

Qualitative Interview with Older Adults and Caregivers on their Perspectives with Self-Management and Remote Vital Sign Monitoring



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ABSTRACT

Background

Research underscores the role of self-management capabilities as a strategy for enhancing the well-being of older adults by mitigating potential health risks and functional decline. Self-management tools like remote vital sign monitoring serve as critical indicators for detecting adverse health outcomes. Thus, the study aims to understand prior experiences of older adults and caregivers in self-management, along with soliciting their perspective on the technical advantages and barriers of using technology in medicine, citing their experience with remote vital sign monitoring as an example.

Methods

Through semi-structured qualitative interviews, 32 participants were interviewed virtually about their personal experience with prior remote vital sign monitoring. Eligibility included older adults and/or caregivers of older adults. Participants who were unable to read or understand English were excluded, unless sufficient support was provided to navigate the study procedures.

Results

The full interview transcriptions were captured under the following five major themes: health-care experience, personal perception of technology in medicine, impact of remote vital sign monitoring, contactless monitoring system considerations, and acceptance and collaboration in remote vital sign measurement.

Conclusion

Based on participants' prior experience using remote vital sign monitoring, compatibility, data security and privacy, and patient education were identified as important considerations when developing monitoring systems for older adults and caregivers.

Key words: health self-management, patient-centered care, digital health, remote patient monitoring

INTRODUCTION

Older adults, constituting approximately 20% of Canada's population, confront a spectrum of health issues and chronic diseases,^(1,2) such as hypertension and heart disease.⁽³⁾ Research underscores the pivotal role of self-management capabilities as a strategy for enhancing overall well-being among older adults by mitigating potential health risks and functional decline,⁽⁴⁾ while reducing the burden of chronic diseases on the health-care system.⁽⁴⁾

Self-management, the adept use of available resources to achieve or maintain a satisfactory level of well-being across physical, cognitive, and social dimensions, varies among individuals.⁽⁴⁾ Factors such as physical capabilities and social support profoundly influence one's capacity for self-management. Monitoring changes in physical symptoms, such as vital signs, stands as an effective self-management strategy. This proactive approach facilitates early detection of health risks, reduces dependence on caregivers, and fosters a proactive stance toward health maintenance.⁽⁴⁾

Various self-management tools can be helpful, and one such approach revolves around vital sign monitoring.⁽⁵⁾ Vital signs, blood pressure, pulse rate, and oxygen saturation serve as crucial indicators for detection of adverse and serious health events.⁽⁵⁾ While vital sign assessment and monitoring traditionally occur within clinical settings, an increasing number of patients manage these measurements at home with the availability of portable equipment.^(6,7) Luceron-Lucas-Torres and Valera-Ortin's study⁽⁸⁾ concluded that older adults using health technology tools showed cardiovascular improvements, and similarly, Aure *et al.*⁽⁹⁾ stated that older adults are willing and able to use self-monitoring tools to make informed health decisions. As technology continues to revolutionize and improve self-management practices, understanding older

adults' preferences and their ability to navigate technological innovations in health care is foundational, especially in the context of vital sign monitoring.⁽¹⁰⁾

Thus, our study objectives were to understand older adults and caregivers' prior experiences using technology for self-management, along with soliciting their perspective on advantages and barriers, in order to integrate their views in future technology and to fill the current knowledge gap.

METHODS

Qualitative Study Design

The data collection method was in-depth semi-structured interviews, encouraging the flexibility needed for participants to discuss their prior experiences and perceptions with technology for self-management. The use of topic guides (attached) ensured the data collected remained relevant to the study objectives (see Appendix S1 in the supplemental material). An inductive approach was used, informed by general principles of Thematic Analysis.^(11,12)

Sample & Recruitment

A convenience sample of community-dwelling older adults (>60 y/o), caregivers of older adults, and/or older adults who were caregivers were recruited through flyers, newsletters, word of mouth, community organizations, and REACH BC, an electronic and publicly funded research tool for patient recruitment pan-provincially.⁽¹³⁾ Inclusion criteria included three groups: older adults (>60 y/o), caregivers (>19 y/o) of older adults age, and adult caregivers (>19 y/o) living with the older adult. Participants were excluded if they were unable to read and/or understand English, unless suitable support was available to ensure participant comprehension of the study, to provide informed consent, and to engage fully in interview procedures.

Ethical Considerations

The study received ethics approval from UBC Research Ethics Board (H22-01522).

Data Collection & Analysis

Interviews were conducted virtually by a research member at participants' preferred time. Topic guides were developed based on input from clinical team members and were modified considering emerging findings, in line with an inductive approach. Key areas explored included: personal perception on technology, previous experience with the health-care system and self-management using vital signs, and desired features of a contactless vital sign monitoring system. Interviews were audio-recorded, transcribed manually, and cross-checked by the team.

Data Analysis

The interview transcripts were read independently by two team members to become familiar with the data. Transcripts were not returned to participants for comments or corrections.

Descriptive data from the sociodemographic questions were entered into Microsoft Excel, where data was analyzed using descriptive statistics to determine the mean, standard deviations, and percentages for each variable. This provided participant background context for the subsequent responses in the interview.

Thematic analysis was completed independently by two research members and guided by the Braun and Clarke's six-step framework.^(11,12) This approach was informed by the method of constant comparison. This included cross-comparison of interviews until data saturation, developing a coding framework to capture these themes, and contextual information to aid data interpretation. The initial codes were shared with a third team member prior to undergoing another round of coding to develop the master code book. NVivo, a qualitative data management tool, was used to facilitate data coding and retrieval (QSR International, Melbourne, Australia). The coded datasets were further analyzed to allow for more nuanced interpretations of the data to be developed.

Rigor

To enhance credibility of the research, the research team encouraged independent, continuous engagement with the data. The researchers continuously checked with one another throughout the analysis process. The methods section and adherence to the consolidated criteria for reporting qualitative research (COREQ) checklist increases the dependability of our findings.⁽¹⁴⁾

RESULTS

Thirty-two participants were interviewed virtually. Twenty-six (81.2%) participants identified as older adults being cared by a caregiver, and six (18.8%) participants identified as a caregiver for an older adult. Table 1 summarizes the socio-demographic characteristics of older adult participants. Table 2 summarizes the socio-demographic characteristics of the caregiver participants. We uncovered five major themes and representative quotes.

The majority of the older adults resided in Greater Vancouver. English is the predominant language, with a majority identifying as White. Living arrangements vary, with twelve (46.2%) living with a partner, twelve (46.2%) living alone, and two (7.7%) living with their children.

Five major themes and sub-themes emerged from the interviews and are summarized in Table 3.

Theme 1: Timely Access to Health-care Services

Participants expressed dissatisfaction with the health-care system as they had to repeatedly advocate for themselves to be heard. This can be distressing as they are unable to have a break from the management of their condition due to a fear of deterioration.

"I get the feeling that I'm not being heard all the time. I explain to the doctor what the problem is, but sometimes he doesn't give the answer that I want to hear." — Older Adult

“He [the doctor] doesn’t go forth as far as he could. I wish he could go a little further with his explanation without me having to ask. I also have to advocate for myself to get something done.” — Older Adult

TABLE 1.
Demographics of older adult participants

<i>Demographics</i>	<i>N (%)</i>
Age	
60-65	6 (23.1)
66-70	7 (26.9)
71-75	4 (15.4)
76-80	5 (19.2)
81+	4 (15.4)
Gender	
Male	11 (42.3)
Female	15 (57.7)
Location	
Greater Vancouver	
Vancouver	9 (34.6)
Abbotsford	1 (3.8)
Coquitlam	1 (3.8)
Richmond	3 (11.5)
Surrey	3 (11.5)
West Vancouver	1 (3.8)
Vancouver Island	
Comox	1 (3.8)
Courtenay	2 (7.7)
Victoria	3 (11.5)
Sooke	1 (3.8)
Interior BC	
Kelowna	1 (3.8)
Language ^a	
English	26 (100)
French	8 (30.8)
Croatian	1 (3.8)
Tagalog	1 (3.8)
Spanish	4 (15.4)
German	1 (3.8)
Hebrew	1 (3.8)
Russian	1 (3.8)
Chinese	3 (11.5)
Ethnicity	
White	20 (76.9)
Filipino	1 (3.8)
First Nations	1 (3.8)
Latin, Central or South American	1 (3.8)
German, English, Scottish	1 (3.8)
African American	1 (3.8)
Chinese	1 (3.8)
Living Arrangement	
Alone at Home	12 (46.2)
Home with Children	2 (7.7)
Home with partner	12 (46.2)

^aSome participants are bilingual.

Participants expressed difficulties in meeting with health-care providers, thereby not having their health-care needs met in a timely manner.

“Sometimes it’s hard to get to see my family physician. He has same-day bookings and so you have to get your day right and it has to be within the hour of 9 o’clock or it’s all booked.” — Older Adult

“I’m waiting to see a specialist for my lung condition because they [GP] don’t know what it is. I’ve been waiting three months on that.” — Older Adult

“I was talking to our GP the other day and we were having communication issues with the specialists, and I was thinking of sending an email trying to get them [GP & specialist] together. Basically, he [GP] said, oh yeah, we never look at that stuff.” — Older Caregiver

Caregivers shared the challenges encountered with day-to-day caregiving responsibilities which are more pronounced in those with comorbidities, like gait issues or a previous stroke.

“Since I had a stroke, I have had bouts of confusion. I’m not sure what’s happening so I have to ask my wife ‘What are we doing right now?’ ‘Where are we going?’, and she also doesn’t trust me driving so she has to...drive me around.” — Older Adult

TABLE 2.
Demographics of caregivers

<i>Demographics</i>	<i>N (%)</i>
Age	
30-39	2 (33.3)
40-49	1 (16.7)
50-59	0 (0.0)
60-69	3 (50.0)
Gender	
Male	1 (16.7)
Female	5 (83.3)
Location	
Greater Vancouver	
Burnaby	1 (16.7)
Coquitlam	1 (16.7)
NewWestminster	2 (33.3)
Vancouver	1 (16.7)
Vancouver Island	1 (16.7)
Black Creek	
Language ^a	
English	6 (100)
Mandarin	1 (16.7)
Cantonese	1 (16.7)
Ethnicity	
Chinese	2 (33.3)
South Asian	1 (16.7)
White	3 (50.0)

^aSome participants are bilingual.

TABLE 3.
Key themes and sub-themes from interviews

<i>Themes</i>	<i>Sub-themes</i>
Healthcare Experiences	Experiencing difficulties in meeting with health-care providers (including virtual and in-person visits) Managing caregiving responsibilities and challenges Experiencing challenges in obtaining a diagnosis or feeling unheard
Personal Perception of Technology in Medicine	Benefits and advantages of telemedicine Drawbacks and limitations of telemedicine Comfort and familiarity with using technology Privacy and confidentiality concerns in relation to technology in medicine
Impact of Remote Vital Sign Monitoring	Advocating for improved quality of health care Motivation and reasons for monitoring vital signs remotely Role of vital sign monitoring in empowering individuals and caregivers
Contactless Monitoring System Considerations	Integration and compatibility with existing software and programs User-friendly design and ease of navigation Importance of data security and privacy Supportive features for caregivers and patients' education
Acceptance and Collaboration in Remote Vital Sign Measurement	Openness to utilizing technology for health-related purposes Communication and collaboration with health-care providers Willingness to explore and adopt suggested solutions

“I have problems walking about the home, and...more severe problems walking outside.” — Older Adult

“When he [husband] fell, I could not get him up so we had to call the fire department and whatever, so I needed someone or something that would have assisted me to help get him off the floor.” — Older Adult

Theme 2: Personal Perceptions of Technology in Health Care

Participants, especially those living in rural communities, expressed benefits of health-care technology such as telehealth or wearable, remote monitoring. Transportation and associated costs can pose as a barrier and limits health-care accessibility. Technology can provide accessibility and reduce the travel costs burdens.

“I think it’s a really good idea, especially for people who live in rural areas or may not have easy access to the health facility.” — Older Caregiver

Participants generally agreed on the importance of technology use in providing easy access to health care. Some participants reiterated the need to be comfortable and familiar with the technology prior to maximizing its functionality and benefits in managing their health.

“People who know how to operate a cell phone, or a computer would actually welcome having an additional feature that would benefit their health in their machine.” — Older Adult

“Because I think my generation and the people I’m working with are probably you know, 75 years and onwards their capacity to manage computers and technology would be

harder so it depends on what health issues the person is dealing with and how accessible the technology is towards that issue.” — Older Caregiver

Participants expressed the drawbacks and limitations of technology in health care, mostly surrounding the system accuracy and reliability.

“Major thing is you need to know how reliable the measurements, like the measurement from the technology, is when compared to when a human being is doing it.” — Older Adult

“A major thing is the results might be flawed or not accurate and this is not in any way saying the technology is bad but, it just seems to be potential with computers for that to occur.” — Older Adult

Participants expressed concerns about privacy and confidentiality regarding their health information.

“Concerns about confidentiality that clients have, wondering what kind of access people have to their information and if there’s security around data that is being collected.” — Young Caregiver

“I’m hesitant to do Google searches...because you know information, prying eyes...” — Older Adult

Theme 3: Implementation & Impact of Self-management Through Vital Sign Monitoring

Participants expressed the potentially positive impact of empowering older adults in managing their health, such that they can communicate their health concerns to the health-care providers and improve the health-care quality received.

“It would be most beneficial for people who are interested in their own health and taking leadership of one’s health.”
— Older Adult

“It would give me confidence and it should provide me guidance...it would give me peace of mind.” — Older Adult

Enabling participants with vital signs remote monitoring can motivate lifestyle tracking and improve their health at home without going to the hospital.

“They are provided with a bunch of remote monitoring devices and...that means less time at the hospital less time to be exposed to germs and more time with loved ones and time for recovery.” — Young Caregiver

“Information is power and having this information [vital signs] will help me manage my health because I would have enough information to change my lifestyle whereas right now, I’m relying on what my doctors say.”
— Older Adult

Theme 4: Features & Design of Monitoring Software & Devices

Participants identified features of remote, contactless vital sign monitoring system that would align with their lifestyle and, again, data security and privacy emerged.

“I’m...going back to privacy again and confidentiality... some people might be extra conscious of... ‘I don’t want my doctor to see what my house looks like and etcetera’ since it’s going to use a camera function.” — Older Adult

“My concern would be what room would it be in and would I choose a time and place for the camera to get that information.” — Older Adult

There was importance placed upon integration and compatibility of this monitoring system with existing software and programs they have. Knowing older adults are less familiar with technology compared to younger generations, it is an important consideration. This would reduce the amount of technology needed to learn.

“As long as there is harmony and ability to communicate across systems and the data is shareable across systems.”
— Older Caregiver

There was emphasis placed on features that support both caregivers’ and patients’ education to provide information on their health progress and well-being.

“I would like information on trends to compare how I look now and how I look like at the next measurement.”
— Older Adult

“I would need a trend and...a baseline to measure it against so if there is a problem I would want to know am I getting better or am I getting worse or am I staying the same.” — Older Adult

Another important topic that emerged was how the system should be user-friendly and easy to navigate, again, alluding

they are older adults and the software should be accessible and appropriate for their age.

“The comfort of technology...you don’t want to be walking around with a big brick or something.” — Older Adult

“Make it simple like easy to operate like this pressure monitor. I think it’s popular because it’s easy to operate.”
— Older Adult

Theme 5: Acceptance & Partnership in Remote Vital Sign Co-monitoring

Participants discussed how remote vital sign monitoring system can be used in partnership with health-care workers to improve co-monitoring and communication, which would serve to mitigate concerns raised prior about ineffective communication with their healthcare providers.

“It should be really useful to have results printed on like scraps of paper that way I can present this in an appropriate spot like at a doctor’s visit or at the ER.” — Older Adult

“It would help when navigating systems like the system of trying to communicate between two different providers.”
— Older Adult

Participants shared how receptive they are to utilizing technology for health-related purposes if they are able to see the usage effect.

“As long as I’m seeing results then I’m willing to utilize such devices and putting as much time as needed.” — Older Adult

Still focused on utilizing technology for health care, participants were willing to explore and adopt the suggested solutions.

“I have no problem with that [using remote contactless vital signs monitoring system], ... I welcome it. I would like to use my computer more than I do for my own health reasons and if there are certain things that will identify certain aspects of my health, I’m all for it.” — Older Caregiver

DISCUSSION

This study reveals underlying interest and hesitancy of older adults and caregivers on the topic of health system support for their wellness, self-management, and augmentation with innovative technologies, providing insight for future technological innovations. A systematic review by Bertolazzi *et al.*⁽¹⁵⁾ revealed that involvement of end-users, older adults, in the design and development of technology can mitigate egocentric bias, and may lead to more inclination to adopt the technology. Our study aims to leverage the perspective of older adults and caregivers in supporting future health-care technology innovations.

Under the discussion of “Health-care Experiences,” participants shared encounters with vital sign monitoring, highlighting challenges like limited access to health-care providers, juggling daily responsibilities, and the need for

persistent advocacy. These challenges, not novel in health care,^(16,17) underscore the ongoing need for enhancements, especially considering recent innovations towards virtual health-care delivery prompted by the pandemic.⁽¹⁸⁾ Despite these changes, there remain significant opportunities for improvement in Canada's health-care system. In particular, Mangin *et al.* found participants older than 70 y/o were less comfortable using the internet, and identified that age and comfort using the internet were significant predictors of disinterest in eHealth.⁽¹⁹⁾ However, other researchers have found telemedicine use increased across all age groups, with the highest rates reported among older adults >65 y/o.^(20,21) These highlight the need of focusing virtual care to effectively support the well-being of older adults.

Within the topic of "Personal Perception of Technology in Health Care," participants voiced benefits and concerns regarding overall technology use in health care. Notably, they recognized its potential to enhance accessibility and alleviate travel burdens, particularly for those in remote communities. However, comfort and familiarity with the technology emerged as crucial factors, echoing previous research findings that identified barriers like lack of guidance, instruction, and confidence⁽²²⁾ in technology use. Moving forward, it may be imperative to emphasize the need for accessible onboarding to foster adoption of new software, which aligns with newly developed telehealth principles and guidelines for older adults.⁽²³⁾

The discussion of "Contactless Monitoring System Considerations" shed light on key factors influencing user acceptance of emerging health technologies, particularly in data privacy, compatibility, and integration with infrastructure used by the older adult's health-care team. A mapping review by Schroeder *et al.*⁽²⁴⁾ described the need to consider factors that influence the sustained use of technology upon its introduction. A factor expressed by participants is apprehension about the security of personal health information, a concern echoed across various health-care technologies, like sensors⁽²⁵⁾ and Aging in Place technologies.⁽²⁶⁾ This may suggest a link between perceived privacy concerns and familiarity with the technology, a factor noted in the previous theme. Additionally, our participants emphasized the importance of compatibility with familiar software, echoing existing preferences observed in research.⁽²⁶⁾ Furthermore, participants stressed the need for educational features within monitoring systems to alleviate stress, particularly among older adults, by providing contextualized insights into health trends and progress.

Limitations

Certain themes are specifically applicable to vital sign monitoring. Although, it may have wider implications for emerging health technologies. Additionally, despite trying to recruit participants from different backgrounds and experiences navigating the health-care system, our sample was predominantly English-speaking Caucasian participants. This sampling may have led to potentially overlooking additional factors that influence health-care experiences and perspectives on using technology due to cultural, linguistic, or geographic variations.

CONCLUSION

Older adults and caregivers shared their experiences navigating the health-care system and found advantages and drawbacks of technology in medicine, including remote vital sign monitoring. Key considerations when developing monitoring systems included integration and compatibility, patient education, data security, and privacy.

Overall, participants demonstrated openness to remote vital sign monitoring system development, viewing them as potential solutions to address existing challenges with health-care providers. The study, encompassing a diverse sample of older adults and caregivers from across British Columbia, achieved data saturation, affirming the recurrence of key themes.

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Not applicable.

CONFLICT OF INTEREST DISCLOSURES

We have read and understood the *Canadian Geriatrics Journal's* policy on conflicts of interest disclosure and declare that we have none.

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- SUPPLEMENTAL MATERIALS**
 Supplemental material linked to the online version of the paper (<https://doi.org/10.5770/cgj.28.833>):
- **Appendix S1:** EBE (Older Adults & Caregivers) Interview Guide