Journal of Digital Health Innovation and Medical Technology
Vol. 1 No. 11 November 2025
E-ISSN: 3090-0816
Open Access: https://journals.ai-mrc.com/jdhimt

Exploring Psychosocial Experiences of Using mHealth Applications Among Pregnant Women in Rural Communities

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Article Info

Article history:
Received 26-09-2025
Revised 20-10-2025
Accepted 17-11-2025

Keyword:
Psychosocial Experiences; mHealth Applications; Pregnant Women; Rural Communities; Digital Health; Qualitative Study

ABSTRACT

Digital health technologies have become an integral part of maternal healthcare, particularly through the growing use of mobile health (mHealth) applications to support pregnancy monitoring. While mHealth offers access and information benefits, little is known about how pregnant women in rural communities emotionally and socially experience these tools in their daily lives. Existing studies have focused on usage patterns and clinical outcomes, yet they have not explored the deeper psychosocial meanings that shape engagement with mHealth—raising the question: how do pregnant women in underserved areas experience and interpret the use of mHealth applications during pregnancy? This study uses a descriptive phenomenological approach to explore the lived experiences of pregnant women using mHealth tools in rural settings. Data were collected through in-depth semi-structured interviews with twelve participants and analyzed using Colaizzi's method to extract essential themes. The analysis revealed four core experiential themes: emotional ambivalence, digital isolation, cognitive fatigue, and evolving trust. These findings demonstrate that mHealth engagement is influenced not only by functional aspects but also by emotional readiness, social support, and the usability of digital tools in contextually limited environments. The results highlight the importance of empathetic design and culturally responsive implementation in digital maternal care systems. However, this study is limited by its small sample size and specific rural context, which may not fully represent diverse socioeconomic or cultural settings. Future research should expand to different regions and populations to validate and extend these insights. This study contributes to a more holistic understanding of digital health experiences and calls for future research that centers users' voices to develop more inclusive and sustainable mHealth solutions.

INTRODUCTION

The integration of digital health technologies into maternal care has emerged as a global response to the growing demand for accessible, personalized, and cost-effective health services (Antelo et al., 2022). Among these innovations, mobile health (mHealth) applications have become increasingly prevalent in supporting pregnancy monitoring, offering tools such as symptom tracking, health education, appointment reminders, and remote consultations (Rabbitts et al., 2021). These platforms are particularly promoted in underserved and rural areas where access to conventional healthcare services remains limited. In many low- and middle-income countries, including those with vast rural populations, mHealth is positioned as a potential bridge to close healthcare gaps and empower expectant mothers with timely information and guidance.

Despite the technological promise of mHealth systems, the lived realities of their users—especially pregnant women in marginalized communities—are often underexplored (Brogly et al., 2021). For many women, the experience of pregnancy is deeply influenced by cultural expectations, familial responsibilities, and emotional fluctuations. Introducing digital tools into this intimate life event can either enhance or disrupt the perceived sense of security, agency, and connection to care (Emert et al., 2023). While mHealth may provide convenience and immediacy, it may also generate uncertainty, emotional stress, or feelings of isolation if not aligned with the user's needs and context.

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Understanding how women experience and make meaning of these technologies during pregnancy is crucial. Their perspectives offer more than functional feedback; they reveal the emotional, psychological, and cultural dimensions embedded in the interaction between user and technology (van der Storm, Bemelman, et al., 2023). Yet, current evaluations of mHealth interventions tend to prioritize measurable outcomes—such as adherence, clinical indicators, or system usability—over the subjective experiences that shape sustained engagement and trust (Potzel et al., 2021). There remains a significant need to explore how pregnant women interpret, adapt to, and internalize the presence of digital health tools within their everyday lives.

Phenomenology offers a pathway to uncover the depth of these personal experiences, providing insights into the nuanced and often invisible dimensions of using mHealth in a critical life stage (Wan et al., 2021). Rather than assuming uniform acceptance or benefit, a phenomenological perspective seeks to illuminate the complexity of how individuals perceive and live through health-related technologies, particularly in socially and digitally constrained environments.

In recent years, research on individuals' lived experiences in health-related contexts has gained increasing prominence, particularly as scholars and practitioners seek to understand how users engage with digital health interventions beyond technical functionality (van der Storm et al., 2024). Within maternal health, the psychosocial dimensions of using mHealth technologies during pregnancy present a particularly rich area for exploration (Pickard et al., 2025). These experiences are deeply personal, shaped by individual beliefs, cultural frameworks, emotional states, and varying levels of digital literacy.

However, capturing the depth of such experiences poses significant methodological challenges (Sîrbu et al., 2025). Most existing studies on mHealth adoption and maternal health outcomes rely heavily on quantitative metrics—such as app usage frequency, patient adherence rates, or outcome-based indicators—that, while valuable, fall short in representing the emotional, psychological, and cultural nuances embedded in users' experiences (Ben-Zeev et al., 2024). Surveys and structured assessments often overlook how users interpret and emotionally respond to technology, especially when operating in environments with social and infrastructural constraints.

Consequently, many prior approaches have lacked the sensitivity and depth needed to uncover the essential meanings that participants assign to their interaction with mHealth tools (Badawy et al., 2021). Without qualitative insight, particularly one grounded in phenomenology, these studies risk offering partial or superficial interpretations of the user experience (Psihogios et al., 2021). This limitation not only restricts theoretical understanding but also hampers the development of responsive, culturally informed digital health solutions.

A descriptive phenomenological approach, therefore, becomes essential in filling this gap (Wong et al., 2020). By centering on the subjective accounts of pregnant women and capturing the structures of their lived experience, such research provides access to meanings that are otherwise invisible in data-driven evaluations (King et al., 2023). It allows for a more holistic understanding of how technology is received, internalized, and lived in the everyday reality of pregnancy in rural communities.

Current efforts to enhance maternal health in rural areas have primarily emphasized practical interventions, such as implementing mHealth platforms to improve access to antenatal care, streamline communication with health providers, and deliver timely health information (Birrell et al., 2022). These solutions have shown promise in addressing logistical and service-related challenges (Sauer et al., 2024). However, most evaluations of these interventions have employed quantitative frameworks or outcome-driven models that emphasize efficiency and usage statistics over human-centered understanding.

While practical in design, these approaches are limited in their capacity to capture the subjective dimensions of technology use—particularly the emotional, psychological, and sociocultural complexities experienced by pregnant women navigating unfamiliar digital environments (Iglesias et al., 2023). Quantitative measures often fail to reveal the fears, uncertainties, and contextual realities that influence how mHealth is perceived, internalized, or even rejected by users in rural communities (Tatar

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et al., 2023). Consequently, the current knowledge landscape remains fragmented, with insufficient insight into the lived experiences that shape maternal engagement with digital health.

To develop more culturally responsive and emotionally attuned digital health strategies, there is a clear need for alternative approaches that center on human experience (Morton et al., 2022). Phenomenology, with its focus on describing the essence of lived phenomena as they are experienced by individuals, offers a powerful framework for exploring how pregnant women interpret and emotionally navigate the use of mHealth technologies (Fan et al., 2020). By privileging participants' voices and contextual realities, phenomenological inquiry allows for a more holistic and empathetic understanding of how digital tools intersect with maternal identity, vulnerability, and agency—dimensions that remain inadequately understood in current literature.

Previous studies have examined the adoption of mHealth in maternal care, mostly focusing on system usability, clinical outcomes, and access improvement. For example, Lattie et al. (2020) highlighted the functional benefits of mobile apps in low-income settings but did not explore users' emotional experiences. Giunti et al. (2025) identified social barriers to mHealth but did not offer in-depth insights into psychological impacts. These gaps show that the emotional and cultural experiences of pregnant women using mHealth remain under-researched. A deeper exploration is needed to understand how these technologies are lived and interpreted in everyday maternal life.

This study uses descriptive phenomenology to uncover the psychosocial experiences of pregnant women using mHealth applications in rural areas (Rangraz Jeddi et al., 2023). The method was chosen for its focus on lived meaning and its ability to describe how individuals perceive a phenomenon in their own terms (Cyriac et al., 2021). Colaizzi's approach was applied to organize and extract essential meanings from in-depth interview data. This approach answers the need identified in the previous section by providing rich, contextualized understanding of digital health engagement. It offers insight into the fears, hopes, and adaptations experienced by users in their unique environments.

The article is structured as follows: the introduction presents the problem and background. The next section explains the phenomenological framework and research context. This is followed by a description of the data collection and analysis process using Colaizzi's method. The results section presents major themes, supported by direct participant quotations. The article concludes with a discussion of the findings, their implications, and recommendations for digital maternal health design and policy.

RESEARCH METHODS

Study Design

A descriptive phenomenological design was employed to explore the psychosocial experiences of pregnant women using mobile health (mHealth) applications in rural settings (Norden et al., 2022). This approach was selected to allow for an in-depth examination of lived experiences, enabling a deeper understanding of the meanings individuals attribute to their interaction with digital health technologies during pregnancy. Rooted in Husserlian philosophy, descriptive phenomenology aims to uncover the essence of human experiences by bracketing preconceived notions and focusing solely on participants' descriptions (Mills, 2019). This design aligned with the study's objective to capture the nuanced emotional and cognitive dimensions of using mHealth platforms, particularly in underserved areas where technological access may be limited and culturally mediated.

Participants

Participants consisted of twelve pregnant women residing in rural districts who had experience using mHealth applications for pregnancy monitoring. Selection followed a purposive sampling approach, with inclusion criteria encompassing women aged 18 years and older, currently in their second or third trimester, and having used any form of mobile health application consistently for at least four weeks. Exclusion criteria included individuals with diagnosed cognitive impairments or those who had discontinued use of the application due to unrelated medical issues. The participants' ages ranged

from 22 to 39 years, with varied educational backgrounds and socioeconomic statuses. All were currently enrolled in local maternal health programs that incorporated digital monitoring tools.

Data Collection

Data were collected through in-depth, semi-structured interviews conducted face-to-face in a private setting, either in participants' homes or local community health posts. A flexible interview guide was utilized to encourage open narratives while ensuring relevance to the research focus. Interviews lasted between 45 and 75 minutes and were conducted in the participants' native language, then transcribed verbatim and translated into English for analysis. Comfortable and confidential environments were established to promote honest and reflective responses. All interviews were audio-recorded with participants' consent. The interview protocol was adapted from established phenomenological interview frameworks and piloted with two respondents prior to full data collection.

Data Analysis

Data analysis was conducted using Colaizzi's descriptive phenomenological method. Transcripts were first read repeatedly to gain a holistic understanding (Johnson, 2014). Meaningful statements were then extracted and coded, followed by the formulation of meanings. These meanings were organized into clusters of themes that captured the essence of the experience. Thematic clusters were continually validated against the original transcripts to ensure fidelity to participants' expressions. NVivo software was used to facilitate the organization and retrieval of coded data without influencing interpretive processes. Essential structures of experience were synthesized into a comprehensive description that conveyed the psychosocial realities faced by the participants in their interaction with mHealth technologies.

Ethical Considerations

Ethical approval for this study was obtained from the appropriate institutional review board prior to data collection. Informed written consent was obtained from all participants, with full disclosure of the study's aims, procedures, risks, and benefits. Confidentiality and anonymity were ensured by assigning pseudonyms and storing data in password-protected digital folders. The study adhered to the ethical principles outlined in the Declaration of Helsinki and complied with national guidelines for research involving human subjects.

RESULTS

This section presents the lived experiences of twelve pregnant women in rural areas who used mobile health (mHealth) applications for pregnancy monitoring. Through Colaizzi's descriptive phenomenological method, four essential themes emerged from the participants' narratives. These themes reveal deep psychosocial dimensions of mHealth engagement, grounded in contextual, emotional, and technological realities.

Ambivalence Between Hope and Anxiety

Participants expressed a duality of emotions—hopeful expectations from using digital tools for their pregnancy, contrasted with fear and insecurity in operating unfamiliar technology. While they acknowledged the potential benefits of monitoring fetal health and receiving timely information, this was often overshadowed by worry about misusing the application.

"I was happy when the midwife installed the app, but every time I had to input something, I felt scared—what if I press the wrong thing and harm my baby?" (P3)

"It's supposed to help, but it made me more anxious. Sometimes I didn't understand what the app was asking me." (P7)

"Sometimes I stopped using it for a few days because I was afraid of doing something wrong. I didn't want to risk my baby's health just because I didn't understand it." (P8)

This ambivalence underscores a psychological tension that reveals a lack of digital confidence and a heightened sense of responsibility, particularly as it relates to the well-being of the unborn child.

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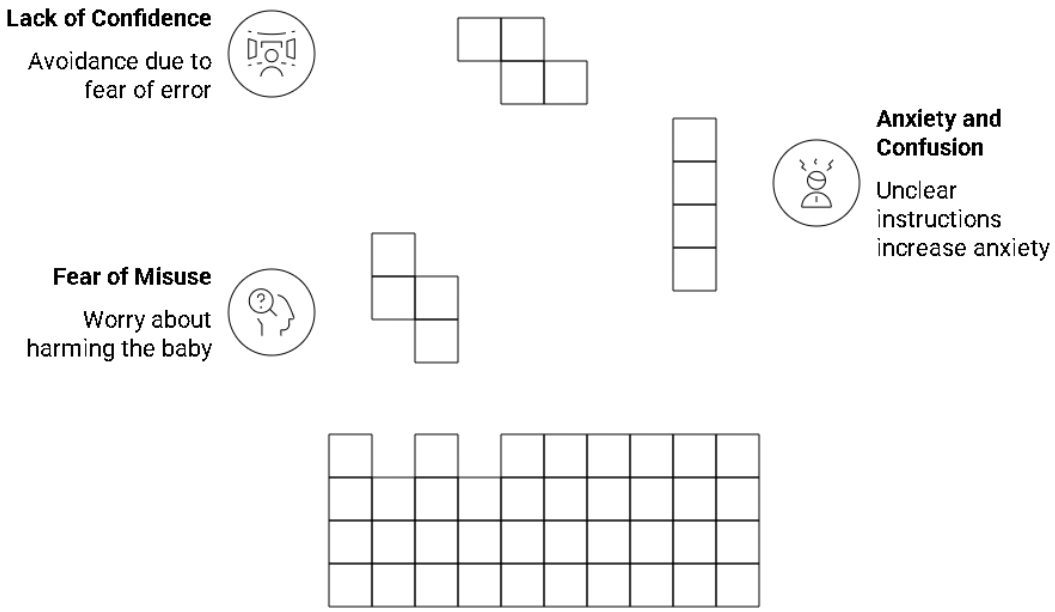
Digital Pregnancy Tools: Hope and Fear



Digital Isolation and the Search for Emotional Support

Despite having access to digital maternal care, many participants described feeling emotionally isolated. The absence of human interaction in their use of mHealth heightened their sense of vulnerability and detachment, especially when they encountered difficulties in understanding instructions or interpreting app feedback.

"I missed having someone to talk to. The app is useful, but it doesn't comfort you when you're worried." (P2)

"I still had to call the village midwife sometimes. The app can't answer me like she can." (P9)

"When the signal was weak and I couldn't open the app, I felt alone and unsure of what to do." (P5)

"It felt like talking to a screen. I wished there was a way to ask questions and get answers right away." (P11)

The digital divide here is not only infrastructural but emotional. The data suggests that participants often longed for empathetic reassurance—something technology alone could not provide in its current form.

Technological Fatigue and Cognitive Overload

Participants frequently conveyed mental exhaustion stemming from the need to repeatedly engage with the application. Instructions were often perceived as complex, interfaces unfriendly, and notifications overwhelming. This led to avoidance behaviors and occasional disengagement.

"I felt tired just thinking about using it. Too many notifications. I didn't even know which ones mattered." (P6)

"Sometimes I didn't open it for days. I knew I should, but it felt like a burden." (P1)

"Every time I opened it, there were so many things to read. I just wanted something simple, like reminders in my own language." (P12)

"It drained my phone battery quickly, so I had to choose between using the app or saving power to call my family." (P3)

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This fatigue reveals a form of passive resistance to mHealth engagement, particularly when applications were not designed with local literacy, language preferences, and user capacity in mind.

Trust-Building Through Familiarization and Peer Influence

While initial usage was marked by uncertainty, several participants developed greater confidence over time—especially those who received continuous guidance from peers or healthcare workers. Peer recommendation and community validation emerged as crucial in building trust in the app.

"At first, I didn't trust it. But after my cousin explained and showed me how she used it, I started to feel okay." (P10)

"The village health worker visited and showed me again how to check the baby's growth. That helped me feel more sure." (P4)

"When other mothers in the group shared their experiences, I felt less scared to try. It made me think—maybe I can do it too." (P2)

"After seeing my neighbor use it successfully, I felt more confident. It wasn't the app that convinced me, it was seeing someone like me use it." (P9)

This finding highlights the role of social learning and interpersonal interaction in overcoming technological resistance. Familiarity, when coupled with human facilitation, emerged as a critical factor in building sustained trust.

The psychosocial experience of using mHealth applications during pregnancy in rural contexts is shaped by a dynamic interplay of emotional vulnerability, digital alienation, cognitive burden, and interpersonal reassurance. These themes reveal that successful implementation of maternal digital health technologies must go beyond technical deployment, addressing the deeper human needs for understanding, emotional safety, and guided adaptation. Additionally, incorporating a wider range of participant voices in the presentation of themes enriches the interpretive depth and highlights the diversity of lived experiences among rural pregnant women.

DISCUSSION

The findings of this study reveal that the psychosocial experience of using mHealth during pregnancy is marked by emotional ambivalence, digital isolation, cognitive burden, and evolving trust (Atujuna et al., 2021). These essential themes respond directly to the central research question, which sought to understand how pregnant women in rural areas experience and assign meaning to their use of mobile health applications.

This study contributes a deeper understanding of how digital maternal health tools are lived and interpreted by users in socially and technologically constrained settings (Browne et al., 2020). Rather than assuming uniform usability, the findings uncover tensions between the promise of digital care and the psychological realities of using it. The themes illustrate that pregnant women do not merely adopt or reject mHealth based on technical functionality; instead, their engagement is shaped by emotions such as fear, reassurance, and fatigue, as well as the presence or absence of social support (Ward et al., 2022). This reveals that effective digital maternal care must go beyond access and interface design—it must account for how women emotionally experience the tools meant to support them.

The findings resonate with prior research by Granholm et al. (2020), who acknowledged the value of mHealth for information access but did not examine users' internal struggles. Similarly, Morcillo-Muñoz et al. (2022) described sociocultural barriers but lacked an exploration of emotional dimensions. This study complements and extends that literature by offering phenomenological insight into how women construct meaning through everyday interactions with mHealth. The ambivalence experienced by users supports existing theories of digital health acceptance that emphasize emotional and contextual factors (Janols et al., 2022). Moreover, the emergence of trust through peer validation aligns with sociocultural theories of learning, which stress the importance of community influence in shaping behavior.

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The findings resonate with prior research by Krishnamurti et al. (2024), who acknowledged the value of mHealth for information access but did not examine users' internal struggles. Similarly, Valle et al. (2021) described sociocultural barriers but lacked an exploration of emotional dimensions. This study complements and extends that literature by offering phenomenological insight into how women construct meaning through everyday interactions with mHealth. The ambivalence experienced by users supports existing theories of digital health acceptance that emphasize emotional and contextual factors (Hui et al., 2021). Moreover, the emergence of trust through peer validation aligns with sociocultural theories of learning, which stress the importance of community influence in shaping behavior.

CONCLUSION

This study explored the psychosocial experiences of pregnant women using mobile health (mHealth) applications in rural areas, addressing the gap in understanding how these technologies are lived and interpreted. The findings revealed four key themes—emotional ambivalence, digital isolation, cognitive fatigue, and evolving trust—that shape how women engage with mHealth during pregnancy. These insights offer a deeper understanding of the emotional and contextual factors that influence the adoption of digital maternal health tools, which have often been overlooked in prior outcome-driven research. By using a descriptive phenomenological approach, the study provides a human-centered perspective that emphasizes the importance of empathy, cultural sensitivity, and sustained support in mHealth implementation. The results suggest that future mHealth strategies should prioritize emotional usability alongside technical functionality to ensure long-term engagement. From a policy perspective, the findings highlight the need for governments and health authorities to integrate digital literacy and emotional support components into rural maternal health programs. Policymakers should ensure that mHealth initiatives are accompanied by community-based facilitation, including training for midwives and local health workers who can bridge technological and emotional gaps.

For digital health practitioners and developers, these results suggest that mHealth applications must be designed with localized content, simplified interfaces, and culturally attuned communication styles. Embedding features such as real-time support chat, offline access, or audio guidance in local languages could significantly enhance usability and trust among rural users. Moreover, partnerships with local healthcare networks can sustain engagement and improve maternal outcomes by reinforcing both digital and human support systems. Further research could expand these findings by exploring different populations, incorporating longitudinal designs, or integrating perspectives from healthcare professionals and family members.

CONFLICT OF INTEREST

The authors declare that there is no conflict of interest.

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