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Medical Practitioners' Perceptions of Artificial Intelligence in Healthcare: A Mixed-Methods Study

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Abstract **Background:** Artificial Intelligence (AI) is increasingly integrated into healthcare systems to enhance diagnostic accuracy, streamline workflows and improve patient outcomes. While the technological capabilities of AI are advancing rapidly, the attitudes and preparedness of medical practitioners remain underexplored, particularly in the context of developing healthcare systems. Existing research has predominantly focused on technical applications, with limited attention to end-user perceptions. **Objective:** This study aimed to assess medical practitioners' perceptions of AI in clinical practice, focusing on familiarity, perceived benefits, barriers and ethical concerns. The goal was to identify factors influencing acceptance and readiness for AI adoption in healthcare. **Methods:** A convergent mixed-methods design was employed. Quantitative data were collected via a structured survey (n = 342) and qualitative insights were obtained through semi-structured interviews (n = 38). Descriptive statistics, chi-square tests, logistic regression and MANOVA were used for quantitative analysis, while thematic analysis was applied to qualitative transcripts. **Results:** A majority (82.1%) of respondents were familiar with AI and 54.3% perceived it as "very useful." Radiologists and younger practitioners (<30 years) demonstrated the highest confidence and acceptance ($p<0.001$). Key barriers included limited training (37.0%) and data privacy concerns (43.5%). Thematic analysis highlighted the need for structured AI education and ethical governance frameworks. **Conclusion:** Medical practitioners generally hold favorable attitudes toward AI, yet substantial barriers remain. These findings underscore the importance of targeted training, interdisciplinary collaboration and policy development to ensure ethical and effective AI integration in clinical practice.

Key Words Artificial Intelligence, Healthcare, Medical Practitioners, Mixed-Methods Research, AI Integration, Ethical Challenges, Health Informatics

INTRODUCTION

Artificial Intelligence (AI), defined as the simulation of human intelligence by machines, has emerged as a transformative force in healthcare. Its applications span diagnostic imaging, predictive analytics, virtual health assistants and clinical decision support systems [1,2]. AI systems can process large volumes of data with precision and speed, offering substantial potential to enhance patient care, streamline clinical workflows and reduce operational inefficiencies. These developments have placed AI at the forefront of digital health innovation, particularly in specialties such as radiology, pathology and health informatics [3].

Over the past decade, multiple studies have evaluated the technical effectiveness of AI in healthcare contexts. Bhargav [4] identified ten critical domains in which AI is reshaping service delivery. Witkowski *et al.* [5] investigated public trust in AI, emphasizing the importance of patient-centered design and ethical safeguards. Similarly, Patel *et al.* [6] highlighted the role of interdisciplinary collaboration in ensuring the interpretability and transparency of AI models. In a local context, Alhur *et al.* [7] explored the acceptance and integration of AI in radiology services in Saudi Arabia, focusing on user confidence and system compatibility.

However, prior research has not deeply and comprehensively addressed the perceptions and experiences of medical practitioners regarding AI implementation in clinical practice. Specifically, gaps remain in understanding how demographic variables (e.g., age, specialty), education and ethical concerns influence readiness to adopt AI.

Furthermore, few studies incorporate qualitative insights into practitioners' experiences with AI in real-world clinical environments [8].

This study addresses these gaps by investigating medical practitioners' perceptions of AI in healthcare. It aims to assess familiarity, perceived usefulness, confidence and ethical concerns while also identifying perceived barriers to adoption among healthcare providers working in major public hospitals in Hail City, Saudi Arabia. A mixed-methods design is used to ensure both statistical breadth and qualitative depth.

This paper contributes to the literature in two ways. First, it provides empirical evidence on how diverse healthcare professionals perceive AI integration, particularly within the context of a developing healthcare system. During our literature search, we found very limited studies conducted in this particular setting. Second, it offers practical implications for medical education, policy development and system design by identifying the structural and ethical considerations necessary for responsible AI adoption.

METHODS

Study Design

This study employed a convergent mixed-methods design to investigate healthcare practitioners' perceptions of AI in healthcare. Mixed-methods research integrates quantitative and qualitative approaches concurrently to enable triangulation of findings and enhance analytical validity. The quantitative component involved a structured questionnaire measuring familiarity, perceived usefulness, confidence and perceived barriers to AI adoption. The qualitative component utilized semi-structured interviews to gain deeper insight into practitioners' experiences, ethical concerns and suggestions for improving AI integration.

Study Population and Setting

The study population consisted of licensed medical practitioners actively working in Saudi Arabia across a variety of clinical and administrative disciplines. All participants were recruited exclusively from public (government-funded) healthcare institutions, including tertiary hospitals, specialty centers and primary care clinics. Clinical specialties represented in the sample included general medicine, surgery, internal medicine, radiology, nursing, pediatrics, physical therapy, health informatics and public health. Inclusion criteria required participants to hold valid professional licensure and have a minimum of six months of clinical or administrative experience within the healthcare system.

Respondents included front-line healthcare providers (e.g., physicians, nurses), allied health professionals (e.g., therapists, clinical pharmacists), clinical informaticians and health administrators. This diversity intentionally captured a comprehensive range of perspectives on AI-related implementation challenges and perceived utility across practice domains. Inclusion criteria required participants to (a) Hold a valid professional license in Saudi Arabia, (b) Have a minimum of six months of clinical or healthcare experience and (c) Consent to participate voluntarily. The final quantitative sample included 342 valid responses.

Among the survey participants, 66.4% were male and 33.6% were female. A significant proportion (48.8%) were aged under 30 years, while 40.6% were between 30 and 40 years. Regarding experience, 43.9% had practiced for fewer than five years, 37.4% for 5-10 years and 15.8% for 11-20 years, with only 2.9% having over 20 years of experience. Radiologists comprised the largest subgroup (27.5%), followed by surgeons (20.1%), nurses (17.0%), health informatics specialists (16.4%) and general medicine practitioners (15.4%). The remaining 3.5% represented public health, rehabilitation and administrative roles.

Sampling Strategy

Quantitative Sampling: Stratified random sampling was applied to achieve a representative distribution across specialties and experience levels. The sample was stratified according to medical specialty and years of practice (<5 years, 5-10 years, >10 years). Recruitment was conducted in two methods, one in person and researchers B and C distributed the electronic questionnaire and collected them and the second involved email invitations distributed via hospital administration, professional networks and institutional mailing lists and this was conducted by researcher A. Although the target sample size was initially set at 300, 342 valid responses were obtained, exceeding the minimum threshold required for statistical power and subgroup analysis.

Qualitative Sampling

For the qualitative component, purposive sampling was employed to select 38 participants from the quantitative pool. Selection criteria included variation in specialty, practice setting and working in the three major hospitals in Hail city (King Salman Specialist hospital, King Khalid hospital and General Hail hospitals) and prior exposure to AI-related tools. This approach ensured thematic richness and diverse viewpoints. Participants included consultants, residents, nurses, IT professionals and department heads. Efforts were made to include both proponents and skeptics of AI to reduce response bias and ensure balanced representation.

Data Collection Procedures

Quantitative Data Collection: Quantitative data were gathered using a structured questionnaire titled Perceptions of Artificial Intelligence in Healthcare Among Healthcare Practitioners. The instrument was pilot-tested with 10 practitioners to assess clarity, structure and face validity. The final version comprised six sections: demographic profile, familiarity with AI, perceived usefulness, confidence in AI utilization, ethical concerns (e.g., privacy, bias, accountability) and barriers to implementation. The survey was available in both Arabic and English and was distributed in paper and electronically in electronic format and Google Forms was used for both approaches.

Qualitative Data Collection

The researcher led A conducted three online sessions with both researchers B and C to guide them in how to do the interviews effectively. Semi-structured interviews were conducted with 38 selected participants using a standardized interview guide. Key areas of inquiry included clinical applications of AI, perceived advantages and risks, ethical dilemmas (e.g., liability, transparency) and recommendations for integration. Interviews were conducted either in-person or via secure virtual platforms (Zoom or Microsoft Teams), depending on participant availability and geographic location. Interviews lasted between 30 and 45 minutes and were audio-recorded with participant consent. Transcripts were anonymized and translated where necessary for consistency.

Data Analysis

Quantitative Analysis: Quantitative data were analyzed using IBM SPSS Statistics version 26. Descriptive statistics (means, standard deviations, frequencies and percentages) were computed to summarize respondent characteristics and item-level responses. Inferential tests included chi-square analysis to explore associations between demographic variables and AI-related perceptions, binary logistic regression to identify predictors of favorable AI attitudes and multivariate analysis of variance (MANOVA) to assess differences in perceptions across specialties.

Qualitative Analysis

Qualitative data were analyzed using an inductive thematic analysis approach, supported by the use of NVivo 12 software (QSR International, Melbourne, Australia). Audio-recorded interviews were transcribed verbatim and imported into the software for coding and analysis. Two researchers, A and D, independently reviewed the transcripts and conducted open coding to identify meaningful text segments related to perceptions of Artificial Intelligence (AI) in clinical practice. Codes were then organized into categories and aggregated into broader themes based on conceptual similarities and relevance to the research objectives.

To enhance the credibility and consistency, coding frameworks were compared and reconciled through iterative discussion and any discrepancies were resolved by consensus. Representative quotations were selected to illustrate key themes and provide contextual depth. The use of dual-coding and software-assisted analysis strengthened the rigor of the thematic process and helped minimize interpretive bias, which is a major issue in the qualitative aspect of the research.

Ethical Considerations

Ethical approval was obtained from the Institutional Review Board (IRB) and Research Ethics Committee (REC) at the University of Hail (Reference No: H-2024-409), dated 27 March 2024. Participants were informed of the study's purpose, procedures, confidentiality safeguards and their right to withdraw at any time. Written informed consent was obtained from all participants prior to data collection. All data were anonymized, encrypted and stored on a password-protected server accessible only to the research team.

RESULTS

Quantitative Findings (N = 342)

A total of 342 medical practitioners participated in the study. The majority were male (66.4%) and nearly half (48.8%) were under the age of 30. In terms of clinical experience, 43.9% of respondents had less than 5 years of practice, while 37.4% had 5 to 10 years of experience. Only a small proportion had over 10 years of practice. Regarding specialties, radiologists represented the largest group (27.5%), followed by surgical specialists (20.1%), nurses (17.0%) and health informatics professionals (16.4%). A detailed summary of participant demographics is provided in Table 1.

Most participants (82.1%) indicated they were familiar with AI applications in healthcare, with 30.2% reporting they were "very familiar" and 51.9% "somewhat familiar." Awareness of AI use within their respective specialties was also high, with 87.7% acknowledging such tools in their practice areas. Confidence in using AI for clinical decision-making was also notable; 43.8% of respondents felt "very confident" and 49.4% "somewhat confident" in their ability to use AI technologies. These results are detailed in Table 2.

In assessing perceived usefulness, the majority of respondents rated AI as beneficial in clinical settings. Specifically, 54.3% viewed AI as "very useful," and 44.4% considered it "somewhat useful." Only 1.2% were neutral and none perceived AI as not useful (Table 3).

When asked about specific benefits, the most commonly cited included improved diagnostic accuracy (54.3%), enhanced workflow efficiency (43.8%) and predictive analytics for early intervention (30.0%), as illustrated in Figure 1.

Table 1: Demographic Characteristics of Participants

Characteristic	N	Percentage (%)
Gender		
Male	227	66.4
Female	115	33.6
Age Group		
Under 30	167	48.8
30-40	139	40.6
41-50	24	7
Over 50	12	3.5
Years of Experience		
<5 years	150	43.9
5-10 years	128	37.4
11-20 years	54	15.8
>20 years	10	2.9
Specialty		
Radiology	94	27.5
Surgery	69	20.1
Nursing	58	17
Health Informatics	56	16.4
General Medicine	53	15.4
Other (Public Health/Admin)	12	3.5

Table 2: Familiarity, Awareness, and Confidence in Using AI

Measure	Category	N	Percentage
Familiarity	Very familiar	103	30.2
	Somewhat familiar	177	51.9
	Slightly familiar	54	15.7
	Not familiar	7	2.2
Awareness in Specialty	Aware	300	87.7
	Not aware	32	9.3
	Uncertain	10	3.1
Confidence in Using AI	Very confident	150	43.8
	Somewhat confident	169	49.4
	Not confident	23	6.8

Table 3: Perceived Usefulness of AI

Measure	Category	N	Percentage
Usefulness	Very useful	186	54.3
	Somewhat useful	152	44.4
	Neutral	4	1.2
	Not useful	0	0

Table 4: Challenges and Ethical Concerns Regarding AI

Challenge/Concern	N	Percentage
Challenges to AI Adoption		
Data privacy concerns	149	43.5
Limited AI training	127	37
Absence of regulatory standards	59	17.3
Resistance from staff or patients	7	2.2
Ethical Concerns		
Highly concerned	34	9.9
Moderately concerned	143	41.7
Slightly concerned	156	45.7
Not concerned	9	2.8
AI Replacing Human Roles		
Believe AI could replace roles	266	77.8
Disagree	44	13
Uncertain	32	9.3

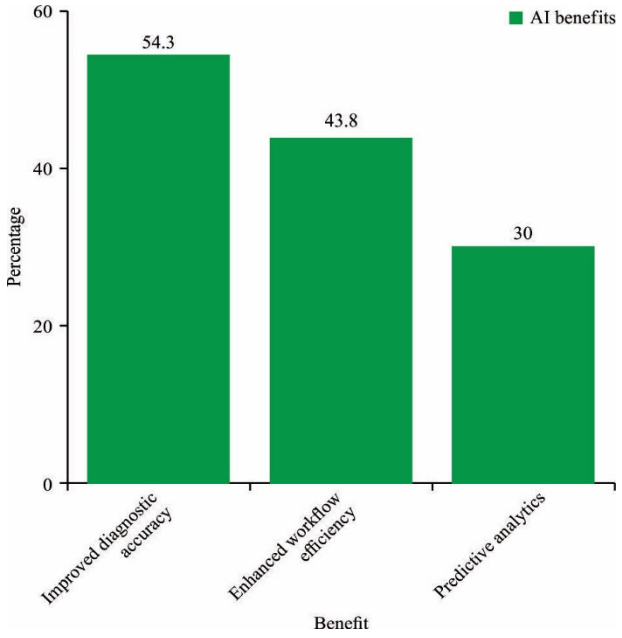

Figure 1: Perceived Benefits of Artificial Intelligence in Clinical Practice Among Medical Practitioners (N = 342)

Several challenges and concerns were identified in relation to AI adoption. Data privacy and patient confidentiality were the most frequently cited concerns (43.5%), followed by limited training opportunities in AI (37.0%) and the absence of regulatory standards (17.3%). Ethical concerns were also reported, with 9.9% being "highly concerned," 41.7% "moderately concerned," and 45.7% "slightly concerned" about ethical implications of AI in clinical contexts. Additionally, a significant majority (77.8%) believed that AI could potentially replace certain human roles in healthcare delivery. These findings are presented in Table 4.

Inferential statistical analyses revealed several significant associations. Chi-square tests showed that younger practitioners (<30 years) were significantly more familiar with AI applications ($\chi^2 = 18.27$, $p<0.01$) and confidence in using AI tools varied significantly by specialty, with radiologists reporting the highest levels of confidence ($\chi^2 = 22.56$, $p<0.001$). Gender was not significantly associated with perceived usefulness of AI ($\chi^2 = 2.11$, $p = 0.15$). Logistic regression analysis confirmed that younger age (<30) was a strong predictor of favorable attitudes toward AI (OR = 2.5, 95% CI: 1.6-3.8, $p<0.001$) and practicing in radiology also emerged as a significant predictor (OR = 3.2, 95% CI: 2.1-4.8, $p<0.001$). Years of experience did not significantly influence AI adoption tendencies ($p = 0.12$). A multivariate analysis of variance (MANOVA) indicated that specialty significantly influenced overall attitudes toward AI integration (Wilks' Lambda = 0.84, F = 5.89,

Table 5: Summary of Inferential Analysis on AI Perceptions Among Medical Practitioners

Statistical Test	Variable/Association Examined	Result/Statistic	Significance
Chi-Square Test (χ^2)	Age and AI familiarity	$\chi^2 = 18.27$	$p<0.01$ (significant)
	Specialty and confidence in AI use	$\chi^2 = 22.56$	$p<0.001$ (significant)
	Gender and perceived usefulness	$\chi^2 = 2.11$	$p = 0.15$ (not significant)
Logistic Regression	Age <30 and favorable AI attitude	OR = 2.5, 95% CI: 1.6–3.8	$p<0.001$ (significant)
	Radiology specialty and favorable AI attitude	OR = 3.2, 95% CI: 2.1–4.8	$p<0.001$ (significant)
	Years of experience and AI adoption	-	$p = 0.12$ (not significant)
MANOVA	Specialty and overall AI attitudes	Wilks' Lambda = 0.84, F = 5.89	$p<0.001$ (significant)
	Effect size	$\eta^2 = 0.12$	Moderate effect size

Table 6: Factor Analysis of Perception-Related Survey Items

Factor No.	Dimension	Variance Explained (%)
1	Perceived Benefits	32%
2	Ethical Concerns	23%
3	Barriers to Adoption	18%

Table 7: Demographic Characteristics of Interview Participants (N = 38)

Characteristic	Category	N (%)
Gender	Male	24 (63.2%)
	Female	14 (36.8%)
Age Group	<30 years	16 (42.1%)
	30-40 years	17 (44.7%)
	>40 years	5 (13.2%)
Years of Experience	<5 years	14 (36.8%)
	5-10 years	16 (42.1%)
	>10 years	8 (21.1%)
Specialty	Radiology	7 (18.4%)
	Nursing	6 (15.8%)
	Health Informatics	6 (15.8%)
	Surgery	5 (13.2%)
	General Medicine	8 (21.1%)
	Public Health / Administration	6 (15.8%)

$p<0.001$), with a moderate effect size ($\eta^2 = 0.12$). A complete summary of the inferential results is provided in Table 5.

Finally, factor analysis of perception-related survey items revealed three primary dimensions. The first factor, "Perceived Benefits," explained 32% of the variance and included items such as improved diagnostic accuracy and enhanced clinical decision-making. The second factor, "Ethical Concerns," explained 23% of the variance and included concerns about bias and data misuse. The third factor, "Barriers to Adoption," accounted for 18% of the variance and reflected issues such as training gaps and interoperability. These findings are summarized in Table 6.

Qualitative Findings (N = 38)

Thematic analysis of qualitative data derived from 38 semi-structured interviews yielded five principal themes. These themes reflect participants' perspectives on the awareness, benefits, barriers, ethical implications and integration strategies related to AI in clinical practice. The participant pool was diverse in terms of gender, age, experience and specialty (Table 7), enhancing the breadth and contextual depth of the findings.

Theme 1: Awareness and Understanding of AI

Participants exhibited varying levels of familiarity with AI technologies. Those working in radiology and health informatics displayed the highest conceptual understanding, often citing regular use of AI-enabled tools in daily clinical workflows. A health informatics specialist with 12 years of experience remarked, "AI is embedded in our workflow-whether it's predictive risk scoring or triage automation." Conversely, professionals from family medicine and nursing noted limited institutional exposure to AI. A nurse with seven years of experience commented, "I've heard about AI but we haven't had formal training or tools in our hospital yet."

Theme 2: Perceived Clinical and Operational Benefits

AI was widely perceived as a tool with potential to improve clinical accuracy and efficiency. Participants acknowledged its utility in assisting with radiological interpretation, enhancing decision-making and automating administrative tasks. For instance, a radiologist stated, "It helps catch things I might overlook, especially in CT scans or chest X-rays." Similarly, a nurse manager observed, "The automation of routine notes and scheduling has really freed up our time."

Theme 3: Barriers-Training Gaps and Resistance to Change

A prominent barrier to AI adoption identified by participants was the lack of structured training. Several practitioners reported learning AI concepts informally through online sources, indicating a gap in formal medical education. As a family physician with eight years of experience explained, "We have a steep learning curve—most of us are learning AI from YouTube or webinars." Additionally, resistance was more common among senior clinicians, some of whom viewed AI with skepticism. A consultant surgeon noted, "Some older colleagues feel AI undermines our clinical judgment."

Theme 4: Ethical Concerns and Accountability

Ethical considerations emerged as a recurrent theme. Concerns were particularly focused on data privacy, transparency in AI decision-making and ambiguity around legal accountability. An internal medicine consultant with 18 years of experience asked, "If an AI system makes a wrong call, who's liable? The doctor or the developer?" A public health specialist added, "There's not enough discussion around how these models are trained—and on what data."

Theme 5: Recommendations for Integration and Future Use

Participants recommended several strategies for effective AI integration. Key suggestions included incorporating AI training into medical education, developing standardized

continuing professional development modules and ensuring interoperability with existing electronic health record (EHR) systems. A medical educator emphasized, "We need mandatory AI training just like CPR—this is the future of medicine." A physical therapist added, "It only works if it speaks to our systems—we don't want a dozen platforms with separate logins."

DISCUSSION

This study employed a convergent mixed-methods design to examine healthcare practitioners' perceptions of AI in healthcare. The findings provide nuanced insight into the determinants of AI acceptance and readiness, with particular emphasis on familiarity, confidence, ethical concerns and educational gaps.

A principal finding of this study is the positive association between younger age and higher levels of AI familiarity and acceptance, this can cusaseed by their utlistions and more expousre to AI applicstions and platforms. Participants under the age of 30 were significantly more likely to report confidence in AI applications, aligning with prior research that identifies younger healthcare professionals as more digitally literate and adaptable to technological innovations [1]. Similarly, practitioners in radiology and health informatics-specialties with greater exposure to AI tools-exhibited the highest confidence in their use, corroborating global trends in specialty-specific adoption [2-3].

Despite these promising indicators, several concerns persist. Ethical issues-particularly data privacy, algorithmic transparency and unclear legal accountability-were raised consistently across both quantitative and qualitative components. These findings reinforce concerns previously articulated in the literature, where the absence of comprehensive ethical frameworks has been cited as a significant barrier to AI adoption [5,7,8].

Equally notable is the widespread lack of formal AI education among participants. More than one-third of respondents indicated they had received no structured instruction in AI, a finding that mirrors global data indicating that fewer than 20% of medical education programs offer formal training in digital health technologies [4,9]. The absence of educational infrastructure was perceived as a key barrier to effective and responsible AI integration, particularly among frontline practitioners expected to interface with AI-enabled systems.

Resistance to AI, particularly among senior clinicians, also emerged as a critical theme. Participants with over two decades of clinical experience were more likely to express skepticism regarding the reliability of AI tools and voiced concerns about potential professional deskilling. This resistance is consistent with previous studies demonstrating generational divides in technology acceptance and highlights the need for targeted change management strategies [10-15].

These findings carry important implications for healthcare practice and policy. First, the correlation between familiarity and acceptance suggests that structured educational initiatives may play a pivotal role in improving AI adoption rates. Second, the lack of regulatory clarity reinforces the urgent need for national and institutional frameworks that define legal, ethical and operational standards. Third, the integration of AI into healthcare must be approached as an interdisciplinary endeavor involving collaboration between clinicians, informaticians, ethicists and system designers.

A key strength of this study lies in its methodological design, which enabled the triangulation of quantitative breadth and qualitative depth. The inclusion of 342 survey respondents and 38 interview participants, representing a broad range of specialties and experience levels, enhances the credibility and transferability of the findings. However, certain limitations must be acknowledged. The use of self-reported data may introduce response bias and the context-specific nature of the sample-limited to practitioners in Saudi Arabia-may constrain the generalizability of results. Moreover, as the study was cross-sectional, it cannot capture temporal shifts in attitudes or behavior.

Future research should seek to address these limitations by incorporating longitudinal methodologies and expanding to comparative cross-national samples. In addition, studies focused on implementation science may further illuminate the factors that facilitate or hinder real-world AI adoption in various healthcare contexts.

Recommendations

Based on the findings of this study, several evidence-informed recommendations are proposed to support the ethical, practical and sustainable integration of AI into healthcare systems.

First, medical education institutions and professional accreditation bodies should incorporate structured AI training into both undergraduate curricula and continuing professional development programs. These educational initiatives should cover foundational concepts of AI, clinical applications, system limitations and ethical implications. Furthermore, the development of specialty-specific modules is essential to ensure contextual relevance and applicability across various clinical domains.

Second, the establishment of robust ethical and legal frameworks is imperative. National regulatory authorities, in collaboration with institutional policy-makers, must formulate comprehensive guidelines that address algorithmic accountability, data privacy, transparency and legal liability. The presence of clear regulatory definitions and enforceable protections will be critical in mitigating practitioner uncertainty and enhancing patient trust.

Third, the co-design and evaluation of AI systems should be carried out by interdisciplinary teams. Such collaboration-between clinicians, data scientists, health informatics professionals, ethicists and administrators-ensures that technological solutions are not only technically sound but also user-centric, ethically aligned and practically embedded within real-world clinical workflows.

Fourth, healthcare institutions should implement structured change management strategies to address resistance to AI, particularly among senior clinicians.

Targeted leadership engagement programs should emphasize AI's role in augmenting, rather than replacing, human expertise. These efforts can foster a culture of innovation and facilitate smoother transitions in practice.

Finally, future research should adopt longitudinal and comparative approaches to track the evolution of practitioners' perceptions and behaviors toward AI over time. Research conducted across a variety of healthcare systems-including those operating in resource-constrained environments-will offer valuable insight into context-specific barriers and facilitators of AI adoption. Such studies are essential for informing globally relevant and locally actionable policy and educational interventions.

CONCLUSIONS

This study explored healthcare practitioners' perceptions regarding the integration of artificial intelligence in clinical practice. Overall, participants expressed a generally positive outlook, particularly among younger practitioners and those in AI-intensive fields such as radiology and health informatics. Familiarity with AI technologies emerged as the most consistent predictor of perceived usefulness and confidence.

However, enthusiasm for AI was tempered by widespread ethical, legal and educational concerns. The absence of formal training in AI, especially in undergraduate and professional development programs, was identified as a critical deficiency. Ethical issues-including concerns related to data security, algorithmic bias and unclear liability-were also salient, underscoring the need for comprehensive governance structures.

These findings suggest that the successful implementation of AI in healthcare is not merely a function of technological advancement but also requires cultural readiness, educational investment and ethical alignment. Addressing these dimensions is essential to ensure that AI enhances, rather than disrupts, clinical care delivery.

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