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Exploring Patients' Lived Experiences and the Emotional and Psychological Impact of Wearable Medical Devices in Chronic Disease Management

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ABSTRACT

Wearable medical devices have revolutionized healthcare by enabling continuous monitoring and management of chronic diseases. Despite advancements in technology, limited research has explored the subjective experiences of patients who use these devices, particularly their emotional and psychological responses. While existing studies have focused on device performance and clinical outcomes, the personal meaning and impact on patients' lives remain underexplored. This study aims to fill this gap by exploring the lived experiences of patients using wearable devices for chronic disease management. Using a qualitative phenomenological design to capture the essence of patients' lived experiences, in-depth insights were gathered from 12 participants through semi-structured interviews, revealing that while wearable devices empower patients, they also introduce emotional stress due to constant monitoring. The analysis identified two main themes: empowerment through health data and the anxiety associated with continuous monitoring. These findings contribute to understanding the complex relationship between technology and patient well-being, emphasizing the need for a balance between technological benefits and psychological comfort. The study's implications highlight the importance of considering emotional aspects in the design and implementation of wearable medical devices for chronic disease management, suggesting avenues for future research to address these challenges.

INTRODUCTION

The integration of wearable medical devices into healthcare has become increasingly prevalent, particularly in the management of chronic diseases (Deyell et al., 2020). These devices, such as fitness trackers, heart rate monitors, and glucose meters, are designed to provide real-time health data to both patients and healthcare providers. The broader field of biomedical engineering has seen significant advancements in medical technologies, aiming to improve the quality of life for individuals with chronic conditions. As these devices become more sophisticated, they offer new possibilities for disease management, remote monitoring, and personalized healthcare (H.-J. Lin et al., 2020). However, despite the technological advancements, the subjective experiences of patients who use these devices remain underexplored, especially in terms of how these innovations are perceived, adapted to, and integrated into daily life.

The relevance of studying the experiences of individuals using wearable medical devices lies in understanding the broader impact of technology on health management from a human perspective (McGirt et al., 2020). While there is a wealth of research on the efficacy and technical aspects of these devices, less attention has been given to the emotional, psychological, and social implications that such technologies have on users. These devices do not merely serve as tools for monitoring; they represent a shift in the way individuals manage their health and perceive their well-being (Mukhlis et al. 2023). The adoption of wearable technology for health management can alter patients' sense of

agency, autonomy, and control over their health, making it essential to explore the lived experiences of those who rely on these innovations.

The need for a deeper understanding of the lived experiences of patients is particularly pertinent in the context of chronic disease management (Lang et al., 2023). Phenomenology, with its focus on capturing and interpreting the subjective experiences of individuals, offers a valuable framework to explore how patients perceive and make sense of their interactions with wearable medical devices. By delving into the personal meanings and emotional responses associated with these technologies, phenomenology provides insights into the ways in which such devices affect patients' everyday lives, health behaviors, and overall quality of life (Têot & Ohura, 2021). This exploration is crucial, as it can inform the design and implementation of future medical technologies that are more attuned to the needs, concerns, and experiences of patients.

Research into the lived experiences of individuals, particularly in relation to the use of medical technologies such as wearable devices, has become a crucial area of study in recent years. Understanding the personal, subjective experiences of patients provides valuable insights into the human aspects of healthcare, particularly for those managing chronic diseases (Blower et al., 2020). This field is vital as it moves beyond the technical effectiveness of medical devices to explore the deeper meanings that patients assign to their experiences with these technologies. In the context of wearable medical devices, studies have often focused on quantitative metrics, such as usability, clinical outcomes, or health improvements (Mukhlis & Saidah, 2025). While these aspects are undoubtedly important, they fail to capture the nuanced, emotional, and personal experiences of patients, which are central to their overall acceptance and effectiveness.

One of the primary challenges in exploring these lived experiences is the methodological limitations of existing research approaches (Dansey et al., 2020). Quantitative studies, which dominate much of the current literature, are well-suited for measuring objective variables but fall short when it comes to uncovering the subjective and emotional dimensions of patient experiences. These approaches cannot capture the complexities of how patients perceive and adapt to technology in their everyday lives, nor can they fully address the psychological impacts of using such devices (Patel et al., 2020). As such, existing studies are limited in their ability to provide a holistic understanding of the phenomenon.

The lack of a methodological approach that emphasizes the subjective experience makes many previous studies inadequate for comprehensively exploring the essence of patients' relationships with wearable devices (Smokovski et al., 2024). Phenomenology, by focusing on individuals' lived experiences, offers a more effective means of addressing these gaps. By emphasizing the subjective meanings and personal insights that patients derive from their interactions with medical technologies, phenomenology enables a deeper understanding of the emotional, psychological, and practical impacts that these devices have on individuals (Mukhlis, 2025). This research, grounded in phenomenological methodology, seeks to fill this gap by providing a richer, more nuanced understanding of the lived experiences of patients using wearable medical devices for chronic disease management.

While existing research on wearable medical devices for chronic disease management has provided valuable insights, much of the literature has focused on practical, quantitative approaches to evaluating device efficacy, usability, and health outcomes (Maatman et al., 2020). These studies often rely on metrics such as adherence rates, clinical improvements, and device performance, providing a solid foundation for understanding the technical effectiveness of wearable devices (A. Y. Lin et al., 2021). However, this practical approach tends to overlook the deeper, subjective experiences of patients the emotional, psychological, and social impacts that play a crucial role in the acceptance and long-term effectiveness of such technologies.

The current body of research lacks a comprehensive understanding of the lived experiences of patients using wearable devices (Petersen et al., 2021). Although clinical and usability studies highlight important aspects of device functionality, they do not capture the personal meanings that individuals attach to their interactions with these technologies (Mukhlis & Abdullah, 2025). This gap limits our ability to understand how wearable devices truly impact the lives of patients,

particularly in terms of their emotional responses, sense of agency, and integration of these devices into their daily routines. Furthermore, current methodologies do not explore how patients experience the continuous monitoring and data collection inherent in wearable devices, which can have significant psychological effects.

To address this gap, a phenomenological approach offers a valuable alternative. Phenomenology, with its focus on uncovering the essence of lived experiences, enables a deeper exploration of the subjective meanings patients assign to their interactions with wearable medical devices (Kouri et al., 2021). By examining the personal, lived experiences of patients, phenomenology provides a more holistic understanding of how wearable devices influence their health management, daily lives, and emotional well-being. This approach allows for a richer exploration of the impacts of wearable technologies, moving beyond technical performance to consider how patients truly perceive and experience these innovations (Sezgin et al., 2023). Therefore, adopting a phenomenological framework will fill a critical gap in our understanding of wearable medical devices, offering new insights into their role in chronic disease management.

Existing research on wearable medical devices has primarily focused on their technical effectiveness and usability, often relying on quantitative measures such as adherence rates and health outcomes (Vinit et al., 2020). However, fewer studies have explored the subjective experiences of users, particularly in the context of chronic disease management. Literature on the emotional and psychological impact of these technologies remains sparse, even though these factors significantly influence patient adherence and overall well-being (Mukhlis et al. 2025). Theories such as Vygotsky's sociocultural theory and Bandura's self-efficacy model suggest that technology adoption is deeply tied to personal meaning and empowerment, which are key components of patient experience. Previous studies on wearable devices have thus failed to fully capture the complexity of these interactions, highlighting a need for a more comprehensive exploration using qualitative methods.

To address this gap, we propose a phenomenological approach to explore the lived experiences of patients using wearable medical devices. Phenomenology allows for an in-depth investigation into the personal meanings patients attach to these technologies and how these devices affect their emotional and psychological states. The primary objective of this study is to uncover the essence of patients' emotional and psychological experiences while using wearable devices for chronic disease management, thereby directly responding to the underdeveloped emotional focus in existing literature. By focusing on the experiences of individuals, this approach offers a more holistic understanding of wearable devices beyond their technical function. It directly addresses the gap identified in previous literature by providing insights into the lived experiences and subjective realities of patients, which are often overlooked in more quantitative studies.

RESEARCH METHODS

Study Design

This research utilized a phenomenological approach to explore the lived experiences of patients using wearable medical devices to manage chronic diseases (Gharibans et al., 2022). The phenomenological design was selected due to its emphasis on understanding the subjective experiences of individuals, which aligns with the aim of uncovering the meaning and essence of patients' interactions with technology. Phenomenology allows for an in-depth exploration of how individuals perceive and make sense of their lived experiences, providing rich insights into the personal and emotional impacts of medical innovations. Specifically, a descriptive phenomenological approach was employed to focus on the detailed descriptions of participants' experiences without interpreting or analyzing them prematurely. This method enables a direct examination of the phenomenon as experienced by the participants, thereby offering a comprehensive understanding of the effects of wearable medical devices.

Participants

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Participants were selected using purposive sampling, ensuring they had relevant experience with wearable medical devices for chronic disease management. The inclusion criteria required participants to be adults aged 30 to 65, diagnosed with a chronic condition (such as diabetes, hypertension, or cardiovascular diseases), and currently using a wearable medical device to monitor or manage their health (Kooij et al., 2021). The age range of 30 to 65 years was intentionally selected to capture individuals who are both actively engaged in long-term disease self-management and technologically capable of integrating wearable devices into their daily routines. Adults within this range are more likely to experience sustained exposure to chronic disease management responsibilities, while also representing a demographic group with significant adoption rates of digital health technologies. This rationale enhances the relevance of the findings to the primary population segment using wearable devices for chronic care.

The selection of chronic conditions—diabetes, hypertension, and cardiovascular diseases—was based on their high global prevalence, long-term management requirements, and frequent reliance on continuous physiological monitoring. These conditions commonly involve measurable indicators (e.g., glucose levels, heart rate, blood pressure) that align directly with wearable device functionalities. By focusing on these diseases, the study ensures conceptual coherence between the technology examined and the lived management experience of participants.

Exclusion criteria included individuals who had not used wearable devices for at least six months or those with significant cognitive impairments that could hinder their ability to provide informed consent or participate in the interviews. The six-month minimum usage criterion was applied to ensure that participants had sufficient experiential depth to reflect meaningfully on both the practical and emotional dimensions of device use, rather than providing impressions based on short-term or trial experiences.

A total of 12 participants were involved in this study, with an average age of 47 years. Of these, 7 were male and 5 were female. The diversity in gender and age contributed to the varied experiences and perceptions of wearable medical devices within the target population. Although phenomenological research does not aim for statistical generalizability, the deliberate variation in age, gender, and disease type enhances the transferability of findings to similar adult populations managing chronic conditions with wearable technologies.

Data Collection

Data was collected through in-depth, semi-structured interviews. The interviews were designed to explore participants' experiences with wearable devices, their perceived benefits, challenges, and emotional responses. Each interview lasted approximately 60 to 90 minutes and was conducted in a quiet, comfortable setting to ensure participants felt at ease. The interviews were audio-recorded with participants' consent, and notes were taken to capture additional observations. A semi-structured interview guide was used, which allowed for flexibility in the conversation while ensuring that key topics were covered. The guide included questions about how participants used the devices, how it impacted their daily life, and their emotional and psychological responses. The interview protocol was adapted from previous studies on wearable technology, with modifications made to suit the specific context of chronic disease management (Bousquet et al., 2023). All interviews were conducted in participants' preferred language to ensure clear communication and comfort.

Data Analysis

The data were analyzed using Interpretative Phenomenological Analysis (IPA), a method that focuses on exploring how individuals make sense of their personal and social worlds. IPA was chosen because it allows for a detailed examination of the participants' subjective experiences and the meanings they attribute to their interactions with wearable medical devices. Data analysis involved several systematic steps: first, the interviews were transcribed verbatim. Then, each transcript was read multiple times to ensure a deep understanding of the participants' narratives. Next, significant statements and phrases were identified, and these were grouped into themes that reflected key aspects of the participants' experiences. The themes were further refined through a process of constant

comparison, leading to the identification of core themes that encapsulated the essence of the participants' lived experiences. NVivo software was used to assist in organizing and coding the data, though the focus remained on the interpretive process rather than the software itself. The final stage involved interpreting the themes within the context of the research questions, highlighting the emotional and psychological impacts of wearable medical devices on chronic disease management.

Ethics

Ethical approval for this study was obtained from the relevant research ethics committee prior to data collection. All participants were informed of the study's purpose, procedures, and their right to withdraw at any time without consequence. Written informed consent was obtained from all participants before the interviews began, ensuring they understood their rights and the confidentiality of their participation. The confidentiality of participants was maintained by assigning pseudonyms and securely storing the interview recordings and transcripts. All data were anonymized to protect participants' privacy, in accordance with ethical standards for research. The study adhered to the principles of respect, beneficence, and justice, ensuring that participants' experiences were treated with the utmost sensitivity and care.

RESULTS

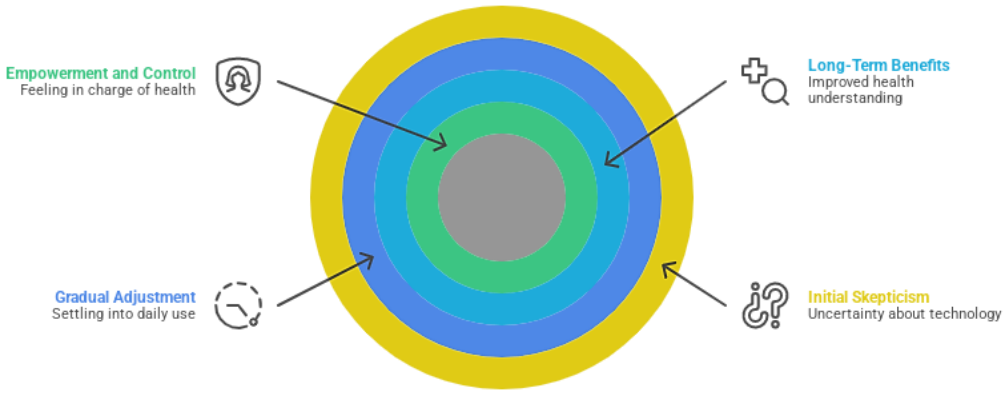
Adaptation to New Technology

One of the primary themes that emerged from the interviews was the patients' process of adaptation to wearable medical devices. Many participants expressed initial skepticism and uncertainty about the technology. However, over time, they found themselves gradually adjusting to the device's use in their daily lives. As one participant (P2) noted:

"At first, I wasn’t sure if this device would really help, but after using it for a few weeks, I began to notice how it gave me a better understanding of my health. It felt like I was in control again."

This sentiment was echoed by several other participants, highlighting that while the initial adjustment period was challenging, the long-term benefits became more apparent. The device allowed them to track important health metrics, thus offering a sense of empowerment and control over their condition.

Patient Adaptation to Wearable Medical Devices



Impact on Daily Life and Health Management

A second theme that surfaced in the interviews was the profound impact that wearable devices had on the participants' daily lives and their approach to managing chronic diseases. Patients described how the devices provided real-time health data, enabling them to make informed decisions about their health. Participant P3 shared:

"I used to miss taking my medication on time or forget about my doctor’s advice. But now, the device reminds me every time, and it makes me feel more in charge of my health. I can see the data in real-time, and it helps me make better choices."

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Another participant (P5) elaborated on the emotional benefits of using the device:

"The device has not just been a tool, it's a partner. It helps me keep track of my condition and gives me the confidence to manage my health more effectively."

This feedback indicates that the devices played an important role in improving the management of chronic conditions, offering not only tangible health data but also contributing to a sense of partnership and control for patients.

Emotional and Psychological Responses to the Wearable Device

The third theme identified in the analysis pertains to the emotional and psychological responses patients had to the wearable devices. Many participants reported feeling more secure and less anxious about their health once they began using the technology. One participant (P1) described:

"I used to feel anxious about not knowing if my health was getting worse. Now, I check my device every day, and it gives me peace of mind knowing where I stand."

Conversely, a few participants mentioned the stress associated with the constant monitoring of their health, suggesting that for some, the device could also evoke feelings of being overwhelmed or "over-monitored." Participant P4 stated:

"At times, I feel like it's always there, reminding me of my condition. It's useful, but it can also make me feel like I'm always being watched."

Despite these concerns, the majority of participants reported positive emotional outcomes, with the sense of control and empowerment outweighing any feelings of discomfort.

The findings of this study demonstrate that wearable medical devices have a significant and multifaceted impact on the lives of patients with chronic diseases. Through the use of these devices, patients experience both practical and emotional benefits, including enhanced health management, a greater sense of control, and improved peace of mind. However, it is also important to acknowledge that some patients experience negative psychological effects, such as anxiety or discomfort from continuous monitoring. These findings suggest the need for further exploration into how these devices can be optimized to balance both the benefits and potential stressors associated with their use.

DISCUSSION

The findings of this study reveal that wearable medical devices significantly impact the daily lives and emotional well-being of patients managing chronic diseases (Costain et al., 2020). Participants reported a sense of empowerment and control over their health, facilitated by real-time data provided by these devices. However, some participants also experienced feelings of being overwhelmed or over-monitored, illustrating the complexity of their relationships with the technology (Mukhlis, Janwari, et al., 2023). These findings align with the research question posed in the introduction, which sought to explore the subjective experiences of patients using wearable devices in chronic disease management (Lok et al., 2020). Through phenomenological analysis, this study provides a nuanced understanding of how these technologies are perceived and integrated into patients' lives.

The research answers the central question by uncovering the dual nature of patients' experiences with wearable devices (Hamo et al., 2024). On one hand, the devices were seen as empowering tools that allowed patients to take a more active role in managing their health, offering reassurance and a sense of control. On the other hand, the constant monitoring and data collection sometimes led to anxiety and stress, particularly among those who felt overwhelmed by the technology (Rahimi et al., 2020). This duality emphasizes the complexity of patient-device interactions and highlights the need for a balance between technological support and emotional comfort (Mukhlis et al., 2024). By focusing on these lived experiences, the study makes an important contribution to understanding the emotional and psychological dimensions of health technology, a largely underexplored area in existing literature.

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When compared with previous studies on wearable devices, our findings both align with and challenge existing theories. For example, studies on self-management of chronic diseases have highlighted the positive effects of technology in enhancing patient autonomy and engagement (Boehmer et al., 2024). However, the emotional challenges observed in our study, such as feelings of being over-monitored, echo concerns raised in other research about the psychological burden of constant health tracking. These findings also support Bandura's self-efficacy theory, which suggests that individuals' perceptions of their ability to manage their health are key to their engagement with health technologies (Mukhlis, 2025a). However, our study goes beyond this by revealing how the experience of empowerment is sometimes accompanied by stress and anxiety, which challenges the more optimistic portrayals of technology adoption seen in some earlier studies (Baseer et al., 2024). Thus, this research contributes to a more balanced understanding of how wearable medical devices affect patients, highlighting both the benefits and the challenges they present.

The findings of this study have significant implications for both the scientific community and the practical application of wearable medical devices in chronic disease management (Hausleiter et al., 2023). From an academic perspective, this research contributes to the growing body of literature that explores the intersection of technology and human experience. It highlights the complex emotional and psychological dynamics that influence how patients perceive and engage with wearable devices. The positive and negative effects reported by participants suggest that while these devices can empower patients by providing more control over their health, they also introduce new stressors (Li et al., 2020). This duality emphasizes the importance of considering both the practical benefits and the emotional costs of health technologies (Halpert et al., 2021). Practically, the findings suggest that healthcare providers and technology developers need to strike a balance between fostering autonomy and minimizing potential psychological burdens, ensuring that wearable devices are supportive without overwhelming patients.

Despite its valuable insights, the study is not without limitations. One of the key limitations is the relatively small and specific sample size, which may limit the generalizability of the findings to broader populations (Seike et al., 2022). The participants in this study were primarily adults aged 30 to 65, diagnosed with chronic conditions, and using wearable devices for disease management (Mukhlis, Arifin, Ridwan, Zulbaidah, et al., 2025). While this demographic is representative of many wearable device users, it does not encompass the full range of patient experiences, particularly among younger individuals, older adults, or those with different chronic conditions. Additionally, the study focused on a specific set of wearable devices, and the experiences of users with other technologies may differ (Jacobs et al., 2021). Future research should include a more diverse sample and consider a broader range of wearable devices to determine if the findings can be generalized across different groups and technologies.

The findings from this research open several avenues for future studies. First, it would be valuable to explore the experiences of younger patients or individuals with varying levels of health literacy to better understand how these factors influence the adoption and use of wearable devices (Mukhlis, Maryam, et al., 2023). Additionally, longitudinal studies could provide insights into how patients' experiences evolve over time, particularly regarding their emotional responses and the impact on their health outcomes (Chu et al., 2023). Further research could also examine the role of social support in patients' engagement with wearable devices, as social influences may mitigate or exacerbate the psychological effects observed in this study. Overall, this research lays the foundation for a more nuanced understanding of the intersection between health technology and the lived experiences of patients, providing a basis for further exploration in this critical area of healthcare.

CONCLUSION

This study explored the lived experiences of patients using wearable medical devices to manage chronic diseases, addressing the gap in existing literature that primarily focuses on technical outcomes rather than the subjective experiences of users. The findings revealed that while wearable devices empower patients by providing them with more control over their health, they also introduce emotional stress and feelings of being over-monitored. This duality highlights the need for a balance

between technological support and emotional comfort, offering valuable insights for both healthcare providers and device developers. By utilizing a phenomenological approach, this research contributes to a deeper understanding of the personal meanings patients attach to their interactions with wearable technology, which has been underexplored in previous studies. Importantly, the findings suggest several actionable strategies to reduce psychological stress associated with continuous monitoring. First, device developers should incorporate customizable notification settings that allow users to control the frequency, intensity, and type of alerts, thereby minimizing anxiety triggered by excessive data prompts. Second, integrating user-centered design principles—such as simplified dashboards and emotionally neutral data visualization—may help reduce cognitive overload and fear-based interpretations of health metrics. Third, healthcare providers should complement wearable device prescriptions with structured counseling or digital literacy sessions that help patients interpret health data in a balanced and context-sensitive manner. Furthermore, periodic "monitoring breaks" or adaptive monitoring modes—where data collection continues but alerts are limited to clinically significant thresholds—could reduce feelings of constant surveillance while maintaining clinical safety. Encouraging shared data interpretation sessions between patients and healthcare professionals may also strengthen patients' sense of agency and reduce anxiety associated with independent data monitoring. Future research could expand these findings by including a more diverse population and exploring the long-term effects of wearable device use on emotional well-being and health outcomes. Additionally, longitudinal studies and the inclusion of various device types could further refine our understanding of the relationship between technology and patient experience. Such investigations may also evaluate the effectiveness of the proposed stress-reduction strategies, thereby translating phenomenological insights into evidence-based design and policy recommendations for chronic disease management.

CONFLICT OF INTEREST

The authors declare that they have no conflict of interest related to this research.

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