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Lived Experiences of Rural Elderly Using Mobile Health Applications for Chronic Disease Management in Indonesia

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ABSTRACT

Digital health technologies, particularly mobile health (mHealth) applications, are increasingly used for chronic disease management among aging populations. Yet, little is known about how elderly individuals in rural Indonesia experience and interpret these technologies in daily life. Prior studies often adopt quantitative methods, overlooking the emotional and subjective aspects of mHealth use. This study employed a descriptive phenomenological approach to explore the lived experiences of elderly patients using mHealth for chronic disease management in rural Indonesia. Data were collected between March and May 2024 through in-depth, semi-structured interviews with eight participants. Thematic analysis was conducted to uncover patterns of meaning. Five central themes emerged: initial apprehension, evolving trust, digital isolation, intergenerational learning, and sustained routine. These findings reflect not only how participants interact with mHealth but also how their engagement is shaped by socio-emotional and cultural factors. The study underscores the need for digital health interventions to incorporate emotional, relational, and contextual dimensions to support elderly users more effectively. These insights inform the development of inclusive and empathetic mHealth systems tailored to aging populations in rural settings.

INTRODUCTION

The rapid advancement of digital technology is reshaping global healthcare systems, notably through mobile health (mHealth) applications, wearable monitors, and telemedicine (Stein & Brooks, 2017). These innovations aim to improve chronic disease management by enhancing access to information, enabling remote monitoring, and encouraging self-care. Among them, mHealth applications stand out by offering features such as real-time tracking, medication reminders, and patient-provider communication.

However, despite increasing availability, adoption among older adults—particularly in rural or underserved areas—remains limited. In countries like Indonesia, this gap is exacerbated by inadequate infrastructure, limited digital literacy, and socio-cultural expectations in healthcare (Miller et al., 2016). For elderly individuals managing chronic conditions, these barriers are further complicated by cognitive, emotional, and relational challenges in interacting with unfamiliar technology.

Prior research has predominantly relied on quantitative methods, focusing on usage patterns and adoption rates without fully capturing the subjective, emotional, and lived dimensions of digital engagement (Majeed-Ariss et al., 2015). Moreover, few studies critically examine how technological and contextual barriers intersect in shaping elderly users' experiences, especially in rural settings. This highlights a methodological limitation in the existing literature—namely, the underrepresentation of qualitative insights into how older adults make sense of mHealth tools within their everyday lives.

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This study seeks to fill that gap by adopting a descriptive phenomenological approach. It aims to explore the lived experiences of elderly patients using mobile health applications for chronic disease management in rural Indonesia (Grainger et al., 2017). Specifically, the research is guided by the following objectives:

- To understand how elderly individuals in rural Indonesia experience and interpret their interactions with mHealth technologies;
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- To identify emotional, social, and cultural factors influencing their engagement with digital health tools;
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To contribute insights for designing more inclusive and empathetic digital health systems for aging populations.

There is a growing recognition of the need to explore such phenomena through the lens of subjective experience. Phenomenology, as a qualitative research approach, offers a pathway to uncover the essence of these lived experiences by focusing on the meanings individuals assign to their interactions with health technologies (Lee et al., 2018). Rather than assessing outcomes or usability metrics, a phenomenological perspective seeks to understand what it is like to use mobile health tools as an elderly person in a remote setting, confronting barriers while navigating possibilities for autonomy and well-being.

Building upon the broader context of digital health transformation, research focusing on the lived experiences of individuals engaging with mobile health technologies—particularly among older adults—has become increasingly critical (Bonoto et al., 2017). As healthcare systems seek to personalize care and promote patient-centered approaches, understanding how users experience these tools offers insights beyond conventional measures of effectiveness or adoption rates.

However, exploring the subjective dimension of such experiences presents significant methodological challenges. Many prior investigations into digital health utilization have relied heavily on quantitative metrics—such as usage frequency, adherence rates, or satisfaction scores—which, while valuable, often fail to capture the deeper cognitive, emotional, and existential aspects of user engagement (Brzan et al., 2016). These approaches tend to reduce rich, multifaceted experiences into predefined categories, potentially overlooking the nuanced meanings that users themselves ascribe to their interactions with health technologies.

Such methodological limitations have resulted in a fragmented understanding of how mobile health tools are lived and interpreted by elderly users, especially those in marginalized or technologically underserved settings. While existing studies have highlighted barriers such as lack of digital literacy or infrastructural constraints, they rarely explore what it feels like for an older person to navigate a chronic illness through a digital interface in the absence of traditional medical contact.

This gap underscores the inadequacy of prior research designs in fully capturing the essence of this phenomenon. A phenomenological approach—rooted in direct accounts of experience—offers a more fitting lens to access the personal, context-bound realities of older adults engaging with mHealth. It enables researchers to move beyond surface-level observations and delve into the meanings, intentions, and values that inform participants' choices, behaviors, and challenges in using digital health tools for chronic disease management.

Current approaches to addressing digital health disparities among the elderly, particularly in rural or remote areas, have largely focused on practical interventions—such as training programs, infrastructure improvements, and usability enhancements of mobile health applications. While these strategies contribute to increasing access and functionality, they often operate under the assumption that technological barriers can be resolved solely through technical solutions. As a result, the subjective, lived dimensions of how elderly individuals experience and interpret digital health tools remain underexplored.

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Most existing studies in this area employ survey-based or observational designs that emphasize measurable indicators of adoption, engagement, or health outcomes (Nicholas et al., 2015). However, these methodologies fall short in capturing the nuanced personal meanings that users attach to their digital health interactions. For elderly individuals managing chronic conditions, the act of engaging with a mobile application is not merely a behavioral choice—it is embedded within emotional, cultural, and existential contexts that influence trust, autonomy, and perception of care. Without a deeper understanding of these experiential layers, interventions may fail to address the core human factors that shape technology use in aging populations.

Therefore, what remains insufficiently understood is how elderly individuals in underserved settings experience the integration of mobile health tools into their daily lives, and what meanings they construct through this digital engagement (Wildenbos et al., 2019). This lack of insight presents a compelling rationale for adopting a phenomenological approach that centers on first-person narratives. By exploring the essence of these lived experiences, phenomenology offers a holistic and authentic pathway to understanding the realities of digital health use among the elderly—realities that are often hidden behind metrics and generalizations.

Previous studies have explored digital health adoption among the elderly, often focusing on usability, literacy, and access issues. While some research has investigated attitudes and behavioral intentions, few have examined the lived experiences that shape how older adults perceive and relate to mobile health tools in daily life. Existing work by Jeffrey et al. (2019) and Chung et al. (2015) provided insights into the practical and motivational aspects of mHealth use, but lacked depth in exploring emotional or cultural meanings. These studies, though informative, relied heavily on structured surveys and thematic generalizations. As a result, important subjective dimensions remain unaddressed, particularly in rural and technologically marginalized populations.

This study uses a descriptive phenomenological approach to explore how elderly individuals experience using mobile health applications for chronic disease management in remote Indonesian settings. The method was selected to uncover the essence of lived experiences through direct, in-depth narratives. By focusing on first-person perspectives, the study addresses the knowledge gap concerning trust, emotional responses, and contextual influences in digital health engagement. This approach allows a more comprehensive understanding of what it means to manage illness through technology from the user's viewpoint. It offers insights that may inform inclusive, empathetic, and user-centered health interventions.

The article is organized as follows. The introduction outlines the background, relevance, and research rationale. The methods section describes the phenomenological design, participant selection, data collection, and analytic process. The results present key experiential themes supported by direct quotations. The discussion interprets findings in relation to existing literature and implications for practice. The conclusion summarizes the main contributions and suggests directions for future research.

RESEARCH METHODS

Study Design

This study employed a descriptive phenomenological design rooted in Husserlian philosophy, aiming to explore the lived experiences of elderly individuals residing in remote areas who use mobile health applications to manage chronic conditions. Phenomenology, as a qualitative research approach, focuses on uncovering the essential meanings of human experiences as perceived by individuals themselves. This design was selected for its capacity to elicit rich, first-person accounts of the phenomenon, free from preconceptions or theoretical bias (Berg, 2001). The descriptive phenomenological method specifically emphasizes epoché or bracketing to suspend assumptions and capture the phenomenon as experienced, allowing the essence of digital health engagement among older adults to emerge through their own narratives.

Participants

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Participants were elderly individuals aged 65 years and above, living in geographically remote or underserved regions in Indonesia, who had at least three months of experience using mobile health applications for chronic disease monitoring. A purposive sampling strategy was used to ensure that participants possessed rich and relevant insights into the phenomenon under investigation. Inclusion criteria included the ability to communicate clearly, willingness to share experiences, and no cognitive impairments affecting memory or verbal expression. Individuals with severe visual or hearing impairments that could obstruct digital app usage were excluded. A total of eight participants (5 females and 3 males), aged between 67 and 76 years (mean age 71.3), participated in the study. Although the sample size may appear modest, it is consistent with methodological standards in descriptive phenomenology, where the focus is on depth rather than breadth. Data saturation was achieved when no new themes or insights emerged in the final two interviews, indicating sufficient representativeness of the core phenomenon. All participants had been managing conditions such as hypertension, diabetes, or heart disease using mobile health applications.

Data Collection

Data were collected through semi-structured, in-depth interviews conducted face-to-face at participants' homes or local health posts to ensure comfort and familiarity. Each interview lasted between 45 and 90 minutes and was guided by a flexible interview protocol focusing on participants' perceptions, emotions, and interactions with mobile health tools. Interviews were audio-recorded with participants' consent and supplemented by field notes capturing nonverbal cues and contextual observations. To facilitate open dialogue, a quiet and private setting was arranged, and rapport was built prior to each session. The interview guide was informed by relevant literature and piloted with two individuals who met the inclusion criteria to ensure clarity and cultural sensitivity.

Data Analysis

The transcribed data were analyzed using thematic analysis, following Braun and Clarke's six-phase approach adapted for phenomenological inquiry. These steps included familiarization with the data, generation of initial codes, searching for themes, reviewing themes, defining and naming themes, and producing the report. In adapting thematic analysis to a phenomenological framework, the researchers applied epoché throughout the analytic process, continuously bracketing prior assumptions to remain grounded in participants' own expressions. Meaning units were derived inductively from the data and then clustered into themes that preserved the subjective essence of the lived experiences. Each theme was constructed with attention to the context, intentionality, and emotional undertones articulated by participants, thereby aligning with phenomenological rigor. NVivo software was used to manage and organize data efficiently during the coding process. The analytic process aimed to capture the essence of the phenomenon as expressed by the participants themselves, ensuring that the final themes reflected both individual and shared experiences in their original contexts.

Ethical Considerations

Ethical approval was obtained from the institutional review board of a relevant university in Indonesia. Written informed consent was provided by all participants prior to data collection. Anonymity and confidentiality were maintained throughout the research process, with all identifying details removed or pseudonymized in transcripts and reporting. The study was conducted in accordance with the ethical principles outlined in the Declaration of Helsinki and adhered to national regulations concerning human subject research.

RESULTS

This study explored the lived experiences of elderly patients in remote areas of Indonesia using mobile health applications to manage their chronic conditions. Through in-depth interviews and observational data, five overarching themes emerged, each revealing the multifaceted interplay between technology, emotion, cognition, and social context in the digital health journey of elderly individuals.

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Navigating the Unknown - First Encounters with Digital Health

Participants described their initial experiences with mobile health applications as both intriguing and intimidating. Most had limited exposure to smartphones, and their first interactions with health-related apps were marked by uncertainty and skepticism.

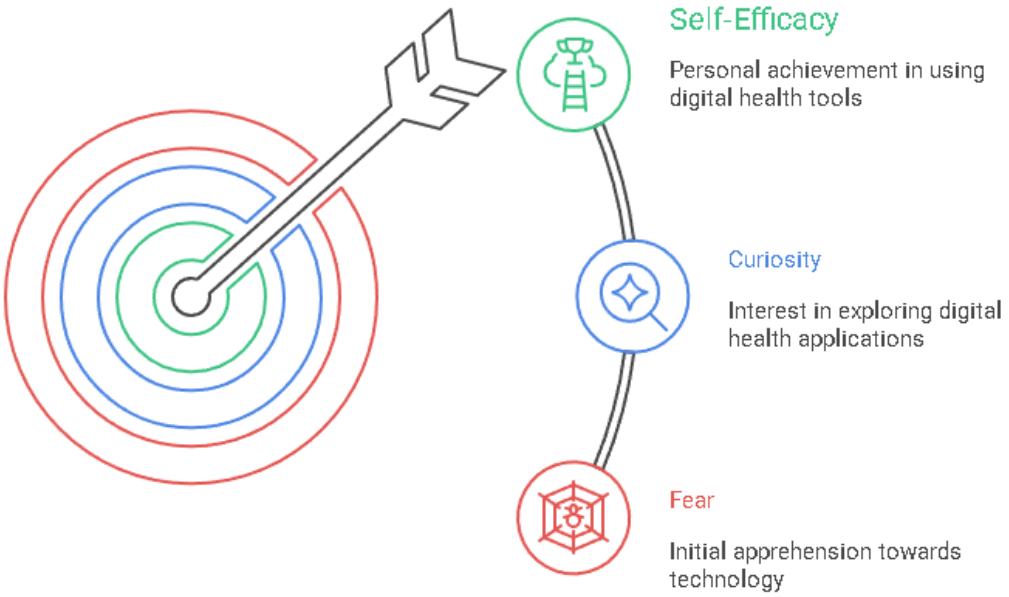
"I was afraid to touch anything at first. What if I press something wrong and break the phone? My grandson had to show me again and again," (P4, male, 73 years old).

The unfamiliarity with digital interfaces often resulted in reliance on younger family members for assistance. Despite this dependence, some participants expressed a sense of personal achievement when they managed to perform simple tasks independently.

"The first time I could check my blood pressure reading without asking for help, I felt like I was doing something good for myself," (P2, female, 68 years old).

This theme reflects a deep emotional landscape shaped by fear, curiosity, and the pursuit of self-efficacy.

Digital Health Adoption Journey



Trusting the Invisible - Faith and Doubt in Technology

The participants' relationship with mobile health apps was significantly influenced by their level of trust in the technology. While some users gradually developed confidence, others remained doubtful of the apps' accuracy and relevance.

"Sometimes I wonder if the numbers it shows are true. How can a machine know what's going on in my body without even touching me?" (P6, male, 70 years old).

This skepticism was often rooted in a cultural preference for face-to-face interactions with healthcare providers. Nevertheless, a few participants perceived the technology as a trustworthy companion that complemented, rather than replaced, traditional healthcare services.

"I still go to the doctor, but this app helps me remember things, like when to take my medicine. It's like a notebook that talks," (P1, female, 72 years old).

The theme highlights the fragile, evolving trust that elderly individuals place in mobile technologies as part of their health routines.

Digital Isolation — When Technology Fails to Connect

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A recurring narrative among participants was the experience of digital isolation, particularly when technological glitches or lack of connectivity prevented them from accessing the apps.

"There were days when the app didn't open. I had no one to ask. I just waited, hoping it would work again," (P3, female, 76 years old).

Participants expressed frustration, helplessness, and anxiety during these moments, especially when they were already managing symptoms of chronic illness. In some cases, this technological breakdown exacerbated feelings of loneliness in geographically isolated settings.

This theme emphasizes that while digital health tools aim to bridge healthcare gaps, they may inadvertently widen emotional and logistical divides when not supported by consistent infrastructure and user support.

Intergenerational Learning - Dependence and Empowerment through Family Support

Family members, particularly younger relatives, played a crucial role in enabling the elderly to interact with mHealth apps. Participants often described the learning process as both humbling and empowering.

"My granddaughter taught me like a school teacher. I didn't want to burden her, but she was patient. Now I can open the app myself," (P5, male, 69 years old).

These interactions facilitated intergenerational bonding and contributed to a growing sense of digital agency among the elderly participants. Some even reported sharing what they learned with friends of the same age.

This theme reflects a nuanced dynamic between dependency and empowerment, where familial engagement becomes a bridge toward digital inclusion.

Sustaining Digital Habits - Health as a Routine, not a Replacement

For some participants, continued use of mobile health apps gradually integrated into their daily routines. However, this integration did not equate to total reliance.

"I use the app every morning, but I still wait for the clinic schedule to confirm. I trust the doctor more," (P7, female, 74 years old).

Mobile health tools were seen as supplements to, rather than substitutes for, conventional healthcare. Participants appreciated the convenience and reminders provided by the apps but still valued human interactions as central to their care.

This theme underscores the potential of mHealth to serve as a sustainable adjunct to healthcare among the elderly, especially when tailored to their lifestyle and cultural expectations.

The findings reveal that elderly individuals' use of mobile health applications is deeply influenced by emotional readiness, trust dynamics, infrastructural limitations, and familial support. Their experiences reflect a transitional space where traditional values and digital innovations coexist. The core essence of the phenomenon lies not merely in using the app, but in navigating a new health paradigm with resilience, curiosity, and caution.

DISCUSSION

The findings of this study reveal that elderly individuals in remote areas experience the use of mobile health applications as a journey of uncertainty, emotional negotiation, and gradual empowerment. These experiences reflect the essential meaning of digital health engagement as both an opportunity and a challenge, situated within a broader context of social dependency, cultural expectations, and evolving self-efficacy (Baldwin et al., 2017). This directly addresses the research question by uncovering how elderly users internalize and make sense of using technology for chronic disease management.

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The study contributes significantly to the understanding of elderly patients lived experiences with mobile health technology by illuminating how digital tools are not simply used, but are emotionally and socially navigated (Riegel et al., 2017). Rather than viewing mHealth as a neutral interface, participants experience it as an extension of their health agency, shaped by trust, family support, and technological reliability. These findings offer a nuanced perspective that bridges the current gap in the literature by focusing on the subjective, contextual, and embodied nature of digital health usage among aging populations in underserved environments. This phenomenological insight allows for a richer understanding that moves beyond conventional usability or access metrics.

In comparison with existing literature, the findings are consistent with Chhabra et al. (2018), who noted that older adults often face both facilitative and obstructive experiences with mHealth applications. However, this study extends prior work by emphasizing the emotional undercurrents—such as anxiety, vulnerability, and pride—that shape these interactions. The results also align with Alessa et al. (2019), who highlighted the role of family in supporting digital health engagement, yet this research deepens that insight by portraying intergenerational learning as a transformative, empowering process. Moreover, while Sallis et al. (2015) pointed to the digital divide among elderly populations, the current study reveals how that divide is not merely infrastructural but also experiential, rooted in personal histories, cultural meanings, and the search for trust in nonhuman interfaces.

The implications of these findings extend beyond individual experiences to broader social, cultural, and healthcare domains. The study underscores the importance of recognizing digital health engagement as a relational and context-bound experience rather than a purely functional or technical interaction. For healthcare practitioners and policymakers, this means designing interventions and support systems that honor the emotional and social realities of elderly users, particularly those in underserved regions. Encouraging family involvement, simplifying user interfaces, and ensuring cultural sensitivity in app development may enhance not only usability but also trust and autonomy among elderly populations. Furthermore, these insights can inform training programs and community-based digital literacy initiatives tailored to the psychosocial needs of older adults.

This study is not without limitations. The findings are based on a small sample of elderly individuals from specific rural settings in Indonesia, which may limit the transferability of insights to other contexts or populations. The study also focused exclusively on mobile health applications, potentially overlooking related digital tools such as wearable devices or teleconsultation platforms. Additionally, while phenomenological analysis provides deep contextual understanding, it does not seek to generalize but to illuminate lived experiences within their particular lifeworlds. These limitations point to the importance of interpreting the findings within their bounded context, while recognizing the potential value of comparative studies across diverse geographic or cultural groups.

Future research may build on these findings by exploring longitudinal dimensions of digital health engagement—how elderly individuals' perceptions, habits, and emotional responses evolve over time. Comparative studies across urban and rural settings, or among different cultural groups, could further enrich the understanding of how social context shapes technology adoption in later life. Moreover, integrating phenomenological insights with design-based research may contribute to the creation of more empathetic and user-informed health technologies. Ultimately, this study lays a foundation for rethinking digital health not just as a tool, but as a lived space where aging, illness, and autonomy converge.

CONCLUSION

This study explored the lived experiences of elderly individuals in remote Indonesian areas using mobile health applications to manage chronic conditions. The findings revealed that digital health engagement among the elderly is shaped by emotional uncertainty, social dependency, evolving trust, and gradual empowerment. These insights affirm that mHealth tools are not merely functional devices but deeply relational and contextual experiences embedded within cultural and social realities. By offering phenomenological depth, this study contributes uniquely to the field by

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illuminating the subjective dimensions of digital health that are often overlooked in prior quantitative or design-centric research. Unlike earlier studies that focus primarily on usability or access, this research foregrounds the voices and emotions of older adults, revealing how trust, autonomy, and intergenerational support play pivotal roles in technology adoption.

Based on these findings, we recommend that:

1. Health practitioners integrate digital literacy coaching and emotional support mechanisms when introducing mHealth tools to older adults;
2. Developers design interfaces that are intuitive, culturally sensitive, and responsive to users' emotional trajectories over time;
3. Policymakers prioritize inclusive infrastructure development in rural areas and support training programs that empower caregivers and community health workers to facilitate digital engagement among the elderly.

Future research may build upon this foundation through longitudinal and cross-cultural studies to further enhance the empathy, adaptability, and inclusivity of digital health ecosystems.

CONFLICT OF INTEREST

The authors declare that there is no conflict of interest.

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