



Psychosocial Experiences of Pregnant Women Using AI-Based Prenatal Care Apps

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ABSTRACT

The rapid integration of artificial intelligence (AI) into maternal healthcare has transformed how pregnant women access information, engage with healthcare systems, and manage emotional well-being. While digital prenatal applications are increasingly used to support self-managed care, little is known about how women experience these technologies at a psychosocial level. What remains unclear is how pregnant women interpret and assign meaning to their interactions with AI-based prenatal care tools—particularly in emotionally significant and culturally embedded contexts. This study adopts an interpretative phenomenological approach to explore the lived experiences of pregnant women using AI-supported prenatal applications, with a focus on trust, emotional reassurance, and autonomy. Semi-structured interviews were conducted with eight participants aged 23–37 years from urban and semi-urban areas, representing diverse educational and socioeconomic backgrounds, who had used AI-based applications for at least one month. Data were analyzed thematically using the Interpretative Phenomenological Analysis (IPA) framework. The findings reveal that women experience a psychosocial journey that moves from initial anxiety to emotional attachment and digital trust, shaped by repeated, personalized interactions with the AI system. Participants often viewed the application as a nonjudgmental companion, highlighting the emotional and relational dimensions of digital care. However, the study's scope is limited to users within a single national context, and findings may not fully capture variations in cultural or healthcare infrastructure across different regions. These results expand current understandings of user-AI interaction in maternal health by emphasizing the emotional meanings behind technological use, offering insights for developers and policymakers seeking to create more empathetic and culturally responsive digital health tools.



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INTRODUCTION

The integration of artificial intelligence (AI) into maternal healthcare has reshaped how pregnant women access information, monitor their well-being, and engage with healthcare systems (Hanson et al., 2021). AI-powered prenatal applications now serve as digital companions, offering features such as symptom tracking, appointment reminders, and automated health recommendations (Koech et al., 2022). These technologies are increasingly positioned as solutions to bridge geographical, economic, and institutional barriers in maternal care, especially in settings where direct access to healthcare professionals may be limited.

Within the broader field of digital public health and health informatics, such innovations reflect a growing trend toward self-managed care and algorithm-driven health support (Li et al., 2024). This shift has been driven by global efforts to increase patient empowerment, promote preventive healthcare, and optimize resource allocation through technology (Yang et al., 2024). However, as these applications become more embedded in the lives of expectant mothers, questions arise regarding how users perceive, interact with, and emotionally respond to such systems in their daily realities.

Pregnancy is not solely a biomedical condition but a deeply personal and socially embedded experience shaped by cultural norms, emotional states, and interpersonal relationships (Jeong, 2020). The introduction of AI into this intimate and sensitive context brings forth complex layers of psychosocial adaptation (von Wowern et al., 2017). Women are not only asked to trust algorithmic judgments regarding their health but also to navigate new forms of digital interaction that may influence how they understand, interpret, and respond to bodily cues and emotional needs during pregnancy.

Despite the technological advancements, little is known about how these digital tools are experienced by their users at a subjective level (Patten et al., 2020). While effectiveness, usability, and accessibility have been studied extensively through quantitative frameworks, the personal meanings, relational implications, and emotional dimensions of using AI during pregnancy remain largely unexplored (Lee et al., 2025). Understanding these facets is crucial, as they inform not just individual user behavior but also broader ethical, relational, and policy considerations in the design and deployment of health technologies.

A phenomenological approach becomes essential in this context, as it provides a pathway to explore how pregnant women live through the experience of engaging with AI-driven care, beyond what is measurable (Razai et al., 2025). It opens the space to examine how meaning is constructed around trust, fear, autonomy, and digital companionship in a time of significant emotional and physiological change.

Research into individuals' lived experiences within healthcare settings has become a critical domain in understanding how medical technologies intersect with human values, perceptions, and behaviors (Robb et al., 2021). In maternal health, specifically, the subjective experiences of pregnant women navigating digital systems such as AI-based prenatal applications present unique emotional and relational dynamics that cannot be fully captured through traditional empirical metrics (He et al., 2025). These experiences are often deeply internal, shaped by personal belief systems, social environments, and emotional fluctuations that occur throughout pregnancy.

Despite the increasing availability and functionality of digital health applications, most prior investigations have relied heavily on quantitative methodologies—surveys, usage analytics, and behavioral models such as the Technology Acceptance Model (TAM) or Unified Theory of Acceptance and Use of Technology (UTAUT) (Pei et al., 2023). While these models offer valuable insights into user adoption patterns and usability factors, they fall short in capturing the rich, nuanced, and often paradoxical meanings that users assign to their interactions with technology (Patten et al., 2018). For instance, feelings of trust may coexist with skepticism; empowerment may be accompanied by dependence.

This methodological gap has created a fragmented understanding of the user experience, where measurable variables are prioritized over existential dimensions of use (İlhan et al., 2016). The complexity of human-technology interaction—especially in emotionally charged contexts such as pregnancy—requires a research lens that prioritizes depth over breadth (Matthew et al., 2022). Quantitative tools are insufficient to illuminate how users feel, make sense of, or navigate uncertainty when engaging with automated, algorithm-driven care during a transformative life event.

Phenomenological inquiry addresses this void by offering a way to access and articulate the meaning structures embedded in everyday experiences (Ochieng' et al., 2024). It enables researchers to trace how individuals interpret technological interactions from within their own lifeworlds, rather than imposing predefined categories of analysis. Within the context of AI-assisted prenatal care, this approach is particularly powerful, as it captures the evolving relationship between human vulnerability and machine logic in real-world scenarios (Warembourg et al., 2016). The present study draws from this tradition to explore how pregnant women construct psychosocial meanings around trust, emotional reassurance, autonomy, and digital companionship through sustained use of AI applications

In the context of AI-assisted prenatal care, most current efforts to understand user engagement rely on practical, solution-oriented approaches that emphasize system efficiency, user

interface design, and behavioral uptake (Minckas et al., 2025). These approaches typically employ standardized instruments such as Likert-scale questionnaires or behavioral intention models (e.g., TAM, UTAUT), which offer broad overviews of user satisfaction and adoption drivers (Nolen et al., 2019, pp. 2003–2015). While informative for system developers and policy planners, such methods reduce complex human experiences into simplified variables, overlooking the emotional, existential, and relational dimensions of technology use during pregnancy.

These conventional frameworks fail to account for the depth and richness of psychosocial meaning that women assign to their interactions with AI-based prenatal applications (de Lima et al., 2015). Emotions such as uncertainty, reassurance, or even digital intimacy are often rendered invisible within empirical models focused on functionality (Kaneko et al., 2021). As a result, the nuanced ways in which pregnant women construct trust, navigate emotional dependency, and negotiate autonomy with AI tools remain poorly understood.

This methodological limitation underscores the need for an alternative lens—one that can access and articulate the subjective, evolving, and often contradictory experiences that emerge from using AI technologies in deeply personal contexts (Chaurasia et al., 2025). Phenomenological inquiry provides such a lens by centering the lived experience itself rather than abstracted indicators of usage (Dashner-Titus et al., 2018). By attending to how meaning is formed within real-world contexts, phenomenology enables a more holistic and human-centered understanding of technology in maternal health.

What remains underexplored is not whether AI applications are accepted, but how they are experienced, interpreted, and emotionally integrated into the everyday lives of pregnant women (Chen et al., 2015). This study seeks to address this gap by investigating the essential meanings and psychosocial dynamics that define women’s lived relationships with AI-based prenatal care technologies.

RESEARCH METHODS

Study Design

This study employed an interpretative phenomenological approach to explore the psychosocial experiences of pregnant women using AI-based prenatal care applications (Kelley et al., 2022). Phenomenology, as a qualitative research design, seeks to uncover the essence of lived experiences by examining how individuals interpret and make sense of specific phenomena in their lifeworld (Johnson, 2014). The interpretative variant of this approach, grounded in Heideggerian philosophy, was chosen to emphasize not only the descriptive accounts of experience but also the contextual, relational, and existential meanings participants attach to their interactions with digital health technology.

This design enabled a deep inquiry into the subjective meanings and emotional realities experienced by participants, particularly in relation to trust formation, emotional adaptation, and autonomy in digital prenatal care (Tucker et al., 2019). Through this lens, the phenomenon was examined not in isolation but as lived and shaped within each participant’s socio-cultural context

Participants

Participants included pregnant women with varying gestational stages who had actively used an AI-based prenatal care application for a minimum of one month. Selection was conducted using purposive sampling to ensure participants had direct, rich experiences related to the phenomenon under investigation. Inclusion criteria comprised adult women (aged 20–40), currently pregnant, possessing access to and the ability to use a smartphone application for prenatal care, and willing to share personal reflections on their usage experience.

Exclusion criteria included individuals with high-risk pregnancies requiring constant in-person medical intervention, or those unfamiliar with mobile digital health tools (Nguyen-Hoang et al., 2024). A total of eight participants were included in the study, with ages ranging from 23 to 38

years. Participants represented diverse socioeconomic backgrounds, all residing in semi-urban or urban areas where digital health infrastructure was accessible.

Data Collection

Data were collected through semi-structured, in-depth interviews conducted in private and comfortable settings selected by the participants. Interviews were guided by an open-ended protocol designed to elicit detailed reflections on emotional responses, perceived support, trust development, and relational experiences with the AI application (Chu et al., 2020). Each session lasted approximately 45 to 60 minutes and was conducted face-to-face or via secure video conferencing, depending on the participant's preference.

All interviews were audio-recorded with participants' consent and transcribed verbatim for analysis. The interview guide was developed based on prior phenomenological research in digital health and was reviewed by two qualitative research experts to ensure clarity and relevance. Minor adjustments were made during the initial interviews to optimize question flow and emotional sensitivity.

Data Analysis

Data were analyzed using the Interpretative Phenomenological Analysis (IPA) framework, which emphasizes understanding how individuals make meaning of their experiences within specific contexts (Padgett, 2017). Transcripts were read repeatedly to gain a holistic understanding, followed by initial noting and identification of significant meaning units. These units were then coded and clustered into emergent themes through a process of iterative abstraction.

The analysis was supported by NVivo software to assist in the organization of codes and thematic visualization. Cross-case comparisons were made to identify recurring patterns while preserving the idiographic richness of each account. The final themes were constructed through a synthesis of both convergent and divergent perspectives, highlighting essential structures of experience related to emotional engagement, trust development, autonomy, and digital relationality.

Ethical Considerations

Ethical approval for this study was obtained from the relevant institutional research ethics committee. Written informed consent was secured from all participants prior to data collection, ensuring they were aware of their rights, including voluntary participation and the ability to withdraw at any stage without penalty. Anonymity and confidentiality were strictly maintained throughout the study, and all data were stored in encrypted digital formats. The study adhered to ethical principles in line with the Declaration of Helsinki and applicable national guidelines for research involving human subjects.

RESULTS

This study revealed four overarching themes that reflect the psychosocial experiences of pregnant women when engaging with AI-based prenatal care applications. The themes were constructed through a rigorous interpretative phenomenological analysis (IPA), highlighting the essence of lived experiences shaped by emotions, perceptions of technology, and relational contexts. The voices of participants are presented verbatim to support the authenticity of each theme.

Navigating Anxiety and Seeking Reassurance in the Digital Space

Many participants initially encountered emotional ambivalence toward the prenatal care application. Feelings of doubt, confusion, and anxiety surfaced when interacting with AI-driven features such as automated health feedback or symptom analysis.

“At first, I was scared that the app would give me the wrong advice, especially when I had abdominal pain. I kept thinking—can I trust a machine with my baby's safety?” (Participant 3)

This uncertainty often stemmed from a lack of prior exposure to AI health tools and the inability to directly validate the accuracy of app-based responses. However, over time, most

participants reported that consistent and supportive outputs from the application helped mitigate their fears and gradually fostered a sense of digital reassurance.

“After using it for a few weeks, I began to trust the advice more. It reminded me of my appointments and helped me track the baby’s movements. That gave me peace of mind.” (Participant 7)

Empirically, this theme illustrates a clear emotional transition—from initial anxiety to growing trust—grounded in participants’ repeated interactions with the system. Analytically, this finding suggests that emotional adaptation is a key precursor to technological trust within digital maternal care.

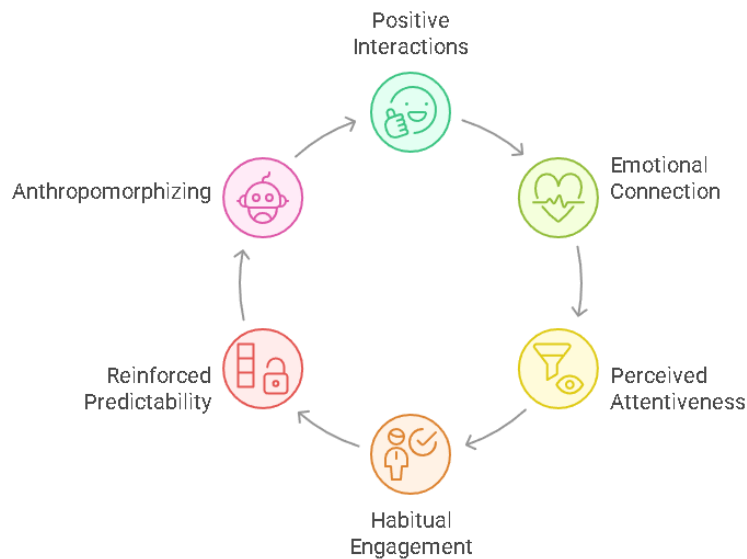
The Construction of Trust through Digital Repetition and Familiarity

Repeated positive interactions with the AI system played a significant role in building relational trust. Many participants developed a sense of connection with the app, attributing a human-like reliability to its recommendations. Trust was not merely technical but emotional, formed through a habitual relationship with the application.

“It felt like the app knew me. When it asked if I drank enough water or reminded me about my iron tablets, it was comforting... like someone cared.” (Participant 1)

At the descriptive level, participants’ quotes emphasize emotional comfort and perceived attentiveness. Analytically, this theme reflects how trust emerges not solely from the system’s accuracy but from habitual engagement that reinforces predictability and perceived empathy. Participants’ anthropomorphizing of the system thus reveals the relational dimension of AI trust formation.

Cycle of Relational Trust with AI



Negotiating Autonomy and Dependence

A recurring tension emerged between the participants’ desire for autonomy and their growing dependence on the application. While the AI system provided structure and guidance, it also occasionally undermined participants’ confidence in their own bodily intuition.

“Sometimes I wanted to listen to my own body, but I checked the app first. When it said everything was okay, I felt relieved—but I also questioned if I still knew what was best for me.” (Participant 5)

Descriptively, this theme captures an internal negotiation between self-reliance and algorithmic reassurance. Analytically, it underscores a psychosocial paradox—where digital tools

intended to empower users can simultaneously create subtle dependency, reshaping perceptions of maternal agency.

Digital Companionship and the Emotional Void

Several participants described the application as a form of “digital companion,” especially for those who experienced limited access to healthcare professionals or emotional support from family. The AI app provided a nonjudgmental and always-available source of information, which participants likened to an “invisible midwife.”

“I live far from the clinic, and my husband works abroad. The app was the only one I talked to about my fears at night. It felt like someone was with me.” (Participant 8)

This theme demonstrates the emotional role of AI applications beyond their instrumental function. Analytically, the finding reveals that digital prenatal tools may operate as affective surrogates, providing perceived emotional presence and relational continuity amid physical isolation.

The core essence of participants’ experiences centers on a psychosocial journey marked by emotional adaptation, the evolution of trust, relational tension, and the emergence of digital emotional support. The AI-based prenatal care application was not perceived merely as a tool but as a social agent that shaped maternal behavior, feelings of safety, and perceived self-efficacy during pregnancy. By clearly separating descriptive findings from interpretive analysis, the results highlight how women’s interactions with AI extend beyond functionality into relational and emotional domains, underscoring the human-AI co-construction of care experiences.

DISCUSSION

The findings of this study reveal that pregnant women using AI-based prenatal care applications undergo a psychosocial journey characterized by emotional adaptation, the gradual development of digital trust, and the negotiation of autonomy (Zhang et al., 2024). These experiences reflect how meaning is actively constructed around technology during a profoundly personal and transformative life event, directly addressing the core question posed in the introduction: How do pregnant women experience and make sense of their interactions with AI-supported maternal health tools?

This study offers a unique contribution by illuminating how women do not simply “use” AI systems, but rather engage with them as affective and relational entities that influence their emotional states and decision-making processes (Tanimura et al., 2017). The phenomenon of digital reassurance emerged as a central construct, wherein participants described feeling comforted by the app’s consistent presence, guidance, and perceived attentiveness. In contrast to traditional clinical interactions, the AI application was experienced as a constant, nonjudgmental companion—especially valuable in contexts of limited healthcare access or emotional support (Patey et al., 2025). These insights suggest that AI technologies may play more than an informational role; they serve as emotional scaffolds during pregnancy, shaping maternal confidence and perceived safety.

The findings align with and extend existing literature that highlights the importance of emotional trust in digital health interactions. Pawlak et al. (2023) emphasized the psychological dimensions of trust in AI-driven maternal care, noting that such trust is developed relationally rather than through rational evaluation alone. Similarly, the emotional ambivalence noted in this study—oscillating between reliance and doubt—echoes the digital health anxiety explored by Tran et al. (2023), who identified both comfort and apprehension among app users. However, this study moves beyond prior research by interpreting these tensions through the lens of lived experience, offering a more nuanced understanding of how trust, dependence, and self-efficacy are dynamically negotiated. It also reinforces Heidegger’s notion of being-in-the-world, as the participants’ encounters with technology were not isolated interactions but embedded in their daily routines, cultural expectations, and personal identities as expectant mothers.

Implications of the Findings

The insights derived from this study carry significant implications for the development and implementation of AI-based prenatal care applications (Tran et al., 2023). Beyond functional design, the findings highlight the emotional and relational dimensions of user experience, suggesting that digital health technologies must be approached as socio-emotional tools, not merely technical interfaces (Faruk Topaloğlu et al., 2023). Health professionals, app developers, and public health policymakers should consider integrating features that acknowledge users' emotional needs—such as empathetic messaging, customizable reassurance tools, or human-AI hybrid support models. Culturally responsive design is also critical, as the way pregnant women interpret and interact with AI is shaped by sociocultural norms, expectations about motherhood, and the broader health system context. These findings are particularly relevant in underserved areas, where digital tools often serve as the primary source of healthcare support.

Limitations of the Study

Although the interpretative phenomenological approach offered rich insights into the lived experiences of participants, several limitations should be acknowledged (Ebina et al., 2015). The study involved a relatively small sample size drawn from a specific demographic and cultural context, which may limit the transferability of findings to broader populations. The reliance on self-reported experiences may also introduce interpretive bias, despite efforts to ensure rigor through member checking and data triangulation. Additionally, since the participants were self-selected and already using AI applications, their experiences may differ from those who have never adopted such technologies or who disengaged early (Miyagi et al., 2021). These limitations underscore the importance of contextual sensitivity in phenomenological research and suggest cautious interpretation of the findings beyond their immediate setting.

Future Research Directions

Building on the current findings, future studies could explore how AI-driven prenatal care applications are experienced by diverse populations, including those in rural settings, high-risk pregnancies, or with varying levels of digital literacy (Tomasoni et al., 2019). Comparative studies across cultural contexts would further illuminate how social values shape the meaning-making process in digital maternal care. Longitudinal research may also offer deeper insights into how emotional relationships with AI evolve over time, particularly as pregnancy progresses or as technology advances (Arreola et al., 2024). In addition, integrating phenomenological insights with design thinking approaches could enhance the emotional intelligence of digital health tools, contributing to more human-centered technological innovations in maternal care. This study thus lays the groundwork for interdisciplinary inquiry at the intersection of health technology, user experience, and the philosophy of care.

CONCLUSION

This study explored the psychosocial experiences of pregnant women using AI-based prenatal care applications, focusing on how they construct meaning around trust, emotional support, and autonomy. The findings revealed that these technologies are experienced not only as informational tools but as digital companions that shape maternal confidence and emotional well-being. Participants described a progression from initial anxiety to emotional reassurance through repeated interaction with the AI system. By highlighting these emotional and relational dynamics, the study underscores the need for healthcare practitioners to recognize AI tools as potential extensions of psychosocial care, not merely as information-delivery systems.

Practically, healthcare professionals should integrate AI-based prenatal applications within routine maternal care by providing guidance on their appropriate use, addressing emotional dependence, and reinforcing human contact where needed. Developers are encouraged to collaborate with clinicians to design empathetic, culturally sensitive, and transparent AI features that complement professional support rather than replace it. In summary, this study offers actionable insights for fostering balanced, human-centered integration of AI in maternal healthcare. Future research should

examine diverse populations and longitudinal patterns to deepen understanding of how digital trust and emotional attachment evolve over time.

CONFLICT OF INTEREST

The authors declare that there is no conflict of interest.

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