

# Older people and rural eHealth: perceptions of caring relations and their effects on engagement in digital primary health care

Jens Lindberg PhD<sup>1,2,3</sup> , Robert Bhatt RN, BSc<sup>4</sup> and Anton Ferm RN, BSc<sup>4</sup>

<sup>1</sup>Department of Social Work, Umeå University, Umeå, Sweden, <sup>2</sup>Centre for Demography and Ageing Research (CEDAR), Umeå University, Umeå, Sweden, <sup>3</sup>Vitalities Lab, Centre for Social Research in Health, University of New South Wales, Sydney, NSW, Australia and

<sup>4</sup>Department of Nursing, Umeå University, Umeå, Sweden

*Scand J Caring Sci. 2021; 35: 1322–1331*

## Older people and rural eHealth: perceptions of caring relations and their effects on engagement in digital primary health care

**Background:** The aim of this article is to describe older people's perceptions of caring relations in the context of rural eHealth, as well as to explore how such relations can facilitate engagement in digital primary health care. There is an ongoing implementation of eHealth in Western health care, and rural areas and older people are specifically targeted. eHealth is said to be a solution to emergent problems and a technology that will facilitate people's opportunities to achieve good and equal health. From this perspective, it is crucial that older people engage in eHealth services, but there are barriers for use, and care providers need to adapt to the preferences of older people.

**Methods:** Semi-structured interviews with 19 individuals aged 61–85 were conducted. The participants were using digital services at two primary healthcare centres located in northern Sweden. Qualitative content analysis was used. An important theoretical tenet was that older people's perceptions of and engagements in eHealth are affected by the specific rural conditions. Ethical approval for the study has been obtained.

**Results:** The analysis rendered a total of three themes: in-person interaction was central to people's perceptions of good caring relations; patient–nurse relations were particularly emphasised; and caring relations in rural eHealth appeared to be multi-directional and fuelled by a shared sense of rural community. Altogether, this facilitated participants' engagement in local eHealth initiatives.

**Conclusions:** eHealth is an opportunity for primary health care and for rural communities. However, the results provide insight into matters that can affect the quality, access, and equality of rural primary health care. Participants' engagement in eHealth was almost always facilitated by close caring relations with local Registered Nurses. Digital care needs to be approached as a combination of digital and in-person presence. Separating digital and physical task assignments among different personnel could make older people refrain from seeking health care.

**Keywords:** eHealth, digital health care, rural eHealth, rural health care, digital primary health care, older people, caring relations, patient–nurse relations, eHealth engagement, patient engagement.

*Submitted 15 June 2020, Accepted 13 December 2020*

### Correspondence to:

Jens Lindberg, Department of Social Work, Umeå University, Umeå SE 901 87, Sweden.

E-mail: jens.lindberg@umu.se

### Present address:

Robert Bhatt, Funktionshindersonsorg Umeå kommun Umeå 901 84 Sweden

Anton Ferm, Infektionskliniken Östersunds Sjukhus Östersund 831 83 Sweden

## Introduction

There is an ongoing implementation of digital health technology – so-called eHealth – in Western health care. According to policy, eHealth can be the solution to problems that follow from situations such as ageing populations and limited public resources (1,2). In Sweden, eHealth technologies should facilitate access to good and equal health care (3). As part of this, it has been suggested that future primary health care should include digital self-care and digital support to patients. Rural areas and older people are specifically targeted (1,4).

From this perspective, it is crucial that older people engage in eHealth services, but there are barriers as well as a need for more knowledge on the preferences and needs of rural users (1,5).

The WHO (2) defines eHealth as digital information and communication technologies used in health care. This article reports findings from two interdisciplinary research projects with a focus on how the implementation of eHealth in rural areas affects older people's experiences and uses of health care.

Earlier research on rural eHealth has addressed benefits as well as barriers for patients (6,7,8,9,10,11). Generally, low levels of education and skills among rural populations have a negative impact on the adoption and use of digital technologies, including eHealth solutions (12). Similarly, while there are reported positive experiences of eHealth from older people (13,14), there are also problems. For instance, older individuals sometimes have problems understanding and operating digital health services (15), and digital services do not always match with patients' perceived needs and life situations (16). Also, the general imperative to use digital health care appears to produce feelings of stress and anxiety (17,18).

While previous studies focus on barriers in digital health care, they also help indicate that caring relationships – or lack thereof – are pivotal for the perceptions of and engagement in eHealth. Within Nursing theory, caring relations in primary care, specifically between nurses and patients, have been deemed a fundamental value (19). Patient–nurse relations are central to patients' health, well-being (20,21), and engagements in health care (22,23). From patients' perspectives, it is important that nurses are both physically and emotionally present (24). In summary, there is substantial evidence that good patient–nurse relations can enrich perceptions and uses of health care (25).

The digitalisation of health care is changing both the practices and experiences of caring relations (26). Compared to 'regular' health care, much digital care is based on self-care and involves fewer physical interactions with trained professionals (27), for example user-operated medical devices or digital healthcare applications. Also, digital care tends to privilege medical conditions at the expense of peoples' lives in broader perspectives (28). The relapse of physical dimensions in caring relations can further contribute to failures or unintended consequences of digital care (29). However, caring relations and their effects have been scarcely explored in relation to digital health care (30).

For eHealth to help solve emergent problems such as access, quality, and equality in rural primary health care, care providers need to adapt to the preferences and needs of older people. In addition, the identified barriers to using digital care, especially among older individuals and rural populations, create an interest in how caring

relations can affect engagement in eHealth. The aim of this article is to describe older people's perceptions of caring relations in the context of rural eHealth, as well as to explore how such relations can facilitate engagement in digital primary healthcare services.

## Methods

### *Participants and settings*

Conventionally, an older person is defined as an individual who is aged 65 or over. This definition is often used in policy on health care (31). However, while current definitions of old age are being contested (32), empirical studies have also shown how people aged under 65 can also have problems with digital technology (15). In this study, we have used a broad definition of old age that includes people aged 60 or over. We conducted interviews with 19 ( $n = 19$ ) participants aged 61–85 years, living in the sparsely populated northern interior of Sweden. Twelve out of the 19 participants were female. Several of the participants had health conditions that are common among older individuals, such as hypertension and diabetes, or had suffered from strokes or cardiac arrests. Many had lived and worked most of their life in the region but were now retired. The majority of the participants had access to high-speed internet and were regularly using technologies like smart phones, tablets, and online banking. This was particularly common among the 'younger old' participants, where many had used computers in their working life.

The participants had all used some kind of eHealth technology at two different healthcare centres in two communities located circa 100 km apart from each other. Each community had populations of below 700 people. Both healthcare centres were staffed with two Registered Nurses available part or full-time, along with part-time Doctors and Enrolled Nurses. Healthcare Centre 1 had a Virtual Health Room and ran a remote patient monitoring system, while Healthcare Centre 2 used a Virtual Acute Cart.

The Virtual Health Room was a physical room housed in Healthcare Centre 1, where patients could go to conduct, self-administer, and digitally upload basic health checks such as blood pressure and blood glucose levels, but the room also provided a means for video consultation with professionals in other geographical locations. The remote patient monitoring system was a personal mobile phone and digital wrist watch application, where users themselves gathered health data about, for instance, physical activity, sleep, blood pressure, and blood glucose. Through the help of the online application, patients could digitally forward that information at any time to Healthcare Centre 1 as well as exchange 'chat-style' text messages with staff during office hours. The Virtual Acute Cart was a digital device located in one

of the examination rooms at Healthcare Centre 2, which enabled people to 'meet' Doctors and specialists via videoconferencing technology. In contrast, the Virtual Acute Care was not based on peoples' self-care; instead it involved in-person interaction with local Registered Nurses at Healthcare Centre 2.

### *Data collection*

The research data were obtained from semi-structured interviews. A Registered Nurse at both healthcare centres in the study was contacted and asked to approach people aged 60 or over who were using digital services. The Registered Nurses were asked to describe the research study in brief to potential participants, ask for permission to forward contact information (name, telephone number, and age) to the First Author, as well as for First Author to contact the individuals by telephone. The second step was for the First Author to contact the people who had agreed to be contacted, to give more substantial information about the study, describe what participation in the study could entail and, finally, ask for a preliminary consent to participate. At that point, a preliminary date and time for an interview was decided. Altogether, contact information for 23 older people was passed on from the two Registered Nurses. The First Author contacted 20 of those people. One individual declined to participate because of recent events connected to personal health.

The individual interviews were between one and three hours. In total, approximately 29 hours of interviews were recorded digitally and transcribed in verbatim. The excerpts used in the article have been translated from Swedish to English by the authors. According to individual participants' preferences, 13 interviews were conducted in the participants' homes and six at either of the two healthcare centres. In three instances, cohabitating couples, where both used eHealth, were interviewed together. While the different settings for the interviews affected their character, and the interviews conducted at the healthcare centres were usually shorter, all the semi-structured interviews were focused on the participants' perceptions about and everyday experiences of using eHealth technologies. Hence, the research data cover matters such as, for example, personal reasons for, perceptions of, and feelings about approaching particular care technologies, but also the experienced relations, benefits, and hurdles encountered in their process of use. During the interviews, participants were encouraged to elaborate on such matters, but also on broader societal issues, such as their views on the future of digital and rural health care.

### *Ethical considerations*

The project adheres to the four main ethical principles provided by The Swedish Research Council (33)

regarding studies in the humanities and social sciences: information, consent, confidentiality, and data use. Given the sensitive subject of the study, an important measure was to inform and remind participants about their right to leave out information or withdraw from participation at any time. The rural settings where the study was conducted are small communities where residents – both healthcare users and professionals – have strong social bonds. To ensure high confidentiality, the authors have refrained from presenting information about individual participants that is not considered essential for the analysis and results of the study. Informed consent was obtained from all participants before and during all interviews. To ensure a secure access to the data, source documents were stored on password-protected computers.

### *Analysis*

The analytical approach adopted in this study is inspired by qualitative content analysis as described by Graneheim and Lundman (34). In line with the aim of the article, perceptions of 'caring relations' as well as how these can help facilitate eHealth engagement acted as preliminary areas of inquiry, implying caring relations to be connections between humans in the capacity of patients and care professionals involved in healthcare practice (35).

Previous studies have shown how contextual conditions in rural settings can affect the adoption of digital technology (36). A central theoretical tenet in the study is that health care and caring relations are 'life phenomena' integrated in patients' everyday lives (37). From this perspective, we consider participants' perceptions of caring relations to guide their concrete engagement in eHealth. Further, both perceptions and concrete uses of digital health care are affected by the specific conditions of rural life and health care (38,39).

We employed an abductive strategy for analysis that involved a 'back and forth movement' between inductive observations of our empirical data and a deductive approach that was building on the theoretical framework of our study (40,41). Our strategy of analysis included detailed readings of the transcribed interviews by all three authors. During our analysis, we were searching for perceived values that study participants expressed in relation to digital caring relations. In collaboration, the authors divided the texts into meaning units related to the purpose of the study, which were then coded, resulting in three different themes. As a second step we were looking for empirical situations that were described in the interviews and how the values that we had identified got participants to engage (or not want to engage) in available services. Parallel to the inductive approach, our analysis was guided by the theoretical stance that rural conditions affect ideas and uses of eHealth. Throughout

our readings of the interviews, an overarching analytical practice was to identify and investigate how participants' notions and engagements were affected by the rural conditions of the research settings.

## Results

Altogether our strategy for analysis rendered a total of three themes as summarised below. The first two themes describe perceived values that emerged as issues in the participants' narrations. These values were associated with good caring relations and can exemplify how engagements in eHealth services were facilitated. Theme three, on the other hand, highlights how a rural context appeared to expand participants' perceptions of caring relations, which in turn facilitated both initial and more long-term engagement in eHealth, for example a shared sense of community made eHealth a 'communal' undertaking, not only a personal one. Overall, these themes describe pervading ways in which the participants of the study perceived caring relations, and as an outcome, engaged in digital primary healthcare services.

### *The importance of in-person caring relations*

A pivotal theme that emerged in the analysis was how physical face-to-face interaction was central to the participants' experiences of good caring relations. Many of the participants felt uncertain about digital care. Nonetheless, they both welcomed and used it. It was, however, important to them to also be able to meet staff in-person. Remote digital relations with care professionals were not experienced as strong or authentic and made some participants want to refrain from using eHealth services more generally.

Surprisingly, most study participants' perceptions of using the Virtual Health Room, remote patient monitoring system, and Virtual Acute Cart, were centred around primary care relations on a physical level. They did not talk about their digital encounters with Doctors located in other areas. Rather, physical meetings with actors, such as Doctors and Registered Nurses at their local healthcare centres, were given fundamental roles in their stories about eHealth use. This could be seen in the interviews more generally but was particularly clear when respondents were asked about features like videoconferencing. For example, one woman said that it felt strange to her to use the Virtual Acute Cart at Healthcare Centre 2, but that this feeling was overcome since in-person contact with local staff was also involved:

It was a bit weird, I think. (...) [The Registered Nurse] asked if I wanted her to be there and I thought that it would feel good if she was.

In the Virtual Health Room at Healthcare Centre 1, none of the participants had used the videoconferencing feature themselves. Many said that they were not

interested in using the technology because it did not involve physical interaction. If they were to make use of videoconferencing, participants wanted staff members to either accompany them, or to act as intermediaries. Sometimes, videoconferencing was simply articulated as being a service for the healthcare personnel, rather than for the patients. One woman said:

I can imagine that if the local healthcare unit doesn't have all the knowledge, they could connect and follow up with a specialist from somewhere else.

It was apparent that participants did not want health care to be 'fully' digital, but that eHealth should also involve in-person caring relations on-site.

Ultimately, the lack of in-person caring relations seemed to deter some participants from using digital health care and, as a consequence, from approaching the local digital primary healthcare services. One of the participants, for example, said that she felt positive towards digital care solutions in general; however, she did not want to use the available technology at Healthcare Centre 1 to talk online to a specialist. She would rather wait to be able to meet the centre's part-time Doctor, or go to the Emergency Room in the city:

If I need to meet a doctor, I would wait until the local doctor comes here again. (...) Of course, if I feel really bad, I will go either to the Emergency Room [in the city] or call and get to go to [a bigger healthcare centre]. That is your first choice. (...) But if it is a minor thing, then I will save it until I know there is a doctor here.

In a similar vein, participants said that the increased focus on digital health care in the region, such as the Virtual Health Room and the remote patient monitoring system, made them feel ambiguous about whether they wanted to engage in rural primary health care more generally. One man said that he did not feel safe after his relationship with local primary health care had been geared more towards digital support, and included fewer personal interactions:

'Cause I don't feel that safe now (...) [like I did] when the nurses at the healthcare centre were checking. (...) [the remote patient monitoring system] has got so big now so that they have needed to hire and they have focused more on nurses' digital [competence] instead of hiring a nurse who is personal and then teaching [that Registered Nurse] the digital. (...). So now they've got this one [Registered Nurse] that's really good at computers and knows all about phones, tablets, and stuff. I think they have made a mistake.

While most of the participants said they would be open to using technology such as videoconferencing for follow-up sessions, or if an initial in-person meeting with staff had already taken place, many were still sceptical. In the above illustrative examples, traits such as physical

presence and local familiarity get intuitively bundled together by the study participants to express a desirable care provision in the context of primary health care. The digital technologies were in themselves described as potential threats to the qualities of those in-person relations. Still, participants were willing to use them as long as they involved those assets.

### *The importance of patient–nurse caring relations*

When participants expressed their experiences of in-person caring relations, patient–nurse relations were particularly emphasised and described as a major source of support. Altogether, this seemed to facilitate both initial and long-term engagement in local eHealth services.

In our interviews, Registered Nurses were recurrently associated with valued traits such as familiarity, dependability, and presence. Participants described how they ‘knew’ the local Registered Nurses and, correspondingly, referred to them by name or as ‘the girls’. In many cases, participants had personal relationships with them that had developed over years. But even in cases where relations did not run as deep, participants described how ‘their’ Registered Nurses provided both practical and more motivating support. The Registered Nurses seemed to be central to participants’ relations to local primary health care and contributed significantly to their engagement in eHealth.

Many of the digital services in our study were new, and patients had to learn how to use them. All participants shared stories about how their Registered Nurses’ practical support had been essential in enabling them to be able to use digital applications. One man described how ongoing support was a prerequisite for him to be able to continue his use of the remote patient monitoring system:

The problem is that it [the remote patient monitoring system] came up with things I had not even done. (...) I was here [at Healthcare Centre 1] and one of the staff showed me and connected it so that they could synchronise it with my phone. You had to download some ‘app’. (...) I cannot do that. She [a local Registered Nurse] did that.

While not explicitly articulated, motivating support was also a part of patient–nurse relations and seemed equally as important for the participants’ engagement in eHealth. Motivating support in this context included actions by the nurses that made participants feel good about and engage in particular health behaviours and/or digital services. For example, when participants felt apprehensive towards using digital health care, local Registered Nurses were the ones who made them interested. Below, a female participant gives an example of how Registered Nurses’ motivational support on both personal health and digital care inspired her to start using the remote patient monitoring system that was run from Healthcare Centre 1:

What attracted me to this was this whole thing with, what do you call it, ‘preventive [digital] care’. They [the local Registered Nurse] told me about it and that maybe in the future it’ll be further developed, so I can get for example a message saying ‘What’s the matter? Did you forget to take your medication?’ when my blood pressure is too high.

This statement also illustrates how close relationships with the local Registered Nurses made individuals invest a lot of faith in the nurses’ words. Above, it was the Registered Nurses’ conveyed message of future potential, rather than health benefits delivered ‘here and now’, that convinced the woman to start using the remote patient monitoring system.

By supporting participants both practically and through motivation, Registered Nurses were credited for being reliable and present. On an everyday level, that could mean that the participants did not feel dumb or senseless when contacting them or asking basic questions. Like many of the participants, one woman explained how she would just ask the Registered Nurses if she had problems with the Virtual Health Room that was located in Healthcare Centre 1, but was really intended for self-care:

If my blood pressure turned out to be high, I would just step out into the hallway [of Healthcare Centre 1] and ask for help.

On a deeper level, participants said that they felt as though the Registered Nurses were emotionally invested in their health and life situations. Another woman spoke about her local Registered Nurses’ dedication in supporting her, how it made her feel calm and helped her to resume her use of the remote patient monitoring system:

I mean when it didn’t work that time, when I didn’t understand and couldn’t get help and was supposed to call around. Then it was me and [Registered Nurse] who were taking a crack at it. At that point I was on the verge of giving up, ‘the hell with it’. But then I calmed down.

Here, it could also be seen how practical and motivational support could be intertwined. Moreover, the fact that the process of support took place both ‘within’ the remote patient monitoring system, and through in-person meetings helps demonstrate how support was extended throughout both physical and digital health care.

Altogether, the familiarity, dependability and presence that was experienced in patient–nurse relations was highly valued and seemed to facilitate the participants’ engagement in local eHealth initiatives, both initially and more long-term.

### *Multi-directional caring relations in eHealth*

The close caring relations described by participants were not one-directional. While participants felt cared for by the local Registered Nurses, they also described using

eHealth technologies as a way of caring for the Registered Nurses, as well as for the local community more generally. Here, eHealth appeared as a communal undertaking that was fuelled by a shared sense of rural community.

The sense of rural community that could be identified among the study participants included mutual understandings and goals. An example of these and their effects was a recurring narrative of not wanting to be a burden to physical primary health care and how engagement in eHealth would help both staff and other local patients. It was proclaimed among participants that the local health centres were understaffed and the personnel under pressure. To the participants, it meant that not everybody could get the care they needed. This consideration for both staff and other community members worked as a way for the participants to understand themselves, both in relation to personnel at the centres and fellow community members. But it also appeared as a major reason for engaging in self-care eHealth, such as the remote patient monitoring system and the Virtual Health Room. A male participant said:

I understand the gain in this [the remote patient monitoring system and the Virtual Health Room], getting people to do some things on their own when staff is short.

In this type of statement, participants' references to the general political and organisational conditions in rural primary health care worked as important motifs for their own personal engagement in eHealth. Thus, the use of eHealth was not just a 'personal' decision for many of the participants, but a choice that was taken in relation to other actors and the perceived collective interests of the rural community.

This shared sense of community also included a desire to help nurses manage their private lives. A perspective that could help exemplify an image of a reciprocal 'contract' between community members, is the insight of study participants into the lives of their caregiver counterparts – the local Registered Nurses. In regard to the nurses at Healthcare Centre 1, those running the remote patient monitoring system online, a female participant said:

The nurse has toddlers, so of course she'd want to work more from home, this is perfect for her, as she can sit by the computer and still help us.

In the interview, the female participant also voiced her doubts about eHealth. Interpretable from the above statement is how she adjusted her perspective on digital care based on her biographical knowledge about the local Registered Nurses; she was doing the Registered Nurse – a member of the local community – a favour by allowing herself to be cared for digitally.

In the above examples, caring relations appeared to be perceived as multi-directional and go beyond a strictly professional relationship where healthcare personnel care

for individual patients. Generally, in the interviews, a shared sense of rural community was enacted through both individual and wider communal motifs, as demonstrated by participants' care for other community members, local staff, and the reoccurring narrative of not wanting to be a burden to physical primary health care. In this regard, personal reasons for engaging in eHealth are difficult to separate from larger collective goals. Even though, it illustrates how the rural context had implications for how participants perceived caring relations and how they, as a consequence, chose to engage in local eHealth initiatives.

## Discussion

The aim of this article is to describe older people's perceptions of caring relations in the context of rural eHealth, as well as to explore how such relations can facilitate engagement in digital primary healthcare services. In the study, participants often welcomed eHealth into their lives. 'Younger old' participants for example, tended to be relatively accepting towards digital technology. Still, most participants were sceptical and feared digital health care would be at the expense of local in-person relations. Noticeably, the study participants had diverse opinions about eHealth but still chose to engage in digital health care.

Previous research has showed that close nurse–patient relations help increase older patients' chances for health and well-being (42,43). An important finding in this study is that in-person relations in rural primary health care – and patient–nurse relations above all – were essential for how older people engaged in digital care interventions, both initially and more long-term. An important point made by Currie, Philip, and Roberts (9, see also 11) is that acceptance of technology in rural areas may relate to existing levels of social contact. The use of digital services may be greater where eHealth is not perceived to be *replacing* in-person health care. In light of our results, it appears that for digital care solutions to be successful in rural areas and for older individuals, it is pivotal to strike a balance between in-person and digital health care.

In further support of such arguments, Milligan and Wiles (39) maintain that a caregiver does not have to be physically close to, or meet a patient regularly, to be emotionally present. Similarly, modes of care correspond. Digital care can help build and foster social and emotional connections and vice versa (26,44). It was clear that the participants in our study wanted local staff to be incorporated into their digital health care. Many of the participants felt that their local Registered Nurses were emotionally invested and close to them, even though they – due to the online character of their health care – mainly interacted with them digitally. Importantly

though, these feelings of familiarity, dependability, and presence were often based on participants having met the local Registered Nurses in-person over a long period of time. Further, in line with previous studies (45), the participants in the study shared a sense of community indebted to their rural setting. This meant that eHealth use was partly interpreted as a way of contributing to the local community, which was understood as being under the pressures of austerity policies, as well as to individual Registered Nurses. This in turn contributed to close patient–nurse relations and, ultimately, to participants' further engagement in digital health care.

The study also points at potential challenges for professionals working with eHealth. The results correspond with findings on how digital caring relations are more 'fragile' due to the lack of physical interaction (46). Scholars have stressed that nurses have to adapt to digitalisation and learn how to be emotionally present in digital modes of health care (30,47,48). From our findings, it becomes clear that nurses who embrace informatics as a core competency in nursing can spearhead the shift to digital care in rural primary health care (49). Nurses who go beyond a more traditional nursing role and *support* people in digital self-care, appear to strengthen their, and their patients', engagement and confidence in e-based methods for health care.

However, eHealth care can be time-consuming for care providers (48,50). While nurses often aspire to develop close relations with patients, organisational conditions can limit their capacity to build and sustain such relations (51). According to Strandås and Bondas (52), the benefits of close nurse–patient relations need to be better accounted for. Against this background, we maintain that for eHealth to be a sustainable practice for both rural communities and medical staff, policymakers and managers need to recognise digital as well as in-person caring relations as formal elements of digital primary health care.

## Methodological discussion

Our context-sensitive approach has inevitably affected the outcome of this study. On the one hand, a strength of our study design is that it helps forward rural conditions that are seldom brought up in research on eHealth engagement (53). On the other hand, our approach makes it harder to make more generalised claims and apply the results to other groups.

Concerning reliability of the results, it is likely that some respondents consented to participate in the study for similar reasons that encouraged their engagement in eHealth: because the local Registered Nurses asked them. An approach to recruitment where the authors themselves had identified individuals within the group of interest could have addressed such matters. Also, given the focus on both usage and renunciation of digital care,

interviews with nonusers could have provided richer perspectives on engagement (54).

All three authors reviewed and analysed the interview data separately, then compared their findings. While a more collaborative data analysis might have increased the trustworthiness of the study, this type of investigator triangulation helped strengthen the validity and reliability of the results (55). To add to the trustworthiness of the study, researchers from both Nursing and Social Sciences have commented on the article.

## Conclusion

From the perspective of the presented study, eHealth remains a source of opportunity for primary health care as well as rural communities. Importantly though, our results provide insights into matters of quality, access, and equality in rural primary health care, specifically in relation to older people.

In our study, participants emphasised the importance of relationships in digital care, especially with local Registered Nurses. Their engagements in eHealth were almost always facilitated by the existence and ongoing maintenance of such relations, no matter if participants were 'the younger old' or older. In light of that, close and in-person caring relations seem a requirement of being able to provide good, accessible, and subsequently, equal health care through digitalisation. This is especially in relation to older people, a group with several barriers to engage in digital health care (56).

Digital connectivity is a prerequisite for equal social, economic, and health-related opportunities for rural areas (57). Access to high-speed internet is generally very high in Sweden. It is also very common that older people use digital communication technologies (58). As part of the reorientation of Swedish primary health care, a pivotal element is for personnel to be digitally available to support patients with self-care (1). However, based on our findings, a clear-cut approach to digital support could create another 'digital divide' (59). To assign digital and physical tasks to different personnel, rather than approaching eHealth as a combination of both digital *and* in-person presence from individual staff, could make older people refrain from using (digital) primary health care more generally.

While the levels of internet access and use in Sweden are unique, these findings have wider implications that are relevant beyond both Swedish and primary health-care contexts. Access to the internet is rising globally and digital innovation is often presented as a solution to unequal distributions of welfare services, especially in remote areas and for older people. To be able to increase the quality and equality in health care and other welfare organisations, there is a need for professionals on different levels – political, managerial, and practical – to recognise how engagements in e-based services are enabled

not only by connectivity and digital innovation, but also different modes of presence in everyday welfare practice.

## Acknowledgements

JLs research is part of the project Digital Landscapes of Care funded by the Swedish Research Council for Health, Working Life and Welfare (Dnr 2017-00666), the project eHealth and Aging in Rural Areas: Transforming Everyday Life, Digital Competences, and Technology (HARVEST) funded by Joint Programming Initiative: More Years, Better Lives (Dnr 643850) and the programme Paths to Healthy and Active Ageing, funded by the Swedish Council for Health, Working Life and Welfare (Dnr 2013-2056). RB and AF received no funding for their research. The authors would like to thank the participants and the contact persons in the study as well as Anna Sofia Lundgren, Helena Antonsson and Ulrika Öberg for their help in different parts of the work.

## Authors contributions

JL, RB and AF contributed to study design; JL contributed to data collection; JL, RB and AF participated in

data analysis; JL, RB and AF participated in the manuscript preparation; JL contributed to the revision of the manuscript.

## Ethical approval

Ethical approval for the study was obtained from the Regional Ethical Review Board at Umeå University (Dnr 2017/364-31).

## Data availability statement

Based on the ethical principles on confidentiality provided by The Swedish Research Council (2017), unauthorised persons are not allowed to access the research data. For further questions, contact First Author.

For secure access privileged to First Author only, all research data are stored in a password-protected computer.

The study includes original data. First Author confirms that he has full access to all the data in the study. First Author takes responsibility for the integrity of the data and the accuracy of the data analysis.

## References

- 1 SOU 2019:42. Digifysiskt vårdval - Tillgänglig primärvård baserad på behov och kontinuitet. Slutbetänkande av utredningen Styrning för en mer jämlik vård (Digi-physical care choice - Accessible primary healthcare based on need and continuity. Final report on the inquiry for a more equal care). 2019.
- 2 World Health Assembly, 66. eHealth Standardization and Interoperability. 2013, <https://apps.who.int/iris/handle/10665/150175> (last accessed 06 May 2020).
- 3 The Swedish Ministry of Health and Social Affairs. *Vision for eHealth 2025 - Common starting points for digitisation of the Social Services and healthcare*. 2016.
- 4 [4]SOU 2016:2. Effektiv vård (Effective care). 2016.
- 5 SOU 2020:19. God och nära vård - En reform för ett hållbart hälso- och sjukvårdssystem (Good and close care - A reform for a sustainable health-care system). 2020.
- 6 McBain H, Shipley M, Newman S. The impact of self-monitoring in chronic illness on healthcare utilisation: a systematic review of reviews. *BMC Health Serv Res* 2015; 15: 565.
- 7 McGrail KM, Ahuja MA, Leaver CA. Virtual visits and patient-centered care: results of a patient survey and observational study. *J Med Internet Res* 2017; 19: e177.
- 8 Nymberg VM, Bolmsjö BB, Wolff M, Calling S, Gerward S, Sandberg M. 'Having to learn this so late in our lives...' Swedish elderly patients' beliefs, experiences, attitudes and expectations of e-health in primary health care. *Scand J Prim Health Care* 2019; 37: 41-52.
- 9 Currie M, Philip LJ, Roberts A. Attitudes towards the use and acceptance of eHealth technologies: a case study of older adults living with chronic pain and implications for rural healthcare. *BMC Health Serv Res* 2015; 15: 1-12.
- 10 Näverlo S, Carson DB, Edin-Liljegren A, Ekstedt M. Patient perceptions of a Virtual Health Room installation in rural Sweden. *Rural Remote Health* 2016; 16: 1-8.
- 11 Roberts A, Philip L, Currie M, Mort A. Striking a balance between in-person care and the use of eHealth to support the older rural population with chronic pain. *Int J Qual Stud Health Well-being* 2015; 10: 27536.
- 12 Salemink K, Strijker D, Bosworth G. Rural development in the digital age: a systematic literature review on unequal ICT availability, adoption, and use in rural areas. *J Rural Stud* 2017; 54: 360-71.
- 13 Blusi M, Kristiansen L, Jong M. Exploring the influence of Internet-based caregiver support on experiences of isolation for older spouse caregivers in rural areas: a qualitative interview study. *Int J Older People Nurs* 2015; 10: 211-20.
- 14 Paul LR, Salmon C, Sinnarajah A, Spice R. Web-based videoconferencing for rural palliative care consultation with elderly patients at home. *Support Care Cancer* 2019; 27: 3321-30.
- 15 Rios GR. eHealth literacy and older adults: a review of literature. *Top Geriatr Rehabil* 2013; 29: 116-25.
- 16 Lantela P. "So, tell me what kind of a thing it really is"—Finnish older adults making sense of home technology. *J Media Lit Educ* 2019; 11: 122-45.
- 17 Urban M. 'This really takes it out of you!' The senses and emotions in



- digital health practices of the elderly. *Digital Health* 2017; 3: 2055207617701778.
- 18 Urban M. Embodying digital ageing: ageing with digital health technologies and the significance of inequalities. In *Precurity within the Digital Age* (Heidkamp B, Kergel D eds.), 2017, Springer VS, Wiesbaden, 163–178.
- 19 Shattell M. Nurse–patient interaction: a review of the literature. *J Clin Nurs* 2004; 13: 714–22.
- 20 Duffy JR, Hoskins LM. The quality-caring model©: Blending dual paradigms. *Adv Nurs Sci* 2003; 26: 77–88.
- 21 Molin J, Graneheim UH, Lindgren BM. Quality of interactions influences everyday life in psychiatric inpatient care—patients’ perspectives. *Int J Qual Stud Health Well-being*. 2016; 11: 29897.
- 22 Angel S, Frederiksen KN. Challenges in achieving patient participation: a review of how patient participation is addressed in empirical studies. *Int J Nurs Stud* 2015; 52: 1525–38.
- 23 Feo R, Rasmussen P, Wiechula R, Conroy T, Kitson A. Developing effective and caring nurse–patient relationships. *Nurs Stand* 2017; 31: 54–63.
- 24 Rørtveit K, Hansen BS, Leiknes I, Joa I, Testad I, Severinsson E. Patients’ experiences of trust in the patient–nurse relationship—a systematic review of qualitative studies. *Open J Nurs* 2015; 5: 195.
- 25 Wiechula R, Conroy T, Kitson AL, Marshall RJ, Whitaker N, Rasmussen P. Umbrella review of the evidence: what factors influence the caring relationship between a nurse and patient? *J Adv Nurs* 2016; 72: 723–34.
- 26 Oudshoorn N. Physical and digital proximity: emerging ways of health care in face-to-face and telemonitoring of heart-failure patients. *Sociol Health Illn* 2009; 31: 390–405.
- 27 Maslen S. Sensory work of diagnosis: a crisis of legitimacy. *Senses Soc* 2016; 11: 158–76.
- 28 Pols J, Willems D. Innovation and evaluation: taming and unleashing telecare technology. *Sociol Health Illn* 2011; 33: 484–98.
- 29 Lupton D, Maslen S. Telemedicine and the senses: a review. *Sociol Health Illn* 2017; 39: 1557–71.
- 30 Nagel DA, Stacey D, Momtahan K, Gifford W, Doucet S, Etowa JB. Getting a picture: a grounded theory of nurses knowing the person in a virtual environment. *J Holist Nurs* 2017; 35: 67–85.
- 31 The Swedish National Board of Health and Welfare. *Vård och omsorg om äldre. Lägesrapport 2020* (Health and Social Care for Older Persons. Progress Report 2020), 2020. <https://www.socialstyrelsen.se/globalassets/sharepoint-dokument/artikelkatalog/ovrigt/2020-3-6603.pdf> (last accessed 07 September 2020).
- 32 World Health Organization. *World Report on Ageing and Health*. 2015, World Health Organization, Geneva.
- 33 The Swedish Research Council. *Good Research Practice*. 2017. [https://www.vr.se/download/18.5639980c162791bbfe697882/1555334908942/Good-Research-Practice\\_VR\\_2017.pdf](https://www.vr.se/download/18.5639980c162791bbfe697882/1555334908942/Good-Research-Practice_VR_2017.pdf) (last accessed 22 November 2019).
- 34 Graneheim UH, Lundman B. Qualitative content analysis in nursing research: concepts, procedures and measures to achieve trustworthiness. *Nurse Educ Today* 2004; 24: 105–12.
- 35 Watson J. *Nursing: Human Science and Human Care: A theory of Nursing*. 1999, Jones & Bartlett Learning, Burlington.
- 36 Wallace C, Vincent K, Luguzan C, Townsend L, Beel D. Information technology and social cohesion: a tale of two villages. *J Rural Stud* 2017; 54: 426–34.
- 37 Hoeck B, Delmar C. Theoretical development in the context of nursing—The hidden epistemology of nursing theory. *Nurs Phil* 2018; 19: e12196.
- 38 Mol A. *The Logic of Care: Health and the Problem of Patient Choice*. 2008, Routledge, Abingdon.
- 39 Milligan C, Wiles J. Landscapes of care. *Prog Hum Geogr* 2010; 34: 736–54.
- 40 Lindgren BM, Lundman B, Graneheim UH. Abstraction and interpretation during the qualitative content analysis process. *Int J Nurs Stud* 2020; 108: 103632.
- 41 Tavory I, Timmermans S. *Abductive Analysis: Theorizing Qualitative Research*. 2014, University of Chicago Press, Chicago.
- 42 Tyrrell EF, Levack WM, Ritchie LH, Keeling SM. Nursing contribution to the rehabilitation of older patients: patient and family perspectives. *J Adv Nurs* 2012; 68: 2466–76.
- 43 Turpin LJ, McWilliam CL, Ward-Griffin C. The meaning of a positive client–nurse relationship for senior home care clients with chronic disease. *Can J Aging/La Revue canadienne du vieillissement* 2012; 31: 457–69.
- 44 Pols J, Moser I. Cold technologies versus warm care? On affective and social relations with and through care technologies. *Alter* 2009; 3: 159–78.
- 45 Chalifoux Z, Neese JB, Buckwalter KC, Litwak E, Abraham IL. Mental health services for rural elderly: innovative service strategies. *Commun Ment Health J* 1996; 32: 463–80.
- 46 Lie SS, Karlsen B, Graue M, Oftedal B. The influence of an eHealth intervention for adults with type 2 diabetes on the patient–nurse relationship: a qualitative study. *Scand J Caring Sci* 2019; 33: 741–9.
- 47 Högberg KM, Sandman L, Nyström M, Stockelberg D, Broström A. Caring through web-based communication: a qualitative evaluation of a nursing intervention to create holistic well-being among patients with hematological disease. *J Holist Nurs* 2018; 36: 218–27.
- 48 Öberg U, Orre CJ, Isaksson U, Schimmer R, Larsson H, Hörnsten Å. Swedish primary healthcare nurses’ perceptions of using digital eHealth services in support of patient self-management. *Scand J Caring Sci* 2018; 32: 961–70.
- 49 Booth RG. Educating the future eHealth professional nurse. *Int J Nurs Educ Scholarship* 2006; 3: Article 13.
- 50 Nickelsen NC. Criteria of implementing feeding assistance robots in disability care: a socio-material perspective. *J Comp Soc Work* 2013; 8: 1–29.
- 51 Bridges J, Nicholson C, Maben J, Pope C, Flatley M, Wilkinson C, Meyer J, Tziggili M. Capacity for care: meta-ethnography of acute care nurses’ experiences of the nurse–patient relationship. *J Adv Nurs* 2013; 69: 760–72.
- 52 Strandås M, Bondas T. The nurse–patient relationship as a story of health enhancement in community care: a meta-ethnography. *J Adv Nurs* 2018; 74: 11–22.

- 53 Barello S, Triberti S, Graffigna G, Libreri C, Serino S, Hibbard J, Riva G. eHealth for patient engagement: a systematic review. *Front Psychol* 2016; 6: 2013.
- 54 Airola E, Rasi P, Outila M. Older people as users and non-users of a video conferencing service for promoting social connectedness and well-being—a case study from Finnish Lapland. *Educ Gerontol* 2020; 46: 258–69.
- 55 Speziale HS, Streubert HJ, Carpenter DR. *Qualitative Research in Nursing: Advancing the Humanistic Imperative*. 2011, Lippincott Williams & Wilkins, Philadelphia.
- 56 Liljas AE, Walters K, Jovicic A, Iliffe S, Manthorpe J, Goodman C, Khari-cha K. Strategies to improve engagement in research on health promotion: a systematic review. *BMC Public Health* 2017; 17: 349.
- 57 Riddlesden D, Singleton AD. Broadband speed equity: a new digital divide? *Appl Geogr* 2014; 52: 25–33.
- 58 Davidsson P, Thoresson A. *Svenskarna och internet 2017. Undersökning om svenskarnas internetanvändande (Swedes and the Internet 2017. Survey about Swedes' Internet use)*. 2017, [https://internetstiftelsen.se/docs/Svenskarna\\_och\\_internet\\_2017.pdf](https://internetstiftelsen.se/docs/Svenskarna_och_internet_2017.pdf) (last accessed 07 September 2020).
- 59 Carpentier N. *Media and Participation: A Site of Ideological-Democratic Struggle*. 2011, Intellect books, Bristol.