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Exploring Physicians' and Nurses' Meaning-Making in AI-Driven Decision Support for Oncology Treatment Planning within Digital Health Platforms

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ABSTRACT

Digital health systems and platforms have increasingly integrated artificial intelligence to support clinical decision-making, reshaping how healthcare is delivered and experienced in contemporary practice. Within this domain, AI-driven decision support systems (AI-DSS) have become prominent, yet understanding has largely focused on technical performance and adoption rather than clinicians' lived experiences. What remains insufficiently understood is how clinicians interpret, experience, and make meaning of AI-DSS in their everyday clinical practice, particularly in relation to professional identity, ethical responsibility, and decision-making. Here we show that an interpretative phenomenological approach provides critical insight into these experiential dimensions by revealing how clinicians actively negotiate meaning and authority when engaging with AI-DSS. This study employed a hermeneutic phenomenological design involving in-depth semi-structured interviews with 15 clinicians working in hospital-based digital health environments who routinely use AI-DSS in their practice. Data were analyzed using interpretative phenomenological analysis (IPA), including iterative coding, identification of meaning units, and thematic abstraction grounded in participants' lived narratives. The analysis generated four interrelated themes: (1) AI-DSS as a co-analyst shaping diagnostic reasoning; (2) tensions between algorithmic recommendations and professional autonomy; (3) emotional responses ranging from trust to skepticism; and (4) the reconfiguration of ethical responsibility in human–AI collaboration. The findings demonstrate that clinicians experience AI-DSS as sociotechnical presences that influence professional identity, evoke emotional and ethical tensions, and transform clinical decision-making into a reflective human–AI dialogue. Rather than passively adopting AI outputs, participants described actively interpreting, validating, and sometimes resisting algorithmic recommendations, thereby reconstructing authority within digitally mediated care. These findings advance understanding of digital health systems by foregrounding clinicians' lived experiences and highlight the importance of human-centered design and future research that integrates phenomenological insights into the development of AI-supported healthcare.

INTRODUCTION

Digital health systems and platforms have become a defining feature of contemporary healthcare, reshaping how clinical services are delivered, managed, and experienced (Doylê et al., 2021). Advances in health informatics, artificial intelligence, and data integration have enabled the widespread adoption of digital platforms that support diagnosis, treatment planning, and clinical decision-making (Meinert et al., 2020). Within this landscape, AI-driven decision support systems (AI-DSS) are increasingly embedded into everyday clinical workflows, positioning themselves as influential components of modern healthcare practice. These systems promise improved efficiency, consistency, and evidence-based support, and are often framed as neutral technological solutions to complex clinical.

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Despite these advancements, digital health platforms do not operate in a social vacuum (Wilmink et al., 2020). Clinical decision-making remains a fundamentally human activity, shaped by professional judgment, ethical responsibility, emotional engagement, and contextual awareness. The integration of AI-DSS into clinical environments introduces new forms of interaction between humans and technology, influencing how clinicians perceive their roles, responsibilities, and relationships with patients (Mukhlis et al. 2023). Prior scholarship has highlighted that technologies in healthcare are not merely tools, but sociotechnical entities that actively shape professional practices and lived experiences.

From a human perspective, the relevance of AI-DSS extends beyond technical performance to encompass clinicians' subjective experiences of trust, uncertainty, reassurance, and tension (Rodrigues et al., 2022). Decisions supported by algorithms are experienced within real clinical contexts where stakes are high and accountability remains personal. As such, clinicians encounter AI systems not only cognitively, but also emotionally and ethically, negotiating between algorithmic guidance and their own professional intuition (Van Den Heuvel et al., 2020). These experiences are embedded within broader social and cultural expectations surrounding medical expertise, responsibility, and the growing authority of data-driven systems in healthcare.

While existing research has contributed valuable insights into the effectiveness, usability, and adoption of digital health technologies, less attention has been paid to how these systems are experienced by clinicians in their everyday practice (Ilan, 2020). There remains a need for deeper exploration of the meanings clinicians attribute to AI-DSS, particularly how such technologies are interpreted, negotiated, and integrated into professional identity and clinical reasoning (Mukhlis & Saidah, 2025). A phenomenological perspective is especially suited to address this gap, as it foregrounds lived experience and seeks to understand phenomena as they are perceived and made meaningful by those who encounter them. By focusing on clinicians' experiential accounts, phenomenological inquiry enables a richer understanding of digital health platforms as lived realities rather than solely technical innovations.

In recent years, scholarly attention has increasingly turned toward understanding how clinicians experience and interpret digital health technologies, particularly as artificial intelligence becomes embedded in clinical decision-making processes (Rodriguez-Villa et al., 2020). Research examining clinicians' interactions with AI-driven decision support systems (AI-DSS) has emerged as an important sub-area within digital health and health informatics, reflecting growing recognition that technological integration fundamentally alters professional practice and meaning-making (Vives-Mestres et al., 2021). Studies have begun to acknowledge that clinicians' experiences with AI are shaped not only by system functionality, but also by professional norms, ethical responsibilities, and contextual pressures inherent in healthcare environments.

Despite this growing interest, investigating the lived experience of clinicians in AI-supported clinical settings presents significant methodological challenges (Graham et al., 2021). Much of the existing literature relies on quantitative surveys, usage metrics, or performance evaluations that prioritize measurable outcomes over experiential depth. While such approaches are valuable for assessing efficiency or accuracy, they offer limited insight into how clinicians emotionally and ethically engage with AI systems, how trust is negotiated, or how professional identity is reconfigured in the presence of algorithmic authority (Mukhlis, 2025). As a result, the subjective dimensions of clinicians' encounters with AI-DSS such as uncertainty, reassurance, moral tension, and interpretative judgment remain underexplored.

These methodological limitations have constrained the field's ability to capture the essence of clinicians' experiences with AI-driven digital health platforms (Hoyte et al., 2022). Predominantly quantitative or technologically oriented approaches tend to reduce complex human–technology interactions to variables or adoption rates, thereby overlooking the meanings clinicians attribute to their everyday encounters with AI systems (Liao et al., 2021). Consequently, much of the current evidence base remains insufficient for understanding how AI-DSS is lived, interpreted, and integrated into clinical practice at a deeper experiential level. Addressing this gap requires research approaches

capable of engaging with clinicians' narratives and interpretative processes, allowing the phenomenon to be understood as it is experienced rather than merely observed or measured.

Current efforts to address the integration of AI-driven decision support systems (AI-DSS) within digital health platforms have largely relied on practical and solution-oriented approaches, such as optimizing system accuracy, improving usability, and increasing adoption through training or workflow redesign (North et al., 2020). These approaches have contributed to important technical and operational advancements, offering insights into how AI systems can be made more efficient, reliable, and scalable in clinical settings (Mukhlis & Abdullah, 2025). However, such solutions are predominantly grounded in instrumental reasoning, treating AI-DSS as functional tools whose value can be assessed primarily through performance indicators or behavioral uptake.

While practical approaches provide measurable benefits, they remain limited in their capacity to capture the depth and complexity of clinicians' lived experiences (Dlugatch et al., 2024). Quantitative evaluations and implementation-focused studies tend to overlook how clinicians make sense of AI-DSS in practice—how trust is formed or disrupted, how ethical responsibility is negotiated, and how professional identity is reshaped in the presence of algorithmic guidance (Elvas et al., 2023). As a result, existing knowledge offers a partial understanding that emphasizes what AI systems do, rather than how they are experienced by those who use them. This limitation restricts the ability of current research to account for the emotional, interpretative, and moral dimensions that are central to clinical decision-making.

Consequently, a critical gap persists in understanding the essential meanings clinicians attribute to AI-driven digital health platforms. Addressing this gap requires an alternative methodological orientation capable of engaging with experience as it is lived and interpreted (Patil et al., 2023). A phenomenological approach offers such a pathway by shifting the focus from system-centered evaluation to human-centered meaning-making. Through systematic exploration of clinicians' narratives, phenomenology enables a more holistic understanding of AI-DSS as sociotechnical phenomena embedded in professional practice (Mukhlis et al. 2025). This perspective is necessary to illuminate aspects of AI integration that remain invisible within prevailing practical approaches, thereby advancing both theoretical insight and the design of more human-centered digital health systems.

Previous studies have examined the integration of digital health technologies by focusing on system performance, usability, and clinical outcomes, offering valuable insights into how AI-driven tools function in healthcare settings (Lopez Alcaraz et al., 2025). Research has also begun to address issues of trust, ethical concern, and professional responsibility in relation to AI-supported decision-making. However, these studies have largely approached the phenomenon through quantitative or mixed-method designs that prioritize measurable indicators over lived experience (Lygizou & Kalles, 2025). As a result, clinicians' subjective interpretations, emotional responses, and meaning-making processes remain only partially understood. This body of literature highlights the need to move beyond functional evaluation toward deeper engagement with human experience in digital health contexts.

This study addresses that need by adopting an interpretative phenomenological approach to explore clinicians' lived experiences with AI-driven decision support systems embedded in digital health platforms (Daghir-Wojtkowiak et al., 2025). Phenomenology is employed to capture how clinicians interpret AI recommendations, negotiate professional identity, and experience ethical and emotional tensions in everyday practice. By focusing on lived experience, this approach responds directly to the knowledge gap identified in prior research (Mukhlis, Janwari, et al., 2023). It enables the exploration of meanings that cannot be accessed through surveys or performance metrics alone. In doing so, the study provides a human-centered understanding of AI-DSS as experienced within real clinical environments.

This article is structured to guide the reader through the phenomenon in a coherent and transparent manner. The introduction outlines the broader digital health context, the specific experiential focus, and the resulting knowledge gap. The method section describes the phenomenological design, participant selection, data collection, and analytic process. The results

section presents thematically organized findings grounded in clinicians' narratives. The discussion situates these findings within existing literature and considers their theoretical and practical implications, followed by a conclusion that summarizes key insights and contributions.

RESEARCH METHODS

Study Design

This study adopted a phenomenological research design to explore clinicians' lived experiences of interacting with AI-driven decision support systems (AI-DSS) within digital health platforms (Auf et al., 2025). Phenomenology was selected because it enables an in-depth examination of how individuals perceive, interpret, and attribute meaning to a particular phenomenon as it is experienced in everyday practice. Rather than focusing on measurable outcomes or system performance, this approach foregrounds subjective experience as a legitimate and essential source of knowledge.

More specifically, an interpretative (hermeneutic) phenomenological approach informed by Heideggerian philosophy guided the study. This approach emphasizes interpretation, contextual understanding, and the co-construction of meaning between experience and its socio-professional context. Such a perspective is particularly relevant for examining AI-DSS, as these systems are embedded within complex clinical environments and are experienced through clinicians' professional histories, ethical responsibilities, and interpretative judgments (Bulloni et al., 2025). The design therefore allowed for a nuanced exploration of how clinicians make sense of AI recommendations, negotiate professional identity, and engage in reflective decision-making.

Participants

Participants consisted of healthcare professionals who routinely used AI-driven decision support systems as part of digital health platforms in clinical practice. Selection was conducted using purposive sampling to ensure that participants had direct and sustained experience with the phenomenon under investigation. Inclusion criteria comprised licensed clinicians (e.g., physicians or medical specialists) with a minimum of one year of experience using AI-DSS in clinical decision-making contexts. Individuals without direct exposure to AI-based systems or those involved exclusively in administrative roles were excluded.

A total of 15 clinicians participated in the study, representing diverse clinical specialties. The sample included both male and female participants, with an average professional experience exceeding five years. These characteristics were considered relevant for capturing variations in how AI-DSS is interpreted across different levels of expertise and clinical responsibility, thereby enriching the contextual understanding of the phenomenon.

Data Collection

Data were collected through in-depth, semi-structured interviews designed to elicit rich descriptions of participants' experiences with AI-DSS. An interview guide was used to ensure consistency across interviews while allowing flexibility for participants to elaborate on personally meaningful experiences. Questions focused on daily interactions with AI systems, moments of agreement or tension with AI recommendations, emotional responses, and reflections on professional responsibility.

Interviews were conducted in a quiet and private setting, either face-to-face or via secure online communication platforms, depending on participants' availability. Each interview lasted approximately 45–75 minutes and was audio-recorded with participants' consent. Efforts were made to create a comfortable and non-judgmental environment to encourage open reflection. All recordings were transcribed verbatim to preserve the authenticity and depth of participants' narratives.

Data Analysis

Data analysis followed a systematic hermeneutic phenomenological process aimed at identifying essential meanings embedded in participants' experiences. Analysis began with repeated

reading of the interview transcripts to achieve immersion and holistic understanding. Meaning units were then identified by highlighting statements that reflected significant experiences or interpretations related to AI-DSS use.

These meaning units were coded and clustered into preliminary themes based on conceptual similarity. Through iterative interpretation and comparison across transcripts, themes were refined to capture shared patterns of meaning while preserving individual variation. The analytic process emphasized the interpretative relationship between parts of the text and the whole, allowing themes to emerge as coherent expressions of lived experience. Qualitative data analysis software (NVivo) was used to support data organization and traceability, without substituting the interpretative judgment central to phenomenological analysis.

RESULTS

Negotiating Professional Identity in the Presence of AI Recommendations

Participants consistently described AI-DSS as reshaping how they perceive their professional role and clinical authority. While AI systems were often viewed as technically sophisticated and informative, clinicians experienced an ongoing negotiation between their professional identity as medical experts and the epistemic presence of algorithmic recommendations.

Several participants expressed an internal tension when AI outputs appeared to challenge their clinical intuition or experiential knowledge. One senior clinician explained:

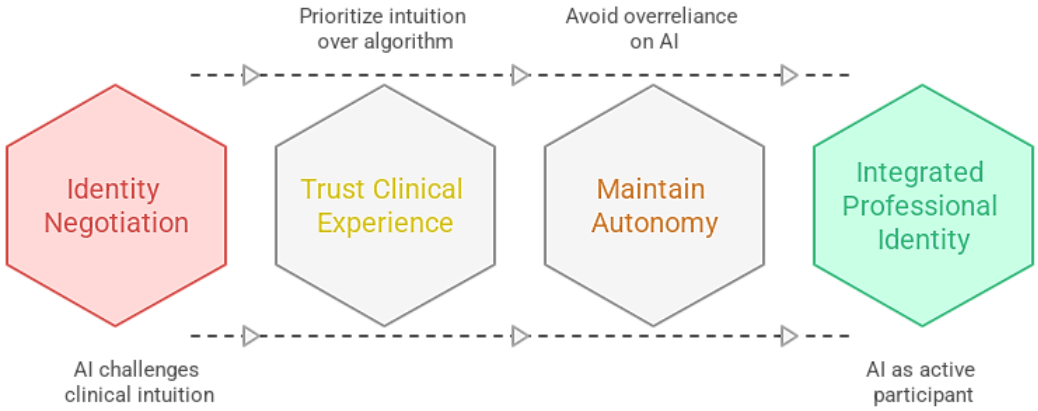
"The system gives recommendations that are statistically convincing, but there are moments when I feel my years of clinical experience are being questioned. I have to decide whether I trust the algorithm or my own judgment." (Participant 4)

This negotiation was not merely technical but deeply personal, as clinicians reflected on their sense of responsibility and accountability. Some participants described a fear that overreliance on AI might gradually erode their professional autonomy:

"I worry that if we follow AI too blindly, we may become operators rather than clinicians. The decision is still mine, but the presence of AI changes how that decision feels." (Participant 11)

These narratives suggest that AI-DSS is experienced not simply as a tool, but as an active participant in clinical decision-making, prompting clinicians to continuously reinterpret their professional identity.

Reconciling Professional Identity with AI



Trust, Uncertainty, and Ethical Tension in Human–AI Interaction

Trust emerged as a complex and situational experience rather than a stable attitude toward AI-DSS. Participants described oscillating between confidence in AI-generated insights and uncertainty regarding the system's transparency and contextual awareness.

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Clinicians often trusted AI recommendations for pattern recognition or risk stratification, yet expressed hesitation when recommendations lacked clear explanations:

"I can accept the suggestion when I understand the reasoning behind it. But when the system gives an output without explanation, I feel uneasy, especially when patient safety is at stake." (Participant 7)

This uncertainty was closely tied to ethical concerns. Participants emphasized that responsibility for patient outcomes ultimately remained with them, regardless of AI involvement:

"If something goes wrong, the system won't be held accountable—I will. That's why I cannot fully surrender my judgment, even if the AI seems confident." (Participant 2)

The ethical tension described by participants reflects an ongoing struggle to balance technological assistance with moral and professional accountability, highlighting the lived complexity of trust in AI-supported healthcare.

Emotional and Cognitive Responses to Algorithmic Guidance

Beyond cognitive evaluation, clinicians reported strong emotional responses when engaging with AI-DSS. Feelings of reassurance, anxiety, and skepticism often coexisted within the same clinical encounter.

Some participants described AI as a source of emotional support, particularly in high-pressure decision-making contexts:

"Sometimes the AI feels like a second opinion that reassures me, especially in complex cases. It reduces the feeling of being alone in making difficult decisions." (Participant 9)

Conversely, others experienced anxiety when AI outputs conflicted with their own assessments:

"When the AI suggests something different from what I believe is right, it creates stress. I start doubting myself, even if I later decide not to follow the recommendation." (Participant 5)

These emotional dynamics illustrate that AI-DSS affects not only clinical reasoning but also clinicians' emotional engagement with their work, shaping how decisions are experienced rather than merely how they are made.

Reframing Clinical Decision-Making as a Human–AI Dialogue

Participants increasingly described clinical decision-making as a dialogical process involving both human judgment and algorithmic input. Rather than viewing AI-DSS as a final authority, clinicians framed it as a conversational partner that invites reflection and critical evaluation.

One participant articulated this dialogical experience as follows:

"I don't see the AI as telling me what to do. It's more like a prompt that forces me to think again why am I choosing this option and not the other?" (Participant 13)

This reframing allowed clinicians to integrate AI insights without relinquishing control, positioning themselves as reflective decision-makers. However, this dialogical relationship required time, experience, and contextual understanding, which were not always supported by organizational workflows.

The theme underscores how clinicians actively construct meaning around AI-DSS, transforming it from a directive system into a reflective component of clinical reasoning.

Collectively, the findings reveal that clinicians experience AI-driven decision support systems as more than technical instruments. AI-DSS is lived as a meaningful presence that reshapes professional identity, generates ethical and emotional tensions, and transforms clinical decision-making into a negotiated human–AI dialogue. These experiences highlight the importance of understanding digital health platforms not only in terms of efficiency or accuracy, but as

sociotechnical systems that deeply influence how clinicians perceive, feel, and act in their everyday practice.

DISCUSSION

Summary of Key Findings

This study demonstrates that clinicians experience AI-driven decision support systems not merely as technical aids, but as meaningful sociotechnical presences that reshape professional identity, ethical responsibility, emotional engagement, and clinical reasoning (Shaw & McCosker, 2025). These findings directly address the central question posed in the Introduction by revealing how clinicians interpret and live with AI-DSS within the context of everyday clinical practice, rather than simply how they use it.

Contribution of the Findings to the Research Question

The findings offer a substantive answer to the research question concerning how clinicians interpret and experience AI-driven decision support systems within digital health platforms (Festor et al., 2025). Rather than perceiving AI-DSS as neutral or purely instrumental, clinicians experience these systems as dialogical entities that actively participate in clinical decision-making (Mukhlis, 2025a). This lived interaction requires continuous negotiation between algorithmic guidance and professional judgment, highlighting that meaning-making is central to AI adoption and use.

Importantly, the study reveals that clinicians' interpretations of AI-DSS are shaped by professional identity and moral accountability (Sarode & Sarode, 2024). The experience of negotiating authority with AI underscores that clinical decision-making remains a deeply human responsibility, even in technologically advanced environments. Emotional responses such as reassurance, anxiety, and self-doubt further demonstrate that AI-DSS influences not only cognitive processes but also the affective dimensions of clinical work (Akay et al., 2024). These insights extend current understandings by foregrounding experience and meaning as foundational to how AI systems are integrated into practice, thereby contributing a human-centered perspective that is largely absent from existing evaluative or implementation-focused research.

Relationship to Existing Literature and Theory

The findings align with and extend prior research suggesting that digital health technologies function as sociotechnical systems rather than passive tools. Consistent with Datta et al. (2023) concept of digital health as an embodied and lived phenomenon, clinicians in this study described AI-DSS as shaping how they feel, think, and act in clinical contexts. The negotiation of trust and authority observed in this study also resonates with Xin et al. (2024) work, which highlights tensions between clinical judgment and decision support technologies.

At the same time, this study deepens existing literature by providing a phenomenological account of these tensions(Mukhlis, Arifin, Ridwan, Zulbaidah, et al., 2025). While previous studies have identified ethical concerns and trust issues related to AI in healthcare, they often conceptualize these concerns at a conceptual or normative level. The present findings show how such issues are lived in practice, revealing how ethical responsibility is experienced as an ongoing, personal burden rather than an abstract principle. From a theoretical perspective, the findings are congruent with hermeneutic phenomenology, which emphasizes interpretation and context as central to understanding human experience. Clinicians' meaning-making processes reflect a continuous interpretative engagement with AI-DSS, shaped by prior experience, professional norms, and situational demands (Shapiro Ben David et al., 2025). This contribution complements existing research by situating AI-DSS within the lived world of clinicians, thereby enriching theoretical discussions of human technology interaction in digital health.

Implications of the Findings

The findings of this study carry important scientific and practical implications for the development and implementation of AI-driven decision support systems within digital health platforms. From a practical perspective, the results suggest that successful integration of AI-DSS

requires more than technical reliability or clinical accuracy; it demands careful attention to clinicians' lived experiences, professional identity, and ethical responsibilities (V Lapão et al., 2021). Digital health systems designed without consideration of how clinicians interpret and emotionally engage with AI recommendations risk fostering distrust, resistance, or cognitive burden (Mukhlis, Maryam, et al., 2023). By foregrounding meaning-making and human–AI dialogue, these findings support the development of more human-centered digital health platforms that respect clinical autonomy while offering meaningful support.

From a broader professional and social perspective, the study highlights that AI-DSS reshapes the cultural norms of clinical practice by redefining authority, accountability, and decision-making processes (Young-Wolff et al., 2020). The experience of negotiating responsibility with algorithmic systems reflects a wider transformation in healthcare professions, where expertise is increasingly shared with data-driven technologies. These insights are relevant beyond the immediate study context, as similar dynamics are likely to emerge across diverse healthcare settings adopting AI-based systems (Mukhlis et al., 2024). Understanding these experiential dimensions can inform policy development, clinical training, and ethical guidelines that acknowledge the human implications of digital health transformation.

Limitations of the Study

Several limitations should be considered when interpreting the findings. First, the phenomenological design prioritizes depth of experience over breadth, which limits the generalizability of the results to all clinical contexts or healthcare systems. The study focused on clinicians with direct experience using AI-DSS, and their interpretations may differ from those of professionals in other settings or with varying levels of technological exposure (Alghamdi et al., 2021). Second, the findings are based on self-reported experiences, which may be influenced by participants' reflective abilities, professional norms, or situational factors at the time of the interviews. Finally, the study did not examine differences across specific clinical specialties or organizational contexts in detail, which may shape how AI-DSS is experienced in practice.

These limitations do not diminish the value of the findings but rather underscore the contextual nature of lived experience. Acknowledging these constraints helps clarify the scope of the study and provides direction for future research.

Prospective Directions for Future Research

The findings of this study open several avenues for future inquiry within digital health research. Subsequent studies could explore how clinicians' experiences with AI-DSS evolve over time, particularly as familiarity with AI systems increases or as institutional norms surrounding AI use become more established. Comparative phenomenological research across different healthcare systems, cultural contexts, or professional roles may also deepen understanding of how sociocultural factors shape meaning-making in AI-supported clinical practice.

Future research could further integrate phenomenological insights with design-oriented approaches to inform the development of AI-DSS that are ethically grounded and professionally supportive. By building on the experiential knowledge uncovered in this study, researchers can contribute to more reflective, responsible, and human-centered models of digital health innovation. Such work has the potential to strengthen theoretical understanding while offering practical guidance for aligning technological advancement with the lived realities of healthcare professionals.

CONCLUSION

This study examined clinicians' lived experiences of engaging with AI-driven decision support systems within digital health platforms, addressing the need to understand how such technologies are interpreted and experienced in everyday clinical practice. The findings demonstrate that clinicians experience AI-DSS as meaningful sociotechnical presences that shape professional identity, ethical responsibility, emotional engagement, and clinical reasoning. By foregrounding subjective meaning and lived experience, this research addresses limitations in prior studies that

focused primarily on technical performance, usability, or adoption metrics. The study contributes a human-centered perspective that clarifies how clinicians negotiate trust, authority, and accountability in AI-supported decision-making. These insights advance theoretical understanding within digital health and offer practical guidance for designing systems that align with clinicians' experiential realities. Future research may extend this work by examining longitudinal changes in experience or by applying phenomenological approaches across diverse clinical and cultural contexts to further enrich understanding.

CONFLICT OF INTEREST

The authors declare that there is no conflict of interest regarding the publication of this article.

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