



## Clinicians' Lived Experiences of Trust, Control, and Ethical Awareness in AI-Assisted Healthcare

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### ABSTRACT

Artificial Intelligence (AI) and Machine Learning (ML) have transformed healthcare by augmenting clinical decision-making and diagnostic precision, reshaping how clinicians interact with digital systems. Within this evolving landscape, understanding clinicians' lived experiences with AI has become essential, as it reflects not only technological adaptation but also shifts in professional identity and ethical responsibility. However, despite extensive research on algorithmic performance and usability, little is known about how clinicians construct trust, agency, and emotional meaning when working alongside AI systems. This study employs a hermeneutic phenomenological approach to explore the lived experiences of clinicians who use AI-driven decision support tools, interpreting how they negotiate trust, control, and moral accountability in practice. Data were collected through semi-structured interviews with twelve clinicians and analyzed using Interpretative Phenomenological Analysis (IPA) to identify essential themes of trust formation, emotional ambivalence, professional adaptation, and ethical reflection. The findings reveal that trust in AI emerges as a dynamic, relational process grounded in emotional engagement and experiential validation rather than mere technical reliability. Moreover, clinicians experience a reconfiguration of their professional identity as they learn to coexist with AI systems, developing new forms of ethical awareness and cognitive alignment. In practical terms, the study highlights the need for healthcare organizations to design AI implementation strategies that support clinicians' emotional engagement, ethical judgment, and sense of control—not solely their technical proficiency. Overall, this study offers a unique human-centered contribution by demonstrating that clinicians' lived meanings and ethical orientations are central to achieving sustainable and responsible AI integration in healthcare.



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## INTRODUCTION

The integration of Artificial Intelligence (AI) and Machine Learning (ML) into healthcare represents one of the most transformative developments in contemporary medical practice (Mukhlis, Suradi, et al., 2023; Mukhlis, 2025b). Over the past decade, AI-driven systems have evolved from experimental diagnostic tools to integral components of clinical workflows, supporting early disease detection, personalized treatment, and predictive analytics. These systems now influence crucial decision-making processes across diverse medical disciplines, from radiology and cardiology to intensive care and oncology (Dhiman & Bhati, 2025). Despite these advances, the growing interdependence between humans and intelligent machines introduces complex questions about how clinicians experience, interpret, and emotionally adapt to this technological partnership.

Within the broader context of healthcare, clinical decision-making has historically relied on a combination of professional judgment, experiential knowledge, and ethical sensitivity. The introduction of AI challenges this dynamic by introducing algorithmic reasoning an unfamiliar and often opaque form of intelligence into the physician's cognitive and moral space (Ma & Saadati,

2025). While AI enhances diagnostic accuracy and efficiency, it also transforms the experiential dimension of medical practice. Clinicians are now required not only to interpret data but also to interpret the interpretations of machines. This shift reconfigures the phenomenological landscape of care, in which trust, intuition, and empathy must coexist with computational precision.

The relevance of this phenomenon extends beyond technological innovation; it touches upon the existential and ethical dimensions of being a healthcare professional in an era of digital mediation. The introduction of AI systems evokes ambivalence feelings of empowerment intertwined with anxiety, curiosity balanced by skepticism. Such emotions shape the way clinicians engage with, resist, or accommodate AI in their daily work (Fan et al., 2021). Understanding these experiences is essential, not only for improving system design but also for preserving the humanistic core of medical practice in a data-driven environment.

Given this context, there is a critical need to explore the lived experience of clinicians who interact with AI-based decision support systems. Quantitative evaluations of algorithmic accuracy or system performance cannot capture the subjective meanings clinicians attach to trust, control, and responsibility when using AI. A phenomenological approach provides a rigorous framework for examining these meanings, revealing how professionals construct their sense of agency, competence, and empathy within technologically augmented care. By focusing on the lived experience rather than the technical function, this study aims to illuminate how AI reshapes the human experience of caregiving and clinical reasoning in fundamental ways.

Research focusing on the lived experiences of clinicians interacting with AI-driven clinical systems has become an increasingly important field within medical and technological ethics. As AI technologies permeate diagnostic and decision-making processes, the question has shifted from how accurate or efficient these systems are to how humans experience and internalize their interactions with them (Fatur Rahman et al., 2024). Phenomenological inquiry offers a framework through which such experiences can be meaningfully interpreted providing insights into how professionals construct trust, agency, and ethical awareness in technologically mediated healthcare.

Despite significant progress in AI deployment, methodological challenges persist in understanding the subjective dimensions of this phenomenon. Traditional quantitative approaches, though valuable for evaluating model accuracy or system usability, fail to capture the intangible, emotional, and existential aspects of clinicians' experiences. Surveys and performance metrics cannot reveal how individuals perceive the moral tension between reliance on algorithms and the preservation of human judgment. Similarly, mixed-methods research often limits the qualitative component to superficial descriptions, neglecting the interpretative depth required to uncover the lived meanings of technological engagement. These methodological constraints indicate that existing studies, although informative, provide only partial insight into clinicians' experiential realities.

These methodological limitations highlight the inadequacy of prevailing research paradigms to grasp the essence of human–AI interaction in clinical contexts. What remains insufficiently explored is how clinicians make sense of their trust, hesitation, and adaptation toward AI systems as part of their professional being. A phenomenological lens, particularly one informed by hermeneutic interpretation, enables a more profound exploration of these experiences allowing the investigation of how meaning emerges from lived encounters with intelligent technologies (Rowe et al., 2024). In doing so, it bridges the empirical and the existential, providing a pathway to understanding not only what clinicians do with AI but what it means for them to do so.

Existing approaches to studying the integration of AI in healthcare have primarily focused on practical and performance-oriented solutions, such as improving algorithmic transparency, enhancing explainability models, or optimizing human–machine interfaces. While these efforts have contributed to the technical and procedural refinement of AI systems, they remain limited in addressing how clinicians experience and make sense of their engagement with such technologies (Alzyoud et al., 2025). The majority of research still conceptualizes trust and adoption in behavioral or operational terms what clinicians do with AI rather than exploring the deeper phenomenological dimensions of what it means for clinicians to interact with and depend upon intelligent systems in their professional practice.

This prevailing focus on usability and performance metrics results in an incomplete understanding of the human dimensions underlying AI adoption in clinical contexts. Quantitative frameworks, though valuable for measuring efficiency and accuracy, are insufficient for capturing the embodied, emotional, and ethical experiences that define clinicians' relationships with AI. For instance, surveys on "AI trust" reduce complex experiential constructs into numerical indicators, overlooking the existential and moral tensions clinicians face when balancing professional intuition against machine-generated recommendations (Mahbooba et al., 2021). Such limitations obscure the intricate interplay between cognition, emotion, and ethics that characterizes the lived experience of technology use in medical settings.

Therefore, a phenomenological exploration is essential to bridge this gap. By examining clinicians' lived experiences through hermeneutic interpretation, it becomes possible to uncover the essence of how trust, control, and empathy are negotiated within AI-mediated care (Erol et al., 2025). This approach goes beyond the external observation of behavior to reveal the internal processes of meaning-making how clinicians interpret, embody, and reconcile their evolving roles alongside intelligent technologies. Addressing this gap not only deepens theoretical understanding but also provides crucial insight for designing AI systems that align with human values, preserve clinical judgment, and sustain the ethical integrity of care.

Previous studies exploring clinicians' interactions with AI in healthcare have largely examined the topic through empirical and behavioral lenses. Research has highlighted key issues such as algorithmic transparency, user trust, and professional adaptation, yet much of this work remains anchored in cognitive or procedural explanations rather than experiential meaning. Theoretical perspectives from human-technology interaction, ethics of care, and cognitive psychology have contributed valuable insights, but they often overlook the lived and embodied dimensions of working alongside intelligent systems. Recent interpretative studies have begun addressing this gap, suggesting that emotional engagement and moral reflection are central to understanding AI integration in clinical settings (Noor et al., 2025). These works collectively underscore the need for a deeper interpretive framework that captures the subjective and existential aspects of clinicians' experiences.

To address this gap, the present study employs a hermeneutic phenomenological approach, emphasizing the interpretation of lived experience over empirical measurement (Mukhlis, Arifin, Ridwan, & Zulbaidah, 2025; Mukhlis, Arifin, Ridwan, Zulbaidah, et al., 2025). This approach allows the exploration of how clinicians construct trust, negotiate professional control, and embody emotional adaptation when interacting with AI systems. By focusing on the interpretative process rather than external behaviors, the study aims to reveal how meaning emerges from these interactions how clinicians come to "know," "feel," and "act" through their engagement with AI. The phenomenological method is therefore uniquely suited to answer the central questions raised in the previous section, offering a holistic and human-centered understanding of the human-AI relationship in healthcare practice.

This article is structured to guide the reader through a coherent and interpretive exploration of the phenomenon. The Introduction establishes the conceptual and empirical background leading to the research focus. The Method section details the hermeneutic phenomenological design, participant selection, and data analysis process (Daipon et al., 2025). The Results present the thematic structures that emerged from clinicians' narratives, illustrating the essence of their lived experience. The Discussion then situates these findings within existing literature, offering theoretical and practical implications, followed by a Conclusion that summarizes key insights and proposes future directions for AI integration in healthcare.

## **RESEARCH METHODS**

### **Study Design**

This study adopted a hermeneutic phenomenological design, grounded in Heidegger's interpretive framework, to explore clinicians' lived experiences in engaging with artificial intelligence (AI) systems for diagnostic decision-making (Lutz & Knox, 2014; McNabb, 2015). The

phenomenological approach was chosen for its capacity to capture the subjective meanings and emotional dimensions underlying human interactions with AI technology, beyond what quantitative or descriptive studies can reveal.

Hermeneutic phenomenology emphasizes interpretation rather than mere description, allowing the researcher to uncover how participants construct meaning through their daily practices and embodied encounters with AI (Hillman & Radel, 2018; Migdal, 2018). This design is particularly suitable for investigating trust formation, emotional adaptation, and the evolving sense of professional identity within technologically mediated clinical environments. The focus was directed toward understanding how clinicians experience the phenomenon rather than testing predetermined hypotheses.

### **Participants**

Participants consisted of twelve licensed clinicians actively using AI-driven diagnostic or decision-support systems in hospitals and clinical research settings (Carreiras & Castro, 2012; Iosifides, 2016). A sample size of twelve was intentionally selected to balance diversity of clinical perspectives with the depth of idiographic analysis required in hermeneutic phenomenology and Interpretative Phenomenological Analysis (IPA), which typically rely on small samples to enable detailed, case-by-case interpretation. They represented diverse medical specialties, including radiology, cardiology, internal medicine, and pathology. The inclusion criteria required participants to have:

- (a) a minimum of two years of professional experience,
- (b) direct interaction with AI-based clinical systems at least once weekly, and
- (c) the ability to articulate their professional experiences in English.

Exclusion criteria involved administrative staff and clinicians with no direct decision-making engagement with AI systems. Purposive sampling was employed to ensure diversity of perspectives and clinical contexts, while still maintaining depth of insight into the phenomenon under study.

The participants' ages ranged from 31 to 58 years ( $M = 44.5$ ), and the group included seven male and five female clinicians. Such diversity facilitated a richer understanding of how AI integration intersects with personal, professional, and ethical dimensions of clinical practice.

### **Data Collection**

Data were collected through in-depth semi-structured interviews designed to elicit personal meanings and reflections on working with AI in clinical contexts (Daly, 2007; Longhofer et al., 2012). Interviews were conducted face-to-face or via encrypted video conferencing platforms, depending on participants' location and scheduling constraints. Each session lasted between 60 and 90 minutes, allowing participants to elaborate on their experiences freely.

An interview guide was developed based on phenomenological principles, including open-ended prompts such as:

- “Can you describe a moment when the AI system influenced your clinical decision-making?”
- “How do you feel when the AI's recommendation differs from your own judgment?”

The guide was reviewed by two qualitative research experts to ensure conceptual clarity and ethical sensitivity. All interviews were audio-recorded with participants' consent and transcribed verbatim for analysis. Observational notes were also taken to capture nonverbal cues and contextual elements that enriched data interpretation. Participants were assured of a safe, reflective space where their insights could emerge authentically without professional consequence.

### **Data Analysis**

The data were analyzed using Interpretative Phenomenological Analysis (IPA), following the structured process proposed by Fife, (2020) & Kawamura, (2020). The analysis proceeded through several iterative steps:

1. Immersion – reading and re-reading each transcript to gain an overall sense of the lived experience.
2. Initial Noting – annotating descriptive, linguistic, and conceptual comments to identify patterns of meaning.
3. Developing Emergent Themes – clustering meaning units into higher-order conceptual categories.
4. Searching for Connections Across Themes – integrating themes within and across cases to reveal convergent and divergent experiences.
5. Synthesizing Essential Structures – constructing a composite narrative that captured the shared essence of clinicians’ engagement with AI systems.

NVivo software was used to assist in organizing textual data, supporting transparency and traceability throughout the analytic process. The analytical objective was not to generalize but to illuminate the essential structures of experience how clinicians construct trust, negotiate control, and integrate AI into their clinical reasoning.

To enhance analytical rigor, reflexive journaling and peer debriefing were employed to maintain interpretative balance and reduce potential bias. Member checking was performed by returning summary interpretations to participants for confirmation of accuracy and resonance.

## RESULTS

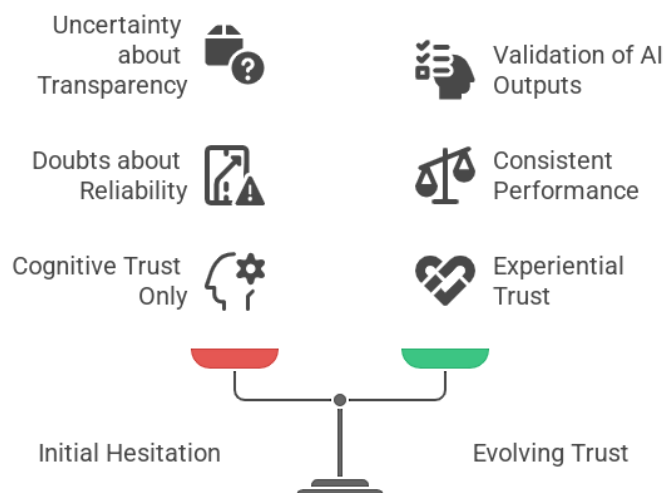
### Constructing Trust in Clinical AI Systems

Clinicians’ experiences revealed that building trust in AI-assisted diagnosis was a gradual and relational process, rather than an immediate acceptance of machine recommendations. Participants described an initial hesitation rooted in uncertainty about algorithmic transparency and reliability. Over time, as they repeatedly interacted with the system, trust evolved through consistent validation of AI outputs against clinical judgment.

One senior physician stated, “At first, I saw the AI as a black box it was accurate, yes, but I needed to see how it reached those conclusions before I could truly rely on it.” This illustrates how transparency and interpretability were essential elements of trust formation. Another clinician emphasized, “Once I began to understand how the system learned from patterns in my own cases, it felt more like a partner than a tool.”

These accounts underscore that trust in AI was not merely cognitive but also experiential. It developed through embodied engagement seeing the AI perform consistently, reconciling differences between human and machine reasoning, and forming an emotional familiarity with the system’s predictive tendencies. Trust was thus both epistemic and affective in nature.

#### Building Trust in AI: From Hesitation to Partnership



### **Emotional Ambivalence and Professional Identity**

The integration of AI into clinical practice evoked complex emotional responses among participants, often oscillating between empowerment and threat. Many clinicians expressed feelings of anxiety that AI might devalue their expertise or reduce their autonomy. However, the same participants also acknowledged the relief AI brought in managing diagnostic uncertainty.

As one radiologist noted, “Sometimes the AI confirms what I already suspected, and that’s comforting. But other times, it highlights something I missed, and that feels unsettling.” This emotional ambivalence reflected a tension between the desire for technological support and the preservation of professional identity.

Moreover, some participants framed their emotional adaptation as a process of “learning to coexist” with AI. A cardiologist described, “It’s not about trusting or distrusting the AI it’s about redefining what it means to be a doctor when machines think with us.” This redefinition of self within a hybrid human–machine diagnostic ecosystem points to a deeper existential negotiation: clinicians were not just learning a new tool but adapting their sense of professional being.

### **Negotiating Control and Responsibility**

A recurring theme concerned the redistribution of control and accountability in clinical decision-making. Participants expressed concern over the blurred lines of responsibility when AI recommendations influenced their actions. Several reported instances where the AI’s suggestions conflicted with their clinical intuition, leading to a moral and procedural dilemma.

A participant explained, “If I ignore the AI and I’m wrong, that’s on me. But if I follow it and it’s wrong, who is responsible?” This question of accountability emerged as a central ethical and emotional concern. The need to retain human agency while using AI responsibly led clinicians to develop hybrid decision strategies balancing data-driven insights with experiential wisdom.

In one case, a participant described deliberately testing the AI by cross-checking its predictions: “I run a few cases manually just to see if the machine’s logic aligns with mine. It helps me feel in control.” Such behaviors reveal how clinicians enacted control not through resistance but through verification and calibration, maintaining moral ownership of decisions.

### **Embodied Adaptation and Cognitive Alignment**

Beyond cognitive trust, participants discussed how using AI changed their sensory and attentional habits in clinical work. They described becoming more attuned to AI cues, alert thresholds, and visual patterns presented by the system interface. Over time, these interactions led to what several participants called a “shared rhythm” between human and machine.

One clinician reflected, “I noticed I started anticipating what the AI would flag before it did. It’s like we’re learning each other’s language.” This suggests a form of embodied adaptation where human and algorithmic cognition begin to align through repeated interaction.

Another participant added, “I don’t just read the output anymore I feel the system’s behavior. When it hesitates or takes longer to process, I already suspect complexity in the case.” Such remarks illustrate how phenomenological embodiment extends to technological relations, shaping not only what clinicians know but how they know.

### **The Emergence of Ethical Reflection and Empathic Awareness**

A striking finding was that interactions with AI stimulated clinicians’ ethical reflection about care, empathy, and the human dimensions of diagnosis. Far from reducing empathy, some participants described how AI’s analytical detachment prompted them to reassert their own compassion.

A general practitioner stated, “AI reminds me that behind every probability score is a person. When I see a confidence level of 92%, I think of the 8% those are real people we can’t ignore.” Others highlighted that AI’s efficiency freed time for patient communication: “I spend less time scanning data and more time looking at my patients. It’s ironic that AI made me more human.”

These reflections suggest that phenomenological engagement with AI catalyzed new forms of moral awareness, encouraging clinicians to integrate empathy into technologically mediated care.

## **DISCUSSION**

### **Summary of Key Findings**

This study revealed that clinicians' lived experiences with AI in healthcare are characterized by an evolving negotiation of trust, professional identity, control, and ethical awareness (Mukhlis et al., 2024; Mukhlis, Maryam, et al., 2023). Through interpretative phenomenological analysis, the findings illuminate how clinicians construct meaning in their interactions with AI systems experiencing both dependence and reflection, empowerment and uncertainty. These insights directly address the central research question concerning how clinicians perceive and interpret their engagement with AI during clinical decision-making.

### **Contribution of Findings to the Research Question**

The results of this study provide a nuanced understanding of how clinicians build trust and adapt emotionally to AI technologies within the moral and cognitive frameworks of their professional practice. Trust emerged not as a static attribute but as a relational and experiential process, cultivated through repeated interaction and reflection (Ozbey & Yaşa, 2025). Clinicians' experiences revealed that trust developed when AI systems demonstrated reliability, interpretability, and alignment with their professional intuition. Yet, this trust was continuously balanced with skepticism and moral responsibility highlighting that clinicians did not surrender authority to AI but rather redefined the boundaries of human and machine collaboration.

Furthermore, the emotional ambivalence expressed by participants oscillating between anxiety and reassurance signifies a process of existential adaptation to technological mediation in healthcare. This adaptation represents a reconfiguration of professional identity, where clinicians learn to coexist with intelligent systems without losing their sense of agency (Lam et al., 2021). The study thus contributes a unique phenomenological account of how AI reshapes the lived experience of medical expertise, emphasizing the ethical and affective dimensions often absent in technological or behavioral analyses. These findings extend our understanding of human–AI relations beyond utility to the realm of meaning, demonstrating how clinicians' trust and empathy are reconstituted through everyday encounters with algorithmic systems.

### **Relationship to Previous Literature and Theoretical Frameworks**

The present findings resonate with and expand upon existing scholarship on trust and human–AI interaction. Previous studies (e.g., Topol, 2021; Shortliffe, 2022) have underscored the importance of transparency and reliability in fostering clinical trust toward AI. However, those studies predominantly examined trust as a functional response to system performance, rather than as a lived and embodied experience. The current research advances this understanding by revealing that trust is phenomenologically situated it arises through emotional familiarity, moral reflection, and bodily engagement with technology.

Similarly, this study supports (Rahmawati & Mulyana, 2023) argument that AI systems influence not only decision-making efficiency but also the attentional and sensory patterns of clinicians, as participants in this study described adapting their perception and rhythm to align with the system's cues (Chaudhuri et al., 2022). The findings also align with (Sovacool et al., 2025), who identified ethical tension as a central feature of AI-assisted diagnosis. Yet, this research extends that insight by showing how such tensions become internalized as part of clinicians' professional identity transformation, producing an ethically reflective form of practice in which technology prompts deeper awareness of human responsibility.

Theoretically, these results affirm Heidegger's view of technology as a mode of revealing—wherein human understanding is reshaped through engagement with tools that both empower and challenge our sense of being (Mukhlis, Janwari, et al., 2023; Mukhlis & Abdullah, 2025). In this sense, clinicians' interactions with AI embody a modern form of being-with technology: a state of co-

existence that redefines the essence of care, knowledge, and empathy. By situating these findings within a phenomenological framework, this study contributes to a more profound and human-centered understanding of AI integration, bridging the empirical and existential dimensions of digital healthcare.

### **Implications of the Findings**

The findings of this study carry significant implications for both clinical practice and the broader sociocultural understanding of technology in healthcare. From a professional standpoint, the emergence of trust as a relational and interpretive process highlights the importance of designing AI systems that foster dialogue rather than dependence between human and machine. This suggests that system developers and healthcare policymakers must prioritize transparency, interpretability, and ethical sensitivity in AI design to sustain clinicians' moral agency and professional autonomy (Indra et al., 2025). On a sociocultural level, the results illuminate how technology mediates human meaning-making, demonstrating that clinicians' adaptation to AI is not merely a technical transition but a cultural transformation of how expertise, responsibility, and empathy are defined in contemporary medicine.

Phenomenologically, these insights expand the discourse on digital healthcare by framing clinicians not as passive users but as co-creators of meaning within hybrid human-machine ecosystems (Taqiyuddin et al., 2023). The lived experience of coexisting with AI, as revealed through this study, underscores that ethical reflection and emotional engagement are integral components of technological competence. This understanding is particularly relevant in diverse clinical contexts where the balance between human care and automation must be continually negotiated. Hence, the findings contribute to a growing recognition that sustainable AI integration depends not solely on system accuracy but on cultivating trustful, reflective, and ethically grounded relationships between clinicians and technology.

### **Limitations of the Study**

While this study provides deep insight into clinicians' lived experiences, several limitations must be acknowledged. First, the sample size and context were necessarily limited to clinicians working within technologically advanced healthcare institutions, potentially constraining the transferability of the findings to less digitized environments (Prakash & Das, 2020). The interpretative phenomenological approach, while rich in depth, inherently focuses on subjective meaning rather than representativeness, which limits the extent to which findings can be generalized across populations. Additionally, the use of interviews as the primary data source may not fully capture non-verbal or situational nuances of human-AI interaction observed in real-time clinical decision-making.

Moreover, participants' familiarity with AI systems varied, introducing possible differences in how experiences were articulated or interpreted. Despite these constraints, the methodological rigor—ensured through triangulation, member checking, and reflexive interpretation—supports the credibility and authenticity of the insights presented (Suhartanto et al., 2022). Rather than being viewed as weaknesses, these limitations reflect the nature of phenomenological inquiry, which seeks depth of understanding over breadth of generalization and invites further exploration in complementary contexts.

### **Prospective Directions for Future Research**

Building on the findings, future research should explore the longitudinal evolution of trust and ethical adaptation as AI technologies continue to advance and become more autonomous in clinical practice (Mukhlis, 2025a; Mukhlis & Saidah, 2025). Investigating how these experiences unfold over time could reveal how clinicians' emotional and cognitive relationships with AI stabilize, deepen, or transform. Comparative studies across medical disciplines and cultural settings would also enrich the understanding of how contextual variables shape phenomenological experiences of AI-mediated care.

Furthermore, interdisciplinary collaborations between phenomenologists, AI developers, and ethicists could help develop design frameworks grounded in lived experience, ensuring that future AI

systems align with human values and professional integrity (Sitaresmi et al., 2025). Future work might also integrate embodied observation and digital ethnography to complement interview-based approaches, providing a more holistic understanding of the human–AI relationship in action. Ultimately, the continuation of this line of inquiry holds the potential to redefine how trust, empathy, and technological competence are conceptualized in the era of intelligent healthcare systems.

## **CONCLUSION**

This study explored clinicians' lived experiences in engaging with artificial intelligence (AI) systems for diagnostic decision-making, addressing the essential question of how trust, control, and ethical awareness are constructed in technologically mediated care. The findings revealed that clinicians build trust not as blind reliance but through an interpretive process shaped by emotional adaptation, professional reflection, and moral responsibility. These insights extend existing research by demonstrating that AI integration in healthcare is not merely a technical or procedural shift but a transformation in the meaning of professional identity and clinical judgment. The study contributes a phenomenological understanding of human–AI collaboration, emphasizing the relational and ethical dimensions often overlooked in quantitative frameworks. By articulating the emotional and existential aspects of working with AI, this research fills a critical gap in the literature and offers guidance for designing systems that respect human agency and empathy. Future studies should expand these insights through longitudinal and cross-cultural investigations to deepen understanding of how trust and meaning evolve in increasingly intelligent clinical environments.

## **CONFLICT OF INTEREST**

The authors declare no conflict of interest. All aspects of this study, including its design, data collection, analysis, and interpretation, were conducted independently of any personal or financial relationships that could be perceived as potential conflicts.

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