Healthcare Providers' Perceptions of How Artificial Intelligence Influences Provider-Patient Relationships in Saudi Arabian Hospitals: A Qualitative Study

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Abstract

Background: Artificial intelligence (AI) is increasingly getting integrated into healthcare, with numerous promising benefits, including operation efficiency, decision support, and workflow optimization. However, its impact on provider–patient relationships remains unclear, particularly in Saudi tertiary hospitals where cultural norms, hierarchical structures, and patient expectations shape clinical interactions. Understanding healthcare providers' perceptions is crucial to guide ethical, patient-centered AI implementation.

Purpose: This study aimed to explore healthcare providers' perceptions of how AI affects provider–patient relationships in selected tertiary hospitals in Saudi Arabia.

Methods: A qualitative descriptive design was employed. Fifteen healthcare providers, including physicians, nurses, allied health professionals, and clinical technologists, were purposively recruited from tertiary hospitals. Data were collected through semi-structured interviews guided by three principal questions on AI use, interactions with patients, and ethical or practical concerns. Interviews were audio-recorded, transcribed verbatim, and analyzed using thematic analysis, following a structured coding and data reduction process.

Results: Four major themes emerged: (1) shifting dynamics of communication, where ai facilitated information delivery but sometimes disrupted interpersonal interaction; (2) trust and professional credibility, highlighting concerns about patients over-relying on ai and potential conflicts with clinician judgment; (3) balancing efficiency with human connection, emphasizing the need to preserve empathy despite AI-driven workflow improvements; and (4) transparency, accountability, and ethical concerns, including responsibility for AI-guided decisions, patient disclosure, and algorithmic bias. Participants underscored the importance of institutional policies, training, and governance to ensure AI complements rather than undermines relational care.

Conclusion and Recommendations: AI offers benefits for efficiency and clinical support but introduces relational and ethical challenges. Implementation should prioritize transparency, clinician training, patient communication, and equitable, context-sensitive governance. Future studies should examine long-term impacts on provider–patient relationships and patient outcomes.

Keywords: Artificial Intelligence (AI), Provider–Patient Relationship, Healthcare Providers' Perceptions, Qualitative Study, Saudi Arabia

BACKGROUND

Currently, healthcare systems across the world are experiencing rapid transformations driven by digital technologies, and Saudi Arabia is not an exception (Mani & Goniewicz, 2024; Kasula, 2023). Alongside the transformations, artificial intelligence (AI) has taken a central stage of attraction, and diverse forms of AI have been introduced in healthcare, including Machine Learning (ML), Natural Language Processing (NLP), predictive analytics, virtual health assistants integrated in chatbots, and Computer Vision, among many others (Abdelmohsen & Al-Jabri, 2025). In Saudi Arabia, the healthcare sector, through the motives of Vision 2030, has accelerated investment in health-sector digitalization, including electronic health records, telemedicine expansion and pilot deployments of AI in clinical workflows and administrative services (Kumar et al., 2025; Suleiman & Ming, 2025). These national initiatives create both opportunities and challenges for frontline clinicians who must integrate AI tools while maintaining therapeutic relationships with patients.

The application of AI in hospitals is vast. It can range from clinical decision support and imaging interpretation to triage chatbots, remote monitoring and administrative automation (Abualruz et al., 2025). Evidence from systematic reviews and country-level analyses indicates that AI can improve diagnostic accuracy, streamline workflows and increase efficiency (Alghareeb & Aljehani, 2025). However, the benefits are not uniformly realized and depend on implementation quality, governance, and end-user readiness. Importantly, improvements in technical performance do not automatically translate into better interpersonal care. This is so because digital tools can alter the timing, content and context of provider–patient interactions, with potential gains (faster information, clearer explanations) and risks (reduced face-to-face time, depersonalization) (Sauerbrei et al., 2023).

Some researchers have pointed out that the healthcare workers' attitudes toward AI shape whether and how these technologies are used in ways that preserve or undermine patient trust, empathy and shared decision-making (Shamszare & Choudhury, 2023). Recent empirical studies from Saudi Arabia show generally positive expectations about AI's utility alongside significant concerns about reliability, accountability, data privacy and readiness (Radhwi & Khafaji, 2024). The same study by Radhwi and Khafaji (2024) further notes that these are concerns that vary by profession, seniority and prior exposure to AI tools. For example, physicians often emphasise liability and diagnostic accuracy, nurses highlight relational and workflow impacts, and allied technologists may focus on technical performance. These are differences that deserve qualitative exploration since they can influence organizational acceptance and patient experience (Alhumaidi et al., 2023).

Trust is central to the provider–patient relationship, and introducing AI raises epistemic and ethical questions. The core concerns include who is responsible when an AI-recommended action harms a patient how transparent are algorithmic decisions, and how are patients informed about AI's role in their care? (Habli, Lawton & Porter, 2020). Research from multiple settings has shown that lack of explainability, unclear accountability, and insufficient patient communication can erode trust even when AI improves objective outcomes (Buhr et al., 2025). Conversely, person-centred implementations that preserve clinician involvement and provide transparent explanations can support continuity of trust and even enhance certain aspects of care (Sauerbrei et al., 2023).

Within Saudi Arabia's rapidly evolving digital health landscape, qualitative evidence is still limited. Most published work consists of cross-sectional surveys measuring awareness, attitudes or readiness, whereas fewer studies offer in-depth accounts of how AI influences

everyday clinical relations (Alghareeb & Aljehani, 2025; Alsaedi et al., 2024; Abdullah & Fakieh, 2020). Qualitative inquiry can help to illuminate the mechanisms by which AI affects communication, perceived empathy, and role boundaries across. There is a need to assess how it affects the relationships across diverse provider groups and settings, insights that are essential for human-centred AI policies, clinician education, and governance frameworks.

Nevertheless, preserving high-quality provider–patient relationships while harnessing AI's benefits requires attention to training, co-design with clinicians and patients, and governance that addresses data privacy and accountability (Ibrahim, 2025). As such, the Saudi hospitals and policymakers need empirical, context-sensitive evidence to guide workforce development and implementation strategies that protect relational care as digital tools expand. This study therefore aims to explore healthcare providers' perceptions of how AI affects provider–patient relationships in Saudi hospital settings, generating actionable findings to inform practice, policy and future research.

METHODS

Study Design

An exploratory qualitative design was adopted.

Setting

The study was conducted in selected tertiary hospitals in Saudi Arabia. Specifically, we chose major public and private facilities in Riyadh and Jeddah. These hospitals were purposefully chosen because they utilize advanced digital health infrastructures and integrate AI-enabled systems such as clinical decision support, radiology AI, and automated triage applications. Their high patient volume, diverse specialties, and multidisciplinary teams provide a rich environment for exploring AI's relational impacts.

Participants and Sampling

The study participants included physicians, nurses, allied health professionals, and clinical technologists with direct patient care responsibilities. The participants were included based on specific criteria, including (1) employment in a tertiary hospital, (2) involvement in patient-facing clinical work, and (3) exposure to AI-supported tools or workflows. Purposive sampling was used to obtain diverse perspectives across professions, clinical areas, and levels of seniority. We targeted between 10 and 20 participants, with final numbers being attained through data saturation.

Recruitment

Recruitment of the participants was done through hospital research offices, unit-level flyers, and snowball referrals. Interested participants contacted the researchers directly. Written informed consent was obtained before data collection.

Data Collection

Semi-structured interviews were conducted via the face-to-face fashion in private hospital meeting rooms and some were done via secure online platforms. Interviews we conducted in English, and lasted between 40 and 60 minutes, and were audio-recorded with the participants' permission. The interview guide contained three open-ended principal questions, including: (1) Can you describe your experiences using AI-supported tools in your clinical practice? (2) How do you feel AI has influenced your interactions and relationships with patients? and (3) What benefits or concerns do you perceive regarding AI's role in communication, trust, empathy, and decision-making with patients? Additionally, probing questions were used to deepen understanding and obtain more realistic examples. Field notes provided additional contextual and reflexive insights.

Data Analysis

Before the analysis begun, the recordings were transcribed verbatim. Data were analysed using reflexive thematic analysis following Braun and Clarke's six steps (Braun et al., 2023). Two researchers independently coded early transcripts and collaboratively refined the coding framework. Codes were organized into themes through iterative discussion and text reduction process (Table 2). To ensure trustworthiness and dependability and credibility, the thematic summaries were manually examined by two experts.

Ethical Considerations

Ethical approval was obtained from institutional review boards of participating hospitals. Participants were assured of confidentiality, voluntary participation, and secure data storage. Moreover, the participants' real identities were concealed, and only given coded names, such HCP (Healthcare Practitioner) ranging from 1 to 15.

RESULTS

Participants' characteristics

A total of 15 healthcare providers participated in the study by completing the interviews. The sample included a balanced representation of genders (8 females, 7 males) and diverse professional roles: physicians (4), nurses (6), allied health professionals (3), and clinical technologists (2). Participants' ages ranged from 28 to 42 years, with 5–16 years of clinical experience (Table 1). Exposure to AI tools varied across participants, categorized as frequent, moderate, or limited, reflecting differences in familiarity and engagement with AI-supported systems within the selected tertiary hospitals.

Table 1. Participants demographic characteristics

Participant ID	Gender	Profession	Age (years)	Experience (years)	Exposure to AI
HCP1	Female	Nurse	29	6	Moderate
HCP2	Male	Physician	35	10	Frequent
HCP3	Female	Allied Health	32	7	Moderate
HCP4	Male	Clinical Technologist	40	12	Moderate
HCP5	Female	Nurse	28	5	Limited
HCP6	Male	Physician	38	15	Frequent
HCP7	Female	Allied Health	31	8	Moderate
HCP8	Male	Clinical Technologist	42	14	Moderate
HCP9	Female	Nurse	34	9	Limited
HCP10	Male	Physician	36	11	Frequent
HCP11	Female	Allied Health	33	7	Moderate
HCP12	Male	Clinical Technologist	39	13	Moderate
HCP13	Female	Nurse	30	6	Limited
HCP14	Male	Physician	41	16	Frequent
HCP15	Female	Nurse	29	5	Moderate

Thematic outcomes

Four apparent themes were noted from the scripts (Table 2).

Theme 1: Shifting dynamics of communication

This theme reflects how AI tools alter the flow and quality of communication between healthcare providers and patients. Participants reported that AI often enhances clarity by summarizing information or prompting discussion points, but may also distract from direct interaction. One nurse noted (HCP14), "It helps me summarize lab results quickly [thinking]... but I spend more time on the screen than with patients." Similarly, a clinical technologist (HCP12) observed, "I find that AI suggestions guide my discussion, but I worry I may sound like a technology (laughs) at times." Overall, AI was perceived as both a facilitator and a potential barrier to natural, patient-centered conversation.

Theme 2: Trust and professional credibility

Participants expressed mixed perceptions of AI's impact on patient trust and their professional authority. While AI could enhance credibility when supporting accurate decisions, it also risked undermining clinicians' perceived expertise. A physician (HCP14) stated, "I was even surprised... you se these patients, some of them seem to trust AI recommendations more than mine sometimes." A nurse (HCP1) further added, "When AI outputs conflict with my judgment, I feel the patient's confidence in me is really challenged, in a way, lost." These findings highlight how AI reshapes relational dynamics, potentially creating tension between technological guidance and human judgment, emphasizing the need for careful integration to preserve trust and professional respect.

Theme 3: Balancing efficiency with human connection

Artificial Intelligence was consistently described as improving efficiency, particularly in documentation, assessments, and information retrieval. However, participants stressed that time savings do not automatically translate into stronger patient relationships. A nurse (HCP1) explained, "AI saves time in documentation, but human connection depends on me." On the same note, a physician (HCP14) added, "Yes, I would say the workflow is faster... but [thinking]; there is something more important than that... the human touch is mostly lost." Providers emphasized that maintaining empathy, rapport, and attentiveness requires deliberate effort. This theme underscores the importance of balancing technological efficiency with relational care to ensure that AI complements rather than diminishes patient-centered practice.

Theme 4: Transparency, Accountability, and Ethical Concerns

Participants consistently emphasized the need for transparency regarding AI involvement in clinical decision-making and highlighted uncertainty around accountability. Many expressed concern about how patients perceive AI's role and how clinicians should communicate these processes. One clinical technologist (HCP4) noted, "Patients ask whether I or the AI made the decision; transparency is critical and important in all clinical decisions." The expression shows the tension between algorithmic assistance and human oversight. Providers worried that insufficient disclosure could undermine trust or create unrealistic expectations about AI accuracy. Similarly, a physician (HCP10) remarked, "I'm not always sure who is responsible if AI gives a wrong recommendation or makes a wrong decision that can hurt my patient." This idea highlights the ambiguity in responsibility when errors occur. This uncertainty can leave clinicians feeling professionally vulnerable, particularly in contexts where legal or regulatory frameworks around AI use are not fully established.

Beyond individual accountability, participants also stressed the ethical implications of AI use, including patient autonomy, informed consent, and algorithmic bias. Many noted that while AI can improve efficiency and clinical accuracy, it might inadvertently marginalize patient voices if recommendations are presented as deterministic or unquestionable. A nurse (HCP1) emphasized, "We need clear institutional guidelines on how to explain AI involvement to patients." The response shows the importance of structured

communication protocols. Additionally, concerns about fairness and equity were raised, as AI tools may reflect biases in training data, potentially affecting diagnosis or treatment for specific patient groups. These findings align with international literature emphasizing the ethical and regulatory challenges of AI in healthcare and highlight the importance of developing context-sensitive policies that balance technological innovation with patient-centered, ethical practice.

Table 2. Text reduction and theme development

Interview Question / Prompt	**Text Extracts**	**Codes**	**Subthemes**	**Main Themes**
Describe your experience using AI-supported tools in your practice.	"It helps me summarize lab results quickly [thinking]... but I spend more time on the screen than with patients" – HCP14	screen reliance; workflow change	Altered communication patterns	Shifting dynamics of communication
	"Sometimes the AI prompts interrupt my explanation, mmm... it feels less personal according to me" – HCP2	disrupted conversation; reduced interaction	Altered communication patterns	Shifting dynamics of communication
	"I find that AI suggestions guide my discussion, but I worry I may sound like a technology [chuckling] at times" – HCP12	guided discussion; scripted interaction	Altered communication patterns	Shifting dynamics of communication
How has AI influenced your interactions with patients?	"I was even surprised... you se these patients, some of them seem to trust AI recommendations more than mine sometimes" – HCP14	patient overreliance; trust shift	Vulnerability of professional authority	Trust and professional credibility
	"When AI outputs conflict with my judgment, I feel	conflicting recommendations; trust concerns	Vulnerability of professional authority	Trust and professional credibility

	the patient's confidence in me is really challenged, in a way, lost" – HCP1			
	"AI can enhance credibility if it supports my decisions, but it can also make me feel like I am only secondary, and not authentic" – HCP3	credibility impact; role perception	Vulnerability of professional authority	Trust and professional credibility
What concerns or benefits do you perceive regarding AI's role in decision-making and communication?	"AI saves time in documentation, but human connection depends on me" – HCP1	efficiency; human connection	Balancing efficiency and empathy	Balancing efficiency with human connection
	"Yes, I would say the workflow is faster... but [thinking]; there is something more important than that... the human touch is mostly lost" – HCP1	workflow efficiency; loss of human touch	Balancing efficiency and empathy	Balancing efficiency with human connection
	"AI helps with initial assessment, but building rapport still depends on me" – HCP2	initial assessment; rapport building	Balancing efficiency and empathy	Balancing efficiency with human connection
How do AI tools affect transparency, accountability, and ethical practice?	"Patients ask whether I or the AI made the decision; transparency is critical" – HCP4	transparency; patient understanding	Need for transparency and guidelines	Transparency, accountability, and ethical concerns
	"I'm not always sure who is responsible if AI gives a wrong recommendation	accountability uncertainty; ethical concern	Need for transparency and guidelines	Transparency, accountability, and ethical concerns

	or makes a wrong decision that can hurt my patient" – HCP10			
	"We need clear institutional guidelines on how to explain AI involvement to patients" – HCP1	institutional policy; patient education	Need for transparency and guidelines	Transparency, accountability, and ethical concerns

DISCUSSION

There is a huge impact of AI on healthcare. The impact continues to surface as more domains of AI gets incorporated into healthcare operations.

and especially how the care providers relate with patients. This study explored such relationships in selected tertiary hospitals in Saudi Arabia, and four critical impacts were identified, including shifting communication dynamics; trust and professional credibility; balancing efficiency with human connection; and transparency, accountability, and ethical concerns. The findings show that AI's incorporation into clinical practice is far from a neutral technical shift; instead, it reshapes relational, ethical, and professional dimensions of care (Čartolovni, Malešević & Poslon, 2023; Chen, 2025). The expanded focus on governance, bias, and interpretability reveals critical challenges that must be addressed to steer AI adoption in a way that preserves the human core of medicine.

Artificial intelligence critically reshapes communication dynamics and relational care in the Saudi healthcare settings. Our finding that AI can both facilitate and compromise communication aligns with concerns from recent reviews that AI-driven healthcare could "weaken empathetic interactions" crucial to therapeutic relationships (Kumah, 2025). It has been established that while AI-supported tools can help organize information, prompt discussion, or standardize explanations, they may also increase clinician screen time, disrupt conversational flow, and risk reducing non-verbal and emotional connection (Traylor et al., 2025; Madan et al., 2025; Topaz, Peltonen & Zhang, 2025). These challenges echo sentiments in studies of nursing practice, where the introduction of decision-support systems reportedly diminished the emotional and compassionate aspects of care (Bodur et al., 2025).

In the context of busy tertiary hospitals, where patient load and administrative burden are high, the temptation to rely on AI-generated summaries or structured prompts is understandable. However, without deliberate safeguarding of empathic and patient-centred interaction, scholars fear the risk that care becomes mechanistic (Topaz, Peltonen & Zhang, Z. (2025). Nevertheless, many researchers and technology developers have recommended and argued in recent literature that AI should only be used to "augment, not replace" the human relational work in healthcare (Salehi, 2024). The concept of replacing humans is the contentious point, which attracts a lot of critique even fields outside healthcare. The debate thus seems to call for more ethical guidance on the best use of AI.

There was a concern over trust, professional credibility, and shifting authority when AI was applied to augment clinical decisions. Providers in this study expressed ambivalence about how AI affects their authority and patients' trust. Some perceived that AI's endorsement might enhance credibility, yet there was also fear that patients may defer to

"the machine" over human judgment. This tension reflects broader ethical and epistemological debates. For instance, a recent work argues that AI's reliability gaps due to opacity, unpredictability, or lack of explainability (Buhr, et al., 2025). This makes it difficult for patients (and even clinicians) to fully trust AI outputs.

From a different angle, AI use in healthcare can be looked at like a dual potential since it can reinforce or to undermine trust. This observation is mirrored in systematic reviews showing that many healthcare professionals support AI in principle, but have reservations about AI-guided clinical decisions, particularly when AI's rationale is not transparent (Henzler et al., 2025). In a setting like Saudi tertiary hospitals, these concerns are especially salient because patient expectations, sociocultural dynamics, and hierarchical authority relationships often emphasize physician expertise (Sheerah et al., 2024). For instance, some researchers observed that caring for patients with strong connection to Islamic faith, typical of the Saudi healthcare settings, calls for a close cultural consideration, being authentic and genuine, which may challenge the scripted approach of AI (Lovering, 2014). When AI assumptions or recommendations diverge from traditional clinician judgment, patients may feel unsettled, and clinicians may feel their professional legitimacy threatened.

Moreover, there is also a concern of phenomenon of automation bias, which challenges the use of AI in the provider-patient relationship. It happens when clinicians over-rely on algorithmic outputs. Yet, researchers have warned that such application may erode critical thinking or reduce engagement in shared decision-making (Stroud et al., 2024). This not only risks clinical error if AI outputs are flawed, but may also change the nature of the therapeutic alliance. It bulges from a human-to-human trust to a human-to-algorithm trust mediated by humans. Therefore, even as the healthcare providers apply AI, evidence warns of negative trust implications, which in the long run may reduce the overall quality of healthcare service delivered.

Another critical outcome was the debate over efficiency gains versus the humanistic core of care. The participants expressed that AI improves efficiency through documentation, triage, preliminary assessment, which may become faster, reducing workload and freeing up time. This aligns with broader evidence that AI's integration can enhance operational efficiency in hospitals (Esmaeilzadeh, 2024). However, our data reveal a critical concern. The efficiency gains do not automatically translate to more time for patient-centered care unless intentionally allocated by clinicians or institutions. Some participants noted that saved time might simply be absorbed by seeing more patients, more tasks — rather than deeper connections. This resonates with existing warnings that without explicit policies and values to safeguard relational care, AI risks accelerating throughput at the expense of empathy, compassion, and individualized attention (Kumah, 2025).

The most worrying issue is the transparency, accountability, equity, which squarely sit on the broad concept of governance and ethical challenges. Expanding our examination of the themes revealed deeper ethical, accountability, and equity concerns, which is perhaps the most consequential for long-term AI integration. Many participants expressed uncertainty about who bears responsibility when AI-informed decisions go wrong: the clinician, the institution, or the developers. As documented in a recent qualitative study in the UK, healthcare professionals struggle with similar ambiguities; many argue for shared accountability involving clinicians, institutions, and AI vendors (Nouis, Uren & Jariwala, 2025).

According to Buhr et al. (2025), the liability gap is exacerbated by the "black-box" nature of many AI systems, where neither clinicians nor patients can fully understand how a particular decision was reached. Such opacity undermines epistemic trust and complicates informed consent processes. Patients may be unaware that AI contributed to their diagnosis or treatment; or if they are told, they may not appreciate the uncertainty or

limitations. This poses threats to patient autonomy, informed decision-making, and the ethical principle of transparency. Indeed, a rapid review by Mooghali et al. (2024) on AI-enabled cardiovascular care found that problematic informed consent and loss of autonomy are frequently raised concerns.

Additionally, algorithmic bias and fairness issues emerged as significant worries. AI systems frequently rely on training data that may not capture the full diversity of patient populations in terms of ethnicity, gender, age, comorbidities, socioeconomic background, or rare clinical conditions (Mooghali et al., 2024). Participants in our study voiced concern that such embedded biases could reinforce existing disparities, particularly in culturally diverse hospital settings where equity is a core expectation of care. This aligns with international calls for fairness-aware AI, including rigorous model validation, subgroup-specific performance testing, and continuous post-deployment monitoring (Chinta et al., 2024). Recent work also emphasizes that systematic bias audits are essential to ensure that AI supports, rather than undermines, justice in healthcare delivery (PLOS Digital Health Staff, 2025).

Clinicians also voiced worry about "de-skilling", a claim that that over time, reliance on AI could erode human clinical judgment and diagnostic skills. This issue has been noted in nursing contexts, where AI systems may reduce clinician autonomy and shift care toward "machine-operator" roles (Bodur et al., 2025). From an ethics and workforce perspective, this raises questions about the sustainability of AI-integrated medicine. There are some worries whether clinicians remain engaged, competent, and ethically responsible, or become passive overseers of opaque algorithmic decisions (Natali et al., 2025; Feldman & De Cremer, 2025). These risks demonstrate that AI adoption is a technical upgrade and a fundamental transformation of medical practice and professional identity. As such, robust governance, ethical frameworks, and regulatory policies are essential to ensure that AI supports rather than undermines the humanistic, equitable, and accountable practice of medicine.

Implications

These findings necessitate a comprehensive, context-sensitive approach to AI integration that moves beyond efficiency and cost arguments to ethical, relational, and organizational considerations. First, institutions should implement transparent governance frameworks that clarify responsibility and accountability when AI is used in clinical decision-making. Audit trails, decision logs, and clear guidelines about clinician vs. AI responsibility are necessary to avoid liability ambiguity. Second, algorithmic fairness and bias mitigation should be prioritized. Hospitals should ensure that AI tools are validated on patient populations reflective of the local demographic diversity. Continuous monitoring and recalibration of algorithms should be required, especially in settings serving heterogeneous communities. There is also a need for clinical education and training to ensure ethical, relational, and communication competencies are adapted for AI-mediated care, and to ensure the continuity of humanistic care.

Limitations

The study's findings are based on a purposive sample from selected tertiary hospitals, limiting generalizability to other settings such as primary care or rural clinics. Also, the participants' responses may reflect social desirability bias, and the cross-sectional design cannot capture how perceptions or practices may evolve with longer-term AI exposure.

CONCLUSION

While AI can offer efficiency, diagnostic support, and workflow improvements in Saudi tertiary hospitals, its impact on provider–patient relationships is complex and uncertain. Participants recognized potential benefits but voiced serious concerns about trust, autonomy, transparency, bias, and professional identity. Without careful governance, ethical safeguards, and attention to humanistic values, AI risks undermining, rather than enhancing, the relational foundations of healthcare. Nevertheless, there is still a need for more studies. The future research should adopt mixed-methods longitudinal designs in Saudi and similar settings to examine how provider–patient relationships evolve over time with increasing AI integration. Additionally, comparative studies between hospitals with different AI governance policies would illuminate which frameworks best preserve relational quality.

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