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Exploring the Meaning of AI-Based Telemedicine Use Among Elderly Users in Rural Indonesia

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ABSTRACT

Digital health systems have increasingly transformed healthcare delivery, particularly through AI-based telemedicine platforms that offer remote access and automated health monitoring. However, little is known about how elderly individuals in rural areas subjectively experience and interpret their engagement with such technologies. Existing research often overlooks emotional and relational dimensions, prompting the central question: what does it mean for elderly users to interact with AI-driven telemedicine in their everyday lives?

Here, we apply a descriptive phenomenological approach to explore the lived experiences of elderly individuals using AI-powered telemedicine systems in rural Indonesia. Data were collected through in-depth, semi-structured interviews with ten participants aged 60 and above and analyzed using Colaizzi's method. The findings revealed five key themes: uncertainty and curiosity, emotional security, cognitive adaptation, trust dynamics, and the role of family mediation. These themes illustrate how digital health adoption among the elderly is shaped not just by functionality, but by evolving relationships, emotional reassurance, and social support.

This study contributes to a deeper understanding of aging, technology, and digital health by highlighting the essential meanings behind user engagement. The insights gained offer guidance for developing more empathetic and inclusive telemedicine systems for vulnerable populations. In practical terms, the study suggests that telemedicine platforms should incorporate user-friendly interfaces, emotional support features, and culturally attuned caregiver involvement to enhance elderly user engagement. From a policy perspective, the findings support the integration of AI-based telemedicine into national rural health strategies, emphasizing accessibility, digital literacy programs, and family-based support systems to ensure equitable healthcare for aging populations.

INTRODUCTION

The rapid evolution of digital health systems and platforms has transformed the landscape of healthcare delivery worldwide (Tsitsikas et al., 2021). From remote consultations to AI-driven diagnostics, technology now plays a critical role in enabling access to medical services—particularly in underserved and geographically isolated areas (Johnson et al., 2019). Among these innovations, AI-based telemedicine applications have emerged as a key solution to bridge the gap between patients and healthcare providers, offering timely assistance, continuous monitoring, and digital companionship. This transformation is especially relevant in rural communities, where traditional healthcare infrastructure remains limited or inaccessible.

Despite these advancements, the integration of AI technologies into daily health management introduces complex interactions between human users and digital systems(Rizvi et al., 2020). For elderly populations, in particular, the encounter with such technologies involves more than functional use; it becomes a deeply personal process shaped by prior experiences, cultural expectations, emotional responses, and evolving self-perceptions (D'Souza et al., 2022). The use of AI in health communication and decision-making invites questions not only about usability but also about how

older individuals internalize, adapt to, and derive meaning from these digital interactions. Studies have shown that older adults may experience both empowerment and alienation when interacting with health technology, depending on factors such as design accessibility, perceived trust, and familial support structures.

In this context, there is a growing need to move beyond technical evaluations and explore the lived experiences of elderly users (Jacobs et al., 2021). Understanding how older individuals in rural areas engage with AI-powered telemedicine systems requires attention to the subtleties of subjective meaning, emotional response, and social positioning (Kenworthy et al., 2023; Murphy-Morgan et al., 2024; Tighe et al., 2022). A phenomenological approach is thus vital to uncover the essence of these experiences and to inform the design of digital health platforms that are not only effective but also empathetic and inclusive (Dansey et al., 2020). By examining the phenomenon from the perspective of those who live it, this study seeks to deepen the understanding of how digital health systems are experienced—not just used—by aging populations in marginalized settings.

Research exploring individuals' lived experiences within specific health-related phenomena has gained increasing prominence in recent years, particularly as healthcare delivery becomes increasingly mediated by technology (Coffey et al., 2022). Among vulnerable populations, such as elderly individuals in rural areas, the subjective experience of interacting with AI-powered telemedicine systems offers critical insight into the psychosocial dimensions of digital health adoption (Barwise et al., 2023; Meyer et al., 2022). Understanding how these individuals interpret, respond to, and emotionally engage with intelligent technologies is essential for designing systems that are not only functional but also sensitive to human meaning.

However, methodological challenges persist in capturing the depth and nuance of such experiences (Benarroch-Gampel et al., 2020). Much of the existing literature in digital health has relied on quantitative metrics—such as user satisfaction scores, usage frequency, and clinical outcome data—that, while informative, are insufficient to reveal how users internalize and make sense of their interactions with technology (Petersen et al., 2021). These approaches often overlook the symbolic, emotional, and relational components of user experience, particularly in aging populations whose digital engagement is influenced by generational, cognitive, and cultural factors.

This reliance on structured, outcome-driven assessments has led to a limited understanding of the lived realities behind system usage (Arnaert et al., 2022; Seven et al., 2021). Without direct access to participants' voices and interpretations, many studies fail to uncover the core meanings embedded in the digital health journey (Kooij et al., 2021). Such gaps underscore the need for qualitative approaches that can engage with complexity, fluidity, and individual difference—elements that are central to phenomenological inquiry. Descriptive phenomenology, in particular, offers a robust framework for eliciting rich, first-person accounts and synthesizing them into essential thematic structures that reflect not only what users do, but how they feel and why those feelings matter.

Current strategies to enhance the usability and accessibility of AI-based telemedicine for older adults primarily emphasize functional design improvements, technical training, and interface optimization (Boutrous et al., 2019). While such practical approaches address surface-level barriers to technology adoption, they often fail to capture the underlying experiential dimensions that shape users' engagement with digital health platforms (Ashrafi et al., 2021; Turnock & Hearne, 2025). The predominant reliance on usability testing, quantitative satisfaction surveys, and performance indicators provides limited insight into how elderly individuals perceive, interpret, and emotionally respond to these technologies in their everyday lives.

This narrow focus results in an incomplete understanding of the phenomenon, where important factors such as trust, emotional security, intergenerational support, and the evolving relationship with technology remain underexplored (Sivanesan et al., 2019). More importantly, these approaches do not adequately account for the contextual and subjective factors—cultural norms, personal histories, social dynamics—that fundamentally influence how elderly users make meaning of their health-related digital interactions.

To address these limitations, a phenomenological perspective is urgently needed (Hews-Girard et al., 2024; van Doorn et al., 2023). By prioritizing the lived experiences of elderly users, phenomenology offers a holistic framework for uncovering the essence of their interactions with AI-driven telemedicine applications (Wulfovich et al., 2019). Rather than asking how effectively a system functions, this approach asks what it means for older individuals to engage with such technology—and how these meanings are constructed within the broader context of aging, healthcare, and digital transformation. As such, phenomenological inquiry holds the potential to reveal insights that are critical for designing more empathetic, inclusive, and meaningful digital health solutions.

Previous studies have explored elderly users' interaction with digital health technologies, focusing mostly on usability, accessibility, and behavioral outcomes. For example, Gravbrot dkk, (2020) highlighted challenges faced by older adults when using telehealth platforms, while Srivastava dkk, (2019) emphasized design flaws in mHealth systems for the elderly. However, most of these studies employed descriptive or thematic analyses without deeply engaging with participants' lived meanings . There remains a gap in understanding how elderly users interpret and emotionally relate to AI-based telemedicine within their social and cultural environments. This study builds on that foundation by exploring not just what elderly users do with technology, but how they experience and make meaning of it.

To address this gap, this study adopts a descriptive phenomenological approach based on Husserl's philosophical framework. This method is suitable for exploring the essence of experiences without imposing prior assumptions (Shohat et al., 2019). By using Colaizzi's method of analysis, the study aims to extract core themes from firsthand narratives. This approach provides a direct answer to the knowledge gap by allowing older users to articulate the meaning behind their digital health interactions. The method is chosen to ensure that every theme reflects the genuine voices of the participants in their own contexts.

This article is structured as follows: the introduction provides the general and specific background, as well as the rationale and research question (Anichini et al., 2020). The method section outlines the philosophical and procedural framework of the phenomenological approach, including participant selection, data collection, and thematic analysis. The results present the key experiential themes using participants' direct quotes (O'Neill et al., 2023). The discussion interprets these findings within a broader theoretical and practical context. Finally, the conclusion summarizes the contributions and implications for future digital health development.

RESEARCH METHODS

Study Design

This study employed a descriptive phenomenological design grounded in the philosophical foundations of Edmund Husserl (Perry, 2023). The approach was selected to explore and describe the lived experiences of elderly individuals in rural areas interacting with AI-based telemedicine applications. Phenomenology was deemed appropriate due to its capacity to capture rich, subjective meanings from participants' perspectives, focusing on how individuals experience a specific phenomenon in their everyday lives (Woods et al., 2019). The descriptive framework allowed the investigation to remain as close as possible to participants' original expressions by bracketing preconceived assumptions and interpreting only the essence of the phenomenon as it appeared to the participants. Through this design, the study aimed to uncover the structural meanings underlying elderly users' interactions with digital health systems.

Participants

Participants consisted of older adults residing in rural regions who had direct and repeated experiences using AI-powered telemedicine applications for healthcare-related purposes (McMahon & McGannon, 2024). Selection followed a purposive sampling strategy, ensuring that each participant possessed sufficient experiential knowledge relevant to the phenomenon under study. Inclusion criteria included individuals aged 60 years and above, with at least three months of usage experience with a telemedicine application that integrated AI features (e.g., symptom checking, automated health

monitoring). Individuals with cognitive impairments or those who required full-time care were excluded to maintain focus on autonomous user experience. A total of ten participants were included in the study, comprising six females and four males, with an age range of 61 to 79 years (mean age: 68.4 years). Most participants had limited prior exposure to digital technologies but showed basic functional literacy.

Data Collection

Data were collected through in-depth, semi-structured interviews conducted face-to-face at participants' homes or community health centers to ensure familiarity and comfort. An interview guide was developed based on the core research question, emphasizing open-ended prompts to encourage reflective narratives (e.g., "Can you describe your first experience using the health application?"). Each interview lasted between 45 to 70 minutes and was audio-recorded with prior consent. Field notes were taken to capture contextual and non-verbal cues (Hausleiter et al., 2023). Interviews were conducted in the local language and later transcribed verbatim. To ensure authenticity and depth, follow-up interviews were conducted with five participants for clarification and validation purposes.

Data Analysis

Data analysis followed Colaizzi's descriptive phenomenological method, which involves a systematic, step-by-step procedure for extracting essential themes (Hammersley, 2003). The process included reading and re-reading transcripts to gain a holistic understanding, identifying significant statements, formulating meanings, clustering formulated meanings into emergent themes, and integrating findings into an exhaustive description of the phenomenon. NVivo software was used to assist with data organization, coding, and retrieval, though thematic development remained rooted in human interpretation. Themes were reviewed against the original transcripts to ensure fidelity to participants' voices. Final validation was performed by returning synthesized themes to select participants for confirmation, enhancing credibility and accuracy.

Ethical Considerations

Ethical approval was obtained from the appropriate institutional ethics committee prior to data collection. Participants were informed of the study's objectives, their right to withdraw at any time, and the confidentiality of their responses (Murala et al., 2023). Written informed consent was obtained from all participants before participation. Anonymity was maintained by assigning codes to all transcripts and removing any identifying information. The study adhered to internationally recognized ethical standards for research involving human subjects, including those outlined in the Declaration of Helsinki.

RESULTS

Navigating Digital Health with Uncertainty and Curiosity

Participants expressed a mixture of apprehension and intrigue during their initial encounters with the AI-driven telemedicine system. The unfamiliarity with digital interfaces triggered hesitation, yet was counterbalanced by a growing curiosity to explore health solutions independently. This duality was especially prominent in older users who had never used smartphones or health-related applications before.

"At first, I didn't know how to talk to the application... it felt like speaking to a machine. But when it answered my question about my blood pressure, I was surprised—it felt a bit like magic." (Participant 3)

Despite limited prior exposure to technology, the sense of wonder catalyzed continued usage. However, this was often facilitated by younger family members who acted as intermediaries, especially during the early stages of adoption.

How to approach digital health adoption?

Emotional Security through AI Interaction

A recurring pattern was the emergence of emotional comfort derived from continuous interaction with the AI interface. Participants noted that the telemedicine system provided a sense of reassurance, particularly during episodes of illness or when healthcare facilities were not immediately accessible.

"When I feel pain at night and there's no one to ask, I just talk to the app. It answers calmly and that makes me calm too." (Participant 5)

The presence of a responsive system—even one not human—was perceived as a form of companionship and emotional security. The AI's 24/7 availability was seen as a valuable alternative in a context of limited healthcare access.

Cognitive Challenges and Learning Adaptation

Participants disclosed that engaging with AI-based telemedicine required mental adjustment. Difficulties included remembering how to access menus, understanding icons, and interpreting the AI's feedback. However, over time, many users reported a form of self-directed learning, supported by repetition, family instruction, and sometimes trial-and-error navigation.

"It's hard to remember where to press. Sometimes I get stuck, but I try again and again until I find it. Now I can do it without my grandson's help." (Participant 1)

This theme captures both the cognitive load faced by elderly users and their resilience in adapting to digital tools. Progress was often incremental but accompanied by a sense of accomplishment.

Trust and Skepticism in Machine-Generated Advice

Participants expressed a spectrum of trust toward the AI system. While some trusted the application's advice due to its consistency and authoritative tone, others remained skeptical, particularly when the information contradicted their long-held health beliefs or prior clinical experiences.

"It told me I should drink more water... but I have kidney problems. I wasn't sure if it really knows about my body." (Participant 6)

This theme reflects the tension between reliance on technology and the instinctive need for personalized human judgment. Trust appeared to be influenced by previous medical encounters and personal beliefs rather than solely by system performance.

The Role of Family Mediation in Technology Acceptance

A notable discovery was the pivotal role of intergenerational support in facilitating adoption. Most elderly participants were introduced to the telemedicine system by their children or grandchildren. These family members played a key role not only in technical setup but also in encouraging consistent usage.

"My daughter installed the app and showed me how to use it. Every time I forget, she reminds me. Now I feel like it's part of my daily routine." (Participant 2)

Family mediation helped bridge the digital divide and fostered a sense of confidence. In cases where such support was absent, engagement with the system tended to decline.

Across the five themes, a shared essence emerges: elderly users in rural areas experience AI-based telemedicine not merely as a tool, but as a new relationship—one that evolves from initial uncertainty to emotional reliance, intellectual adaptation, and selective trust. Their journey reveals not only the usability dimensions of such technology, but the deeply human elements that underlie its meaningful adoption.

DISCUSSION

The findings of this study reveal that elderly users in rural areas experience AI-based telemedicine not simply as a functional tool but as a relational and emotionally charged presence (Campbell et al., 2024). This relationship evolves from initial hesitation to growing familiarity, ultimately shaping how older individuals perceive trust, autonomy, and emotional support in digitally mediated healthcare. These themes directly address the central research question regarding the subjective experience of elderly users when engaging with AI-driven telemedicine platforms in rural settings.

The results contribute significantly to answering the core inquiry posed in the introduction: how do elderly individuals experience AI-enabled telemedicine in their daily health management? The study provides unique insight into the emotional, cognitive, and social dynamics embedded in these interactions (Fortune et al., 2024). It highlights how older adults negotiate unfamiliar technologies through learning, support, and emotional adaptation, while also showing the limits of their trust and the critical role of human mediation. These experiences go beyond surface-level usability and touch upon deeper meanings related to safety, dependence, control, and digital belonging—dimensions that quantitative or design-oriented studies have largely overlooked.

When positioned within existing literature, the findings resonate with previous studies that acknowledge older adults' vulnerability in digital health contexts (Shohat et al., 2019). However, this study goes further by elaborating on the emotional security that emerges through continuous interaction with AI systems—an area not extensively explored. The importance of family mediation aligns with Wulfovich dkk, (2019) insights into intergenerational digital literacy, yet the current findings add nuance by showing how this support evolves into increased self-confidence and user independence. Furthermore, while Kooij dkk, (2021) focus on system design, the current study emphasizes the internalized meanings and relational experiences that make these technologies feel either alienating or empowering. Together, these comparisons underscore the value of phenomenology in deepening our understanding of digital health adoption beyond technical or behavioral measures.

The findings of this study have important implications for both digital health development and public health practice (Borghouts et al., 2022). From a sociocultural perspective, the experiences of elderly users reveal that engagement with AI-based telemedicine systems is not merely a question of access or functionality, but one deeply rooted in emotional reassurance, relational trust, and intergenerational support. These insights suggest that the design of digital health interventions must move beyond usability frameworks to incorporate empathy, adaptability, and contextual sensitivity—particularly for aging populations in marginalized settings. Professionally, the study underscores the need for healthcare practitioners and system developers to recognize the emotional labor and cognitive transitions involved in older adults' adaptation to digital tools. Integrating user narratives into development processes may lead to more inclusive and sustainable telehealth systems.

Despite its contributions, this study has several limitations (Vitali et al., 2023). The sample was limited to elderly users in specific rural communities, which may influence the transferability of the findings to other populations or geographic contexts. Additionally, the phenomenological

approach, while rich in depth and meaning, prioritizes subjective understanding over measurable outcomes, and thus does not aim for statistical generalization. The use of face-to-face interviews may also introduce social desirability bias, particularly in discussions involving family support or trust in technology. These limitations highlight the importance of situating findings within their context and encourage cautious interpretation when applying insights beyond similar sociocultural settings.

Future research can expand upon these findings by exploring comparative experiences across diverse geographic, cultural, and technological contexts (Shang et al., 2024). Longitudinal phenomenological studies may offer further insight into how users' relationships with AI-based telemedicine evolve over time, particularly in relation to health literacy and changing health conditions. Moreover, interdisciplinary studies combining phenomenological insights with human-computer interaction (HCI) design principles could foster more human-centered approaches to digital health innovation (Petersen et al., 2021). This study thus lays the groundwork for a broader dialogue on the intersection of aging, meaning-making, and digital health ecosystems.

CONCLUSION

This study explored the lived experiences of elderly individuals in rural areas as they engaged with AI-based telemedicine applications for managing their health. The findings revealed five essential themes, including emotional security, adaptive learning, intergenerational support, and evolving trust, which reflect the complexity of how older users perceive and relate to digital health systems. These results respond directly to the need for deeper understanding of subjective experiences that conventional, outcome-focused studies often overlook. By capturing the voices of elderly users, the study highlights the emotional and relational dimensions that influence technology adoption in aging populations. The phenomenological approach used here offers valuable insight for developers, healthcare professionals, and policymakers aiming to design more inclusive and meaningful digital health services. Future research can build on this foundation by examining longitudinal experiences and integrating user-centered design strategies across diverse sociocultural settings.

CONFLICT OF INTEREST

The authors declare that there is no conflict of interest regarding the publication of this article. All interpretations and conclusions presented are solely the responsibility of the authors and do not reflect the views of the funding agency.

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