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Applying Interpretative Phenomenological Analysis to Understand the Experience of Digital Health: A Methodological Reflection

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Abstract

Interpretative phenomenological analysis (IPA) is uniquely positioned to enable health researchers and practitioners to gain a rich understanding of the psychosocial experiences of people living with health conditions and their family caregivers. The majority of research in this field pertains to the acceptability, usability and effectiveness of supportive technology in managing or treating health conditions. Acknowledging the ever-growing development and application of digital health technologies to support people living with health conditions, the meaning of such technologies in the lives of those using them has been overlooked in the evidence-base. This article offers methodological reflections in addressing this gap using IPA to understand the lived experiences and psychosocial meaning of digital health during cancer treatment. While the methodology has scarcely been applied to the topic, the article also describes the practical process of navigating positionality, methodological considerations and ethical issues using an innovative longitudinal and multi-perspective IPA approach to explore the impact of digital health on family members and how their relationship with the technology changed over time during cancer treatment. The opportunity IPA presents to contribute novel recommendations for practice, policy and future research in the context of digital health is described. This article signals the appropriateness and applicability of IPA to explore the deeper meaning of using digital health technologies to promote both their therapeutic effectiveness and meaningfulness in the personal lives of people living with health conditions and their family caregivers.

Keywords

interpretative phenomenology, methodology, digital health, cancer, family caregiving, psycho-oncology

Background

Digital health has been identified as a way of providing person-centred care to people living with acute and chronic health conditions. The term ‘digital health’ can be understood as the field of knowledge and practice associated with the development and use of digital technologies to improve health (World Health Organization [WHO], 2021). Numerous strategies have been developed internationally (Centres for Disease Control [CDC], 2022; WHO, 2021; European Union, 2022; Australian Digital Health Agency, 2020) to promote the adoption and implementation of digital health technologies to support our communities in the management and treatment of health conditions. A fundamental aim common to all existing strategies is to improve the experiences of people accessing and engaging with healthcare when they need it.

While the field of digital health is still emerging and being actively researched regarding how technologies can be embedded in clinical practice and how effective they can be, a broader question remains of what these supportive health technologies can mean in the lives of individuals using them to support the management of their health condition in the home

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setting. Furthermore, a knowledge gap exists regarding how people living with health conditions and their family caregivers develop relationships with technology in the home setting. A recent review (Darley et al., 2023) highlighted how people with cancer and their families can experience psychosocial benefits beyond the intended health outcomes of digital health interventions. Understandably, the principal driving focus of research in this field pertains to the clinical effectiveness and acceptability of technology in managing or treating health conditions. While digital health in cancer care has previously been studied using qualitative and mixed-method approaches, most of the existing evidence to date focuses on the acceptability, usability and effectiveness of technologies, rather than the meaning it has in the lives of people (Darley et al., 2023). There is limited evidence available which demonstrates the application of phenomenology to investigate the lived experience of people using digital health (Curran et al., 2023; Narbutaitienė et al., 2023; Runz-Jørgensen et al., 2017), and even greater scarcity of publications on digital health technology which report using interpretative phenomenological inquiry in a healthcare setting.

Interpretative phenomenological analysis (IPA) is a robust and commonly used methodology that enables researchers to access this understanding and lived experience. There has been an increasing investment in using IPA to understand the experience of digital technology regarding health including engagement with devices (Wilde et al., 2024), innovation in improving healthcare quality in adverse contexts (Lounsbury et al., 2022) and attitudes towards the digital health transition (Győrffy et al., 2020). Nevertheless, to the best of the authors' knowledge, IPA has rarely been applied by researchers to understand the psychosocial experience of using digital health in the home setting and the relationships that people develop with technology when managing a health condition. Our recent research utilised IPA to address these knowledge gaps and provided in-depth explorations of the meaning of supportive symptom management technology and relationships (Darley et al., 2023, 2024) in the context of cancer care. The key findings of this work, facilitated by using IPA, highlighted how digital health technology can have important psychological benefits for people with cancer, such as reassurance and a sense of control during their cancer treatment. Although family caregivers did not directly use the technology, they also experienced a sense of support from the technology in caring for their relatives with cancer. This additional support meant that they could maintain their independence and regular activities during chemotherapy while maintaining their identity and interpersonal relationship with their relative with cancer, for example, as a wife or daughter (Darley et al., 2023, 2024).

Furthermore, digital health technology can be experienced by their users as a person guiding them during their cancer treatment, in which they can form an emotional bond and view the technology like a supportive family member. Our findings underlined the substantial vulnerability and sense of abandonment amongst both participant groups after the technology was returned to the research team during chemotherapy treatment. However, the longitudinal approach enabled an insight into the process of participants' understanding that it was not the technology that successfully facilitated them through their initial chemotherapy cycles; rather, the technology helped them learn to manage and emotionally respond to their symptoms and broader cancer experience (Darley et al., 2023). This series of articles set out to explore how technology can personally support people with cancer and their family caregivers and negotiate the pathway of cancer treatment following a first-time diagnosis. The application of IPA illuminated both the meaning and relationship that participants developed with the technology (Darley et al., 2024). To continue to support this development and place the person using digital technologies at the centre of healthcare improvements, a new vision is needed. Innovation in the application of IPA is a step forward in the right direction to understand people's experiences with digital health technology in an in-depth way.

Using the exemplar of this empirical work (Darley et al., 2023, 2024), the aim of this article is to provide a critical methodological reflection on the application and value of IPA in the field of digital health. As Frechette and colleagues (2020) recently highlighted and addressed the knowledge gap in scholarly articles that provide methodological guidance in using interpretative phenomenological inquiry, this article specifically seeks to provide practical and personal methodological reflections from using IPA in the distinct context of digital health. Additionally, this article offers insight into utilising IPA in an innovative longitudinal and multi-perspective fashion to comprehensively explore the topic. It must be noted from the outset that the current article is written from the perspective of the lead researcher (AD), whereby co-authors provided methodological support and guidance.

Selecting Longitudinal and Multi-Perspective IPA

The current article uses the exemplar of an IPA study conducted in conjunction with a European-wide digital health clinical trial. This research was a nursing-led, multicentre randomized controlled trial examining the smartphone-based, remote patient monitoring intervention on key patient health outcomes and delivery of care during and after chemotherapy (Maguire et al., 2021). The lead author was a member of the clinical trial research team and wanted to further explore the experiences of participants using the technology to support their symptom management processes, as well as their supporting family members.

IPA was chosen for its ability to delve deep into participants' experiences to answer the research question: "*What are the lived experiences of and meaning for people with colorectal cancer using digital health symptom management technology and their family caregivers during* *chemotherapy*?" IPA is admittedly a relatively new methodology compared to other qualitative approaches, such as ethnography and grounded theory. In their seminal book, Smith and colleagues (2009) outlined a series of iterative and rigorous steps to be taken when conducting IPA research. Given the depth of analysis that IPA requires of researchers, studies typically include small, homogenous populations to obtain a rich understanding of a specific phenomenon. Also, IPA is commonly conducted at one time point using an in-depth interviewing style. Nonetheless, Smith and colleagues (2009), in their guidance, also emphasised that researchers should be flexible in their implementation of these steps and accept that they may not all be appropriate for each research study.

Acknowledging that a key objective of the study undertaken was to explore people with cancer and their family caregivers' experience of chemotherapy while using digital health technology over time meant that the study approach needed to adapt IPA to include sequential time points and both cohorts' perspectives. Longitudinal research designs are regarded as a solution for establishing temporal order, examining change and making stronger causal interpretations (Hermanowicz, 2013). In terms of qualitative research, longitudinal approaches are well suited to understanding transitions, pathways and adaptations from an individual's perspective (Holland et al., 2006). As I sought to understand the experience of participants before and after using digital health technology during the chemotherapy process, a repeated interview approach was required in the study. Repeated interviewing refers to the research practice of interviewing a participant more than once about the same event (La Rooy et al., 2009) and is particularly suited for research that aims to explore evolving and complex processes or experiences (Murray et al., 2009). Similar to traditional IPA studies, longitudinal IPA has been valued as a key tool in exploring temporal experiences, using multiple interviews, such as life transitions, chronic illness and evaluations of health interventions (McCoy, 2017; Smith et al., 2009; Snelgrove, 2014).

While McCoy (2017) postulated that IPA has rarely been used in longitudinal studies in comparison to non-longitudinal studies, a more recent review found that there has been an increasing trend in adopting this approach since 2013 (Farr & Nizza, 2019). In longitudinal studies, IPA's inductive and idiographic method of inquiry enables researchers to interpret individual trajectories which show how the participants' experience develops within and between study time points. The aim for researchers using longitudinal IPA is to "*find ways to clearly express both the dynamism and nuance of individual trajectories as they evolve in the participants' temporal world*" (Farr & Nizza, 2019, p. 208). Therefore, researchers using longitudinal IPA must attempt to encapsulate the temporal experience as it occurs from an idiographic perspective and describe it using the analysis process (Farr & Nizza, 2019). Thus, longitudinal IPA enabled me to explore participants' experiences while using the technology during their initial cycles of chemotherapy and after it was returned to the research team while still receiving chemotherapy. This aspect was particularly important given that participants were first-time diagnosed with cancer so did not have a comparative experience of standard care without the technology when they started.

Moreover, I decided to adopt a multi-perspective design to capture the experiences of people with colorectal cancer using digital health technology and that of their family caregivers. Larkin and colleagues (2018) observed that the meaning of phenomena can often be challenged or contested which can benefit from multiple perspectives which can offer a more complex and holistic view of an experience. Using this multi-perspective approach is a useful way for researchers using IPA as the convergence and triangulation of viewpoints may give more insightful and persuasive findings than those obtained through analysis conducted from a single sample (Larkin et al., 2018). This multi-perspective approach enabled me to investigate the role and meaning that the technology had to people with cancer and their family caregivers and what it meant to them as a family unit. As such, data were collected by the lead researcher using one-to-one in-depth interviews with people with colorectal cancer (n = 3) and their family caregivers (n = 4) at two time points and analysed using IPA.

Navigating the Interpretative Analytical Process

Analysis was conducted in adherence to methodological guidance on IPA (Smith et al., 2009). All initial and follow-up interviews with people with cancer and their family caregivers were analysed by the lead author using IPA (Smith et al., 2009), which the process employed is depicted in Figure 1. Each interview was coded individually before cross-case analysis of each interview was used to code themes, identify patterns and develop the final superordinate themes and their related subthemes emerging from the data and interpretation. The lead author iteratively conducted the analysis steps to refine and ensure accurate reflections of participants' lived experiences, whereby all coding and interpretations were reviewed and validated by doctoral supervisors (BC, EF) and an external advisor within the lead researcher's university (MC) who held extensive experience using IPA in health research contexts to ensure credibility. The external advisor's role in the research was to read draft interpretations of data from both people with cancer and family caregivers, following doctoral supervisory feedback and refinement. Their involvement helped to further challenge interpretations of the data and offer guidance on the analysis process.

A core concept of IPA is the double hermeneutic which encourages researchers to think about data in a dynamic and non-linear way. The double hermeneutic refers to how interpretation is two-fold; firstly, the participant must make sense of their experience of the phenomenon of interest (i.e. digital health technology), which in turn, they interpret for the

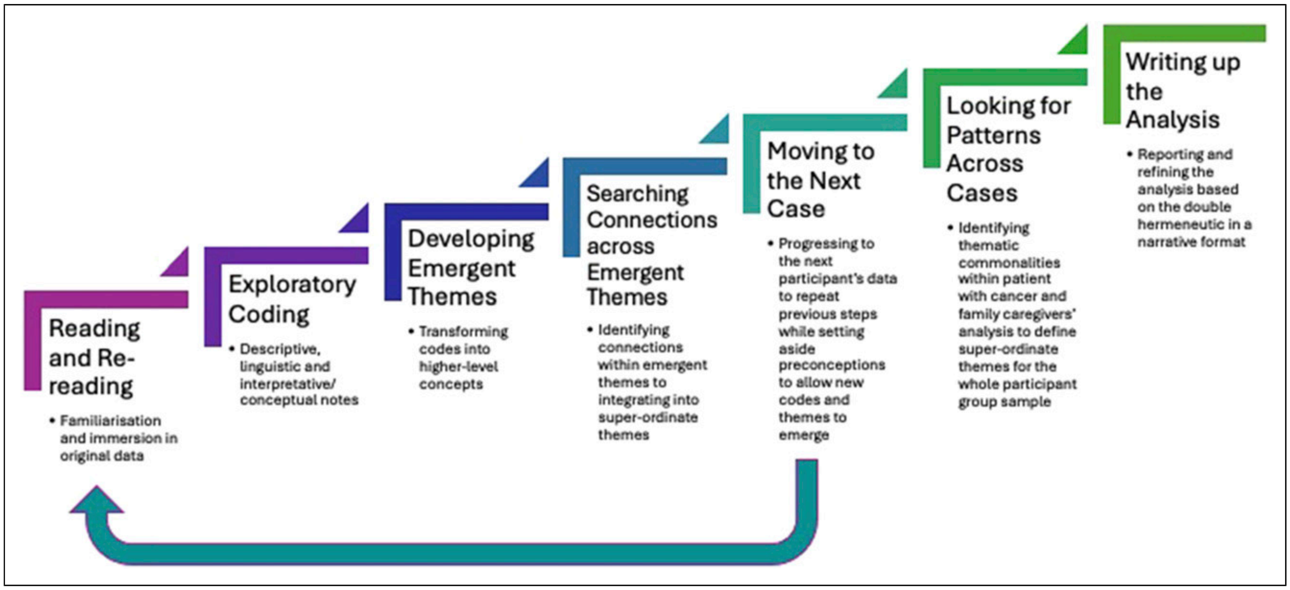

Figure 1. Analysis process using IPA.

researcher. Secondly, the researcher commits to making sense of the participants' interpretation. This is achieved in two ways: by empathising with the sense-making as well as questioning and challenging it within the analysis (Smith et al., 2009). Although the experiences of both people with cancer and their family caregivers were viewed as intrinsically connected, the lead author analysed all data from people with cancer transcripts first before progressing to analyse the family caregiver transcripts for both the initial and follow-up interviews. This decision was made to gain a comprehensive understanding of using the technology directly before moving on to how its presence impacted family members and their dynamics during the chemotherapy treatment process. To ensure rigour and transparency, the lead researcher maintained both a reflective journal to document how codes and themes developed over time, as well as field notes from data collection. The identified themes were iteratively challenged and refined through discussions with members of the author team before the final list was agreed.

Following Smith and colleagues' guidance on IPA, Table 1 illustrates how data was coded and interpretations were made regarding the theme development. The data excerpt pertains to a participant with cancer following the return of the digital health technology to the research team and his experience of symptom management without the technology. The excerpt contains data and interpretations which ultimately informed and shaped the superordinate theme 'People with Cancer's Relationship to Digital Health Technology' and the associated subthemes 'Attachment', 'Abandonment' and 'Adjusting Without the Technology' in the study findings (Darley et al., 2024). Table 1 illustrates how participant data was interpreted using exploratory, linguistic and interpretative coding to develop emergent themes (presented in bold):

An accompanying excerpt from my reflective journal, regarding this participant's relationship with the technology and his attitude towards support after it was returned to the research team, illustrates how I made sense of the participant's own sense-making and informed theme development:

> He [Stuart] repeatedly said that he did not miss the phone because he only had minor symptoms to deal with. However, if he had had more significant symptoms, he would have missed it more and likely asked for it back to deal with the symptoms. He wanted to appear well to me during the interview while simultaneously disclosing that had he experienced any new or worrisome symptom; he would want the technology back. Stuart acknowledges that he needed the device for physical and psychological support though he may want to appear independent during the interview. This echoes the first interview when Stuart repeatedly stated that he "*does not have cancer*" while receiving chemotherapy. He has a desire to be in the next phase with both the cancer and technology, which he sees as stable and not needing support.

In this reflective journal entry, I documented Stuart's ability to express his sense of abandonment while simultaneously reconciling that he was able to manage his symptoms and emotional well-being without supportive technology. IPA enabled a nuanced exploration of the experience wherein multiple truths could be interpreted from an experience. In this case, I was able to question and interrogate the participant's ambivalence towards self-care seeking support and the desire to be independent, as well as his underlying concern of becoming unwell and rumination regarding how he would cope without the technology to support him.

Table 1. Excerpt of IPA Coding and Interpretation Process.

Transcript	Descriptive	Linguistic	Conceptual/Interpretative
S: My wife keeps telling me "go down to your doctor and ger your blood pressure taken" but you know, I don't feel that I *need* to. I usually go down on the Fri after the chemo to get a neulasta injection to keep my bloods up because on two occasions my blood count was low and they had to defer one of the sessions and when I go into herm the nurse gives me the injection but I don't, I don't feel any need for a thermometer. I Missed it initially. I Missed the phone initially because as I told you it's got great reassurance and I did miss it initially but like everything else you got used to it.	Wife worried /advising Blood pressure is concern for family – Does not feel he needs to get checked Visits to get neulasta injection Experience of chemotherapy session deferred Missed the phone initially Reports no need for a thermometer Missed the phone initially Reassurance Got used to not having device	Stressed the word "need" – his own interpretation "Initially" x 3 times Emphasis on reassurance "I was able to say" – articulating feelings/ thoughts "Ill enough to justify it"	Stuart expresses a feeling of being nagged by wife, insists he doesn't feel the need to get treatment and contradict her. Needs nurse for neulasta which is an extra visit outside of chemotherapy - **Impact on family** - **Need for autonomy** - **Need for appearing well** - **Rejecting patient identity** No need for thermometer – not true during chemotherapy Need for autonomy and to appear well - **Lack of/Changing self-care after phone returned** Missed the phone for reassurance
I: Why did you miss it?	Reports not feeling unwell Would miss phone if did not have technology	Engages the researcher by name	Emphasis on "initially" – later says he would rather have for full 12 cycles with choice If he felt sick, he would miss it more – BUT he did feel sick and missed the reassurance
S: Because of the reassurance. Now I didn't feel, I suppose, if I felt very, very sick I'd miss it more but I didn't feel very, very sick. But still, I missed not being able to take my temperature because that was one of the things they warned me here: to keep an eye on your temperature and if it goes very high to come into us straight away. I missed it for that reason but because I didn't feel ill, I didn't miss it that much. I was able to say "well that's you know". If I was very, very ill I would certainly miss it. Because I'd be able to say "look (clicks fingers), I should text in how I feel and send them how I feel and they will help me" but I never felt at that stage (researcher name removed) that I was ill enough to justify it	Said he didn't unwell to contact ward No effect without routine of completing daily questionnaire		NO PHONE ≠ NO TEMPERATURE - **Attachment** - **Sense of loss** "Like everything else" – compares to everything – became used to his loss – This is an experience [cancer treatment] unlike any other and he mentioned that he had no idea what to expect - **Change in self-care** - **Asserting autonomy** Stops taking temperature even though warned to take temperature but he has stopped since no phone - **Comfort in pattern** Not proactive about infection Previous cycles with phone gave him knowledge ≠ control over symptoms
I: What was it like not having that routine of doing it (the symptom questionnaire within the device) on a daily basis?			- **Developing confidence** His perception of person on chemo does not match reality If he was sick would have augmented his need for it
S: Eh (sighs) no effect really, no effect really. Not having it on a daily basis, it's just as I said to you a while ago, if I was feeling very, very oll, I would certainly miss it, I wasn't feeling very, very ill. I didn't feel at all inclined to contact the hospital			"I was able to say" – he feels equipped to call judgement over it - **Justifying needs** He imagines being very sick and missing the phone more - **Desire to appear well** Loved the routine in interview 1 - **Justifying low need** Didn't need VS Didn't want? Contradiction = expressed deep worry about giving back the phone Hangs on to the fact that he wasn't "very ill" as reassurance - **Adapting without the technology**

Reflections from the Researcher: Positionality, Methodological Considerations and Ethical Issues

Positionality

Positionality refers to an individual's worldview, which is regarded as critically influential in how researchers approach phenomena and methodologies (Savid-Baden & Howell Major, 2023). Professor and sociologist Norman Denzin (1989, p. 12) articulated that "interpretative research begins and ends with the biography and self of the researcher". An individual's worldview, or 'where the researcher is coming from' involves ontological and epistemological assumptions, as well as assumptions about human nature and agency (Sikes, 2004), which are shaped by individual values, cultural background, experiences and beliefs (Short & Mollborn, 2015). In undertaking this research, it was necessary to reflect on my positionality as I was already embedded in the digital health randomised controlled trial, as a researcher and project manager, before deciding to undertake a doctoral study. Within my role, I contributed input regarding the function and content of the digital health technology and implementation in clinical practice (Fox et al., 2017; Furlong et al., 2019) and worked directly with people with cancer during participant recruitment, training and data collection in its pilot stage and randomised controlled trial.

Being a researcher and project manager within the clinical trial was also my first time working in clinical practice collaborating with healthcare professionals and meeting with patients and their family caregivers. Working in this new context was a substantial learning curve for me, especially witnessing and speaking with people living with cancer daily. I also held an educational background in the field of psychology, which predisposed my interest in its impact on psychosocial well-being and behavioural change. My preunderstanding of participants' experiences of the technology, informed the choice of interpretative phenomenological inquiry to utilise and incorporate this knowledge in understanding the phenomena. This worldview further informed the decision to involve family caregivers who informally discussed the benefits of the technology during their relative's chemotherapy treatment visits in the context of the clinical trial, which was an evident gap in the evidence base.

My worldview was further shaped during the research process by the experience of my father's unexpected diagnosis of cancer, which was my first direct experience of the condition in my personal life and being a family caregiver. I had completed data collection and was analysing the data at the time of my father's diagnosis. This experience informed my engagement and interpretation of participants' experiences, as I obtained my own rich understanding of the complexities in several aspects of the cancer experience, including: the physical and psychological impact of cancer on the person diagnosed and their family members, the experience of chemotherapy in an outpatient setting, symptom management at home and the decision-making process regarding care. This meant that I was deeply immersed in the cancer experience during the time of using IPA – as a cancer researcher, doctoral student and family caregiver to a close relative with cancer.

Methodological Considerations

A common criticism associated with IPA research is its validity, though this issue is not unique to IPA and has been historically applied to qualitative research more widely (Kvale, 1996). Reasons for this critique range from lack of transparency in analytical processes and the influence of personal bias of researchers (Cope, 2014). To ensure validity in the exploration of digital health, I adhered to Yardley's (2008) guidelines for demonstrating validity in qualitative psychological research, as well as following the guidelines of the founders of IPA (Smith et al., 2009) and achieving the markers of excellence in IPA (Nizza et al., 2021). Yardley's (2008) key criteria of these guidelines are sensitivity to context, commitment and rigour, transparency and coherence, and impact and importance. To ensure sensitivity to context, I conducted a narrative review of qualitative research in digital health in cancer care to contextualise the study approach within previous evidence (Darley et al., 2021). I maintained a strong understanding of the philosophical underpinnings of IPA and why they were relevant to the issue of digital health.

A key methodological consideration related to my positionality within the clinical trial while conducting this IPA study. It was important to ensure that participants in the main clinical trial did not feel obligated to take part in the IPA study. To address this consideration, I organised that a research nurse would introduce the IPA study to participants and asked if they agreed to be approached by me about the separate qualitative study. The research nurse asserted that there would be no consequence to their clinical care or participation in the main clinical trial if they did not wish to take part. All participants approached by the research nurse agreed to be contacted and were provided with the relevant information leaflet and consent form to take part. Yardley advocates for sensitivity regarding participant data, which in the case of IPA, grounds any interpretation using verbatim quotations and participant excerpts using the hermeneutic circle to ensure participants' voices are included in the research and allows readers to follow how the researcher reached their viewpoint and organisation of themes (Smith et al., 2009).

My commitment to the study is evidenced in the longitudinal research design to understand their experience over time, by the willingness to undertake all the interviews necessary to address the research question and by ensuring participants were comfortable during the interview and data collection process. Regarding rigour, I achieved an appropriate and homogenous sample to address the research question with participants in the main clinical trial. I maintained an audit trail (comprising notes and reflections regarding the research design, the interview schedules, recorded transcripts, the analytic process, the establishment of themes and the write-up) which enabled an independent audit by doctoral supervisors at different points in the study's progression regarding the evolving interpretation of participants' experiences.

I took great care in the transparency and coherency of the findings to ensure themes were logically connected and maintained a coherent narrative of the participants' experience and followed my interpretative process. I deemed it important to immerse myself in the experiences of people with cancer using the technology by initially coding their interview transcripts before progressing to their family caregivers' experiences. Later in the analysis process, I read both participant groups in conjunction with each other to identify any key findings within the family setting. I also read each participant's initial and follow-up interview transcript as a stand-alone and together to identify changes in their experience with the technology and how they communicated it to me during the interview. Finally, Yardley (2008) advocated for the impact of qualitative research. From the studies' conception, I was committed to adding value to the existing literature regarding people with cancer's experience of digital health technology and their family caregivers, using longitudinal interpretative analysis from a multi-perspective design, which has not been conducted before.

When designing the IPA study, I appreciated the potentially emotionally distressing content of the interviews for participants. I maintained a strong duty of care to participants as I understood the interview process may prompt participants to think about or focus on stressful emotions or cause concern about their health during the chemotherapy process. I took great care in writing the interview questions and prompts and avoided discussing issues that may be upsetting to discuss unless initiated by the participant. A key consideration with interviewing using the lens of interpretative phenomenology is that people, particularly those experiencing illness, may not appear or express their emotions, or their extent, within the interview environment but may become distressed following the session. Each participant was provided with local evidence-based information booklets on a range of topics related to cancer care. Participants were also provided with information and contact details for cancer support helplines and cancer-specific counselling and support services. Equally, I had to ensure my own psychological safety and well-being during the data collection and analytical process, especially to be open and present when listening to participants' experiences. I agreed with my doctoral supervisors that we would have a debriefing session in the event I felt concerned or overwhelmed following an interview or during the analysis process. Debriefing sessions provided a space to describe any challenging emotional experience in my role as a researcher and identify effective strategies to navigate them as the study progressed.

Ethical Considerations

In light of the longitudinal and multi-perspective interpretative phenomenological approach, important ethical issues arose while exploring the experiences of digital health. The decision to conduct separate interviews with people with cancer and their family caregivers meant that I could document the lived experience of each participant and their inner cognitive world (Smith et al., 2009) without the potential influence of their other dyad member (Eisikovits & Koren, 2010). Individual interviews with dyad members were chosen to enable an interpretation of parallels and divergences between experiences, as well as access to each individual's subjective perspective without diminishing the dyadic perspective (Eisikovits & Koren, 2010). However, this method presented a challenge regarding the data collection and analysis of individual accounts as their dyad member's account cannot be disregarded. Each member of a dyad discussed an aspect of their relative's experience of cancer and the technology, which they did not mention in their own interview. Often these topics discussed by the dyad partner about their relative were central to the research question and thus created an ethical challenge in whether to raise these topics in the follow-up interview with the relevant participant. For example, one family caregiver mentioned their worry about how her mother would under-report her physical symptoms through the technology to avoid being contacted by the clinical team, which was a cause of concern for the family. However, their relative with cancer did not discuss this experience with me during her interview. While I was cognisant during data collection that people may want to make their best impression and refrain from discussing personal issues, I determined that avoiding salient topics was counter-intuitive in exploring their lived experiences. Guided by Ummel and Achille (2016), I decided to ask open-ended questions or questions intended to normalise aspects of their experience that they may be reluctant to share for example, "*Can you tell me about your experience of reporting symptoms to your clinical team using the device?*" Once asked, if these questions did not lead to discussion, I did not probe further for the topic to be addressed, in line with good ethical practice in qualitative research.

A further ethical issue related to navigating the researcher relationship within the dyad during data collection. As the interviews set out to discuss their lived experiences, which is an inherently psychological process (Smith et al., 2009), I could not provide psychological support or advice if I detected unmet needs during the course of data collection. This was particularly challenging when interviewing family caregivers as they expressed how their relatives with cancer would not speak to them about their psychological or emotional well-being. Family caregivers felt that the technology was supporting the physical needs and symptom management of their relative, they also wished that there it had the capacity option to support their psychological needs in a similar fashion. As family caregivers expressed their concern for the emotional well-being of their relative, most referred to how the interview process was similar to a counselling session, which they believed their relative would benefit from.

During an interview with one family caregiver, they discussed how she imagined her husband was feeling, both about his experience with the technology and wider emotional well-being, as she commented on how he keeps to himself. The participant subsequently asked me directly how he was doing and what he had disclosed to me in his interviews. The family caregiver observed that I was in a unique position in their lives, in that she believed that her husband disclosed thoughts and feelings during his interviews that he would not mention to her. This experience mirrors Taylor and de Vocht's (2011) observation of how conducting separate interviews in dyads, particularly couples, may promote anxiety as one partner may interpret the choice of separate interviews as confirmation that secrets do exist in their relationship and that their partner is willing to disclose them to the researcher but not within the relationship.

In this study, some family caregivers saw their interview as an opportunity to request information about their relative's psychological well-being, beyond the experience of digital health. Larkin and colleagues (2018) stated how multi-perspective designs highlight the dynamic nature of good ethical practice, which particularly requires the researcher to respond in an ethically informed manner. When asked about the well-being of their relative, I could not disclose any information that would breach confidentiality. In navigating the situation, I ensured that I remained professional in affirming that I could not breach confidentiality while also remaining friendly and open so as not to obstruct established rapport with the participant, as previously recommended (Ummel & Achille, 2016). I observed a discrepancy of power within dyads during data collection and analysis as people with cancer can withhold their emotions, which was an evident source of distress for their family caregivers. I upheld my duty of care towards both participant groups by referring them to support services and information booklets available at the cancer centre or nationally in Ireland, as described in their information and consent forms. Despite these steps, I did experience some subsequent personal discomfort in witnessing the complexities of their family dynamic and being privy to information regarding each other's experiences that, if shared, could potentially improve each other's circumstances.

Discussion

This article offers methodological insights into applying IPA to understand the experience of using digital health technology in the management of people with cancer and their family caregivers, which to the best of the authors' knowledge, has been overlooked in the evidence-base. The value of IPA in the field of digital health is exemplified in the richness of data on experiences, such as psychosocial benefits and self-efficacy development (Darley et al., 2023, 2024), which have scarcely been explored before in the depth achieved as a result of its application. IPA enabled a rich qualitative interpretation that incorporated participants' psychological responses and lifeworld and my pre-understanding of the context and experience of the technology, as well as my personal experience with cancer.

Moreover, using the novel lens of longitudinal and multi-perspective IPA enabled a holistic understanding to key experiences which have not been identified in the evidence-base to date, such as the psychological bonds and attachment developed over time to technology, the experience of anthropomorphism, the sense of abandonment after it is returned to the research team and its impact on family caregivers' ability to maintain their identity and independence during the treatment process (Darley et al., 2024). I believe this level of evidence may not have been achieved through other qualitative approaches which ask researchers to take a descriptive approach or bracket their pre-understandings and real-time life experiences as the data is being collected and analysed. IPA was both a doorway and a tool which enabled the researcher to access and express the essence of participants' lived experiences of living with cancer, as a person with cancer or as their caregiver.

Adopting the lens of IPA highlighted how imperative it is to understand participants' wider context and cancer trajectory to effectively interpret their experience using digital health technology. Maramba and colleagues (2019) observed how digital health technology is difficult to map onto an individual's health conditions due to their complexities. Our research findings suggest that it may be further challenging to fit a technological solution without the consideration of the intended users' personal and contextual factors. IPA respects the viewpoint of psycho-oncology that each person's experience of cancer is individual and unique (Gregurek et al., 2010) and correspondingly recognises that each person's lived experience is also unique (Peat, 2019). IPA enabled a close reading of each participant's inner cognitive world and did not seek to generalise their experience or create a theory (Smith et al., 2009). Rather, IPA revealed dimensions of each participant's experience; providing an understanding of the similarities and differences within the sample, as well as in each account (Smith et al., 2009). This meant that I could simultaneously draw upon each individual's experience and the shared or congruent experiences of people with cancer and their family caregivers in the interpretation.

IPA is particularly important for researchers and technology developers, as the methodology advocates for those using it to bring in their pre-understandings and prior knowledge. This feature of the methodology was particularly important in navigating the complexities of my positionality, as a researcher, doctoral student and family caregiver to a relative with cancer, during the analysis and write-up stages. Using

IPA allowed me to synonymously understand my own experience of becoming a family caregiver of a relative with cancer while sense-making the participants' lived experiences. For example, becoming a family caregiver during the IPA process gave me access to the lived experience of cancer treatment in the standard care context that is without the support of digital health technology. While the analysis and interpretations are solidly grounded in participants' experiences of digital health, my personal experience of living with the responsibilities of caring for someone with cancer and the associated unmet needs of being a family caregiver helped me further understand the complex and often psychologically challenging phenomenon of cancer and its treatment process, as well as the supportive role digital health may play in the home setting which I may not have gained otherwise. Therefore, IPA enabled me to navigate the many roles I had at the time and to incorporate the knowledge transparently and rigorously to enrich the data analysis process and study findings.

One seminal methodological finding of using IPA in the context of digital health was how I entered the field with the specific intention of exploring the psychosocial experience of using digital health technology. However, I quickly discovered after conducting initial interviews that participants' sense-making of the technology was enmeshed in their broader experience of cancer, particularly their diagnosis and could not be understood or interpreted without it. This insight led to a shift in the study's perspective, meaning that the research became a broader work encompassing the overall experience of cancer while using digital health technology, rather than a specific focus on the impact or influence of the technology. This finding indicates that researchers examining the experience of digital health technology cannot study the lived experience in isolation from the condition or the circumstances it is being used to support.

Participants with cancer in this study experienced a variety of physical and psychosocial consequences because of their diagnosis and treatment similar to those reported in previous literature (Reese et al., 2018; Röhrl et al., 2020; Stanton et al., 2015). The common "battle" or "fights" discourse around cancer was also evident in their accounts (Semino et al., 2018). However, the interpretative analysis of their lived experience shed light on how they viewed digital technology as a tool or resource to help them conquer or solve challenges during their cancer treatment. Interestingly, the social and emotional domains of quality of life were not found to be statistically significant in the digital health clinical trial (Maguire et al., 2021). However, IPA provided an understanding of how the digital health technology helped participants emotionally adjust to their condition and treatment, as well as interact with others (particularly their family members) during this unfamiliar and emotional experience. This congruence justifies the rationale of using IPA in that people's experiences cannot be comprehensively understood using quantitative measures or a descriptive qualitative approach or may not capture the complex nature of their experience through quantitative methods.

Likewise, the lived experience of family caregivers to people with cancer using digital health technology offers a unique understanding of how they can personally benefit from their relative's use of digital health technology. All family caregivers' lived experience was informed by their previous experience of providing care to relatives with cancer where they experienced a lack of support and information resources. Family caregivers also described a loss of independence due to caregiving responsibilities, which is well-documented in the evidence base (Marzorati et al., 2018; Wang et al., 2018). All family caregivers expressed their desire to support and maintain their relative's autonomy and reluctance to infantilise them. Family caregivers viewed digital health technology as a way to facilitate this and maintain their relationship with their relatives as much as possible. While evidence exists regarding family caregivers' experience of using digital health technology, this is the first study to explore the impact of relatives' using digital health technologies on the family caregiver experience.

Adopting a longitudinal IPA approach enabled me to further interpret participants' relationship with the technology over time, which may not have been possible with an interview at one time point (Larkin et al., 2018; Maguire et al., 2014). A multi-perspective approach using interpretative phenomenology has been argued by Larkin and colleagues (2018) to foster a more holistic and congruent understanding of the phenomenon as it allows for more convergence and triangulation to occur within the researcher's interpretation than a single sample can provide. By including both people with cancer and their family caregivers, I sought to understand the meaning of the technology in participants' personal lives and, more broadly, within the family dynamic. The concentrated lens of interpretative phenomenology on participants' lifeworld enabled me to see that while the digital health technology provided participants with practical and emotional scaffolding during their experience of chemotherapy, over time its purpose became redundant as they learned about their condition and adjusted to their circumstances.

In light of how people can build resilience and experience positive personal changes without digital health during treatment (Papadopoulou et al., 2017), this IPA study illustrates that while digital health technology may have made their cancer experience easier, the more pertinent aspect of its use is their recognition of their ability to rely on their resources and what they have learned from using it going forward in their life. The multi-perspective methodological approach supports Ummel and Achille's (2016) observation that in conducting individual dyad interviews, the partner is virtually present in the interview space, despite their physical absence. This was further particularly pertinent in terms of the integration and meaning of digital health technology. Family caregivers were able to provide context to their relatives' usage and avoidance of answering questions to evade being contacted by a healthcare professional. Such findings garnered from using IPA emphasise the fact that we cannot overlook the human in the digital space and that people bring their emotions and history to, not only the condition they live with but also the digital technology that seeks to support them.

The Future of IPA in Digital Health

As this article offers methodological reflections on using IPA in the ever-growing field of digital health, many learnings can be taken into the future. While the current article pertains to how IPA was applied to smartphone-based symptom management technology (Darley et al., 2023, 2024), the relevance of the qualitative approach can only expand as a tool to investigate current and forthcoming digital health technologies. For example, the immersive functions of virtual reality (Mäkinen et al., 2022) and the personalised role of artificial intelligence (Alowais et al., 2023) herald empirical research on the nuances of the lived experiences of engaging with such technologies within a healthcare context. It should also be noted that the current article speaks to the experience of digital health in the context of cancer care, we believe that empirical knowledge is needed regarding the wide variety of health conditions, physical and psychological, using IPA as a research methodology.

Moreover, the methodological approach undertaken in this study points to the feasibility of incorporating IPA in digital health clinical trials, as well as other health trials. As noted by Powell and colleagues (2022), few clinical trials embed qualitative research in their methods as trial leaders may not realise their full potential in research. Studies that do engage in qualitative methods commonly use thematic analysis, as interpretative phenomenology has been noted for the requirements it places on researchers in terms of immersion, detail and time (Pietkiewicz & Smith, 2014). The value of IPA within the context of a digital health clinical trial has meant we could enhance the knowledge by shifting the focus from its effectiveness to how they interpret and attribute its meaning in their lives while experiencing cancer treatment. Evaluating the experience of digital health using IPA means that we can personally tailor technologies with the hope of promoting stronger adherence and better health outcomes – if we know why people engage, behave and connect with supportive health technologies, we can adapt how they are made. Ais researchers, we need to make room for in-depth qualitative methodologies, including IPA, that can capture the convergence and divergences of the experiences, needs and values of the people we seek to support.

In recent years, there has been an important movement in participatory research and co-design methodologies (Cummings et al., 2022; Malloy et al., 2023; Sanz, et al., 2021) to facilitate the co-creation of digital health technologies with the relevant stakeholders (e.g. people with health conditions, family caregivers, healthcare professionals, policymakers). Though this is an important and necessary shift of placing qualitative research 'at the front' of digital health technological development, rather than prescribing or making assumptions about what would be useful to people living with health conditions, it is typically conducted in iterative, group settings wherein multiple participant voices and experiences are channelled into the development of a solution. The value of IPA in this context of digital health is in how it allows researchers to access the lives and inner cognitive and emotional worlds of participants which may not be as well-suited in a group dynamic with many voices around the table. The data produced from IPA can promote and result in person-centred solutions that encompass underlying psychosocial values such as reassurance, identity and resilience. As shown in this article, multiple perspectives can be gathered and interpreted on an individual basis to gain an in-depth, holistic understanding of a phenomenon. In this case, the utilisation of a multi-perspective approach provided an insight into the individual experiences of people with cancer and family caregivers of symptom management digital health, however, it also illuminated a unique look into what it meant to them within their family dynamics.

Exploring the lived experiences of digital health using IPA has a strong potential to change and shape clinical practice, especially as the desire and interest to implement supportive technologies is intensifying internationally (Centres for Disease Control, 2022, European Union, 2022; WHO, 2021). IPA as a methodology can uncover key aspects of the experience that will make our transition into a digital space person-centred and nuanced. As exemplified in the main study findings, the analysis showed that participants with cancer did not need the technology for the full duration of their treatment and recognised over time that it was them that was caring for themselves and not the technology that is they learned what they needed to learn and were able to apply it (Darley et al., 2023). This finding implies that real-world cost-effectiveness, as described in our previous article (Darley et al., 2023), how digital health supports could be provided to people for an agreed period to help the education and adjustment process, rather than the full treatment period. This approach could result in supporting more people concurrently with the same number of available devices at the cancer care centre. However, this approach may also need to consider personal preferences as some may want to use the technology for the full duration of their condition and/or treatment regime.

A crucial methodological finding of this research shows that when conducting qualitative research regarding digital health technology and cancer or other chronic conditions researchers must comprehend that when people and their family caregivers are faced with a limiting or life-threatening illness, this experience becomes the epicentre of their life-world. Therefore, researchers may garner more insightful findings if they view digital health technology as a tool in conjunction with their cancer experience and give importance to both concepts in their investigation. This novel methodological insight from using IPA raises the question of whether digital health technology research and development can learn from the broader understanding of the cancer experience or whether it would discover more by continuing its tradition of focusing on acceptability, usability and effectiveness, rather than the whole lived experience? Acknowledging that the common aim of the existing international digital health strategies is to improve the experiences of people accessing and engaging with healthcare when they need it, it would appear fitting to use a methodology that is fundamentally rooted in the lived experience and how people attribute meaning in their lives. IPA presents an opportunity to inform and shape future policies and strategies in the field of digital health, evidence-based clinical practice and future research initiatives.

Conclusion

In this article, we reflect on the function, merits and challenges of using IPA to understand the lived experiences of using digital health amongst people living with health conditions and their family caregivers, based on an exemplar of evidence regarding symptom management technology in the context of cancer care. As the majority of research in the field of digital health has focused on feasibility, usability and effectiveness, IPA is a key approach in our qualitative arsenal to investigate and facilitate psychological interpretation of what technology means to people in the context of health and well-being, that may not have been accessed using other qualitative methodologies. Achieving the rich and in-depth knowledge that can be produced from applying IPA may support the development and delivery of digital health technologies that are not only therapeutically effective but personally meaningful to those using them, with the potential to develop a relationship with them in guiding them on their health journey. This is a timely article considering how patient and public involvement has become an integral part of designing solutions for people living with health conditions. IPA may lend itself well to the rise of digital health technologies that will be created to meet the needs of our growing and ageing population, by capturing the essence of people's experiences and stimulating real-world changes in the field.

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Ethical Statement

Ethical Approval

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