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Original article

Perceived value of eHealth among people living with multimorbidity: a qualitative study

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Abstract

Background: The prevalence of multimorbidity is increasing, creating challenges for patients, healthcare professionals, and healthcare systems. Given that chronic disease management increasingly involves eHealth, it is useful to assess its perceived value among people with multimorbidity. **Objective:** To explore challenges related to multimorbidity and patients' perspectives on eHealth. **Design:** Ten semi-structured interviews with adults, living with multimorbidity in Copenhagen, Denmark. Interviews focused on patient-experienced challenges, from challenges related to self-management to challenges experienced in the healthcare sector, as well as perceptions of eHealth. During interviews, participants were presented with pictures of different eHealth technologies. Data analysis followed the systematic text condensation approach. **Results:** Participants experienced challenges in their daily lives, e.g. when practicing self-management activities, when navigating the healthcare sector, and when interacting with healthcare professionals. Patient-perceived value of eHealth varied, depending on their burden of illness and treatment: those with a greater burden had more positive perceptions of eHealth, and expressed more intention to use it. Participants with less complex disease patterns and less burdensome treatment regimens were more likely to perceive eHealth as something worthless and undesirable. Participants stressed that eHealth should only be introduced as an optional supplement. **Conclusions:** eHealth can potentially address some patient-experienced challenges related to multimorbidity by promoting self-management, patient-centeredness, and access. However, patients' needs and preferences vary and eHealth cannot substitute the personal interaction between patient and healthcare professionals. Our findings point to the importance of patient assessment and stratification to ensure appropriate use of eHealth.

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Keywords: chronic illness, comorbidity, eHealth, needs assessment, patient care management, qualitative research, self-management, telemedicine

Introduction

The number of people living with more than one chronic condition (multimorbidity) is rising [1,2], causing severe and wide-ranging consequences for the individual patients as well as for healthcare systems [3]. Multimorbidity is associated with poor clinical outcomes, including increased rates of mortality [4], reduced quality of life [4–7], disability, functional decline [6], higher healthcare utilization [7–10], and psychological distress [11]. The prevalence of multimorbidity also increases with age [12,13]. It is, however, not simply a problem of chronological aging [14]. Multimorbidity is more common, occurs earlier, and has a higher burden in patients living in deprived areas [12,13,15]. Also, in these areas, patients with complex needs are found to be less enabled to cope with, and understand, their health problems compared with those

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in more affluent areas [16]. Further, several qualitative studies have found that managing multimorbidity is burdensome for patients [17–20], and that the presence of multiple chronic conditions can create barriers for effective self-management [19].

Patients can find it challenging to understand and monitor various clinical conditions and symptoms, to obtain information and management strategies across conditions, adhere to several medication regimens and treatment plans, and to follow different recommendations across conditions from different healthcare professionals [19]. In addition, people with multimorbidity experience challenges when communicating with healthcare professionals, and when trying to schedule, coordinate, and attend clinic visits [19,21]. Furthermore, when seeing multiple healthcare professionals, patients can experience their care as fragmented and chaotic [22,23]. Studies suggest that continuity of care is difficult to establish for people with multimorbidity in healthcare systems that are predominantly organized around a single-disease paradigm [13,24]. Adhering to clinical practice guidelines can have undesirable effects, such as adverse drug interactions [25]. Thus, many healthcare systems are insufficiently organized to handle multimorbidity [26], and even though multimorbidity is becoming increasingly common, the evidence base for enhancing care for people with multimorbidity is still limited [27].

Information and communication technology (ICT) is increasingly being used in chronic disease management [28], and there is a growing trend in the use of digital health technologies [29–31]. "Digital health" is a term that is becoming frequently adopted to encompass a wide range of technologies related to health and medicine. Many technologies come under the rubric of digital health, and the variety of contemporary digital health technologies ranges from technologies directed at individuals to those used at a population level [30].

While eHealth solutions are important components of health technology, the term "eHealth" is broad [29,32]. Most definitions highlight the importance of Internet-related technologies to support, enable, promote, and enhance health, and augment the efficacy and efficiency of the healthcare process [29]. It is acknowledged that eHealth has the potential to improve care and offer new services for people with multimorbidity [21,31,33]. For example, eHealth could allow for improved access to healthcare services, easier and faster communication and information sharing (between healthcare professionals and patients), better coordination and integration of care, and facilitate better self-management [21,31,33].

Despite its potential and the growing investment and interest in eHealth, the progress of eHealth implementation – in general, but especially for multimorbidity care – remains fairly limited in the European Union [31]. According to a recent survey (2015) involving 47 European countries, the most widespread eHealth tools in multimorbidity care are used for improving the integration, quality, and efficiency of care processes within and between care providers. Such tools include electronic health records (EHRs), professionals' own databases of patient data, and systems for ICT-based communication between providers. Self-management tools that are used by patients to manage their health more independently, and remote eHealth tools that provide and enhance the remote interaction between patients and healthcare professionals, are less common [31]. Self-management tools include computerized systems (e.g. computers, tablets, mobile health, wearable devices or other assistive technologies), which educate and empower patients in their self-care, e.g. by providing feedback or supporting adherence to treatment [31]. Remote eHealth solutions include consultations and "virtual" visits (e.g. video, phone), online appointment scheduling, and registration of health status parameters by patients.

People with multimorbidity express interest in using such patient-facing eHealth tools, which they believe can be valuable to them [21,33], and opportunities have been identified to support them in using it for self-management and healthcare [21,31,33]. However, as patients have also expressed concerns about eHealth that can discourage them from using it [33], further exploration of the variation in patient needs and preferences would clearly be useful [21].

Existing knowledge in this area is based on patients who either are already familiar with smartphone and computer technologies [33], or have experience using technology to help them care for their health or manage their healthcare [21]. In this study, we therefore give voice to patients with no prior eHealth experience or special ease in using technology. Furthermore, this study includes people living in an area of high deprivation who could potentially benefit the most from eHealth due to a high burden of illness and treatment. The study sought to identify the challenges that people with multimorbidity experience in their self-management processes and in the healthcare sector, and to explore their perspectives on eHealth. More specifically, we aimed to examine patients' assumptions and expectations about how self-management tools and remote eHealth solutions might support them and help to address their challenges.

In this study, "eHealth" is used as an umbrella term that covers a wide range of health and care services delivered through ICT [31]. However, we focus on patient-facing eHealth tools, including self-management tools and remote eHealth solutions, and do not address tools used within and between care providers (e.g. video-conferences or EHR integration), or health data

analytics systems used at population level. Concerning the scope of self-management, we focused on the cluster of daily behaviors that patients perform to manage their chronic condition, such as monitoring and managing symptoms and signs of illness, adhering to treatment regimens, and managing the impacts of illness on functioning, rather than managing emotional responses and maintaining everyday life such as employment and family relationships. Since participants were likely to be experiencing substantial challenges, we expected that they might consider Health as a potentially helpful tool.

Methods

Study design

Ten in-person, individual, semi-structured qualitative interviews were conducted with people with multimorbidity. Guided by phenomenology, we sought to explore and understand the "lived experiences" of multimorbidity and to reveal the "essence" of eHealth from the patients' perspectives [34]. Phenomenology – the study of phenomena – seeks overlap in the experience of various subjects: given that individuals can perceive and experience things differently, phenomenology tries to reach an intersubjectively meaningful understanding of a phenomenon that captures its essential qualities [34]. In this case, we aimed at exploring how patients experience various challenges, and revealing the many aspects and nuances of the concept of "eHealth" from their perspectives. The interviews were conducted using a semi-structured guide with open-ended questions. The guide included questions regarding challenges identified in the literature as relating to self-management, navigation of the healthcare sector, and interaction with healthcare professionals. However, the open, explorative nature of the interviews allowed other challenges to emerge. To explore participants' underlying assumptions, expectations, and knowledge about eHealth, the guide included three conceptual domains (nature of technology, technology strategy, and technology in use) based on "Technological Frames" [35] – a framework to facilitate understanding of how individuals' assumptions, expectations, and knowledge of technology can either hamper or promote its development and use [35]. Topics included in the interview guide are listed in Table 1.

Based on the first two interviews, minor changes were made to the guide. To avoid influencing participants' subjective perspectives on eHealth, the interviewer provided no clear definition of eHealth. Instead, participants were first asked about their familiarity with using ICT and eHealth; then they were presented with different pictures of eHealth (a description of the pictures is listed in Table 2) and invited to reflect and comment on these – a technique inspired by photo-elicitation technique, which aims to prompt responses and reveal participants' assumptions and expectations [36]. This technique corresponds with the theoretical framework, which acknowledges the value of visual images in obtaining important clues to people's implicit understandings, values, and concerns [35]. Even though the interviews primarily dealt with the examples of eHealth portrayed in the pictures, the participants also talked about other types of technology that came to mind, as they were also asked to use their imagination and express their potential wishes or needs.

Sampling and recruitment

Participants were recruited from Bispebjerg University Hospital in the Capital Region of Denmark. Using purposeful sampling, a briefing letter about the study was initially sent to 22 potential participants. These individuals had at least two of the following diseases: chronic obstructive pulmonary disease (COPD), heart disease, diabetes, or depression, and had been hospitalized or had one or more outpatient clinic visits in 2013. In addition, in 2014, they had all provided written consent to

Table 1 Topics included in the semi-structured interview guide.

Topics	Sub-topics
Background information	• Age, conditions, social relations, labor market attachment
Challenges related to self-management	• Patients' experiences of their self-management, including monitoring and managing symptoms and signs of illness, and adhering to treatment regimens and healthy lifestyle behaviors
Challenges in the healthcare sector	• Patients' experiences of healthcare navigation, treatment, and interaction and communication with healthcare professionals
eHealth	• Patients' experiences with eHealth and technology in general • Understanding of the capabilities and functionality of eHealth • Understanding of the motivation or vision behind using eHealth in the healthcare sector • Perceived pros and cons of eHealth • Suggestions for future eHealth tools

Table 2 A description of the pictures that participants were presented with during interviews.

Picture no.	eHealth type	Description of the picture
1	Remote consultation and monitoring	A woman is performing a pulmonary function test alone in her living room and communicating with a healthcare professional using a video link on a computer
2	Remote consultation	A man is communicating with a healthcare professional using a video link on a small, purpose-built computer. He is sitting alone in his home office
3	Remote care (rehabilitation)	An instructor is performing physical exercises in front of a camera. Five participants follow her instructions at a distance using a video link. She is able to see the participants on a screen in front of her
4	Remote care (rehabilitation)	A woman is sitting alone in her living room. She is doing physical exercises in front of a computer screen
5	Self-management tool (self-monitoring)	A man is sitting alone in his living room. He is measuring his blood pressure using a device for his smartphone
6	Self-management tool (self-monitoring)	A smartphone application and a smartwatch are pictured. The application shows the person's blood pressure and pulse
7	Self-management tool (drug reminder)	A smartphone drug-reminder application is pictured
8	Self-management tool	The main menu of a self-management application for smartphone and tablet is pictured. The menu consists of symptoms, doctors, facilities, diseases, medications, iTriage, hotlines, and news

access to their medical records for a parallel study [20]. Subsequently, participants were approached by phone. Eight potential participants were never reached, despite several attempts. One person said they lacked the energy to take part in the study; another declined to participate, without stating a reason. Altogether, 12 interviews were arranged, but two were later cancelled due to acute worsening of the patients' condition. These two cancelled interviews were not rearranged; nor did we make contact with the remaining potential participants, as we agreed that we had gathered sufficient data of high quality.

In determining how much data was required, we aimed for sufficient "information power" – a concept introduced by Malterud *et al.* to guide adequate sample size for qualitative studies [37], positing that the more information the sample holds that is specifically relevant to the study, the fewer participants are needed [37]. As suggested by Malterud *et al.*, we appraised the information power of the sample continuously during the research process [37]. The participants included were highly appropriate to the research question, as they belonged to a specified target group with characteristics that matched the study aim [37]. In addition, participants had a broad range of experiences, and the interview dialogues were of high quality. As interviews were supported by photo-elicitation technique, all participants had the necessary insight to talk about eHealth, which promoted a strong and clear communication between researcher and participants. Characteristics of the participants are provided in Table 3.

Setting and procedures

The interviews had an average duration of 48 min (range 40–80 min). Seven were conducted in a meeting room at the hospital and three in the participants' private homes, depending on participant preference. Only

Table 3 Participant characteristics.

ID	Sex	Age	Marital status	Illnesses	Illness burden*	Treatment burden*
1	F	71	Married	Heart disease, diabetes, and Crohn's colitis	Low	Low
2	M	72	Single	Heart disease, diabetes, and knee pain	High	Low
3	M	55	Married	Diabetes, COPD, and other chronic lung disease	High	High
4	M	48	Cohabiting	Heart disease and depression	Low	Low
5	M	71	Widowed	Heart disease (requiring a pace maker), diabetes, and COPD	High	Low
6	F	58	Married	Diabetes, COPD, and fibromyalgia	High	High
7	F	55	Married	Diabetes, depression, rheumatoid arthritis, psoriasis, poor kidney function, PCOS, herniated disc, and chronic UTI	High	High
8	M	72	Single	Heart disease, diabetes, COPD, and poor kidney function	High	High
9	M	65	Single	Heart disease (requiring an ICD) and diabetes	Low	Low
10	F	69	Single	COPD, depression, back pain, and peptic ulcers	High	High

*The level of illness and treatment burden is based on the participants' statements and the interviewer's observations.
COPD, chronic obstructive pulmonary disease; F, female; ICD, implantable cardioverter defibrillator; M, male; PCOS, polycystic ovary syndrome; UTI, urinary tract infection.

the participant and the interviewer were present during the interview, with the exception of one woman (ID: 6) who was accompanied by her husband. Participants were informed about the interviewer's educational and professional background, and the purpose of the study. All participants signed a written informed consent to participate. Interviews were audio-taped and fully transcribed verbatim by the first author. In addition, field notes were made during and after the interviews. No repeat interviews were conducted.

Data analysis

Data analysis was informed by the stepwise "systematic text condensation" (STC) approach described by Malterud [38]. The analysis dealt with challenges related to multimorbidity, and perceptions of eHealth. Field notes were included in the analysis and served as a source to inform, validate, and provide additional insight into the identified themes. Inspired by phenomenology, STC seeks to identify and precisely describe the essence of a phenomenon [38]. In this case, it helped to elucidate participants' experienced challenges as well as their underlying subjective assumptions about eHealth and their expectations for its use. When coding the transcripts, we took a flexible approach to the three domains [35]: drawing on phenomenology, we used the following process to generate codes from the findings, rather than applying pre-existing codes to the data:

(1) First author read the transcripts several times, to obtain a general impression of the whole, and identified key themes.
(2) In all individual interviews, meaning units potentially related to the key themes were identified, classified, and sorted.
(3) Data were reduced to a decontextualized selection of meaning units sorted as thematic code groups across individual interviews.
(4) Data were reconceptualized, and descriptions and concepts were developed and summarized into main findings.

An example of the coding process is shown in Table 4.

Though the coding was undertaken by the first author, all the identified themes, meaning units, codes, and findings were closely scrutinized and validated by the co-authors at all stages of the process. To ensure that no meaning was lost in the process, every transcribed quotation was analyzed and discussed in detail with the co-authors. In this process, the research group compared the deconstructed text with the original transcripts. Ongoing discussions and critical reflections within the research group created a wider analytic space. We discussed our interpretations of the content and whether and how the identified themes and codes were related. To ensure trustworthiness and credibility, findings were discussed until agreement was reached. Discussions primarily dealt with our own expectations and presuppositions, e.g. expectations about participants' perceived value of eHealth. NVivo10 qualitative data analysis software (QSR International, Melbourne, Australia) was used for data analysis and synthesis. The analytic process started after the first interview, and as described, we continuously appraised the information power [37] of the sample to decide on the sample size. After the first seven interviews, the research group agreed that sufficient data of high quality had been gathered. By this point, it was already clear that participants were likely to hold either a positive or a negative perspective on eHealth, thus defining two groups; however, the research team agreed to conduct three further interviews to see whether any new themes or perspectives might emerge.

Table 4 Example of the coding process.

Major theme	Meaning unit	Code groups
Access	Perceived barriers to healthcare services	Getting help when needed The general practitioner as gatekeeper Ability to reach

Results

Six men and four women were included; the mean age was 68 years (range 48–72 years). All participants were of Danish origin, and all lived in their own homes in an area of high deprivation; five lived alone, and five with a partner. All except one participant were on income support: six were retired, and three were unemployed. Participants had an average of 5.5 diagnoses (range 2–8), and two had a recorded diagnosis of mental illness. The participants had varying experience with ICT. All mentioned having computers, whereas smartphones and tablets were less common. Participants used these technologies in varying degrees and for different purposes: some mentioned using the Internet to search for health-related information, while others expressed disinterest in ICT and very limited use of it. None of the participants had prior eHealth experience, and in general, participants had a very narrow understanding of the term "eHealth" until shown the prompt pictures.

Challenges experienced by people with multimorbidity

The analysis showed that living with multimorbidity is often related to various challenges, with many participants describing challenges in their daily lives when practicing self-management activities, navigating the

healthcare sector, and interacting with healthcare professionals. The analysis revealed a correlation between the intensity of experienced challenges and patients' illness and treatment burden – those with physical restrictions, and/or complex disease patterns and drug regimens feeling most challenged. Our qualitative analysis identified six key categories related to patient-experienced challenges:

- Worrying about medication and feeling responsible for medication treatment
- Seeking reliable information and advice
- The impact of physical restrictions
- Uncoordinated procedures and access barriers
- The importance of patient-centered care
- A desire for longer consultations.

Worrying about medication and feeling responsible for medication treatment

The analysis showed that living with multimorbidity involves several daily self-management activities, such as managing multiple complex medication regimens, measuring vital signs such as blood glucose and blood pressure, and adhering to diet and physical activity recommendations. When asked about how living with multimorbidity impacted their everyday lives, the participants emphasized how medication and medication management was an important component of their self-management and a big part of their daily lives. Participants described how they use self-invented routines involving notebooks, diaries, pill boxes, and alarm clocks to manage their medication, and therefore some participants described having no trouble managing their conditions and their medications. One patient said, "*It's very easy for me to handle my medicines. I have a little plastic basket with all my pills, and I dispense them regularly each week. I have no troubles at all*" (Male, 65 years, ID: 9).

On the other hand, participants with greater illness burden and more complex medication regimens mentioned concerns about taking too many medications and expressed a desire to reduce the amount: "*The more pills I can throw out of the pill box, the better I feel. In fact, the only time I feel bothered by having chronic illnesses is when I'm sitting looking at the pill box Sunday morning – when I'm filling it up Sunday morning. I'm putting 8–10 pills in each room. There you go!*" (Male, 55 years, ID: 3).

Participants worried about taking multiple medications prescribed by different specialists for separate conditions, and most described an apparent lack of liaison between healthcare professionals to monitor potentially harmful drug interactions: "*There has not been much coordination of the medicine. For example, aspirin was prescribed because I have diabetes, but the cardiologist prescribed some other blood thinning pills for my heart. And not until just recently, after several years, they found out that I should not be taking both pills. So they don't really coordinate. That, I don't think they are good at*" (Male, 71 years, ID: 5).

Several participants felt responsible for ensuring appropriate, safe, and effective medication use. This sometimes provoked feelings of confusion and anxiety, and conflicting advice could generate feelings of distrust: "*Not many hospital departments work together regarding your medicine, and if you're not aware yourself then…But I'm not really a good judge; and I feel like I have to listen to the doctors. But you become doubtful and you don't know who to trust. […] Sometimes the doctors just say, 'You have to take this', but I always ask for an explanation. I think that can irritate the doctors, and a doctor once said, 'You really ask a lot'. But of course I ask! I am the one who is going to eat the pills, and I have seen dangerous drug interactions in my job and in my family*" (Female, 55 years, ID: 7).

Seeking reliable information and advice

Self-managing multiple conditions while adhering to complex treatment regimens appeared to be difficult and stressful for patients with a high illness and treatment burden: "*It stresses you every day! And all of a sudden, you will break down. As soon as you have just one chronic condition, you can get stressed. Because it can be stressful just having to measure [blood glucose], take pills, and remember this and remember that*" (Female, 58 years, ID: 6).

Several of the participants with a high illness burden described having limited knowledge about adequate self-management practices, which left them feeling challenged in their everyday lives. Many felt the need for guidance or recommendations about how to reduce the impact of illness on their wellbeing. They had encountered difficulties obtaining practical advice from multiple healthcare professionals, and this perceived lack of adequate support clearly places a huge burden of responsibility on the patients. Most mentioned being unable to obtain self-management advice that took account of the coexistence of several conditions. As one woman reported, "*I don't get any advice. For example, the lung doctor doesn't give me any advice. He just told me to use the inhaler. What I can do besides that to get better, that's something I have to come up with myself. I know that exercising is good. They also say it's good for diabetes, but it just isn't good for my fibromyalgia, but no one pays attention to that. […] That makes it difficult for me to move on and get better. I feel like I have to… I know I have to take care of my self – but it's difficult to tell what to do*" (Female, 58 years, ID: 6).

Challenges related to obtaining satisfying self-management advice or information were mainly mentioned by participants with a high illness burden, whose self-management activities were more complex.

The impact of physical restrictions

Every participant spoke about how their daily lives were impacted, to varying degrees, by reduced energy and physical strength due to their chronic illnesses. Those with major physical restrictions mentioned that daily activities and social participation had become more difficult: "*Well, when I have a job I do it diligently, almost no matter how I feel, compromising my family and my leisure time. Because, when I come home after a 6-hour workday I am completely exhausted*" (Female, 55 years, ID: 7).

Physical restrictions meant that attending healthcare appointments could be physically hard and exhausting; rehabilitation programs involving physical training could be particularly demanding and, in some cases, impossible to complete. In general, leaving the house could be a daunting task, resulting in social isolation for some. Rather than go out, some participants relied on public support and/or help from relatives: "*Now I have come to a point where everything is just so difficult, difficult, difficult. And I feel a lot of pain, and I am very tired, and I can almost not…. Well, I do get good support from the municipality. They do my shopping and bring out food. […] I don't have the energy to leave the apartment*" (Male, 72 years, ID: 8).

In contrast, participants with fewer physical restrictions found it easier to attend healthcare appointments and to take part in social activities: "*I'm glad that I'm retired and that I still drive a car, because if I was still working it would have been very difficult because the treatment takes place in different locations. I can just go there [to the clinic] and hopefully the appointment doesn't conflict with babysitting of my grandchildren or something else*" (Male, 71 years, ID: 5).

Uncoordinated procedures and access barriers

The analysis showed that all participants had experienced frustration with the healthcare system, citing poor coordination between different healthcare providers and difficulty accessing appropriate care when they needed it. The severity of such challenges is clearly related to the individual's burden of illness and treatment. Participants with less burdensome treatment regimens and no physical restrictions described themselves as encountering fewer problems with access to care – perhaps partly because of their relatively limited interaction with the healthcare system: as one man explained, "*I don't have regular visits in the healthcare system. The only contact is when I'm ill, so I don't have to plan and coordinate my visits*" (Male, 48 years, ID: 4).

In contrast, participants with more complex disease patterns, more burdensome treatment regimens, and more physical restrictions mentioned having experienced significant access barriers, since their complex disease patterns mean that questions and acute concerns can arise on a daily basis: "*Very often, you're just a bit uncertain about something and about how to react in a given situation*" (Female, 55 years, ID: 7).

Getting in touch with the right person at the right time, and obtaining useful answers, was perceived as a special challenge: "*Getting in touch with the public institutions [talking in general about public departments and other agencies] is practically impossible – you can't call them without waiting in line for an hour*" (Male, 71 years, ID: 5).

Access to specialists was perceived as especially problematic, with general practitioners' gatekeeper function described as frustrating by patients seeking highly specialized care. Participants described uncoordinated procedures across healthcare providers, noting that healthcare professionals seemed to have limited knowledge about services in other sectors. Several participants recalled having had to guide their GP in referral procedures to access services in other sectors, and some described feeling responsible for finding information and asking for prevention or health-promoting activities: "*As a patient, you have to be good at asking about new opportunities yourself. […] I had heard about rehabilitation and smoking cessation, and asked for that. But actually, I feel that's something the ambulatory should inform about – about what opportunities you have*" (Male, 55 years, ID: 3).

Most participants advocated more straightforward access to specialists and better multidisciplinary collaboration to coordinate patient care.

The importance of patient-centered care

Participants described how their interaction with the healthcare system is compromised by healthcare professionals not taking all their conditions into account during a consultation. From their perspective, healthcare professionals lacked comprehensive awareness of their situation and total care plan: "*It seems like the overall overview of the patients' care is missing. That's how I perceive it. I don't hope it's carelessness, but it looks like it*" (Male, 65 years, ID: 9).

Regular follow-up visits were described as very standardized, with physicians appearing to focus mainly on numbers and test results. Most participants would have welcomed more attention to their individual and special needs, acknowledging that their GP's generalist approach may not adequately equip them for this: "*And quite often my GP can't answer my questions because she's not specialized. […] She rejects many things, and says that I have to talk to the cardiac department or the thoracic department […] It would be great if it was easier to get in touch with them [the specialists]*" (Male, 71 years, ID: 5).

A desire for longer consultations

All participants mentioned limited consultation time as a problem in the healthcare system, with short

consultations providing insufficient time to deal with extra questions or address concerns of importance to the patient: "*The thoracic department is, for example, only interested in lung function and respiration. And there is not much time to sit and talk with the physician or the nurse*" (Male, 55 years, ID: 3).

Several participants referred to leaving the consultation with unanswered questions – either having forgotten them, or having decided against asking them out of concern for other patients waiting when the consultation time is limited. In general, participants expressed a strong desire for longer consultations and a stronger focus on their individual situation and needs.

Perceived value of eHealth and identified solutions

It became clear during interviews that all participants had very limited knowledge about eHealth; perceptions varied of its capabilities and functionalities, as well as their understanding of the strategy or vision behind using eHealth in the healthcare sector. Patients expressed very different expectations about using eHealth, with two major themes emerging in the analysis: (1) eHealth as something undesirable and worthless, and (2) eHealth as something that makes things easier. Participants were likely to hold one of these two distinct perspectives, and the analysis showed a correlation between perceived value of eHealth and participants' burden of illness and treatment. The two perspectives on eHealth are summarized in the following two sections, and the main contrasts in perceptions of eHealth are provided in Table 5.

eHealth as something undesirable and worthless

About half of the participants expressed disinterest in eHealth technologies, which they considered of limited value – perhaps because this group of participants was characterized by having more well-controlled conditions, fewer interactions with the healthcare sector, and less physical restrictions; they also appeared to be more involved in activities providing social interaction. They generally assumed that they could not benefit from eHealth, perceiving its capabilities and functionalities as unnecessary. Confident in their own self-management routines, they saw no need for self-management tools, including drug reminder applications: "*I don't need it. It's stored in here*" [pointing at his head] (Male, 72 years, ID: 2). "*It's confusing with all the information you get and so on, but in order not to forget it, I write everything in my diary – also my scheduled clinic visits. I have done that for many years now*" (Female, 71 years, ID: 1).

These patients assessed eHealth in terms of their general perceptions of technology. Being unaccustomed to using smartphones and computers was reflected in their lack of interest in eHealth: "*From my perspective, the purpose of a cell phone is to make calls, maybe a text message; but all the other functions I don't use. […] I couldn't see myself using it [eHealth in general] – because I'm not very technical, and I don't spend a lot of time familiarizing myself with technology*" (Male, 48 years, ID: 4). "*My husband has a computer, and when I see how much time he spends on it… I have no interest in that computer at all! […] I would only use it [for remote consultations] if I really needed it. I just think that all that technology, that's just not something for me!*" (Female, 71 years, ID: 1).

Skepticism of technology was also reflected in participants' interpretation of plans to implement eHealth in the healthcare sector. They often assumed that eHealth is being implemented not to benefit patients, but to address resource challenges: "*I think it [eHealth in general] is used because of staff savings. The few specialists we have can then be used to reach more people*" (Male, 71 years, ID: 5). "*It [eHealth in general] is used to save money and time, and time is money, and we don't have any money*" (Male, 72 years, ID: 2).

Describing their expectations about using eHealth, participants were wary of distant communication, anxious remote consultations could compromise the quality of their care since physicians may be unable to detect other health problems: "*Maybe you're walking around with another disease that might be overlooked because the conversation is too focused on the lungs, for example. And maybe there is no time to talk about something else. […]. I don't pay a lot of taxes, but I think we have to be careful that our healthcare sector doesn't get too reduced. It's easy to say that patients should 'do this and do that' at home and send the information. That just means that the number of doctors and nurses will fall*" (Male, 48 years, ID: 4).

Participants expressed a clear preference for face-to-face consultations, whereas communicating with a doctor using technology was perceived as superficial and impersonal: "*I wouldn't say I'm anxious of technology, but to me it sounds like a superficial kind of communication. […] I have no reasoned objections; I just find it emotionally unpleasant*" (Male, 71 years, ID: 5). "*I think it's creepy. It's like the doctor is just sitting there waiting for the next person in line. I guess I would think, 'Don't they care about me at all?' I would feel like an idiot using it, and think that it was not normal*" (Male, 65 years, ID: 9).

Attending social activities and maintaining social relations appeared to be important to this group of participants, some of whom feared that eHealth could lead to social isolation: "*One consequence is a greater detachment from other people. In today's society people care a lot about themselves, and I could fear that the more you introduce something like that [eHealth in general] the more isolations*" (Male, 48, ID: 4). One woman did not want remote eHealth consultations to replace her regular control visits, which

Table 5 Main contrasts in perceptions of eHealth between groups.

	eHealth as something undesirable and worthless	eHealth as something that makes things easier
Remote consultation	Remote consultations were perceived as unpleasing and superficial, and participants highlighted a preference for face-to-face consultations: "*I don't mind going to the hospital. I don't! Because it sort of gives me an aim to go for. I think it's quite good to take those small trips. Yesterday I also went to the hospital with my husband.*" (Female, 71 years, ID: 1) "*When I look at that picture, I literally find it pleasant to sit and wait in the department and talk to a real human being. I get that you are able to do almost the same thing this way […] I have no reasoned objections; I just find it emotionally unpleasant.*" (Male, 71 years, ID: 5) "*I prefer talking to the person who has to help me with something. It can easily get too impersonal. I don't find it interesting at all! I would think: 'God, they really don't care about me.'*"(Male, 65 years, ID: 9)	Remote consultations were perceived as useful for some healthcare appointments. Due to frequent appointments and experienced challenges such as access barriers and burdensome transportation, participants perceived remote consultations as an easier alternative to face-to-face consultations: "*In many situations, it would be fine to talk to the nurse on the phone – when there is no need to be face-to-face.*" (Male, 55 years, ID: 3) "*I think it's great that you are able to see the person you're talking to, and the doctor is able to see what it is all about. […] It would be great if I could show him my swollen leg, and it's positive because it's difficult for me to get ready and leave the house and get to the other side of the city.*" (Male, 72 years, ID: 8) "*First of all, a good thing is that you don't have to use 77 different means of transportation, and you're in your own home, which is more relaxing. […] I think it's fantastic. […] Also, it would be useful when you have doubts about the pills. Then you could get an answer much faster.*" (Female, 69 years, ID: 10) "*For some purposes, it would be great. It would be difficult with the rheumatologist, I think, but my diabetes could easily be handled on a screen. Typically, I just have to talk with the doctor about a blood test, and that can easily be done via a screen. […] It would also be great if it was more easy to call the doctor if you're worried about something.*"(Female, 55 years, ID: 7)
Remote monitoring	Remote monitoring was perceived as unnecessary due to stable and well-managed conditions, and good self-management abilities: "*My conditions are quite stable and my blood pressure is more or less always the same. […] I know what to do when I have to measure my blood pressure, and if it is too high, I also know what to do. I just take some diuretics. I mean, I have had these conditions for a very long time now, so I doubt that I could benefit from something like that. I would prefer an easier access to the specialists. But I don't think they have the time to sit behind the screen the whole day, so the limitations would probably be the same as today.*" (Male, 71 years, ID: 5) Remote monitoring was perceived as impersonal, superficial and unnatural, and participants expressed no intention to use it when in their current state of health: "*I really don't like it. I would feel like an idiot if I had to sit there and use it. I think it is creepy. I would not use it, whatsoever. Of course, I would use it if I really had to, but then I would be thinking all the time that it wasn't normal.*" (Male, 65 years, ID: 9)	Remote monitoring was perceived as useful for monitoring different body parameters. In addition, it was perceived as a time-saving alternative to clinic visits, and as a way to keep better track of own health status: "*A lot of small things, like blood pressure and other tests, could easily be done this way. That would save both the doctors' and my own time. If you could just call the doctor and he could make out a prescription, that would be great.*" (Female, 55 years, ID: 6) "*I would find it useful for my blood pressure. I mean, you cannot always feel and tell if something is wrong. […] As I told you, I've been feeling kind of strange the last couple of days, and what am I supposed to do, if I suddenly collapse? […] When I haven't walked for a long time, I have trouble just getting to the bathroom, and sometimes my legs cannot carry me and I fall. So I would use it in those periods where I feel a need to measure my blood pressure.*" (Female, 69 years, ID: 10)

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Table 5 (continued)

	eHealth as something undesirable and worthless	eHealth as something that makes things easier
Remote rehabilitation	Remote rehabilitation was perceived as undesirable, and participants highlighted a preference for social interaction with other people, and expressed no intention to use it when in their current state of health: "*I have been in two heart rehabilitation programs, and I would say that a positive thing is that you are together with a lot of people who are in the same situation as yourself. It was great fun! Making rehabilitation alone, I don't think I would do it… I would forget to connect myself. I couldn't take it seriously.*" (Male, 48 years, ID: 4) "*I would really not like that. […] I don't think it would make me more active. Well, I can see that it put some kind of moral pressure on you when the screen is lighting up and it's beeping and saying 'Now it's time'. But, no thanks! […] I also think it's a lonesome affair.*" (Male, 71 years, ID: 5) "*It's very impersonal. I would fall with laughter. […] I prefer spending time with happy people. I feel most comfortable that way.*" (Male, 65 years, ID: 9) "*Maybe it can be necessary. If you have troubles leaving the house. I had that the first time. I had to catch two buses and walk to get to the rehabilitation center. That was too much.*" (Male, 72 years, ID: 2)	Remote rehabilitation was perceived as an easier alternative to standard rehabilitation in a rehabilitation center due to physical restrictions and burdensome transportation: "*I think it would be wonderful! That somebody sort of comes to you and says: 'It's workout time'. It's a positive thing that you're able to communicate with another person in front of you. And that person can tell you if you're not doing the exercises the right way. She can correct you immediately.*" (Female, 58 years, ID: 6) "*I think it would be easy for many people. […] It can be difficult to do exercises alone at home. I mean, if you can see it on a screen, I think it would be easier. I mean, I think it's like standing just in front of the physiotherapist who tells you what to do – instead of just getting a piece of paper with the exercises. That can be difficult, I think. […] You also avoid transportation troubles and long waiting times. […] I could see myself using it.*" (Female, 55 years, ID: 7) "*Yes, I could imagine myself using it. A positive thing is that you can use it even when you have almost no energy. You don't have to get ready and get out of the door and get to the other part of the city. You just have to push a button.*" (Male, 72, ID: 8) "*I'm convinced that it is something that will get you active. I cannot imagine anything else. If I knew how to use it, I would. […] I have no muscles at all, and I'm in pain all over my body. I think it's brilliant.*" (Female, 69 years, ID: 10)
Self-management tools	Self-management monitoring tools were perceived as unnecessary as participants were already managing their conditions well: "*I don't really need it because I know what to do. When I'm taking it, and my blood glucose is too high I say: 'Alright, I need some insulin', and if it's too low I say: 'Alright, I better get some sugar'. […] I measure my blood pressure at home, but I don't keep track of the results anymore. […] If you have had the same chronic conditions for 10–25 years, then you know when you're not well, and I know when I need to see a doctor. I would prefer that, if I were not well. I think that's most safe.*" (Male, 72 years, ID: 2) Drug-reminder applications were perceived as unnecessary and worthless, as participants experienced no difficulties with medication management: "*I don't need it. It's stored in here*" [pointing at his head]. (Male, 72 years, ID: 2) "*It would only make sense if I were taking even more pills than I am doing now.*" (Male, 48 years, ID: 4)	Self-management monitoring tools were perceived as an easier way to monitor conditions: "*That would be quite nice to have. Because, for example, my blood pressure – I take it every day, but I actually don't… I mean, I don't really have a realistic and useful picture of the variation over time.*" (Female, 58, ID: 6) Participants were interested in improving their health by obtaining health-related information via self-management tools: "*It would be great if you could make a system that patients could enter to see if any new drugs were on the market, and to get proposals on possible drug adjustments.*" (Male, 55 years, ID: 3) To improve patient-centered care, participants expressed a desire for a pre-visit reporting tool: "*I think it would be great if I could type in questions in the system. Sometimes you feel bad, and suddenly you have questions. It would be great if the questions could just lie in the system and be used in the next consultation or something like that.*" (Female, 58 years, ID: 6)

she perceives as a socially rewarding daily activity: *"I don't mind going to the hospital. I don't! Because it sort of gives me an aim to go for. I think it's quite good to take those small trips*" (Female, 71 years, ID: 1).

This group of participants primarily perceived eHealth technologies as a help for people worse off than themselves, such as those who are housebound or facing transport issues. They all stressed that eHealth should only be offered as an optional supplement to existing care: "*It [eHealth in general] can of course be necessary if you have troubles leaving your home. But you have to be open towards it!*" (Male, 72, ID: 2).

eHealth as something that makes things easier

Participants with a greater burden of illness and treatment, whose physical restrictions made going out difficult, held more positive expectations about eHealth. Despite their limited knowledge of eHealth, this group was optimistic about its capabilities and functionalities, seeing it as something of value that could help to address some of the challenges they experienced. They expressed a greater intention to use the presented eHealth technologies, and suggested other eHealth solutions from which they assumed they could benefit (as detailed below). Also, in this group, participants assessed eHealth in terms of their general perceptions of technology. In general, they were more likely to express being familiar with, interested in, and confident about using smartphones and computers, which was reflected in their interest in eHealth: "*To me, it [eHealth in general] would be fantastic, I would say. Because I know how to use it [technology in general]. It would be fun to try. Technology and I are pretty good friends*" (Woman, 58 years, ID: 6).

These participants' generally positive perspective on eHealth was also reflected in their understanding of the intention behind implementing eHealth in the healthcare sector: "*It's implemented for the sake of the users. To help the users. That's how I see it. That's why you do it. You don't do it to release some resources. That would be the wrong reasons*" (Female, 69 years, ID: 10).

When talking about their expectations related to using eHealth, participants – while acknowledging lack of physical interaction as a potential disadvantage– emphasized its positive opportunities and expressed considerable interest in eHealth tools that could promote self-management, patient-centered consultations, and access to specialists. Because of challenges related to frequent healthcare appointments, burdensome navigation, and transportation, participants emphasized the benefits of communicating with a healthcare professional at a distance using remote eHealth consultations: "*I think it's great that you are able to see the person you're talking to, and the doctor is able to see what it is all about. […] It would be great if I could show him my swollen leg, and it's positive because it's difficult for me to get ready and leave the house and get to the other side of the city*" (Male, 72 years, ID: 8).

Attending healthcare appointments was mentioned as especially challenging by patients with reduced mobility, which was also found to be related to restricted social activity and isolation in their own homes: "*I don't get on the street every day. And that's because it's difficult to get down (from the apartment) and impossible to get up again. And how should I get that monster [referring to her mobility scooter] up? You cannot leave anything down there – my scooter has been stolen twice even though it was locked away*" (Female, 69 years, ID: 10).

In relation to this, the analysis showed that some participants assumed that eHealth could create opportunities for some kind of social interaction: "*Yeah, I think it could be fun [remote rehabilitation in a group]. Then you can see how other people do the exercises. And you get some kind of social interaction – a different kind, though*" (Female, 58 years, ID: 6).

These participants also expressed an interest in receiving continuous support and not being left on their own feeling responsible for their own care. To address the perceived lack of adequate self-management support, several participants expressed a desire to receive support and counseling through remote consultations: "*I think it would be great to have just a small talk every second week; that someone had an eye on you – that would be great*" (Female, 58 years, ID: 6).

Most of these participants assumed that eHealth could be valuable to them by improving access to healthcare professionals. In particular, they expressed a need for easier access to specialists, and explained the anticipated benefits of a hotline or a telephone counseling service when they needed instant advice: "*often it's actually sufficient that you can call a professional. Mostly, that's enough to calm you down*" (Female, 55 years, ID: 7).

Participants were also interested in using eHealth to improve their own health-related knowledge and expressed a desire for a supportive smartphone- or web-based application with updated information on drugs: "*It would be great if you could make a system that patients could enter to see if any new drugs were on the market, and to get proposals on possible drug adjustments. […] The information in the package inserts about drug–drug interactions is very limited*" (Male, 55 years, ID: 3).

Two participants explained how eHealth could enable greater focus on their specific needs during consultations. A pre-visit reporting tool, for example, would allow patients to enter specific questions for upcoming consultations: "*I would like it if I could say prior to a consultation: 'This is what's important for me today' […] I think it could lead to much more targeted consultations, and prevent future problems*" (Male, 55, ID: 3).

Several participants expressed an interest in remote rehabilitation and individualized training sessions. The

ability to communicate with, and be corrected by, an instructor was highlighted as beneficial: "*I think it would be easy for many people. […] It can be difficult to do exercises alone at home. I mean, if you can see it on a screen, I think it would be easier. I mean, I think it's like standing just in front of the physiotherapist who tells you what to do – instead of just getting a piece of paper with the exercises. That can be difficult, I think*" (Female, 55 years, ID: 7).

Even though this group of participants, characterized by greater illness and treatment burden, were more likely to expect benefits from using eHealth, they also expressed concerns. A general concern was the limitations of eHealth technologies. For example, participants noted that some treatments or examinations are impossible to do alone at home: "*When you just have to talk things through with the doctor, a screen would be fine. But you must have the long-term blood sugar test done in the clinic, and then you have to go [to the clinic] anyway, because you cannot take that test yourself*" (Female, 55 years, ID: 7).

Lack of technical skills was also a concern, especially for older people: "*Of course we should use the technology. That's why we have it. But I do think that a lot of old people will be challenged. I don't know about them. What you can do?*" (Female, 69 years, ID: 10). Though not completely confident using technology herself, this woman was very interested in using eHealth, including remote consultations, for which she was sure that she would receive proper user instructions: "*If I don't get it the first time, I'm sure he* [the healthcare professional] *will repeat it. Or they will send some service if you don't get it at all. I could expect that, because I'm not very good with computers and such things*"(Female, 69 years, ID: 10).

One woman mentioned that eHealth monitoring tools could shift more responsibility onto the patients, adding to their daily pressures: "*Then there's even more you have to manage and even more you have to keep track of. That creates a bit more stress*" (Female, 58 years, ID: 6).

Everyone in this group stressed that eHealth should only be introduced as a voluntary offer, and that it is important to make an initial assessment of patients before introducing it: "*If you only use technology, I see some potential risks. I mean, I think that you should still have some contact with your doctor. […] I think you have to be very good at assessing people. And if you know your doctor well, he can maybe make the assessment to see if it [eHealth] could be something or not*" (Female, 55 years, ID: 7).

Discussion

As expected, the participants in this study expressed experiencing significant challenges related to living with multimorbidity, but in varying degree. Participants described experiencing challenges associated with self-management, including medication management, difficulties with obtaining adequate self-management support and reliable information, and challenges caused by physical restrictions. In addition, participants mentioned challenges caused by uncoordinated cross-sectoral procedures in the healthcare sector, access barriers to healthcare services, a lack of patient-centered consultations, and time constraints in consultations. These findings are congruent with a recent systematic review of barriers to managing living with multiple chronic conditions [19].

Given the expectation that participants would be highly challenged by multimorbidity, we expected they would perceive the value of eHealth as high. Our findings support this hypothesis, as participants most challenged by multimorbidity due to a high burden of illness and treatment were likely to see the value and potential of eHealth. However, drawing on the conceptual framework of Technological Frames [35], we were able to identify different ways of thinking about eHealth and two distinct perspectives on eHealth emerged in the analysis. A novel finding was the variation in patients' assumptions and expectations about eHealth; awareness of such inconsistencies is particularly useful before designing and introducing new technology, to minimize problems in implementation [35]. Participants' assessment of the significance of their experienced challenges appeared to be the main reason for the differences in assumptions and expectations about eHealth. Those with a greater burden of illness and treatment, who were more likely to be socially isolated and housebound due to physical restrictions, and who assessed their experienced challenges as more significant, had more positive perceptions of eHealth. They also expressed a greater interest and intention to use eHealth and believed they could benefit from using it.

In contrast, participants with less complex disease patterns and less burdensome treatment regimens were more likely to perceive eHealth as something worthless and undesirable. They highlighted expected consequences and limitations of eHealth and did not express intention to use it while in their current state of health. This finding is in line with results of an extensive empirical comparison of eight information technology acceptance models conducted by Venkatesh *et al*., who found that the strongest determinant of intention to use technology is the degree to which the individual believes that using the system will help attain gains [39]. Also, in line with prior research, the participants in our study assessed eHealth based on their general perception of, and experience with, technology and evaluation of communicating at a distance [21,40–43].

Based on findings within the group of participants with a greater burden of illness and treatment, our study

suggests that eHealth can be of value to people with multimorbidity by supporting patient self-management, communication, access, coordination, and continuity. These findings echo those of previous studies [21,33], and can inform the future development of patient-faced eHealth technologies to this patient group. Offering out-of-office hours acute telephone counseling could improve access to specialized healthcare professionals and potentially prevent acute hospital admissions. Roberts *et al.* found that a nurse-led 24-hr hotline for patients with COPD reduced hospital presentations with acute exacerbations [44]. Likewise, Due-Christensen *et al.* mapped out the usage of out-of-office hours acute telephone counseling provided by diabetes specialist nurses and found that it had prevented admissions [45]. In addition, Ström suggests that medical care help lines have the potential to support and promote patients' self-care through personal advice [46]. Another suggestion is allowing patients to enter specific questions or data before consultations using pre-visit reporting tools. The existing literature suggests that such tools can have a positive impact on patient satisfaction [47] and improve primary care consultations [48].

Regarding self-management, participants expressed interest in using eHealth smartphone applications to improve their own health-related knowledge. Development of a system with updated information on topics such as medications, drug–drug interactions, side effects, and treatments would, however, be challenging due to a poor evidence base underpinning care of people with multimorbidity [49,50]. However, as individual patient needs and preferences appear to vary, none of these initiatives alone would meet the diverse needs of this patient group. Neither does eHealth appear to be suitable for all people living with multimorbidity. One size does not fit all, as previously stressed in another Danish qualitative, comparative study of tele-medical solutions for patients with COPD. Similar to our findings, Ballegård *et al.* highlight that patients have diverse needs depending on disease progression, and emphasize that the technology should match the specific needs of the patient [51]. The existing knowledge, together with the findings of the current study, stress the need to develop eHealth technologies as voluntary supplements to existing care, and point to the importance of patient assessment and stratification to ensure appropriate use of eHealth.

The conceptual framework of Technological Frames contributed to the content validity of our semi-structured guide, as all interviews included participants' assumptions, expectations, and knowledge about eHealth. Further, the interviews were supported by the photo-elicitation technique, which ensured that all participants had the necessary insight into the relevant technologies. In addition, our quite focused hypothesis worked as a tool for reflexivity and self-critique, which is relevant in all qualitative studies [52,53]. Qualitative methodology recognizes that the subjectivity of the researcher is intimately involved in scientific research [54], and by initially explicating our assumptions and expectations we were in a better position to explore the topic honestly and openly. During the entire research process, we carefully examined our own involvement and impact; for example, during data collection and analysis we were aware of and discussed potential judgments that could occur based on our own belief system rather than on the actual data collected from the participants. We believe this enhances the credibility of our findings.

This study has some limitations. Firstly, it is important to consider how we applied the conceptual framework of Technological Frames [35]. This framework is originally based on findings of an empirical study that illustrated how a groupware technology was interpreted differently by various organizational stakeholders, such as managers, technologists and users [35]. We only studied perceptions of eHealth within a single group of potential users, consisting of people with multimorbidity without any prior eHealth experience. Hence, even though the framework helped us bring to surface important knowledge about different perceptions of eHealth that are of relevance when designing and implementing new technology, our findings must be supplemented by studies of healthcare providers' perceptions of eHealth. In addition, we selected the framework *a priori* before conducting the interviews, and we used the framework to support the coding of the interview transcripts. One could argue that this approach deviates from phenomenological methodologies for carrying out qualitative research, and that it does not allow for an open exploration of human experience free of perceptions and interpretations, and discovery of new and different meanings. However, we did conduct the interviews and the analysis with great openness and continually reexamined our biases and presuppositions. Therefore, we believe that the findings reflect the experiences of the participants and that the two identified perspectives on eHealth represent the essential qualities and meanings of eHealth as experienced by the participants.

Secondly, the generalizability of the findings is restricted as all participants were of Danish origin and residing in a major urban, deprived area with short distances to healthcare services. In addition, most of the participants were on income support and had low levels of educational attainment. Other studies have found a greater intention to use eHealth among people with a higher level of education [43] and among people on the labor market [42], and more research is needed to explore variation in challenges, needs, and perspectives on eHealth among people in employment, with higher

educational levels, other cultural backgrounds, and people living with longer distances to healthcare services. However, as multimorbidity is more prevalent among people with lower socioeconomic positions, we find our group of participants to be highly relevant. In addition, as the study included patients with no prior eHealth experience or special comfort in using technology, the findings add to the existing evidence about perspectives on eHealth among people with multimorbidity.

Thirdly, as previously described, we did not include as many participants as initially planned, and it is possible that a greater number of participants could have enriched the content with more diverse experiences and perspectives on eHealth. However, the participants were of high quality for this specific study as the sample belonged to a distinct target group and held specified characteristics, while also exhibiting some variation within the experiences that were explored. Guided by the concept of information power [37], we therefore decided not to include more participants. As mentioned, it adds to the relevance and the transferability of our findings that the participants represented a group of elderly and unemployed people, living in a deprived area, without prior eHealth experience or special comfort in using technology.

Conclusion

The results from this study show that people living with multimorbidity are experiencing challenges in their daily lives when practicing self-management activities, when navigating the healthcare sector, and when interacting with healthcare professionals, but in varying degrees. eHealth can potentially address some of these challenges, such as by promoting self-management support, facilitating patient-centered care, and simplifying access to healthcare professionals. However, as patient-perceived value of eHealth varies and patients have different needs and preferences, depending on their burden of illness and treatment, we stress that eHealth should be developed as voluntary supplements to existing care. eHealth cannot substitute the personal interaction between patient and healthcare professionals, and our findings point to the importance of patient assessment and stratification to ensure its appropriate use.

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Conflicts of interest

The authors declare no conflicts of interest.

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