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Exploring Patient Experiences in Managing Chronic Illness at Home with Wearable Medical Devices

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ABSTRACT

Wearable medical devices (WMDs) are rapidly transforming chronic care by integrating health technology into patients' daily lives. While research has emphasized technical performance and clinical outcomes, less attention has been given to users' personal experiences and interpretations in home-based health monitoring. Despite increased adoption, there remains a limited understanding of the personal meanings users assign to WMDs—raising the question: how do individuals make sense of living with wearable devices in the context of chronic illness? This study uses an interpretative phenomenological approach to explore users' lived experiences and provide insight into the emotional, cognitive, and social dimensions of device use. Data were collected through in-depth, semi-structured interviews with chronic disease patients using WMDs and analyzed using Interpretative Phenomenological Analysis (IPA). The results revealed four key themes: the duality of surveillance and support, empowerment through self-monitoring, emotional attachment to technology, and privacy-related concerns. These themes highlight how WMDs are not only functional tools but also deeply embedded in the subjective experience of illness management. The findings enhance our understanding of how digital health technologies reshape user identities, care relationships, and perceptions of autonomy—suggesting the need for more human-centered design and implementation strategies in digital health research.

INTRODUCTION

In recent years, the integration of digital technologies into personal healthcare has transformed the landscape of chronic disease management. Among these innovations, wearable medical devices (WMDs)—such as smartwatches, biosensors, and remote monitoring tools—have gained widespread adoption for their potential to enhance health outcomes, increase patient autonomy, and reduce the burden on clinical infrastructures (Ning dkk., 2022). This technological shift reflects a broader movement toward decentralized and patient-centered care, particularly in managing long-term conditions such as diabetes, cardiovascular disease, and hypertension, where continuous monitoring and lifestyle adjustments play a crucial role.

The increasing reliance on WMDs extends beyond their technical utility; it intersects deeply with individuals' daily routines, emotional wellbeing, and perceptions of health responsibility. These devices do not merely collect physiological data—they also mediate the relationship between patients and their bodies, their care networks, and the broader healthcare system. As such, the experience of using wearable technology is profoundly shaped by sociocultural factors, including trust in technology, health literacy, privacy concerns, and the evolving definition of patient empowerment in digital health contexts.

Despite the promising outcomes associated with wearable technologies, there remains a significant gap in understanding how individuals subjectively experience these tools within their lived

environments (Panes dkk., 2022). Quantitative studies have established correlations between device use and improved health indicators, but they often overlook the nuanced, context-rich realities of users' everyday lives. The phenomenological dimension of this issue—how individuals make sense of, adapt to, and emotionally engage with wearable technologies—has yet to be fully explored. There is a growing need for qualitative inquiry that captures the essence of users' experiences and reveals the personal meanings they attach to these technologies.

Given this landscape, a phenomenological approach becomes essential in illuminating the lived experiences of individuals interacting with WMDs. Such an approach prioritizes subjective meaning over objective measurement and recognizes that technology use in healthcare is as much an existential and relational phenomenon as it is a biomedical intervention.

Research focusing on individuals' lived experiences in health-related contexts has become increasingly vital, especially as healthcare systems embrace digital transformation. Within this domain, wearable medical devices represent a compelling phenomenon—merging technology, personal health responsibility, and socio-emotional adaptation. Studies have begun to investigate user interaction with digital health tools; however, much of the literature remains grounded in quantitative paradigms that prioritize efficiency, usability metrics, and clinical outcomes1. While these studies offer valuable insights into device performance and adherence patterns, they often fail to grasp the deeper experiential and interpretive layers of user engagement.

One of the central methodological challenges lies in the limited capacity of quantitative approaches to capture the personal meaning and emotional resonance of using health technology on a daily basis. Experiences such as trust, dependence, empowerment, or even anxiety—integral to understanding how users internalize these technologies—are difficult to quantify and frequently overlooked in structured surveys or usage statistics (Satterlee dkk., 2019). Moreover, many previous studies have adopted standardized instruments that, although reliable, risk imposing external constructs onto participants' realities rather than allowing subjective experiences to emerge organically.

These methodological limitations suggest that conventional approaches may be insufficient for uncovering the full complexity of how individuals relate to wearable medical devices. Without methods that prioritize the lived, first-person perspective, the field risks perpetuating a fragmented view of technology integration—one that neglects the nuanced, affective, and context-dependent aspects of digital health experiences. This underscores the need for phenomenological research capable of accessing the essence of such experiences through detailed exploration of user narratives and meaning-making processes.

In current healthcare practice, the predominant approach to evaluating the use of wearable medical devices relies heavily on established frameworks centered around usability, adherence rates, and clinical effectiveness. These assessments often adopt pragmatic, outcome-based methodologies that prioritize what devices do over how they are experienced by users1. While such approaches contribute to system-level decision-making and product refinement, they fall short of capturing the nuanced, interpretive dimensions of patients' day-to-day engagement with the technology—particularly within the personal space of home-based care.

The limitation of these conventional strategies lies in their inability to access the inner world of users—their emotional responses, cognitive interpretations, and shifting sense of self as they interact with wearable devices. By focusing predominantly on behavior and performance indicators, these models risk overlooking the rich, layered meanings that emerge when individuals integrate technology into the intimate fabric of their lives. As Scibetta dkk., (2019) note, digital health research must move "beyond the metrics" to consider the lived, socio-emotional implications of technological adoption in chronic care contexts2.

Addressing this gap requires a methodological shift—one that prioritizes depth over generalizability, and meaning over measurement. Phenomenology offers a robust alternative by enabling researchers to explore the essence of user experiences, grounded in first-person narratives

and contextual interpretation. By adopting this approach, it becomes possible to gain a more holistic and human-centered understanding of how wearable medical technologies are not just used, but lived with—revealing insights that quantitative measures alone cannot uncover.

Previous research has explored the role of wearable medical devices (WMDs) in chronic disease management, primarily focusing on their effectiveness, usability, and clinical outcomes. While these studies provide valuable insights into technological performance, they often overlook how individuals personally experience and make sense of using these devices in daily life. Studies by Sheets dkk., (2020) have begun to highlight emotional and cultural aspects, but their treatment remains limited in depth and scope. The theoretical foundation for this research is grounded in interpretative phenomenology, which emphasizes lived experience and meaning-making. This study builds upon existing literature by shifting attention from functionality to the subjective realities of users.

To explore this perspective, the study adopts Interpretative Phenomenological Analysis (IPA) as its methodological framework. This approach allows for a deep investigation into how users interpret their interactions with WMDs within the context of their everyday lives. It is especially suitable for addressing the limitations identified in earlier studies, which failed to reveal the experiential core of technology use. By focusing on personal narratives, IPA facilitates a richer and more holistic understanding of how WMDs are embedded in emotional, cognitive, and social dimensions. This method provides meaningful answers to the knowledge gap by uncovering how technology influences and reshapes users' sense of agency, identity, and care.

The structure of this article is as follows: The introduction outlines the phenomenon and its relevance to health and technology studies. The next section presents the specific background and research context for the study (Shi dkk., 2021). The methods section describes the phenomenological approach, participant selection, and data collection and analysis processes. This is followed by the results section, which organizes findings into thematic interpretations based on participants' lived experiences. Finally, the discussion and conclusion highlight key insights and their implications for theory, practice, and future research.

RESEARCH METHODS

Study Design

This study adopted an interpretative phenomenological approach to explore the lived experiences of individuals using wearable medical devices (WMDs) for chronic health monitoring at home (Shin dkk., 2019). The phenomenological method was selected due to its strength in uncovering the subjective meanings participants assign to their interactions with technology in a healthcare context. As a qualitative inquiry grounded in Heideggerian philosophy, interpretative phenomenology seeks to understand not only what individuals experience, but also how they interpret and make sense of those experiences within their lifeworld. This design was deemed suitable for investigating the deeply personal and context-specific dimensions of health technology use that quantitative methods may overlook.

Participants

Participants in this study consisted of adult individuals diagnosed with chronic illnesses who had been using wearable medical devices for at least six months as part of their home-based health monitoring routine. A purposive sampling strategy was employed to ensure relevance to the phenomenon under investigation. Inclusion criteria required participants to be aged 30 years or older, capable of providing informed consent, and actively engaged in using WMDs such as smartwatches, biosensor patches, or continuous monitoring devices (Wang dkk., 2019). Individuals with cognitive impairments or those who discontinued device use within the last three months were excluded. The final sample included ten participants (6 females and 4 males), with an age range of 34 to 67 years (mean age = 51), representing diverse socio-economic and occupational backgrounds to capture a variety of perspectives.

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Data Collection

Data were collected through in-depth, semi-structured interviews conducted in-person at participants' homes or private settings of their choosing, ensuring both comfort and confidentiality. An interview guide was utilized to steer the conversation while allowing flexibility for participants to elaborate on significant aspects of their experiences. Interviews lasted between 45 and 90 minutes and were audio-recorded with prior consent (Yang dkk., 2019). Field notes were also taken to capture non-verbal cues and contextual details. All interviews were transcribed verbatim, and identifying information was removed during the transcription process to protect anonymity. The interview protocol was adapted from validated phenomenological studies and refined through pilot testing with two non-participating individuals.

Data Analysis

Data were analyzed using Interpretative Phenomenological Analysis (IPA), which emphasizes a detailed, case-by-case exploration of participants' lived experiences. Following IPA principles, analysis proceeded idiographically—each transcript was analyzed individually before identifying patterns across cases. The process began with multiple readings of each transcript to facilitate immersion, followed by initial noting that captured descriptive, linguistic, and conceptual comments. These notes informed the development of emergent themes grounded in the participants' own words and context.

Subsequently, emergent themes were clustered into superordinate themes through an inductive process that prioritized participants' meaning-making rather than imposing pre-established codes. Throughout this stage, reflexive engagement was maintained to account for the double hermeneutic process, wherein the researcher interprets how participants make sense of their experiences. NVivo software was used as a tool for organizing data and enhancing auditability, but not to automate coding. The final thematic structure was refined collaboratively among researchers to ensure interpretative depth, transparency, and fidelity to IPA's phenomenological foundations.

Ethical Considerations

Ethical approval was obtained from the appropriate institutional review board prior to data collection. Participants were provided with detailed information about the study's purpose, procedures, and their rights, including the right to withdraw at any time without consequences. Written informed consent was secured from all participants (Zhu dkk., 2019). Confidentiality and anonymity were ensured through the use of pseudonyms and secure data storage. This study complied with ethical standards outlined in the Declaration of Helsinki and adhered to national guidelines for conducting research involving human subjects.

RESULTS

Feeling Cared for Yet Watched — Duality of Surveillance and Support

Participants frequently expressed a sense of being simultaneously empowered and observed through the use of wearable devices. While the technology offered reassurance and a perceived extension of professional medical care, it also introduced an element of psychological surveillance.

"It's like having a nurse on my wrist… but sometimes I wonder if I'm living for myself or the machine." (P3)

This theme illustrates the dialectic tension participants felt: WMDs acted as a bridge to healthcare providers, reducing anxiety about health deterioration, yet they also evoked a subtle loss of autonomy.

Wearable Medical Devices: Dual Impact

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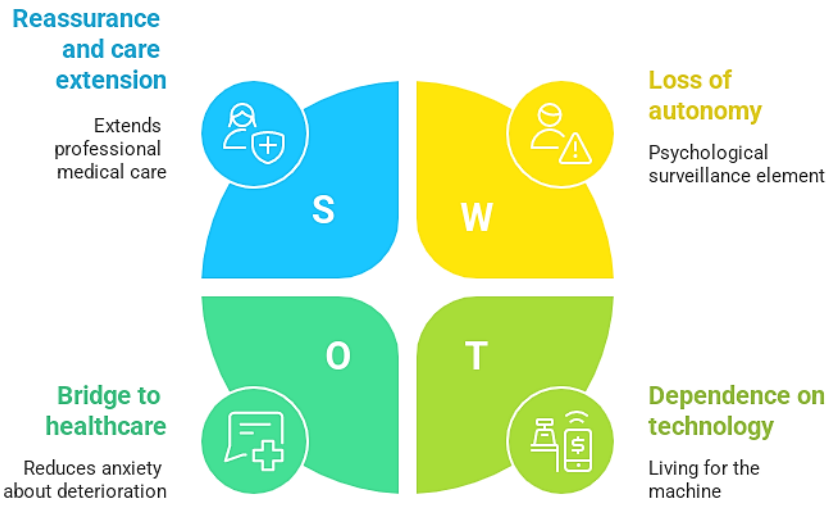

Reclaiming Control — Technology as an Agent of Empowerment

Many participants experienced a renewed sense of agency in managing their chronic conditions. They described WMDs as tools that helped them actively participate in their care, monitor symptoms, and make informed decisions.

"Before, I waited for symptoms to hit. Now, I can see the signs early and act. It gives me control again." (P6)

This theme emphasizes the empowering aspect of WMDs, particularly in shifting the locus of control from healthcare professionals to the individuals themselves, enhancing their health literacy and self-confidence.

Emotional Attachment to Technology — Humanizing the Device

Some participants developed an emotional connection to their devices, anthropomorphizing them or associating them with loved ones. These bonds suggest that the devices were not merely functional but had integrated into the personal and emotional fabric of daily life.

"My watch reminds me of my mother—always reminding me to take care of myself. It's like she's still with me." (P4)

This humanization of technology underscores the emotional meanings ascribed to WMDs, which extended beyond utility into realms of memory, comfort, and companionship.

Negotiating Privacy and Trust in a Digitally Mediated Space

Despite recognizing the benefits, participants also voiced concerns regarding data privacy and trust. The continuous collection and transmission of health data raised questions about who accessed the information and for what purposes.

"I like knowing my doctor can see my data… but I'm not sure who else might be watching." (P2)

This theme reveals a tension between the convenience of real-time monitoring and the ambiguity surrounding data governance, reflecting broader societal concerns about digital surveillance in healthcare.

Across the themes, participants' experiences illustrate a complex interplay between technological empowerment and vulnerability. The WMDs were not just clinical tools but deeply embedded in users' social, emotional, and existential contexts. These findings highlight the nuanced and multifaceted meanings users attach to wearable medical devices in managing chronic health conditions at home.

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DISCUSSION

The findings of this study reveal that individuals using wearable medical devices (WMDs) for chronic health monitoring experience a complex interplay of empowerment, emotional connection, and concerns about surveillance and data privacy. These experiences reflect the deeper meanings patients assign to the presence of health technology in their daily lives and address the central research question concerning how users make sense of and engage with wearable devices in a home-care context.

The results contribute meaningfully to answering the primary question posed in the introduction by uncovering the subjective dimensions of technology use that are often hidden in quantitative evaluations (Ahmed, 2020). The study demonstrates that WMDs are not perceived merely as tools for clinical efficiency but are deeply woven into patients' self-perceptions, routines, and emotional landscapes. Participants' narratives reflect how these devices reshape their understanding of health responsibility, personal agency, and emotional security, providing a richer and more nuanced perspective on their role in digital health.

These findings align with and extend previous literature, such as Bunnik dkk., (2021) exploration of the psychological dimensions of wearable technology use, by adding depth to our understanding of how these technologies become emotionally significant. Similarly, the dual themes of empowerment and surveillance echo the dialectic observed by Cannon dkk., (2021), who identified both trust and unease among rural users of telemedicine platforms. However, this study advances the discourse by showing how these themes are simultaneously experienced and interpreted by users as they live with technology daily. The research also supports the theoretical lens of interpretative phenomenology, which asserts that individuals' experiences are shaped not only by functional interaction but also by their broader social, emotional, and existential contexts.

The findings of this study hold important implications for both the scientific community and healthcare practice. From a social and cultural perspective, the use of wearable medical devices reconfigures traditional understandings of patient care by shifting responsibility toward the individual while simultaneously embedding healthcare within intimate, daily routines. This duality—empowerment coupled with perceived surveillance—calls for more human-centered designs that recognize emotional and psychological dimensions of technology use (Grassi dkk., 2019). For healthcare providers and device developers, acknowledging users' emotional attachment and concerns about data privacy could inform more ethical and personalized approaches to digital health intervention. Furthermore, the insights drawn from this study are relevant beyond the immediate population, as they reflect broader global shifts toward digitally mediated, home-based care in chronic disease management.

Despite these contributions, the study is not without limitations. The sample was limited to individuals with sufficient technological literacy and stable access to WMDs, potentially excluding users from more vulnerable or digitally marginalized groups. The interpretative nature of phenomenological inquiry also means that findings are context-specific and not meant for broad generalization. While this is consistent with phenomenological aims, it constrains the transferability of results to different healthcare systems or cultural settings. Additionally, reliance on self-reported narratives may introduce bias, though this is addressed in part by methodological strategies such as triangulation and member checking.

Looking ahead, future research could explore variations in experience across different demographic or cultural groups, particularly in low-resource or rural environments where technology access and health beliefs may differ (Hajj dkk., 2021). Longitudinal studies might also investigate how user perceptions of WMDs evolve over time, especially as devices become more advanced and integrated into everyday life. Expanding this line of inquiry could deepen our understanding of digital health's role in shaping identity, autonomy, and care relationships—key questions at the intersection of technology, health, and the human experience.

CONCLUSION

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This study explored the lived experiences of individuals using wearable medical devices (WMDs) to manage chronic health conditions at home, aiming to understand how users interpret and engage with these technologies in their daily lives. The findings revealed a dynamic interplay between empowerment, emotional attachment, and concerns about digital surveillance, highlighting the deeply personal and contextual nature of device use. Through an interpretative phenomenological approach, this research offered rich insights into the subjective meanings users assign to WMDs, addressing gaps in previous studies that focused mainly on clinical or usability metrics. By emphasizing emotional, cognitive, and relational dimensions, the study contributes to more human-centered perspectives on digital health. These insights should prompt healthcare professionals and policymakers to prioritize not only functional efficiency but also the lived realities of users when designing and implementing wearable health technologies. A shift toward empathetic, participatory, and culturally responsive design is essential to ensure these devices align with users' values, identities, and daily practices. Researchers are encouraged to build on this work by conducting longitudinal and cross-cultural studies that can inform inclusive digital health strategies at scale.

Failure to address the complex human dimensions of technology use risks reinforcing health disparities and diminishing user trust—highlighting an urgent need for policies and innovations grounded in experiential understanding.

CONFLICT OF INTEREST

The authors declare that there is no conflict of interest regarding the publication of this article. All authors have contributed independently and ethically, and no financial or personal relationships exist that could have inappropriately influenced the research and findings reported in this study.

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