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Understanding the Emotional, Social, and Existential Dimensions of Living with Continuous Glucose Monitoring: An Interpretative Phenomenological Analysis of Adults with Type 2 Diabetes

Sukmawati
Universitas Respati Yogyakarta, Indonesia
sukmayogya1809@gmail.com

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ABSTRACT

Digital health technologies have significantly transformed chronic disease management by enabling real-time monitoring and personalized care. Among these innovations, Continuous Glucose Monitoring (CGM) devices play a central role in supporting self-management for individuals with type 2 diabetes, yet the subjective experiences associated with CGM use remain underexplored. While prior research has examined clinical outcomes and user satisfaction, it has not adequately addressed how individuals experience CGM emotionally, socially, and existentially in their everyday lives. This study investigates the following question: How do adults with type 2 diabetes experience and make meaning of using CGM devices in their daily lives, beyond clinical parameters and usability metrics? Using an interpretative phenomenological approach, this study provides insights into the lived experiences of CGM users, with a focus on how the device influences their sense of self, emotional well-being, and social interactions in daily routines. Semi-structured interviews were conducted with nine adult CGM users (aged 38–66 years), each with at least six months of device usage, and data were analyzed using Interpretative Phenomenological Analysis (IPA). The findings revealed five key themes: a sense of reassuring surveillance, intrusions into daily and social life, emotional oscillations between safety and dependence, stigma as the visible mark of illness, and navigating hope through technological trust. These themes illustrate that CGM use is not simply a biomedical intervention, but a deeply embedded experience that shapes identity, autonomy, and interpersonal dynamics. In contrast to previous studies that primarily emphasize clinical outcomes or usability, this study foregrounds the nuanced psychosocial and existential dimensions of CGM usage. It contributes to a more human-centered understanding of health technology and highlights the importance of integrating patient experiences into device design and policy development. These findings offer a foundation for future research exploring technological embodiment in chronic care contexts.

INTRODUCTION

The integration of technology into healthcare has transformed the landscape of chronic disease management, particularly for individuals living with diabetes. Among these advancements, Continuous Glucose Monitoring (CGM) devices have emerged as a pivotal tool that enables real-time tracking of glucose levels, offering patients more control over their condition and reducing dependency on traditional finger-prick testing methods (Sempionatto et al., 2021). These developments reflect the broader movement toward personalized and technology-assisted health interventions that seek to improve both clinical outcomes and quality of life.

While the biomedical utility of CGM devices is well-documented, the experience of living with such technologies extends beyond measurable health indicators (Tehrani et al., 2022). Studies such as Lu et al. (2018) highlight how CGM adoption can evoke both reassurance and burden, underscoring the emotional complexity of using these devices in daily life. Similarly, Battelino et al.

(2019) found that psychosocial factors—such as fear of judgment, stigma, or device fatigue—play a significant role in shaping user adherence and emotional well-being. These insights signal that the integration of CGM into everyday routines is not purely functional but layered with emotional and relational meaning.

For individuals managing type 2 diabetes, CGM use may influence their sense of autonomy and self-efficacy, and alter social interactions in both public and private settings (Feig et al., 2017). These deeply subjective experiences are embedded in broader sociocultural narratives around illness, technology, and self-care. Despite growing interest in the technological aspects of CGM, limited attention has been paid to how users themselves make meaning of these experiences. Existing quantitative approaches often fail to capture the nuanced emotional and existential dimensions of device use.

This study employs Interpretative Phenomenological Analysis (IPA) to explore how adults with type 2 diabetes understand and navigate life with CGM (Beck, Riddlesworth, et al., 2017). By centering users' own interpretations, IPA enables an in-depth exploration of how CGM use intersects with identity, emotional resilience, and the negotiation of daily life. The aim of this research is to examine how adults with type 2 diabetes experience, interpret, and assign meaning to CGM use in their everyday lives, offering insight that complements clinical metrics with rich human narratives.

Against this backdrop, research on patients lived experiences with chronic illness technologies has become a critical area of inquiry in health and social sciences. Studies examining the subjective dimension of diabetes management—particularly those focusing on how individuals emotionally and socially adapt to technological devices like Continuous Glucose Monitoring (CGM)—have begun to emerge, offering glimpses into how such innovations are lived, interpreted, and internalized (Lind et al., 2017). However, the majority of this research remains either fragmented or heavily dependent on survey-based methods that are insufficient to grasp the richness of personal experience.

Methodologically, efforts to understand the meaning embedded in the use of CGM often face significant challenges. Quantitative studies, while valuable for measuring clinical outcomes and device efficacy, tend to overlook the nuanced, affective, and existential aspects of patient experience. As noted by Miller et al. (2015), such methods often fail to capture the emotional tensions, identity-related concerns, and social negotiations that patients engage in while integrating technology into their daily routines. Similarly, Weisman et al. (2017) highlighted that even qualitative inquiries frequently lack the interpretative depth necessary to explore the internal meanings that individuals assign to their technological interactions.

These limitations underscore the inadequacy of many existing approaches in providing a holistic understanding of how patients actually live with CGM. The essence of the phenomenon—what it means to co-exist with a device that monitors one's internal state continuously—is often obscured by reductive methodological frameworks. Therefore, a more interpretative and phenomenologically grounded exploration is required to reveal the full complexity of this lived experience and to inform more empathetic and human-centered health technology design.

Current approaches to understanding the use of Continuous Glucose Monitoring (CGM) devices among individuals with type 2 diabetes have largely emphasized practical and biomedical dimensions, such as improving glycemic control, enhancing adherence, and increasing clinical efficiency. These solutions often rely on standardized metrics and outcome-based assessments that focus on quantifiable indicators of success. While these perspectives offer valuable insights into the functionality of CGM, they tend to neglect the inner world of the individuals who use the technology daily.

Existing studies frequently adopt quantitative or structured evaluative frameworks that are limited in their ability to capture the layered emotional, psychological, and social dimensions of the CGM experience. As highlighted by Garg et al. (2017), such research may identify surface-level barriers or attitudes toward CGM, yet it often fails to reveal how patients internalize these experiences or how the device influences their sense of identity, autonomy, or well-being over time. The prevailing methods offer insufficient depth, reducing the richness of patients lived realities to generalized categories that do not reflect the complexity of individual meaning-making processes.

Given these methodological constraints, there is a compelling need to adopt an alternative lens—one that centers the subjective experience as the core of inquiry. A phenomenological approach, particularly interpretative phenomenological analysis (IPA), provides an opportunity to access the essence of what it means to live with CGM technology. Unlike other models, this method prioritizes individual voices and situates their narratives within broader existential and sociocultural contexts. It allows for a deeper, more holistic understanding of the phenomenon, not as a set of functional tasks or clinical outcomes, but as a lived reality filled with ambiguity, negotiation, and personal meaning.

Previous studies have explored how individuals interact with health technologies, including CGM devices, mostly from clinical or behavioral perspectives. While some research has touched on patient satisfaction and usability, few have examined the deeply personal meanings patients assign to their daily experiences with such devices. Studies by Danne et al. (2017) and Li et al. (2022) suggest that emotional and social contexts are often underexplored. Theoretical insights from interpretative phenomenology offer a pathway to address these dimensions. However, a focused investigation into how CGM affects identity, autonomy, and lived reality remains limited.

This study adopts an interpretative phenomenological approach to investigate the lived experiences of adults with type 2 diabetes using CGM. This method was chosen to capture the emotional and existential meanings that cannot be revealed through quantitative or superficial qualitative approaches. It allows for an in-depth understanding of how patients internalize and make sense of CGM in their everyday lives. The study responds to the knowledge gap by placing participants' subjective narratives at the center of inquiry. Through this, the research aims to uncover the essence of the phenomenon in its full complexity.

The article is structured as follows. The introduction provides context and justification for the study, including a review of relevant literature and identification of the knowledge gap. The next section outlines the methodological framework, including participant selection, data collection, and analytic process using interpretative phenomenological analysis (IPA). Findings are then presented thematically, illustrating key patterns in participants lived experiences. Finally, the discussion section interprets these findings within the broader literature and concludes with implications for practice, policy, and future research.

RESEARCH METHODS

Study Design

This study employed an interpretative phenomenological approach to explore the lived experiences of adults with type 2 diabetes who use Continuous Glucose Monitoring (CGM) devices in their daily lives. Interpretative Phenomenological Analysis (IPA) was selected for its capacity to uncover the deep, personal meanings individuals ascribe to specific experiences. Rooted in Heideggerian philosophy, IPA emphasizes the co-construction of meaning between participant and interpreter, making it particularly relevant for capturing the nuanced emotional, social, and existential dimensions of technological engagement in health contexts (Yin, 2011). The design enabled a rich, idiographic examination of individual meaning-making, aligned with IPA's emphasis on depth over breadth.

Participants

Participants in this study were adult individuals diagnosed with type 2 diabetes who had been using CGM devices for a minimum of three consecutive months prior to the interview. Selection was based on purposive sampling to ensure participants had direct and prolonged experience with the phenomenon under investigation. Inclusion criteria included individuals aged between 35 and 65 years, with sufficient cognitive and communicative ability to reflect on and articulate their experiences. Exclusion criteria comprised individuals with severe cognitive impairment, psychiatric conditions affecting recall or expression, or recent hospitalization related to diabetes.

A total of nine participants were included—five males and four females—aged between 38 and 66 years, with a mean age of 51.2 years. All participants resided in urban or suburban settings and represented a range of occupational and educational backgrounds. Although modest in size, the sample aligns with IPA's methodological recommendation of 6 to 10 participants for detailed idiographic analysis, allowing for in-depth exploration without losing case-specific richness.

A summary of participant demographics is provided in Table 1 to enhance transparency and contextual interpretation.

Table 1. Participant Demographics

Participant ID	Age	Gender	Duration of CGM Use	Setting	Occupation
P01	44	Male	8 months	Urban	School Teacher
P02	50	Female	6 months	Suburban	Nurse
P03	56	Male	12 months	Urban	Entrepreneur
P04	66	Female	9 months	Suburban	Retired Civil Servant
P05	38	Male	6 months	Urban	Sales Manager
P06	61	Female	7 months	Suburban	Office Administrator
P07	53	Male	10 months	Urban	Engineer
P08	48	Female	6 months	Urban	Homemaker
P09	54	Male	11 months	Suburban	Accountant

Data Collection

Data were collected through in-depth, semi-structured interviews guided by an open-ended interview protocol developed in accordance with phenomenological principles. Interviews were conducted face-to-face in private clinical counseling rooms or participants' homes, depending on their preference, to ensure a safe and comfortable environment. Each session lasted between 45 to 70 minutes and was audio-recorded with prior permission. The interview guide included broad prompts such as "Can you describe your daily experience living with the CGM device?" and "What feelings or thoughts arise when you rely on CGM readings?" Follow-up questions were employed flexibly to delve deeper into individual narratives. Field notes were taken immediately after each session to capture contextual observations and emotional cues. No modifications were made to the protocol during data collection.

To promote trustworthiness, the researcher engaged in bracketing during the interview process and maintained a reflective journal to monitor evolving assumptions and reactions. These reflexive strategies helped mitigate undue influence of the researcher's clinical background in diabetes education on data interpretation.

Data Analysis

Data analysis followed the principles of Interpretative Phenomenological Analysis. Transcripts of each interview were reviewed multiple times to gain familiarity with the content. Meaningful units were identified and labeled through an open coding process. These codes were then clustered into emergent themes that reflected shared patterns across individual experiences. The analysis progressed through iterative abstraction, leading to the development of superordinate themes that encapsulated the essence of participants lived experiences. NVivo software (version 14) was used to facilitate the organization and retrieval of data segments but did not replace interpretative processes.

Reflexivity was systematically embedded throughout the analytic process via memo writing, team debriefs, and critical peer feedback. The primary researcher's dual role as health practitioner and investigator was continuously examined to ensure transparency and accountability in theme construction. The final themes were validated through member checking and peer debriefing.

Ethical Considerations

Ethical approval for this study was obtained from the institutional research ethics committee prior to data collection. Participants received an information sheet outlining the study's purpose, procedures, and their rights, including the right to withdraw at any point without consequence. Written informed consent was obtained from each participant prior to participation. Confidentiality was assured by anonymizing transcripts and storing all data in encrypted digital files accessible only to authorized personnel. This study adhered to international ethical standards for research involving human participants, including the Declaration of Helsinki.

RESULTS

This study explored the lived experiences of adult patients with type 2 diabetes using Continuous Glucose Monitoring (CGM) devices in their daily lives. Through in-depth interviews and interpretative phenomenological analysis, five major themes emerged that illustrate the psychological, social, and practical meanings patients attributed to their engagement with CGM technology.

A Sense of Reassuring Surveillance

Participants described the CGM device as a constant presence that offered a sense of security and control over their health condition. The ability to continuously track glucose levels reduced feelings of unpredictability and enabled immediate action.

“I feel like it’s always watching over me... It gives me peace of mind knowing I won’t miss any sudden drops or spikes.” (Participant 03)

Despite the initial adjustment period, this sense of being “monitored” was interpreted positively, reinforcing a sense of autonomy and vigilance.

Intrusions into Daily and Social Life

While the CGM provided reassurance, it also intruded into the participants’ daily routines and social engagements. Alerts, data checks, and device visibility occasionally caused embarrassment, self-consciousness, or inconvenience.

“Sometimes it beeps in the middle of meetings. People look at me like something is wrong. It makes me uncomfortable.” (Participant 07)

Participants expressed a constant negotiation between the benefits of health data and the burden of being visibly and audibly connected to a medical device in public settings.

Emotional Oscillations between Safety and Dependence

The emotional landscape surrounding CGM use was complex. While some participants felt empowered by the device, others developed a psychological dependency, fearing any moment without access to their data.

“I can’t go anywhere without it... it’s like my second brain. But that’s also scary, because what if it fails?” (Participant 02)

This emotional duality highlights the paradoxical experience of safety that leads to dependence—where participants simultaneously valued and questioned their reliance on technology.

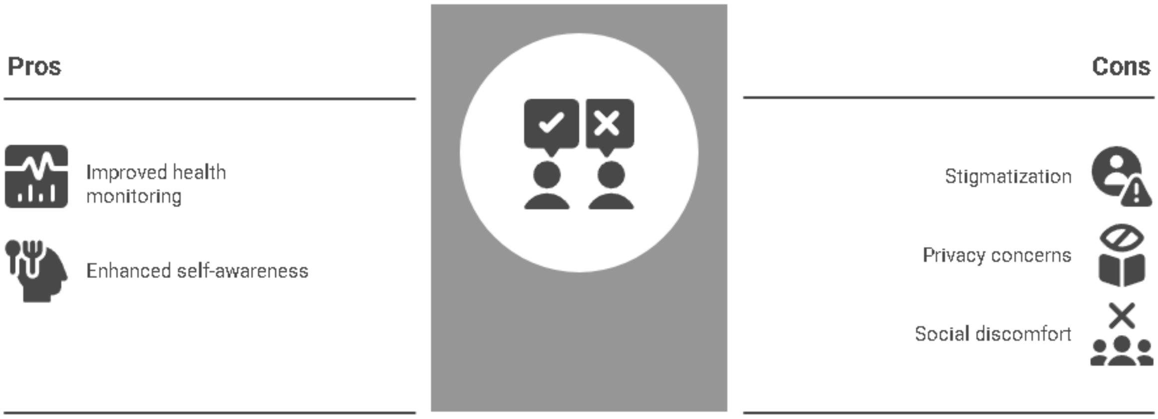
Stigma and the Visible Mark of Illness

Several participants revealed that the visibility of the CGM sensor led to feelings of stigmatization, particularly in professional or social environments. The device became a marker of illness that elicited unwanted attention or pity.

“When people see it on my arm, they always ask questions. I don’t want to talk about my diabetes all the time. It makes me feel like I’m just... the disease.” (Participant 05)

This theme illustrates how the physical presence of medical technology intersects with personal identity, self-presentation, and social dynamics.

CGM Visibility



Navigating Hope through Technological Trust

Despite the burdens, participants also shared stories of hope and optimism. The CGM was seen as a symbol of progress in diabetes care, offering not just data, but a path to a better future.

“It makes me believe that managing diabetes is not as scary anymore... It’s not perfect, but it’s better than being in the dark.” (Participant 09)

Many participants expressed a belief that with continued innovation, future iterations of CGM would become more seamless, less invasive, and even more integrated into their lifestyles.

The lived experience of CGM use among adult patients with type 2 diabetes is characterized by a tension between technological empowerment and psychosocial vulnerability. CGM is not merely a clinical tool—it is embedded in patients’ emotional lives, social identities, and existential reflections on control, dependency, and hope.

DISCUSSION

Opening: Summary of Core Findings

This study revealed that the lived experience of adults with type 2 diabetes using Continuous Glucose Monitoring (CGM) is shaped by a dynamic interplay of emotional security, social tension, personal dependency, and future-oriented hope (Heinemann et al., 2018). These findings respond directly to the central research question by uncovering how CGM technology is not merely used, but embodied, interpreted, and negotiated within the patients’ daily lives.

Contribution to the Research Question

The study’s findings offer a nuanced understanding of how individuals experience CGM as a continuous presence that reshapes their relationship with their illness, autonomy, and social world (Kim et al., 2018). By foregrounding the voices of participants, the research captures the paradox of reassurance and intrusion, as well as the tension between technological empowerment and psychological dependence. This interpretative insight addresses the knowledge gap identified in the introduction, where conventional methods failed to articulate the emotional and existential dimensions of CGM use. Rather than positioning CGM solely as a clinical innovation, the study contributes a humanized perspective that highlights how technology becomes integrated into one’s identity, routines, and anticipations of health. This experiential knowledge is critical for informing patient-centered innovation and policy development in digital health management.

Relationship to Previous Literature and Theory

The findings are consistent with Brown et al. (2019), who observed that adolescent CGM users experienced emotional conflict and social vulnerability; however, this study expands the scope by examining adult populations and emphasizing the existential dimension of device dependence. Similarly, the theme of stigma aligns with Beck, Connor, et al. (2017), who noted external barriers to CGM use, though this study reveals how internalized perceptions—such as feeling "reduced to a disease"—amplify social discomfort. In contrast to prior studies that focused primarily on user satisfaction and device functionality, this research offers deeper insights into the psychological burden and adaptive strategies employed by users. The findings also resonate with Heidegger's concept of being-in-the-world, where technology is not neutral but actively co-constitutes the way individuals experience their world. Thus, this study not only affirms but extends existing literature by situating CGM within the broader existential and sociocultural landscape of illness and health.

Implications of the Findings

The findings of this study offer both theoretical and practical implications for diabetes care and technology integration in chronic disease management. From a social and cultural perspective, the lived experiences described by participants highlight the complexity of engaging with medical technology not simply as a tool but as a constant companion that shapes one's identity, autonomy, and social visibility. These insights emphasize the need for more empathetic design approaches that take into account the emotional, psychological, and sociocultural realities of patients. In clinical practice, understanding how CGM users navigate their daily lives can inform more personalized education, support strategies, and policy decisions that honor not only biomedical needs but also experiential realities. More broadly, these findings contribute to ongoing discussions in health humanities and medical sociology by framing CGM use as a lived phenomenon situated within the ethical and existential conditions of modern self-care.

Limitations of the Study

As with all qualitative research, this study has limitations that shape the interpretation and transferability of its findings. The sample, while diverse in age and background, was limited to a specific urban and suburban population, which may not reflect experiences in rural or culturally distinct settings. The use of purposive sampling, though methodologically appropriate for phenomenological inquiry, inherently restricts generalizability. Additionally, data were derived solely from verbal narratives, which may not capture non-verbal dimensions of the experience. The findings should therefore be understood as contextually situated, offering rich insight into particular lived realities rather than universal truths. These limitations, however, open valuable avenues for expanding the inquiry in future research.

Prospective Directions for Future Research

This study lays the groundwork for further exploration of technological embodiment in chronic illness care through a phenomenological lens. Future research could investigate how CGM experiences differ across cultural or generational lines, or how they evolve over longer periods of use. Comparative studies involving different types of diabetes-related technologies could also deepen our understanding of user adaptation, stigma, and emotional labor. Moreover, interdisciplinary approaches—integrating design studies, medical anthropology, and narrative medicine—may yield holistic frameworks for developing user-centered innovations in digital health. Ultimately, these directions aim to bridge the gap between technological advancement and the lived human experience, ensuring that innovations resonate with the needs and meanings of those they are meant to serve.

CONCLUSION

This study explored the lived experiences of adults with type 2 diabetes in using Continuous Glucose Monitoring (CGM) devices, focusing on how the technology shapes their emotional, social, and existential realities. The findings revealed that CGM use creates a complex experience of reassurance, dependence, intrusion, and hope, offering a deeper understanding of the human dimensions behind technological health interventions. Through an interpretative phenomenological approach, this research highlights how CGM use intersects with users' sense of identity, autonomy, and social interaction—dimensions often overlooked in clinically focused studies. To translate these insights into actionable outcomes, device developers are encouraged to incorporate features that enhance usability while minimizing social visibility and alarm-related stress. For clinicians, the findings underscore the importance of addressing emotional and psychosocial concerns during CGM counseling sessions, not just technical training. Policymakers should consider integrating patient experience data into procurement standards and reimbursement frameworks, ensuring that technologies align with lived realities rather than solely biomedical metrics.

This research contributes to a growing body of literature advocating for human-centered design and empathetic care strategies in chronic disease management. Future studies may expand this inquiry across cultural contexts or explore the long-term evolution of CGM experiences in diverse patient populations.

CONFLICT OF INTEREST

The authors declare that there is no conflict of interest.

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