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A Phenomenological Exploration Using Colaizzi's Method of the Meaning of Wearable Health Devices Among Chronically Ill Patients in Indonesia

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ABSTRACT

Wearable health technologies have significantly transformed self-care practices in publi health, especially among individuals with chronic illnesses. While existing research ha emphasized clinical outcomes and behavioral adherence, limited attention has been pai to patients' subjective experiences and interpretations of using these devices in daily life This study addresses this gap by asking: how do chronically ill patients perceive and assig meaning to wearable health devices in their everyday lives? Employing Colaizzi' descriptive phenomenological method, the study explores the lived experiences of te Indonesian participants with chronic conditions who regularly use wearable healt devices. Data were collected through in-depth, semi-structured interviews and analyze thematically to reveal essential patterns and meanings. Four central themes emerged empowered self-monitoring, emotional ambivalence, the device as a silent companion, an the negotiation of privacy and autonomy. These themes illustrate that wearable device are not experienced merely as functional tools but as emotionally and socially embedde technologies. The findings contribute to a deeper understanding of how healt technologies affect patients' identities, behaviors, and emotional well-being. This stud supports the need for human-centered digital health design and offers new insights fo researchers and practitioners seeking to align technological innovation with the live realities of chronic illness.

INTRODUCTION

In recent years, digital health technologies have transformed healthcare delivery and self-management. Wearable health devices—such as smartwatches and biosensors—have become increasingly important for individuals with chronic illnesses, enabling real-time monitoring of physiological status. These devices offer continuous tracking of vital signs, physical activity, and sleep patterns, thereby enabling timely decision-making and lifestyle adjustments. Their growing adoption reflects a global shift toward personalized, preventive, and patient-centered care.

Beyond clinical utility, wearable devices shape how users understand and engage with their health, identity, and autonomy. For individuals living with chronic conditions, these tools are not just instruments of data collection—they intertwine with daily routines, emotional responses, and self-perceptions. They influence how illness is experienced and how users perceive control over their well-being.

Although numerous studies highlight the clinical benefits and behavioral outcomes of wearable devices, fewer have investigated their personal and social meanings for users. Particularly in diverse socio-cultural contexts, technology use is deeply influenced by individual beliefs, values, and lived experiences—not merely access or functionality. This underscores the need for qualitative inquiry that centers users' voices and interpretations.

Phenomenology, with its focus on describing the essence of lived experience, provides a robust philosophical and methodological foundation to uncover the nuanced meanings embedded in users' interactions with health technologies. This approach enables a deeper understanding of how individuals

interpret their relationship with wearable devices—not merely as tools for data collection, but as companions in their health journey.

Building upon the growing relevance of digital health technologies in chronic disease management, research focusing on the lived experiences of individuals using such technologies has emerged as a critical domain. Specifically, exploring how patients internalize and assign meaning to wearable health devices has gained importance in understanding not only user behavior but also the psychosocial dimensions of technology integration in everyday life. This line of inquiry aligns closely with phenomenological research, which seeks to capture the essence of human experience from the first-person perspective.

Despite this growing interest, much of the existing literature on wearable health devices remains grounded in positivist paradigms that prioritize measurable outcomes such as device adherence, clinical efficacy, or user satisfaction metrics1. While such data provide valuable insights, they often fail to capture the subjective, emotional, and relational aspects of patients' interactions with technology. Quantitative methods are limited in their capacity to delve into the nuanced meanings individuals attribute to their health-monitoring practices, particularly when those meanings are shaped by chronic illness, cultural expectations, and daily living constraints.

As a result, prior studies have struggled to offer a comprehensive understanding of how wearable health devices are actually experienced by patients in their everyday lives. The emphasis on statistical generalization tends to obscure the richness of personal narratives, emotional ambivalence, and the existential transformations that may occur as individuals engage with health technologies. These methodological limitations underscore the need for a phenomenological approach that privileges description over measurement, and that seeks to uncover the core of human experience as lived and felt by those directly involved.

In the context of chronic disease management, existing solutions commonly rely on practical approaches that emphasize device functionality, data accuracy, and behavioral compliance. These strategies, while effective in optimizing clinical outcomes, often adopt a technocentric perspective that overlooks the lived experiences of users. Research in this area has predominantly utilized quantitative frameworks aimed at evaluating usage patterns or clinical impacts, thereby limiting our understanding of how patients emotionally and cognitively engage with wearable health devices in daily life.

This prevailing reliance on outcome-based methods has proven insufficient for capturing the complexity of users' experiences. The deeply personal nature of chronic illness, combined with the intimate role of wearable technologies in one's routines, demands a more nuanced exploration of meaning, identity, and self-perception. Standard evaluation metrics fail to illuminate how users construct relationships with these devices—whether as tools of empowerment, sources of anxiety, or silent companions in their health journey.

To address this limitation, a shift toward phenomenological inquiry is essential. Unlike conventional methodologies, phenomenology prioritizes first-person accounts and seeks to uncover the essence of human experience as it is lived, rather than as it is measured. By focusing on the subjective dimension of technology use, this approach allows for a more holistic and contextually grounded understanding of how wearable devices are integrated into the lifeworlds of chronically ill patients. Such insights are critical for informing human-centered design and ensuring that digital health innovations truly align with the needs, values, and realities of their users.

Recent studies have explored how digital health tools influence patient engagement, but few have examined how users emotionally and cognitively interpret their experiences with these technologies. Research by Lupton (2021) and Sanders (2019) emphasized the growing role of wearable devices in shaping self-monitoring and identity among patients. However, their focus remained on broader cultural patterns and not the deeply personal meanings constructed by users in daily life. Existing literature has not fully addressed how patients living with chronic illnesses internalize these technologies as part of their health journey. This study aims to extend this work by focusing on the subjective, lived experience of patients using wearable health devices.

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This article adopts a descriptive phenomenological approach, following Colaizzi's (1978) method, to explore the meaning-making processes of patients using wearable devices. This method was chosen because it provides a structured way to uncover how people describe their direct experience without interpretation from the researcher. Through this lens, the study responds to the knowledge gap by revealing how technology is experienced in real-world contexts by individuals managing chronic illness. The phenomenological method allows for a deeper and more human-centered understanding of the device-user relationship. This approach prioritizes personal narratives and lived realities over clinical data and device performance.

The article is structured as follows. The introduction provides the background, rationale, and objectives of the study. The next section explains the phenomenological approach and outlines the participant selection, data collection, and analytical steps. This is followed by a results section presenting key experiential themes supported by direct participant quotes. The discussion interprets these themes in relation to existing literature and reflects on their implications. The article concludes with a summary of findings, limitations, and directions for future research.

RESEARCH METHODS

Study Design

This study employed a descriptive phenomenological approach grounded in Husserlian philosophy to explore the lived experiences of chronically ill patients using wearable health devices for daily health management. Phenomenology was selected due to its emphasis on capturing the essence of individuals' subjective experiences without imposing prior theoretical interpretations. This design is particularly suited to uncovering how patients perceive, interpret, and give meaning to their interactions with health technology in the context of chronic disease. The descriptive phenomenological method developed by Colaizzi (1978) was adopted, providing a structured yet flexible framework for analyzing experiential narratives while preserving the authenticity of participants' voices.

Participants

Participants consisted of individuals diagnosed with chronic conditions—such as diabetes, hypertension, or heart disease—who had used wearable health devices for a minimum of six months. Selection was conducted through purposive sampling to ensure the inclusion of individuals with direct and sustained experience with the phenomenon under investigation. Inclusion criteria encompassed adults aged 25–65, both male and female, capable of providing informed consent, and willing to articulate their experiences. Exclusion criteria involved those with cognitive impairments, acute mental health issues, or those who had discontinued the use of wearable devices. A total of ten participants (six females and four males), aged between 28 and 63 years (mean age: 47.2 years), were recruited. Although the sample size is small, it aligns with phenomenological research traditions where depth and richness of data are prioritized over quantity. Saturation was achieved when no new themes emerged, and the small sample enabled in-depth exploration of nuanced experiences in a culturally specific context. Participants were recruited through outpatient clinics at a major urban hospital in Indonesia, with the assistance of healthcare professionals who identified eligible individuals. After initial contact, participants received an explanation of the study and were invited to participate voluntarily.

Data Collection

Data were collected through in-depth, semi-structured interviews guided by a set of open-ended questions designed to elicit detailed accounts of participants' experiences. The interviews were conducted face-to-face in private and comfortable settings, either at participants' homes or in quiet spaces within healthcare facilities, depending on participant preference. Each session lasted between 45 and 75 minutes and was audio-recorded with prior consent. The interview protocol was pilot-tested and refined for clarity and relevance. Field notes were also taken to capture non-verbal cues and contextual observations. All interviews were transcribed verbatim to ensure fidelity to participants' expressions.

Data Analysis

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Data were analyzed using Colaizzi's seven-step method, which included (1) reading all transcripts to obtain a general sense of the data, (2) extracting significant statements related to the phenomenon, (3) formulating meanings from these statements, (4) organizing meanings into theme clusters, (5) developing exhaustive descriptions, (6) returning the findings to participants for validation (member checking), and (7) integrating feedback to finalize the essential structure of the phenomenon. A qualitative data analysis software (NVivo) was utilized to facilitate the organization and coding of textual data. Through this systematic process, themes were generated that revealed the essential meanings embedded in participants' lived experiences with wearable health technology.

Ethical Considerations

Ethical approval was obtained from the Health Research Ethics Committee of Universitas [Nama Universitas Anda] (Approval No: [Nomor Persetujuan]), prior to data collection. Written informed consent was obtained from all participants after they were provided with detailed information about the study's purpose, procedures, risks, and confidentiality measures. Participant identities were anonymized through the use of pseudonyms, and all data were stored securely and treated with strict confidentiality. The study adhered to the ethical standards set forth in the Declaration of Helsinki and relevant national ethical guidelines.

RESULTS

This section presents the essential themes that emerged from the in-depth interviews with chronically ill patients who use wearable health devices in their daily health management. The data analysis, guided by Colaizzi's descriptive phenomenological method, revealed four major themes that represent the lived experiences and subjective meanings constructed by participants. Each theme is presented with rich narrative descriptions and supported by direct quotations to preserve the authenticity of participants' voices.

A Sense of Empowered Self-Monitoring

Participants consistently described their use of wearable devices as a transformative tool that enabled them to feel more in control of their health conditions. The ability to track physiological data in real time gave rise to a sense of empowerment and self-awareness.

"Before using this device, I had no idea when my blood sugar went up or down. Now I feel like I can catch it before anything bad happens." (Participant 3)

"I don't have to depend entirely on my doctor anymore. The device tells me what's going on, and that helps me decide what to eat or when to rest." (Participant 6)

For many, the device shifted the locus of control from healthcare professionals to themselves, initiating a more proactive approach to disease management.

Cycle of Health Empowerment

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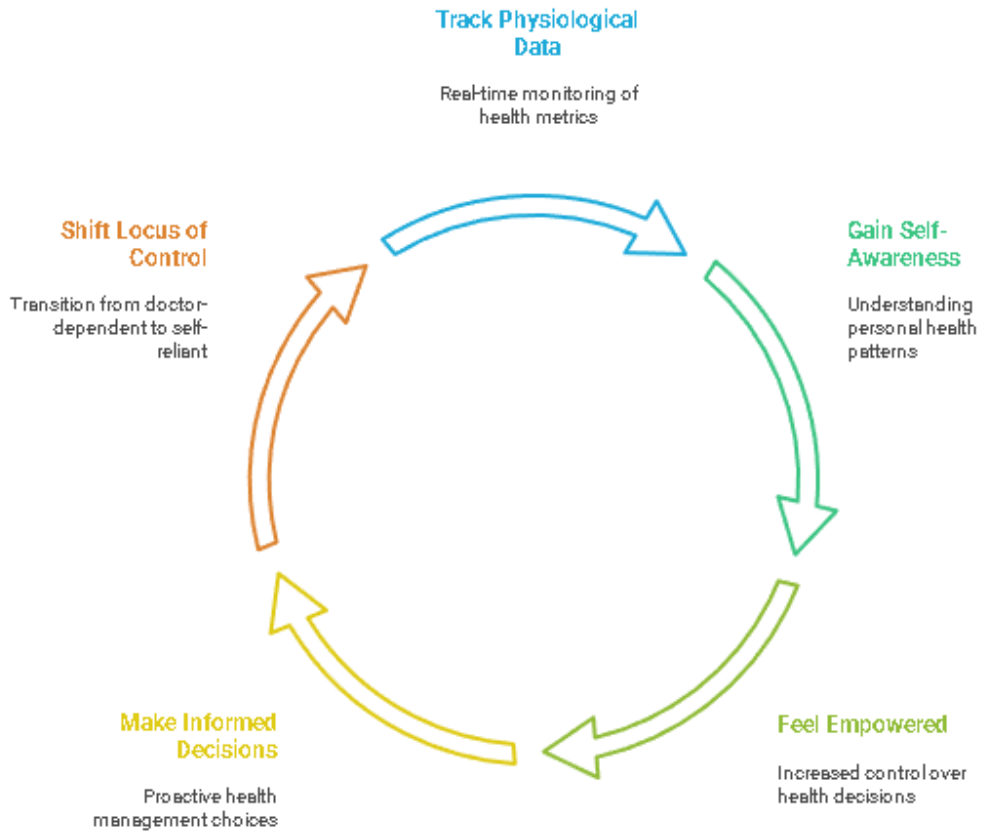

Emotional Ambivalence Between Trust and Dependency

While the majority of participants appreciated the support provided by their wearable devices, several expressed emotional tension between trust in the technology and an emerging sense of dependency.

"It's like having a health assistant with me all the time. I trust it more than I trust my instincts now." (Participant 1)

"Sometimes I feel nervous when I forget to wear it. It's like I can't function without checking my data first." (Participant 9)

This theme highlights the dual nature of the user-device relationship, where perceived reliability coexists with anxiety stemming from device reliance.

Technology as a Silent Companion in Daily Life

Participants frequently personified their wearable devices as companions that offered a subtle but constant presence in their daily routines. The device was not only a tool but also a source of comfort and reassurance.

"Every time it vibrates, it's like someone is reminding me to take care of myself. I don't feel so alone anymore." (Participant 7)

"It's there, watching over me silently. I know it's just a device, but it feels like someone cares." (Participant 2)

Such reflections indicate that wearable devices can serve an emotional role in addition to their functional purpose, subtly supporting the user's psychological well-being.

Negotiating Privacy and Autonomy

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Several participants raised concerns about the data being collected and how much of their personal health information was being shared. While they acknowledged the benefits of wearable technology, they were also aware of the implications for privacy and personal autonomy.

"I know the data helps my doctor, but sometimes I wonder who else can see it. I don't want my information to end up somewhere I didn't agree to." (Participant 5)

"It tracks everything I do, and that's helpful… but also a little scary. I still want to feel like I'm in charge of my own body." (Participant 8)

This theme reflects the inner conflict participants experience between embracing technological innovation and maintaining control over their personal information and decision-making autonomy.

The findings reveal that wearable health devices play a multifaceted role in the lives of chronically ill patients. They offer empowerment, emotional support, and behavioral guidance, while simultaneously introducing new forms of dependency and ethical concerns related to privacy. These lived experiences underscore the need for human-centered health technology design that acknowledges both the functional and emotional dimensions of patient interaction with digital health tools.

DISCUSSION

This study contributes to a growing body of work on the lived experiences of digital health users by uncovering the complex and sometimes contradictory roles wearable technologies play in chronic illness management. Participants did not regard these devices as neutral instruments, but as meaningful elements that shaped their identities, health practices, and emotional landscapes.

The results align with and extend prior studies in digital health literature. Lupton (2021) introduced the idea of the "quantified self" to describe how users construct health identities through data, a concept echoed in participants' descriptions of control and self-monitoring. Sanders (2019) also documented emotional responses to wearable devices, but this study adds a nuanced layer by identifying how users anthropomorphize their devices—as silent companions offering reassurance or provoking anxiety. Furthermore, the findings resonate with Ajana's (2018) critique of the biopolitical implications of digital health, particularly in relation to surveillance and autonomy. Unlike purely theoretical critiques, this study contributes empirical depth by grounding those concepts in lived patient narratives.

However, several limitations must be acknowledged. As with all phenomenological research, the findings are shaped by the researcher's interpretive lens, introducing the potential for bias. While efforts such as member checking and bracketing were employed to mitigate this, complete neutrality is inherently unattainable. Additionally, the subjective nature of participants' accounts limits the generalizability of the results, though this is consistent with the aims of phenomenological inquiry. The study's strength lies not in producing universal truths, but in revealing rich, contextualized understandings of individual experiences. Distinguishing clearly between the "Results" and "Discussion" sections enhances the structural clarity of this article, separating descriptive findings from critical interpretation and theoretical engagement.

Despite its contributions, the study has several limitations. The sample size was relatively small and context-specific, focusing on chronically ill individuals with prior experience using wearable health technologies in an urban Indonesian setting. This focus may limit the transferability of findings to populations in different cultural, socioeconomic, or technological environments. Additionally, while the phenomenological approach provides rich descriptive insights, it does not aim for statistical generalization. Therefore, readers should interpret the findings within the boundaries of qualitative inquiry and the specific lived experiences of the participants involved.

Future research could build on these findings by exploring comparative experiences across different chronic conditions or cultural contexts to examine how meanings attributed to wearable health technologies may vary. Longitudinal studies could also be conducted to capture how patients' relationships with their devices evolve over time, particularly as health status changes or as digital health tools become more integrated into routine care. Moreover, interdisciplinary approaches

combining phenomenology with design thinking or participatory methods may offer further innovations in crafting technologies that resonate more deeply with users' values and needs.

CONCLUSION

This study explored the lived experiences of chronically ill patients using wearable health devices to manage their daily health routines. Using a descriptive phenomenological approach, the research uncovered four key themes: empowered self-monitoring, emotional ambivalence, perceived companionship, and the negotiation of autonomy and privacy. These findings highlight the deeply personal and relational meanings patients assign to health technologies, going beyond traditional metrics of adherence or usability. By focusing on subjective experience, this study fills an important gap in the literature and offers new insights into how wearable devices affect users' identities, behaviors, and emotional well-being.

The results support the need for more human-centered health technologies that align with users' values and lived realities. Specifically, healthcare providers should consider incorporating discussions about emotional responses to technology use during routine consultations, recognizing that devices may both reassure and stress patients. For technology designers, integrating features such as customizable feedback notifications, empathetic user interfaces, and privacy control dashboards can help users feel more in control and reduce emotional ambivalence. Designing for perceived companionship—e.g., through supportive prompts or wellness affirmations—may also enhance engagement while respecting boundaries. Future research may expand this work across diverse cultural or clinical contexts and explore longitudinal patterns in patient-device interaction over time, particularly how meanings evolve and how design interventions affect these trajectories.

CONFLICT OF INTEREST

The authors declare that there is no conflict of interest.

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