clinicians and AI Systems	Role clarity, task sharing, monitoring outputs, integrating AI into workflows
3. Organizational Culture and Leadership	Leadership Vision and Strategy	Lack of AI roadmap, top-down communication, strategic ambiguity
	Change Management Capability	Staff resistance, lack of transition plans, emotional fatigue, cultural inertia
	Innovation Climate	Reward structures, openness to experimentation, bureaucratic rigidity
	Policy and Protocol Alignment	Inconsistent AI policies, lack of clinical guidelines, undefined usage limits
	Interdepartmental Coordination	Siloed departments, weak inter-team communication, unclear decision pathways

Health Nexus
E-ISSN: 2981-2569

4. Perceived Value and Impact of AI	Diagnostic Accuracy and Support	Improved detection rates, second opinion utility, concern about false positives
	Workflow Efficiency	Time-saving promise, real-time alerts, alert fatigue
	Patient Outcomes and Safety	Reduction in errors, faster diagnosis, enhanced risk stratification
	Patient Trust and Acceptance	Perceived impersonality, patient skepticism, informed consent barriers
	Cost-Effectiveness	Long-term savings, upfront investment concerns, ROI ambiguity
	Equity and Accessibility	Bias in training data, digital divide, language model limitations

Theme 1: Technological Infrastructure and Readiness

System Compatibility. Participants frequently pointed to the lack of compatibility between existing hospital systems and AI platforms. Integration issues between AI tools and electronic health records (EHRs) were repeatedly cited. One physician noted, *"It feels like AI is speaking a different language than our EHR—it just doesn't fit into our system."* Many described outdated infrastructures that made even basic integration cumbersome.

Data Quality and Accessibility. A major barrier to effective AI utilization was the inconsistent quality and availability of clinical data. Fragmented databases and incomplete patient records were cited as common problems. *"Half the time, the data the AI pulls from is missing key labs or notes—it's not reliable,"* stated a diagnostic technician.

Technical Support Availability. Several participants emphasized a lack of reliable technical support. Limited staffing and inadequate training of IT teams were reported, often resulting in delays. One clinician mentioned, *"When something goes wrong with the system, there's no one immediately available who really understands it."*

Interoperability Issues. The challenge of interoperability across vendors and systems emerged clearly. Participants described difficulties in scaling systems due to vendor lock-in and data silos. *"Every department uses a different tool, and none of them talk to each other,"* shared a hospital administrator.

Security and Data Privacy. Concerns about data breaches and unclear regulations were common. There was hesitation in fully trusting AI systems due to fear of liability. *"If the AI misdiagnoses and we used its output, who's responsible? That's not clear,"* a senior clinician questioned.

Investment in Digital Tools. Budget constraints were seen as major hurdles. Several institutions reportedly undervalued AI tools, delaying procurement. *"There's always a bigger priority than AI when the budget gets cut,"* said one informant.

Infrastructure Scalability. Scalability concerns were expressed in relation to limited server space and outdated hardware. *"We don't even have reliable Wi-Fi on all floors—how can we run complex AI models?"* one participant stated.

Theme 2: Human and Professional Factors

Clinician Attitudes Toward AI. Attitudes ranged from skepticism to cautious optimism. Many clinicians expressed discomfort about relying on AI outputs. *"I don't mind using it for support, but I wouldn't let it make the call for me,"* explained an internist. Some feared being replaced, while others welcomed the potential efficiency.

Experience and Training. Participants agreed that most clinicians lacked formal training in AI, which limited effective adoption. *"We learned nothing about AI in med school—this is all new to us,"* said a younger physician. Gaps in digital literacy were more pronounced among older staff.

Perceived Threat to Expertise. Some professionals expressed concerns that AI could deskill the clinical workforce. *"I didn't go through a decade of training to second-guess a computer,"* said one radiologist, reflecting a sentiment of professional insecurity.

Professional Identity and Ethics. Ethical dilemmas were central in clinicians' reflections. They worried AI could compromise the humanistic aspect of care. *"Patients want to be seen, not scanned by an algorithm,"* one family doctor emphasized.

Collaboration Between Clinicians and AI Systems. There was a strong preference for AI to serve as a collaborator rather than a controller. *"AI should be like a second set of eyes—not the final word,"* stated a participant. Clear role definition and task-sharing were seen as essential.

Theme 3: Organizational Culture and Leadership

Leadership Vision and Strategy. Many participants highlighted a lack of strategic vision from leadership regarding AI. Without a clear roadmap, implementation remained fragmented. *"We need more than hype—we need direction,"* one administrator asserted.

E-ISSN: 2981-2569

Change Management Capability. Organizational inertia and poor transition planning were cited as major issues. *"People resist what they don't understand, and no one's helping them understand it,"* noted a nurse manager.

Innovation Climate. The broader institutional environment was often described as resistant to experimentation. *"Trying new things always hits a wall of paperwork,"* remarked a frustrated physician. Lack of incentives further discouraged innovation.

Policy and Protocol Alignment. Inconsistent internal policies were viewed as a barrier. *"One department uses AI, another forbids it—there's no cohesion,"* one participant said. The absence of clear clinical guidelines exacerbated this confusion.

Interdepartmental Coordination. Participants described weak communication between departments regarding AI implementation. *"We have silos within silos—nobody's talking to each other,"* stated a clinical coordinator.

Theme 4: Perceived Value and Impact of AI

Diagnostic Accuracy and Support. Many clinicians acknowledged AI's utility in increasing diagnostic precision, especially in radiology and pathology. *"It catches what tired eyes might miss,"* said a radiologist. However, there were also concerns about false positives.

Workflow Efficiency. Participants noted time-saving benefits of AI but also flagged the risk of alert fatigue. *"The system throws up so many alerts we end up ignoring them,"* said one physician.

Patient Outcomes and Safety. Improved safety and quicker diagnosis were commonly cited benefits. *"AI helped us flag a case of sepsis early—we might have missed it otherwise,"* recounted an emergency physician.

Patient Trust and Acceptance. Clinicians reported mixed reactions from patients. While some were open to technology, others expressed unease. *"One patient asked if a robot was diagnosing them—it shook their trust,"* noted a family physician.

Cost-Effectiveness. While long-term savings were anticipated, initial investments were a deterrent. *"It's a big upfront cost, and the returns aren't immediately visible,"* said a healthcare finance officer.

Equity and Accessibility. Concerns were raised about algorithmic bias and unequal access. *"The AI doesn't work well with non-English records—it misses things,"* one participant noted. Others worried about widening the digital divide.

4. Discussion and Conclusion

This study explored the multifaceted factors influencing the integration of artificial intelligence (AI) into clinical diagnostic decision-making in Canadian healthcare settings. Through in-depth interviews with 23 healthcare professionals—including physicians, diagnostic radiologists, clinical informaticians, nurse practitioners, and administrators—the findings revealed four core thematic domains: technological infrastructure and readiness, human and professional factors, organizational culture and leadership, and perceived value and impact of AI. These domains were supported by varying subcategories, reflecting the complex and interconnected nature of AI adoption in clinical practice.

A primary finding of this study was the challenge of technological readiness and system compatibility. Many participants highlighted that AI tools often lacked seamless integration with electronic health records (EHRs) and other hospital information systems, creating barriers to efficient use. These findings echo earlier reports that AI applications, although technologically advanced, are often impeded by outdated legacy systems, fragmented data silos, and a lack of standardized interoperability protocols (1, 2). As previous literature suggests, the success of AI in diagnostic contexts heavily depends on the robustness of data infrastructure and the ability to feed high-quality, accessible, and interoperable data into learning algorithms (10, 11). Without addressing foundational issues like data governance, accessibility, and system scalability, healthcare institutions may struggle to realize AI's potential benefits.

Equally important was the role of human and professional factors, particularly clinicians' attitudes toward AI, their level of training, and the perceived threat to professional expertise. Participants varied widely in their openness to using AI, with some viewing it as a valuable support tool, while others expressed deep concerns about losing clinical autonomy or becoming overly reliant on algorithmic suggestions. These apprehensions mirror findings from other research which suggest that skepticism, fear of deskilling, and unfamiliarity with AI tools hinder their adoption (6, 8, 9). Notably, this study reinforces calls for integrating AI

Health Nexus
E-ISSN: 2981-2569

literacy into medical education and professional development curricula to enhance clinicians' confidence and interpretive skills in working with intelligent systems (8, 13). The observed generational differences in AI acceptance further underline the need for ongoing, inclusive training strategies.

Another significant insight concerned the influence of organizational culture and leadership on AI integration. Participants repeatedly cited a lack of vision and strategic direction from leadership, as well as weak change management capacities, as major barriers. These findings align with the literature that emphasizes the importance of top-down leadership commitment, interdepartmental collaboration, and the presence of an innovation-supportive climate in fostering successful AI implementation (10, 14). Moreover, fragmented governance structures and the absence of unified institutional policies often led to inconsistent adoption across departments, echoing what has been termed "innovation fatigue" in prior research (3, 12). Addressing such structural and cultural barriers requires a coordinated strategy involving both clinical and administrative stakeholders.

The study also highlighted clinicians' views on the perceived value and impact of AI in diagnosis. Most participants acknowledged the potential of AI to enhance diagnostic accuracy, reduce cognitive burden, and improve patient safety. However, they also raised concerns about alert fatigue, false positives, and the time-consuming process of validating AI outputs. These reflections are consistent with reports that AI can both enhance and complicate clinical workflows depending on how it is implemented (4, 7). While some participants shared examples of AI catching early-stage pathologies that would otherwise have been missed, others described how excessive or poorly prioritized alerts often added to their cognitive workload rather than reducing it. This paradox is well-documented in the literature, where AI systems, if not properly aligned with user needs and workflows, may generate more "noise" than actionable insights (22, 23).

Ethical and regulatory concerns were a cross-cutting theme that permeated nearly every conversation. Participants voiced uncertainty regarding liability in the event of diagnostic errors involving AI, as well as discomfort with the lack of transparency in how algorithms arrive at specific conclusions. These concerns are supported by recent scholarly work pointing to the "black-box" nature of many AI models, which complicates their ethical and legal evaluation (5, 15). Furthermore, some participants expressed concern about equity and fairness, noting that AI tools trained on homogeneous datasets might underperform in diverse patient populations. This reflects broader concerns in the literature about algorithmic bias and its implications for healthcare access and safety (16-18). Addressing these challenges will require rigorous external validation, transparent model development, and inclusive training datasets.

Interestingly, the study also revealed insights into patient perceptions as relayed by clinicians. Several participants noted that patients often responded with either curiosity or skepticism toward AI-assisted care. This is consistent with findings that patient trust in AI varies widely and is often mediated by the clinician's ability to explain the technology's role in care delivery (12, 13). In this context, the clinician remains the linchpin for maintaining trust, even in technologically mediated environments. Studies suggest that AI integration should be accompanied by robust communication strategies that inform patients and protect their autonomy, especially regarding consent for AI use in diagnosis (6, 9).

Ultimately, the findings of this study point to the need for a more holistic approach to AI implementation—one that recognizes its technological promise while addressing the human, cultural, and institutional realities of clinical settings. A solely technical solution to AI integration is insufficient; what is required is a sociotechnical approach that attends to the interactions between people, processes, and technologies. The study supports the growing consensus that AI should not aim to replace clinicians but rather to augment their capacity for evidence-based, timely, and patient-centered decision-making (1, 19).

This study, while offering rich insights into the factors influencing AI integration in diagnostic decision-making, is not without limitations. First, the sample was limited to 23 participants from Canada, which may affect the transferability of the findings to other healthcare systems with different technological infrastructures, regulatory environments, or cultural contexts. Second, the study employed a qualitative design with semi-structured

Health Nexus
E-ISSN: 2981-2569

interviews, which prioritizes depth over breadth; as such, the findings may not capture all possible perspectives, especially those from regions or specialties underrepresented in the sample. Third, although efforts were made to ensure diversity in roles and experience levels, the rapid pace of AI advancement means that some insights may quickly become outdated as technologies and policies evolve.

Future research could expand on this work by conducting longitudinal studies that track AI implementation over time to observe changes in clinician attitudes, workflow efficiency, and patient outcomes. Comparative studies across different countries or healthcare systems would also be valuable in identifying context-specific facilitators and barriers to AI integration. Additionally, research that includes direct patient interviews could provide a more holistic view of AI's role in diagnostic care from the perspective of those most affected by its outputs. Finally, there is a pressing need for interdisciplinary research that brings together clinicians, ethicists, computer scientists, and policy-makers to co-create frameworks for ethical and effective AI deployment in clinical environments.

To promote successful AI integration into diagnostic workflows, healthcare institutions should invest in both technological infrastructure and human capital. This includes ensuring interoperability of systems, enhancing data quality, and upgrading digital platforms. Simultaneously, it is essential to develop and implement AI literacy programs tailored to different professional roles within the healthcare setting. Organizational leaders should articulate a clear strategic vision for AI use, backed by inclusive policies and adequate technical support. Finally, AI systems should be designed with user feedback loops and transparency features that enhance trust, usability, and clinical relevance.

Authors' Contributions

All authors equally contributed to this study.

Declaration

In order to correct and improve the academic writing of our paper, we have used the language model ChatGPT.

Transparency Statement

Data are available for research purposes upon reasonable request to the corresponding author.

Acknowledgments

We would like to express our gratitude to all individuals helped us to do the project.

Declaration of Interest

The authors report no conflict of interest.

Funding

According to the authors, this article has no financial support.

Ethics Considerations

The study placed a high emphasis on ethical considerations. Informed consent obtained from all participants, ensuring they are fully aware of the nature of the study and their role in it. Confidentiality strictly maintained, with data anonymized to protect individual privacy. The study adhered to the ethical guidelines for research with human subjects as outlined in the Declaration of Helsinki.

References

1. Basubrin O. Current Status and Future of Artificial Intelligence in Medicine. Cureus. 2025. [DOI]
2. Kotowicz M, Bieniak-Pentchev M, Koczkodaj M. Artificial Intelligence in Medicine: Potential and Application Possibilities - Comprehensive Literature Review. Quality in Sport. 2025;41:60222. [DOI]
3. Wheatley M. The Impact of Artificial Intelligence on Diagnostic Medicine. Pjai. 2024. [DOI]
4. Lee KWA, Chan LKW, Lee CH, Bohórquez J, Haykal D, Wan J, et al. Artificial Intelligence Application in Diagnosing, Classifying, Localizing, Detecting and Estimation the Severity of Skin Condition in Aesthetic Medicine: A Review. Dermatological Reviews. 2025;6(1). [DOI]
5. Selvakumar P, Sivaraja M, Dharmalingam S, Jeyakarthika K, Dhaaraani R, Manjunath TC. Ethical and Regulatory Considerations of AI in Nuclear Medicine. 2025:29-50. [DOI]
6. Salomon I, Sibomana O. Artificial Intelligence in Medicine: Advantages and Disadvantages for Today and the Future. International Journal of Surgery Open. 2024;62(4):471-3. [DOI]
7. Rubini A, Via RD, Pastore VP, Signore FD, Rosto M, Bonis AD, et al. Artificial Intelligence in Chest Radiography—A Comparative Review of Human and Veterinary Medicine. Veterinary Sciences. 2025;12(5):404. [DOI]

8. Domrös-Zoungrana D, Rajaeean N, Boie S, Fröling E, Lenz C. Medical Education: Considerations for a Successful Integration of Learning With and Learning About AI. Journal of Medical Education and Curricular Development. 2024;11. [DOI]
9. Singh S, Devi J, Kumar D. The Impact of Artificial Intelligence on Healthcare and Medicine. 2025:68-77. [DOI]
10. Cabral BP, Braga LAM, Filho CGC, Penteado BE, Sandro Luís Freire de Castro S, Castro L, et al. Future Use of AI in Diagnostic Medicine: 2-Wave Cross-Sectional Survey Study. Journal of Medical Internet Research. 2025;27:e53892. [DOI]
11. Pasupuleti MK. Revolutionizing Healthcare: AI and Big Data for Predictive Analytics and Precision Medicine. 2025:151-60. [DOI]
12. Erizo JJ. Navigating the Frontier: Assessing the Extent of AI's Influence in Healthcare. Jafotik. 2024;2(1):7-12. [DOI]
13. Czerwinska M, Ejdys J, Rzepka A. Understanding Patient Attitudes Towards the Use of AI in Medical Diagnosis Using Necessary Conditions Analysis. European Conference on Innovation and Entrepreneurship. 2024;19(1):984-6. [DOI]
14. Westphal A, Mrowka R. Special Issue European Journal of Physiology: Artificial Intelligence in the Field of Physiology and Medicine. Pflügers Archiv - European Journal of Physiology. 2025;477(4):509-12. [DOI]
15. Rimkutė D. AI and Liability in Medicine: The Case of Assistive-Diagnostic AI. Baltic Journal of Law & Politics. 2024;16(2):64-81. [DOI]
16. Li Y, Q L, Fu K, Zhou X, Zhang K. Progress in the Application of Artificial Intelligence in Ultrasound-Assisted Medical Diagnosis. Bioengineering. 2025;12(3):288. [DOI]
17. Miskeen E, Alfaifi J, Alhuian DM, Alghamdi M, Alharthi MH, Alshahrani NA, et al. Prospective Applications of Artificial Intelligence in Fetal Medicine: A Scoping Review of Recent Updates. International Journal of General Medicine. 2025;Volume 18:237-45. [DOI]
18. Udegbe FC, Ebulue OR, Ebulue CC, Ekesiobi CS. Ai's Impact on Personalized Medicine: Tailoring Treatments for Improved Health Outcomes. Engineering Science & Technology Journal. 2024;5(4):1386-94. [DOI]
19. Zafar S, Rana N. The Convergence of Nanotechnology and Artificial Intelligence: Unlocking Future Innovations. Recent Innovations in Chemical Engineering (Formerly Recent Patents on Chemical Engineering). 2025;18. [DOI]
20. Ruan C, Zhu Y, Xiong J. Applications and Prospects of Artificial Intelligence in Oral Medicine. 2024;1(2):11-5. [DOI]
21. Taksøe-Vester C, Bashir Z, Sejer EPF, Ngo ML, Pedersen LH, Friis ML, et al. Artificial Intelligence and Ultrasound in Fetal Medicine. Ugeskr Læger. 2025:1-6. [DOI]
22. Pacholec C, Flatland B, Xie H, Zimmerman KA. Harnessing Artificial Intelligence for Enhanced Veterinary Diagnostics: A Look to Quality Assurance, Part II External Validation. Veterinary Clinical Pathology. 2025. [DOI]
23. Kuttan N, Pundkar A, Gadkari C, Patel A, Kumar A. Transforming Emergency Medicine With Artificial Intelligence: From Triage to Clinical Decision Support. Multidisciplinary Reviews. 2025;8(10):2025285. [DOI]
24. Sitarek G, Żerek M. Artificial Intelligence in Emergency Medicine: A Literature Review. Quality in Sport. 2024;33:55839. [DOI]

E-ISSN: 2981-2569