ORIGINAL RESEARCH

Personalized Telehealth: Redesigning Complex Care Delivery for the 65+ During the COVID Pandemic: a Survey of Patients, Caregivers, and Health-care Providers

Sofia Nene, MD[1], Magnus Rauch, BSc[2], David Belanger, MD[3], Roxanne Bennett, MSc[2], Gregory Berry, MD[1,2,4], Nathalie Saad, MD, MBA[5], Michelle Wall, MSc[2], José A. Morais, MD[2,6], Suzanne N. Morin, MD, MSc[1,2,3]

[1]Faculty of Medicine and Health Sciences, McGill University, Montreal; [2]Research Institute of the McGill University Health Centre, Montreal; [3]Division of General Internal Medicine, McGill University, Montreal; [4]Department of Orthopedic Surgery, McGill University, Montreal; [5]Division of Respiratory Medicine, McGill University, Montreal; [6]Division of Geriatrics, McGill University, Montreal, QC

https://doi.org/10.5770/cgj.26.641

ABSTRACT

Background

In the context of the ongoing COVID-19 pandemic, rapid transitions have been made towards telehealth. Optimal use of telehealth in elderly patients remains poorly understood and adaptation challenges persist. Our study aimed at identifying perceptions, barriers, and possible facilitators to telehealth use amongst elderly patients with comorbidities, their caregivers, and health-care providers (HCPs).

Methods

Health-care providers, patients 65 years and older with multiple comorbidities, and caregivers were recruited from outpatient clinics and invited to complete an electronic self-administered or telephone-administered survey on their perceptions of telehealth and of barriers to its implementation.

Results

A total of 39 health-care providers, 40 patients, and 22 caregivers responded to the survey. Most patients (90%), caregivers (82%), and HCPs (97%) had experienced telephone visits, but few were conducted via videoconference platforms. Patients and caregivers showed interest in pursuing some future telehealth visits (68%, 86%, respectively), but felt they lacked access to technology and skills (n=8, 20%), and some felt that telehealth visits may be inferior to in-person visits (n=9, 23%). HCPs showed interest in incorporating telehealth visits into practice (n=32, 82%), but identified challenges in lack of administrative support (n=37), lack of HCP (n=28) and patient (n=37) technological skills, and limited infrastructure (n=37)/internet access (n=33).

Conclusions

Older patients, caregivers, and HCPs show interest in pursuing future telehealth visits but elucidate similar barriers. Facilitating access to technology, as well as to administrative and technology support guides, could promote high quality and equal access to virtual care for the older adult.

Key words: telehealth, barriers, patient engagement, survey

INTRODUCTION

In the wake of the COVID-19 pandemic, a series of unprecedented measures to mitigate the spread of the virus were implemented including large-scale social isolation, restriction of public gatherings, and nationwide lockdowns. Although these social distancing strategies have been necessary from a public health standpoint, they have introduced challenges in the management of many chronic medical conditions, and have resulted in social isolation and limitation in social activities.(1) For elderly patients with multiple comorbidities, this may result in fragmentation of care, in deterioration in their clinical status, and substantial anxiety.(2) In an attempt to reduce transmission of COVID-19 and close the divide in health-care accessibility, rapid transitions have been made towards telehealth throughout the medical field. According to a study by Canada Health Infoway data published in June 2021, rates of virtual care rose from about 10% in 2018 to approximately 60% of health-care visits across Canada.(3) This has been the case across many medical specialties, notably in primary care. Specifically, Ontario saw a rise in primary care virtual visits from 1.2% in July 2019 to 71.1% in July 2020.(4)

Telehealth can be defined as the convergence of digital technologies with health to enhance its promotion, to improve disease management, and to provide remote health-care delivery.[5,6] It focuses on connecting patients, their caregivers, and their treating team, in synchronous (e.g., home telehealth visit) or asynchronous manners (e.g., home monitoring), with the goal of enriching patient-centred care.[7,8] Effective use of these technologies has been shown to decrease the number of hospital visits and the costs of treatment, and improve patient experience.[9-11] There is growing evidence that, with proper policies in place, health care could be safely and confidentially delivered through telehealth visits.[12]

Adoption of telehealth has not been without its challenges for both patients and their health-care providers (HCPs). It has been noted that this transition may disproportionately affect older patients, whose health condition, socioeconomic status, and digital literacy could cause additional challenges.[13] The level of eHealth literacy and adoption of technology among older Canadians has increased; nevertheless, to a lesser degree in those who are 65+ years and in those with lower levels of education.[14] This suggests that older populations would benefit from personalized solutions that integrate their caregiver and treating team, and provide adequate technological support to help mitigate health-care access inequities.[15] Although there is an increasing body of literature on telehealth use, evidence has been predominantly in patients with single-organ disease, and those with cognitive impairment are often excluded from studies.[16]

For new technologies to succeed, they must accommodate a spectrum of user needs. Patients need skills and tools to proactively apply technology information. In addition, use of new technology should be personally meaningful in terms of relevant self-care, and must serve to bring health into focus at a personal level and not define patients based on their disease state.[17] Therefore, novel and hybrid models of outpatient care that combine in-person clinic visits interspaced with personalized telehealth visits with ongoing remote educational and monitoring support are needed. Data related to access to electronic devices, proficiency, and interest in using digital health, as well as constituents of effective remote care visits, continue to be lacking for older and frail adults.

Therefore, the aim of this study was to evaluate the perceptions, the barriers, and facilitators to telehealth in adults of 65 years and older with multiple comorbidities, as well as in their caregivers and their health-care teams.

METHODS

Study Design and Study Population

We conducted a survey of patients, caregivers, and health-care providers during a period of three months, from February to May 2021.

Men and women over the age of 65 with at least three comorbidities followed in the General Internal Medicine or Geriatrics clinics of a large university tertiary care hospital were approached to participate in the study. Exclusion criteria included living in a long-term care institution, inability to provide informed consent and inability to communicate in French or English, and refusal to take part in the survey. Potential participants were approached by an HCP and were then referred to trained research personnel, who screened them for eligibility.

Caregivers of patient participants or of patients who were not eligible to, or refused to, participate in the study were also approached. Exclusion criteria and recruitment procedure of this group were similar to that of patient participants.

Health-care providers included physicians, nurses, and other HCPs working in the internal medicine, geriatric medicine or orthopedics outpatient clinics at the same institution. HCP recruitment was done through targeted email by the clinic leadership.

Survey Design

Surveys were developed by our research team in collaboration with patient partners, caregivers, physicians, and nurses. Questions were designed to obtain input from each group regarding their experiences and perceptions of telehealth in an engaging manner using specific web-based survey design and technical interface.[17] We categorized telehealth visits as visits that occurred using the telephone (telephone visits) or visits that occurred using a videoconference platform (videoconference visits).

The surveys were conducted using the REDCap Platform (Vanderbilt University, Nashville, TN) an online survey development cloud-based software that is compliant with Canadian privacy and accessibility standards (W3C) and does not collect computer internet protocol (IP) address or any other participant identifying information.[18] Surveys were available in either English or French. Consent was assumed based on the completion of the survey. The study was approved by the McGill University Health Centre Research Ethics Board.

Patient Group Survey

Eligible participants were invited to complete a survey composed of 25 close-ended questions and one open-ended question (Appendix A). Eight questions were related to demographics (including age, race, level of education, and current living arrangement), and known medical conditions. Next, participants were questioned on their access to technology and previous experience with telephone or videoconference visits. Participants were asked to rank their perceptions of telehealth visits, as well as benefits and challenges related to their implementation in the future, according to a Likert-type scale (Strongly disagree, Disagree, Neutral, Agree, Strongly agree). Finally, in an open-ended question, respondents were asked to list barriers contributing to future use of telehealth visits. This survey was either self-administered online or over the phone by our research personnel. Caregivers were allowed to complete the survey on behalf of patients, with real-time patient input, language-barrier, for technical or accessibility reasons. No personal ID information was gathered, and the data were entered directly into the REDCap platform.

Caregiver Group Survey

Eligible caregivers were invited to complete a similar survey composed of 16 close-ended questions and one open-ended question pertaining to experience, and perception of benefits and challenges related to assisting in conducting telehealth visits (Appendix B). In the open-ended question, caregivers were also asked to list barriers to pursuing this modality.

HCP Survey

A self-administered online survey was developed and distributed to all HCPs affiliated with the clinics in question. Participants were notified by email of the survey's imminent release. The survey was sent by their divisional director in February 2021; a reminder was sent two weeks after its initial distribution. This survey consisted of 15 close-ended questions and one open-ended question (Appendix C). Three questions pertained to demographics of the HCPs; nine questions were related to previous experience with various telehealth modalities, as well as any technical issues experienced during telehealth visits. Next, HCPs were asked to express their personal comfort level using and troubleshooting various telehealth modalities and expressed their answer on a five-point Likert scale (Strongly disagree, Disagree, Neutral, Agree, Strongly agree). Similarly, respondents were asked to rate their perception of various barriers as Not important, Mildly important, Moderately important, Important, Very important. Finally, HCPs were asked to list suggestions they would have to improve sustainable telehealth implementation in the future.

Analysis

The close-ended questions were analyzed using descriptive statistics expressed as frequencies and percentages for categorical variables and as means and standard deviations (SD) for continuous variables. Thematic content analysis was conducted for the open-ended questions and principles of simple induction without research-based expectations were applied. [19] Content analysis was performed by a first analyst (MR) and validated by a second analyst (SN) for patient and caregiver responses. For the HCP survey, open-ended responses were coded by a first researcher (DB) and then further validated by a second (SN). Content was organized into categories through a consensus process considering the possible range and variability of subcategories. Participants responded to open-ended questions in either French or English. Therefore, both French and English data were analyzed and validated simultaneously by bilingual analysts (SN, DB, MR).

RESULTS

Patient Group

Amongst the fifty-three patients who met inclusion criteria approached for the study, forty patients completed the survey questionnaire (75% participation rate) (Appendix D). The mean age of participants was 79.5 (SD 7.1) yrs, most were women (N= 27; 68%) and self-reported white race/ethnicity (N= 37; 93%). The majority reported living at home alone (N= 14; 35%) or with their spouse (N= 18, 45%). Eleven (28%) respondents reported having help at home from private or community services (Table 1). Most (71%) of respondents had a college degree or higher. The most common identified medical conditions amongst participants were arthritis (25%); visual impairment such as cataracts, glaucoma, macular degeneration (24%); cardiovascular diseases (23%); and diabetes (10%). Almost all previously had experienced telephone visits and only two had previous experience with videoconference visits.

Caregiver Group

Out of a total of twenty-four caregivers who were approached for the survey, twenty-two agreed to participate and responded to the survey (92% participation rate). The majority were women (N= 17, 77%) with a mean age of 68.7 (SD 13.0) yrs (Table 1). Most respondents were spouses (N=10, 46%) or children (N=10, 46%) of a patient participant. Caregivers reported having access to a variety of technological modalities for telehealth visits (Figure 1). Amongst this group, 18 caregivers (82%) reported having previously participated in telephone visits with only very few experiencing technical difficulties (N=2, 11%) (Table 2). Amongst the caregivers who previously participated in telehealth visits, 12 (67%) were in-person with the patient, one participant (6%) had connected via a three-way call, and two (11%) were on a separate call with the patient. Two people responded to have experienced videoconference visits, in-person with the patient, without any technical difficulties. Caregivers mostly felt comfortable assisting with the basic set-up and troubleshooting of a telehealth visit (Figure 2).

HCP Group

We identified seventy HCPs who met inclusion criteria to take part in the online survey. A total of thirty-nine surveys were completed (56% response rate) (Appendix D); participants had an average age of 51.4 (SD 13.7) yrs and gender was equally distributed in this group (Table 1). Amongst the HCPs, the majority were General Internal Medicine physicians. Ninety-seven percent (n=38) of participants reported having previously conducted telephone visits; however, only 41% (n=16) had conducted videoconference visits, and most reported experiencing technical difficulties both during telephone and videoconference visits (Table 2).

All groups surveyed reported having access to a telephone either with or without hands-free capability (Figure 1). While 70% and 90% of patients and caregivers, respectively, reported having access to a device (e.g., mobile device, computer, or tablet) capable of performing a videoconference visit, only about 45% of HCPs reported having access to a computer with videoconferencing capabilities in the clinic rooms.

The most used platform for videoconference visits amongst all groups was Zoom or Zoom Telehealth, with 17 HCPs, two patients and one caregiver. Participants reported no technical issues during their videoconference encounters, whereas HCPs noted difficulty with the connection, inability to hear or see the patient, and patients who did not understand how to use the videoconference platform (Table 2).

TABLE 1.
Participant Characteristics

Characteristic	*Health-care Provider (HCP) N=39 (%)*	*Patient N=40 (%)*	*Caregiver N=22 (%)*
Women	18 (46%)	27 (68%)	17 (77%)
Age – Mean (SD)	51.4 (13.7)	79.5 (7.1)	68.7 (13.0)
Language: English	39 (100%)	26 (65%)	16 (73%)
Have experienced telephone visits (during COVID-19)	38 (97%)	36 (90%)	18 (82%)
Have experienced videoconference visits (during COVID-19)	16 (41%)	2 (5%)	2 (9%)
Profession			
Physician -Internal Medicine	18 (46%)		
Physician - Geriatrics	4 (10%)		
Surgeon - Orthopedics	10 (26%)		
Nurse	5 (13%)		
Other[a]	2 (5%)		
Level of Education			
University		17 (43%)	
Professional/Trade		11 (28%)	
High school		7 (18%)	
Living Situation			
Home alone		14 (35%)	
Home with spouse		18 (45%)	
Other		7 (20%)	
Relationship to Patient			
Spouse/Partner			10 (46%)
Child			10 (46%)
Other			2 (10%)

[a]Physiotherapist

Preferences and Barriers to Telehealth Use

In general, health-care providers felt that future visits could be continued either by telephone or videoconference modalities (19 HCPs for telephone, 19 videoconference). Amongst patients, 14 (47%) noted they had no preference regarding which mode of telehealth visits they would prefer in the future, whereas 11 (37%) patients preferred telephone visits and five (17%) preferred videoconferences. Eighty-two percent of HCPs reported wanting to continue to offer telehealth visits after the pandemic was over. Most patients had positive perceptions of telehealth visits in general and were able to identify benefits to pursing this in the future (Appendix E). Thirty patients (75%) reported that they were interested in pursuing telehealth visits in the future, of which 28 (68%) patients noted wanting to pursue future telehealth follow-ups at least half the time. Most caregivers (19, 86%) noted that an ideal frequency for telehealth would be every visit. Specific to videoconference visits, HCPs reported that they were likely to incorporate this type of consultation in their practice (n=32); nevertheless, HCPs still responded that they lacked adequate knowledge (n=13) and preparedness (n=14) to conduct a videoconference consultation.

Patients, caregivers, and HCPs identified barriers to participating in telehealth visits in the open-ended questions (Appendix F, Appendix G). Patients and caregivers noted health-related barriers including cognitive impairment (n=6), caregiver health limitations (n=2) and sensory impairment including vision and hearing (n=2). Some patients (n=9) and caregivers (n=4) perceived telehealth visits as inferior to in-person visits.

Overall, most barriers identified by patients and caregivers and HCPs pertained to technology use difficulties and lack of access to tools and guides. Some of the themes that were identified included patients or caregivers not feeling comfortable with technology (n=8). Lack of skills by patient or caregiver was also identified as an important barrier by HCPs (n= 37) (Appendix G). Similarly, HCPs also felt that they lacked the technological skills to facilitate telehealth visits without support (n=28).

In terms of technology infrastructure, patients, caregivers, and HCPs all identified poor internet connection (n=1 patient, 1 caregiver, 33 HCPs) as a barrier to providing videoconference visits, and one patient reported elevated costs of technology as a barrier. HCPs' responses also highlighted challenges related to lack of technology availability (n=37), lack of administrative support (n=28), and significant workload related to the process of implementing this technology (n=32).

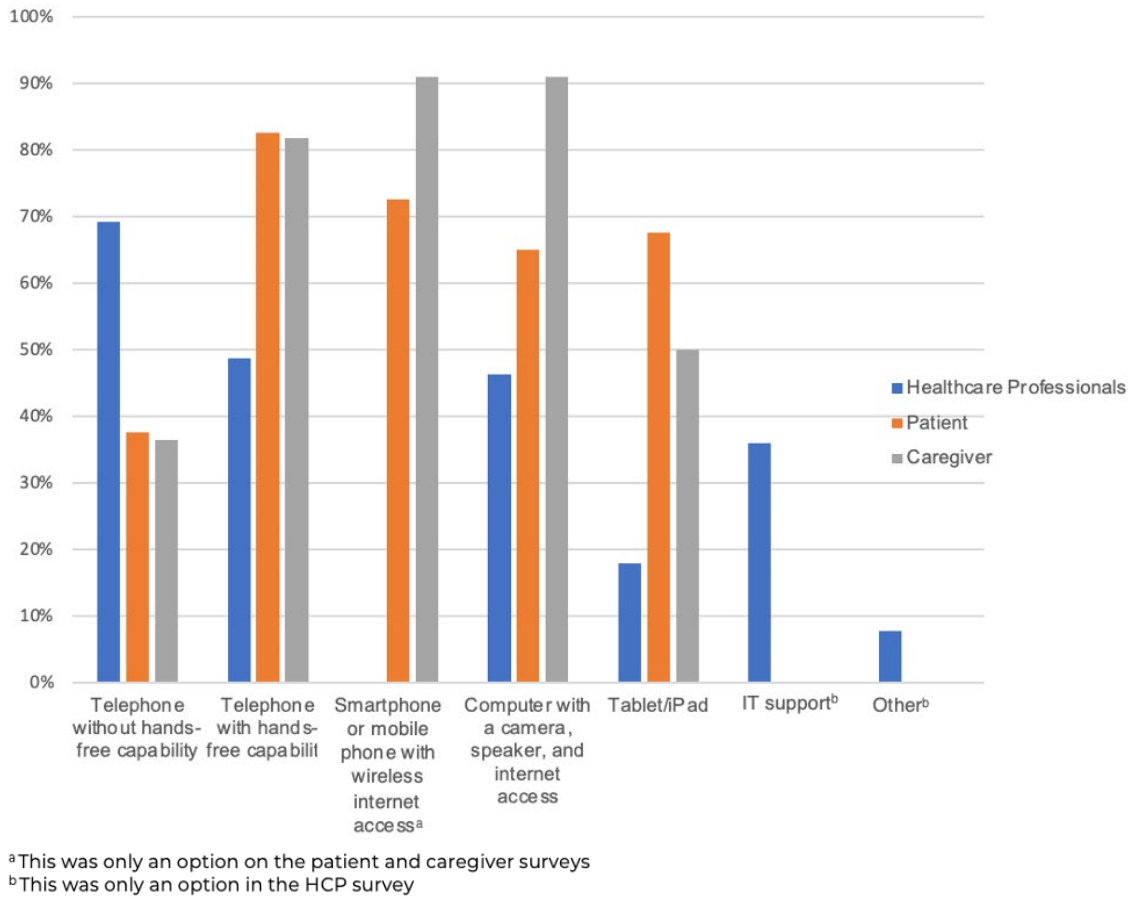


FIGURE 1. Participant access to technology

HCPs' suggestions to reduce the aforementioned barriers pertained to improved access to technology (n=17) including infrastructure and technological support, as well as administrative support for scheduling and set up (n=29). Further suggestions included creation of tools and guidelines to facilitate a safe and confidential process of conducting telehealth visits both for HCPs, and patients and their caregivers (n=16) (Appendix H).

DISCUSSION

We found that while most patients, caregivers, and HCPs respondents have previously experienced telehealth visits, few of these visits were conducted using videoconference platforms. In general, participants and caregivers have access to devices able to conduct videoconference visits; however, hospital infrastructure and access to technology were reported to be lacking by the HCP group. Moreover, HCPs noted they would like to integrate videoconference consultations into their practice, but felt they lacked administrative support and guidelines on troubleshooting options both for themselves and the patient. Manipulation of technology and health-related barriers were the other most frequently identified barriers. Participants reported wanting to pursue some degree of virtual visits in the future. Participants noted that telehealth visits could facilitate communication with the HCPs, especially if the patient and/or caregiver have cognitive or mobility issues.

Our study revealed that few of the telehealth visits that patients, caregivers, and HCPs already experienced were conducted using videoconference platforms. This is in keeping with previously reported findings amongst patients of all ages and is explained by the relative ease of use and technological availability of phone visits compared to that required for videoconferences, as we have also identified in our study.[20]

In a 2018 study commissioned by the Canadian Medical Association on public opinion of digital health technologies (additionally mentioned in the Organization for Economic Cooperation and Development [OECD] 2020 report),[21] it was reported that seven out of ten participants surveyed said they would take advantage of virtual visits in the future.[12] This is consistent with our findings which revealed interest to participate in telehealth visits in the future amongst patients, caregivers, and HCPs. It is noted, both in our study and in currently available literature, that patients prefer a hybrid formula for future health-care delivery.[22] This will require the creation of novel models of outpatient care that combine in-person/in-clinic visits interspaced with personalized telehealth visits with ongoing remote educational and monitoring support.

Most caregiver respondents in our study preferred to pursue telehealth in every visit. This preference may be explained

by the facilitated accessibility to health-care providers and the elimination of distance or time constraints associated with travelling. This reiterates the importance of ensuring that the caregiver is included in every visit, even if they are only present remotely.

Barriers identified in our study were similar across HCPs, patients, and caregivers, as well as to those previously reported in literature.[23-26] Amongst the three groups, lack of administrative support, technological skills, and local infrastructure were frequently identified.

TABLE 2.
Technical problems encountered during telephone and videoconference visits

Technical Problem Noted	*Patient N=36 (%)*	*Caregiver N=18 (%)*	*HCP N=38 (%)*
The HCP was not on time	4 (11)	1 (6)	NA
Unable to reach the patient/HCP/Caregiver	0 (0)	1 (6)	29 (76)
Unable to hear the patient/HCP/Caregiver	3 (8)	0 (0)	14 (37)
Poor signal	0 (0)	0 (0)	6 (16)
Unable to connect to 3-way call	0 (0)	0 (0)	5 (13)
None, I did not encounter any technical problems	28 (78)	16 (89)	7 (18)

Technical Problem Noted	*HCP N=16 [a] (%)*
Patient/caregiver unable to install the application	2 (13)
Patient/caregiver did not understand how to use the application	6 (38)
Unable to reach the patient/HCP/Caregiver	2 (13)
Unable to hear patient/HCP/Caregiver	6 (38)
Unable to see the Patient/HCP/Caregiver	6 (38)
Poor signal/connection	7 (40)
None, I did not encounter any technical problems	1 (6)

[a]Each participant could give up to 3: 1 reference = 1 problem.

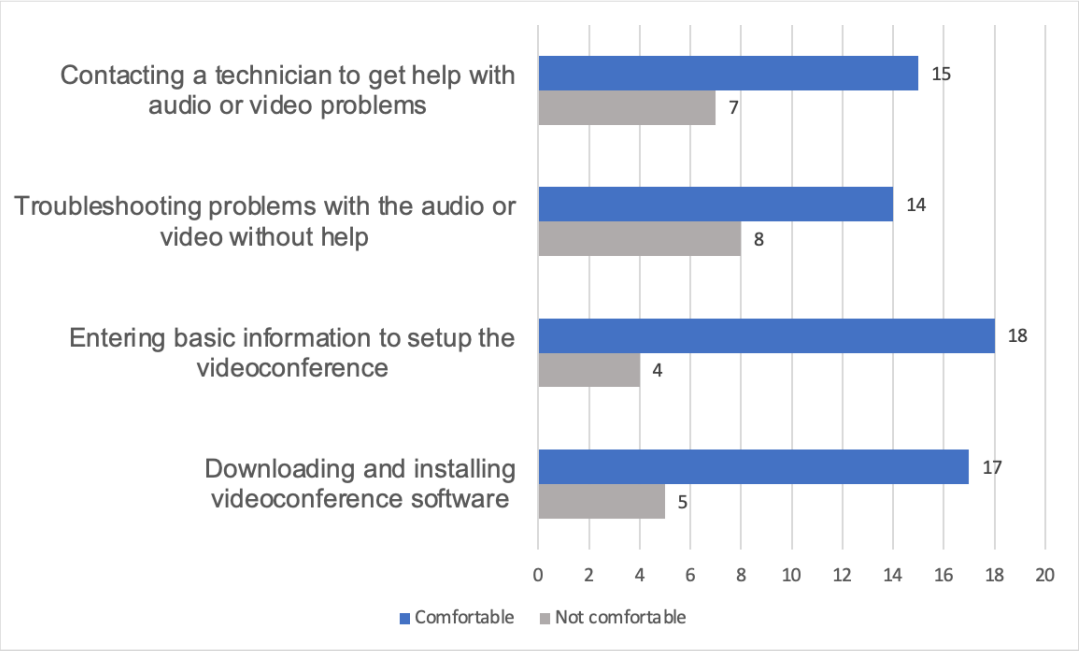


FIGURE 2. Caregiver comfort level assisting patients in caregivers/family members

While some physicians feel sufficiently prepared to conduct videoconference consultations, frequent comments were made pertaining to the need for more standardized tools and guidelines for patients and staff, as well as dedicated administrative and technological support to ease the application of telehealth. These are factors that should be considered in the future development of interventions and policies aimed at supporting telehealth for health-care delivery in the elderly. As per findings in a study by Kalicki *et al.*, physicians are not always aware of non-medical barriers that may be limiting proper telehealth use, notably the financial situation of the patient including their ability to obtain a videoconference device and pay for the internet connection.[27] This was not a barrier that we identified. However, it remains a factor that should be taken into consideration, especially in the elderly population. A proposed solution for this is a collection of targeted data on the patient's medical and non-medical capacity to engage in a telehealth visit prior to pursuing this modality.

Study respondents felt that telehealth visits will facilitate health-care accessibility and communication with the HCPs, especially if the patient and/or caregiver have cognitive or mobility issues in the future. It is known that improved accessibility to health care in the elderly limits fragmentation of care, improves survival outcomes, and alleviates substantial anxiety.[28] Bashshur *et al*. showed improved outcomes with telehealth: decreased hospital admissions, emergency room visits and even mortality in patients with chronic diseases (i.e., COPD, heart failure and stroke).[9] Currently, there is little data pertaining to these outcomes in the elderly population.

Some patient participants in our study perceive telehealth visits as inferior to in-person visits. Although reasons for this were not explored in this study, possible causes including perceived lower quality care due to limited physical exam, loss of interpersonal connection, and technology and health-literacy disparities in older and more vulnerable populations have previously been identified.[29,30] Interestingly, in a study by Ladin *et al*., this dissatisfaction was mainly noted by HCPs and was not consistently shared by patients.[30]

A strength of our study is that we identified the perceptions and challenges to telehealth not only from the perspective of elderly patients, but also from their caregivers and their HCP team. Perspectives and difficulties in implementation of telehealth in the older population with multiple comorbidities, including cognitive impairment, is poorly represented in current literature,[31] and obtaining information from all stakeholders is a crucial step to finding solutions.

Our results are limited by the survey methodology and the relatively modest number of participants in all groups. Our sample size was small because recruitment occurred early in the COVID-19 pandemic. It was therefore increasingly challenging to reach out to potential participants. Furthermore, our results only apply to the population seen in tertiary academic settings, thereby limiting their generalizability. However, the demographic information in all groups is representative of the study populations. There were significantly more physician responders than other HCPs, which is in keeping with the professionals who participated the most in telehealth visits. Amongst the patient and caregiver groups, patients were preselected by their HCP. This accounts for the higher participation rate and an overall lower number of participants, and supports the presence of a selection bias, since patients and caregiver participants were already positively disposed to telehealth measures. Nonetheless, our findings are in keeping with previously published data regarding demand and interest.[22] Participation bias was reduced by providing multiple pathways to completion of the survey (for example, patients or caregivers with lower eHealth literacy or of lower socioeconomic background who wished to complete the survey with the help of a research staff on the phone). The surveys were only available in French and English, thereby excluding participants who could not communicate in these languages. This is a well-recognized challenge in digital technologies, and the availability of tools solely in English[32] leads to inequities in health-care delivery.

CONCLUSIONS

The ongoing COVID-19 pandemic is forcing us to redesign the way we deliver care, now and for the future. Telehealth offers a promise for the provision of health-care delivery in the elderly. There is evidence of increased demand to incorporate telehealth for health-care delivery in the elderly; however, important challenges in implementation of this technological avenue are still present. In order to bridge this digital divide, we must continue to adapt telehealth to create a more personalized approach to meet the unique needs of older adults, specifically those with multiple comorbidities. Nonetheless, telehealth should not be "one-size-fits-all" model, but rather tailored to the patient's needs, their interest, and the available technological resources.[27] Our study findings highlight an opportunity for broader engagement by hospitals, various stakeholders, and policymakers to provide necessary technological and infrastructure support, and for the creation of guidelines to facilitate the transition to telehealth for the older adult.[12,33]

ACKNOWLEDGEMENTS

The authors would like to thank the respondents for their participation in the surveys. SNM is a scholar of the Fonds de Recherche du Québec en Santé.

CONFLICT OF INTEREST DISCLOSURES

We have read and understood the *Canadian Geriatrics Journal*'s policy on conflicts of interest disclosure and declare there are no conflicts of interest.

FUNDING

This study was funded by the Montreal General Hospital Foundation Helen McCall Hutchinson Scholarship. The funding source had no role in the design of the study, analysis of the results, writing of the manuscript or decision to submit for publication.

REFERENCES

1. Ankuda CK, Leff B, Ritchie CS, Siu AL, Ornstein KA. Association of the COVID-19 pandemic with the prevalence of homebound older adults in the United States, 2011-2020. *JAMA Intern Med*. 2021;181(12):1658–60.
2. Sepúlveda-Loyola W, Rodríguez-Sánchez I, Pérez-Rodríguez P, Ganz F, Torralba R, Oliveira DV, *et al*. Impact of social isolation due to COVID-19 on health in older people: mental and physical effects and recommendations. *J Nutr Health Aging*. 2020;24(9):938–47.
3. COVID-19 Tracking Survey, Canada Health Infoway and Leger. Canadians' health care experiences during COVID-19: uptake of virtual care. Toronto, ON: Canada Health Infoway; 2021 [updated April 2022]. Available from: https://www.infoway-inforoute.ca/en/component/edocman/3828-canadians-health-care-experiences-during-covid-19/view-document?Itemid=0
4. Glazier RH, Green ME, Wu FC, Frymire E, Kopp A, Kiran T. Shifts in office and virtual primary care during the early COVID-19 pandemic in Ontario, Canada. *CMAJ*. 2021;193(6): E200–10.
5. Steinhubl SR, Muse ED, Topol EJ. The emerging field of mobile health. *Sci Transl Med.* 2015;7(283):283rv3.
6. O'Shea CJ, McGavigan AD, Clark RA, Chew DPB, Ganesan A. Mobile health: an emerging technology with implications for global internal medicine. *Intern Med J*. 2017;47(6):616–19.
7. Semple JL, Armstrong KA. Mobile applications for postoperative monitoring after discharge. *CMAJ*. 2017;189(1):E22–24.
8. Wosik J, Fudim M, Cameron B, Gellad ZF, Cho A, Phinney D, *et al*. Telehealth transformation: COVID-19 and the rise of virtual care. *J Am Med Inform Assoc*. 2020;27(6):957–62.
9. Bashshur RL, Shannon GW, Smith BR, Alverson DC, Antoniotti N, Barsan WG*, et al.* The empirical foundations of telemedicine interventions for chronic disease management. *Telemed e-Health*. 2014;20(9):769–800.
10. Rojas SV, Gagnon MP. A systematic review of the key indicators for assessing telehomecare cost-effectiveness. *Telemed e-Health*. 2008;14(9):896–904.
11. Sathiyakumar V, Apfeld JC, Obremskey WT, Thakore RV, Sethi MK. Prospective randomized controlled trial using telemedicine for follow-ups in an orthopedic trauma population: a pilot study. *J Orthop Trauma*. 2015;29(3):e139–45.
12. Hashiguchi TCO. Bringing health care to the patient: an overview of the use of telemedicine in OECD countries. OECD Health Working Papers No. 116. Paris: OECD Publishing; 2020.
13. Foster MV, Sethares KA. Facilitators and barriers to the adoption of telehealth in older adults: an integrative review. *Comput Inform Nurs*. 2014;32(11):523–33.
14. Cherid C, Baghdadli A, Wall M, Mayo NE, Berry G, Harvey EJ, *et al*. Current level of technology use, health and eHealth literacy in older Canadians with a recent fracture-a survey in orthopedic clinics. *Osteoporos Int*. 2020;31(7):1333–40.
15. Vergara J, Parish A, Smallheer B. Telehealth: opportunities in geriatric patient care during COVID-19. *Geriatr Nurs*. 2020;41(5):657–58.
16. Bernocchi P, Scalvini S, Galli T, Paneroni M, Baratti D, Turla O, *et al*. A multidisciplinary telehealth program in patients with combined chronic obstructive pulmonary disease and chronic heart failure: study protocol for a randomized controlled trial. *Trials*. 2016;17(1):462.
17. Snyder CF, Wu AW, Miller RS, Jensen RE, Bantug ET, Wolff AC. The role of informatics in promoting patient-centered care. *Cancer J.* 2011;17(4):211–18.
18. Harris PA, Taylor R, Thielke R, Payne J, Gonzalez N, Conde JG. Research electronic data capture (REDCap)—a metadata-driven methodology and workflow process for providing translational research informatics support. *J Biomed Inform*. 2009; 42(2):377–81.
19. Saldaña J. The coding manual for qualitative researchers, 2nd ed. London: SAGE Publications; 2013.
20. Latus-Olaifa O, Norman GJ, Kurliand M, Slaboda JC, Abrashkin KA, Smith KL, *et al*. Not yet ready for prime time: video visits in a home-based primary care program. *J Am Geriatr Soc*. 2019;67(10):2202–04.
21. Canadian Medical Association. CMA Health Summit: Inspiring a Future of Better Health. Summit held in Winnipeg, MB, August 20–21, 2018. Ottawa: CMA.
22. CMA. What Canadian's think about Virtual Health Care: Nationwide Survey Results. Survey conducted by ABACUS DATA, May 2020. Published June 8, 2020. Available from: https://abacusdata.ca/what-do-canadians-think-about-virtual-healthcare/
23. Nieman CL, Oh ES. Connecting with older adults via telemedicine. *Ann Intern Med*. 2020;173(10):831–32.
24. Merrell RC. geriatric telemedicine: background and evidence for telemedicine as a way to address the challenges of geriatrics. *Healthc Inform Res*. 2015;21(4):223–29.
25. Zulman DM, Jenchura EC, Cohen DM, Lewis ET, Houston TK, Asch SM. How can eHealth technology address challenges related to multimorbidity? Perspectives from patients with multiple chronic conditions. *J Gen Intern Med*. 2015;30(8):1063–70.
26. Makhni MC, Riew GJ, Sumathipala MG. Telemedicine in orthopaedic surgery: challenges and opportunities. *J Bone Joint Surg Am*. 2020;102(13):1109–15.
27. Kalicki AV, Moody KA, Franzosa E, Gliatto PM, Ornstein KA. Barriers to telehealth access among homebound older adults. *J Am Geriatr Soc*. 2021;69(9):2404–11.
28. United Nations Sustainable Development Group. Policy brief: the impact of COVID-19 on children. New York: UN; 2020.
29. Miner H, Fatehi A, Ring D, Reichenberg JS. Clinician telemedicine perceptions during the COVID-19 pandemic. *Telemed e-Health*. 2021;27(5):508–12.
30. Ladin K, Porteny T, Perugini JM, Gonzales KM, Aufort KE, Levine SK, *et al*. Perceptions of telehealth vs in-person visits among older adults with advanced kidney disease, care partners, and clinicians. *JAMA Netwk Open*. 2021;4(12):e2137193.
31. Kruse CS, Krowski N, Rodriguez B, Tran L, Vela J, Brooks M. Telehealth and patient satisfaction: a systematic review and narrative analysis. *BMJ Open*. 2017;7(8):e016242.
32. Heckemann B, Wolf A, Ali L, Sonntag SM, Ekman I. Discovering untapped relationship potential with patients in telehealth: a qualitative interview study. *BMJ Open*. 2016;6(3):e009750.
33. Doraiswamy S, Jithesh A, Mamtani R, Abraham A, Cheema S. Telehealth use in geriatrics care during the COVID-19 pandemic-a scoping review and evidence synthesis. *Int J Environ Res Public Health*. 2021;18(4):1755.

Correspondence to: Suzanne Morin, MD, MSc, Centre for Outcomes Research and Evaluation, Research Institute of the McGill University Health Centre, 5252 de Maisonneuve O, Room 3E.11, Montreal, QC, Canada H4A 3S5
Email: suzanne.morin@mcgill.ca

APPENDIX A. Patient survey

Research Survey Title:	Personalized Telehealth: Redesigning complex care delivery for the 65+
Protocol number:	XXXXXX
Researcher responsible for the research survey:	Dr. Suzanne Morin
Co-Investigators:	Dr. Sofia Nene Dr. José Morais Dr. Gregory Berry Dr. Nathalie Saad

Dear Sir/Madam,

You are invited to take part in a research survey about the experience of people who may be involved in medical consultations administered by telephone or videoconference (also known as a televisit). As a patient aged 65 years or older, your answers will help the research team develop user-friendly tools and interventions to provide support for each step of the televisit. To be eligible to participate, you must:

- **Be a patient at the MUHC**
- **Be aged 65 years or older**

This survey should take you no longer than 15 minutes to complete. There are no known risks associated with completing this survey. By agreeing to participate in this research survey, you are not waiving any of your legal rights.

This survey is completely anonymous. We do not ask for your name, and there are no questions that allow you to be identified by your answers. REDCap is compliant with Canadian privacy and accessibility standards (W3C) and will not collect any information (such as your IP address) that would allow your computer to be identified. The results of the survey may be published or shared during scientific meetings; however, it will not be possible to identify you.

We truly appreciate your time and participation in this survey. Completing this survey indicates that you are a patient at the MUHC and are aged 65 years or older.

The McGill University Health Centre Research Ethics Board reviewed this survey and is responsible for monitoring it at all participating institutions in the health and social services network in Quebec.

Contact Information:

If you have questions, you may communicate with the researcher responsible for the survey or with someone on the research team at the following number: 514-934-1934 ext. 45742.

For any question concerning your rights as a research participant taking part in this survey or if you have comments, or wish to file a complaint, you may communicate with: The Patient Ombudsman of the at the following phone number: 514 934-1934, ext. 44285.

PATIENT QUESTIONNAIRE

This questionnaire explores the challenges and potential advantages of televisits from the perspective of the patient.

Patient refers to the person who is receiving a medical consultation/examination.

A televisit is a remote meeting with a healthcare professional by telephone or via a video conference platform.

Please answer all questions from your personal perspective if you are completing this questionnaire on behalf of yourself. If you are helping a patient complete this questionnaire because of a language barrier and/or a visual, reading, or writing impairment, please answer the questions from the perspective of the patient.

1. Are you completing this survey alone or with the help of a family member/caregiver?
   - □ I am completing this survey alone
   - □ I am completing with the help of a family member/caregiver
2. What is your age (years)? _____
3. Which best describes how you self-identify?
   - □ Man
   - □ Woman
   - □ Other
   - □ Prefer not to say
4. People living in Canada come from many different cultural and racial backgrounds. What do you identify as? Please choose all that apply.
   - □ White
   - □ Chinese
   - □ South Asian (e.g., East Indian, Pakistani, Sri Lankan)
   - □ Black
   - □ Filipino
   - □ Latin American
   - □ Southeast Asian (e.g, Cambodian, Indonesian, Laotian, Vietnamese)
   - □ Arab
   - □ West Asian (e.g., Afghan, Iranian)
   - □ Japanese
   - □ Korean
   - □ American Indian
   - □ Inuit
   - □ Métis
   - □ Other, please specify:
   - □ Prefer not to say
5. Please indicate the highest degree or level of education you have completed:
   - □ Elementary school
   - □ High school
   - □ College (CEGEP)
   - □ Professional program/Trade
   - □ University Degree
   - □ Prefer not to say
6. What is your current living arrangement?
   - □ Home alone
   - □ Home with spouse
   - □ Home with domestic partner
   - □ Home with other family, without a spouse or domestic partner
   - □ Home with roommate
   - □ Rehabilitation centre
   - □ Residence for autonomous seniors
   - □ Long-term care home
   - □ Other
7. If you live at home, do you receive services from the CLSC or a private agency?
   - □ Yes □ No

8. Has your doctor ever told you that you have any of the following conditions? Please check all that apply:
   - □ Diabetes, borderline diabetes or that your blood sugar is high
   - □ Heart disease (Examples: Congestive heart failure, angina, a heart attack, problems with heart rhythm)
   - □ Stroke or ministrokes (also called cerebrovascular accident)
   - □ Poor circulation in your limbs (also called peripheral vascular disease)
   - □ A disease of the lungs (Examples: Emphysema, chronic bronchitis, chronic obstructive pulmonary disease [COPD], or changes in lungs due to smoking)
   - □ Dementia or Alzheimer's disease
   - □ Parkinson's disease
   - □ Gastrointestinal disorder (Examples: Crohn's Disease, ulcerative colitis, or Irritable Bowel Syndrome)
   - □ Cancer
   - □ A mood disorder (Examples: Depression and manic depression, bipolar disorder, mania, or dysthymia)
   - □ Kidney disease or kidney failure
   - □ Arthritis (Examples: Rheumatoid arthritis, osteoarthritis or any other type of arthritis)
   - □ Cataracts, glaucoma or macular degeneration

9. Please check the box that best describes how you would rate the following.

	1	*2*	*3*	*4*	*5*
	Poor	*Fair*	*Good*	*Very Good*	*Excellent*
Your hearing (using a hearing aid if you use one)					
Your eyesight (using a glasses or corrective lenses if you use them)					

10. To which communication devices do you have access? Please check all that apply.
    - □ Telephone without hands-free capability
    - □ Telephone with hands-free capability
    - □ Smartphone or mobile phone with wireless internet access
    - □ Computer with a camera, speaker, and internet access
    - □ Tablet or iPad device with wireless internet access

11. Since the start of the COVID-19 pandemic, have you had a telephone visit with a healthcare professional?
    - □ Yes □ No

11a. If yes, how did you schedule your appointment that was conducted as a telephone visit?
    - □ I was contacted by the clinic administrative assistant
    - □ I was contacted directly by my healthcare professional
    - □ I made an appointment through the MUHC telephone appointment booking system
    - □ I made an appointment through an online booking system
    - □ I don't know

11b. If yes, did you require help with the telephone for the visit?
    - □ Yes (please specify from who) _____
    - □ No

11c. If yes, what technical problems did you encounter during your telephone visit(s)? Please check all that apply:
    - □ The healthcare professional was not on time
    - □ Unable to reach the healthcare professional
    - □ Unable to hear the healthcare professional
    - □ The healthcare professional was unable to hear me talking
    - □ Other (please specify) _____
    - □ None, I did not encounter any technical problems

12. Since the start of the COVID-19 pandemic, have you had a videoconference visit with a healthcare professional?
    - □ Yes □ No

12a. If yes, how did you schedule your appointment that was conducted as a videoconference?
- □ I was contacted by the clinic administrative assistant
- □ I was contacted directly by my healthcare professional
- □ I made an appointment through the MUHC telephone appointment booking system
- □ I made an appointment through an online booking system
- □ I don't know

12b. If yes, which videoconference platform(s) did you use? Please select all that apply:
- □ Facetime video
- □ Skype video
- □ Zoom or Zoom Health
- □ Microsoft Teams
- □ Google Hangouts
- □ React
- □ Other (please specify) _____
- □ I don't know

12c. If yes, did you require help with the videoconference technology for the visit?
- □ Yes (please specify from who) _____
- □ No

12d. If yes, prior to your videoconference visit, how was the videoconference platform installed on your device?
- □ I was able to download it on my own
- □ A family member, or a friend assisted me in downloading the platform
- □ The clinic clerk assisted me in downloading the platform
- □ My healthcare professional assisted me in downloading the platform
- □ I was unable to download the platform
- □ I did not have to install the platform

12e. If yes, what technical problems did you encounter during your videoconference visit(s)? Please check all that apply
- □ I was unable to install the application
- □ I did not understand how to use the application
- □ The healthcare professional was not on time
- □ Unable to reach the healthcare professional
- □ Unable to hear the healthcare professional
- □ The healthcare professional was unable to hear me talking
- □ Unable to see the healthcare professional
- □ The healthcare professional was unable to see me
- □ Poor signal/connection
- □ Other (please specify) _____
- □ None, I did not encounter any technical problems

13. How often would you be interested in participating in televisits with your physician or healthcare team?
- □ Every visit
- □ Most visits (with only very important visits in person)
- □ Around half the time (with half the visits in person)
- □ Not interested in televisits
- □ Don't know

13. If any response other than not interested, would you prefer that your televisits to take place over the telephone or by videoconference?
- □ Telephone
- □ Videoconference
- □ No preference
- □ Don't know

14. Please check the response that best indicates to what extent you agree or disagree with the following statements regarding televisits with your physician or healthcare team.

	1	*2*	*3*	*4*	*5*
	Strongly Disagree	*Disagree*	*Neutral*	*Agree*	*Strongly agree*
I feel comfortable using the telephone without assistance					
I feel comfortable using video conference platforms (Facetime, Zoom, Skype, Teams, etc.) without assistance					
If need be, I have access to help for setting up my televisit					
I believe that telephone visits are secure and confidential					
I believe that videoconference visits are secure and confidential					
I have access to a quiet environment where I can participate in a televisits					
I feel comfortable having my healthcare professional see inside my home during videoconference visits					
I feel that televisits are easy to organize with my healthcare professional					
I would like to be able to have a family member/caregiver participate in my televisit					

15. Please check the response that best indicates to what extent you agree or disagree with the following statement. The benefits of participating in televisits are:

	1	*2*	*3*	*4*	*5*
	Strongly Disagree	*Disagree*	*Neutral*	*Agree*	*Strongly agree*
Decreased travel time and cost					
Less time spent in the waiting room					
Easier to accommodate my schedule					
Improved access to medical professionals					
Reduced risk of contracting COVID-19					

16. Please indicate any barriers or issues that would prevent you from participating in a televisit? Please list a maximum of 3 barriers or issues.

    1. _____
    2. _____
    3. _____

APPENDIX B. Caregiver survey

Research Survey Title:	Personalized Telehealth: Redesigning complex care delivery for the 65+
Protocol number:	XXXXXX
Researcher responsible for the research survey:	Dr. Suzanne Morin
Co-Investigators:	Dr. José Morais Dr. Gregory Berry Dr. Nathalie Saad

Dear Sir/Madam,

You are invited to take part in a research survey about the experience of people who may be involved in medical consultations administered by telephone or videoconference (also known as a televisit). As a caregiver or family member of a patient aged 65 years or older, your answers will help the research team develop user-friendly tools and interventions to provide support for each step of the televisit. To be eligible to participate, you must:

- **Have been identified by a MUHC clinic patient aged 65 years or older as a caregiver or family member involved in their care**

This survey should take you no longer than 15 minutes to complete. There are no known risks associated with completing this survey. By agreeing to participate in this research survey, you are not waiving any of your legal rights.

This survey is completely anonymous. We do not ask for your name, and there are no questions that allow you to be identified by your answers. REDCap is compliant with Canadian privacy and accessibility standards (W3C) and will not collect any information (such as your IP address) that would allow your computer to be identified. The results of the survey may be published or shared during scientific meetings; however, it will not be possible to identify you.

We truly appreciate your time and participation in this survey. Completing this survey indicates that you are involved in the care of a patient aged 65 years or older.

The McGill University Health Centre Research Ethics Board reviewed this survey and is responsible for monitoring it at all participating institutions in the health and social services network in Quebec.

Contact Information:

If you have questions, you may communicate with the researcher responsible for the survey or with someone on the research team at the following number: 514-934-1934 ext. 45742.

For any question concerning your rights as a research participant taking part in this survey or if you have comments, or wish to file a complaint, you may communicate with: The Patient Ombudsman of the at the following phone number: 514 934-1934, ext. 44285.

FAMILY MEMBER QUESTIONNAIRE

This questionnaire explores the challenges and potential advantages of televisits from the perspective of a family member, partner, friend, or caregiver who would be accompanying a patient to a televisit.

Patient refers to the person who is receiving a medical consultation/examination.

A televisit is a remote meeting with a healthcare professional by telephone or via a video conference platform.

Please answer all questions from your personal perspective.

1. What is your age (years)? _____

2. Which best describes how you self-identify?
   - □ Man
   - □ Woman
   - □ Other
   - □ Prefer not to say

3. What is your relationship to the patient?
   - □ Spouse/Partner
   - □ Sibling
   - □ Child
   - □ Grandchild
   - □ Friend
   - □ Paid caregiver
   - □ Other (please specify) _____

4. To which communication devices do you have access? Please check all that apply.
   - □ Telephone without hands-free capability
   - □ Telephone with hands-free capability
   - □ Smartphone or mobile phone with wireless internet access
   - □ Computer with a camera, speaker, and internet access
   - □ Tablet or iPad device with wireless internet access

5. Since the start of the COVID-19 pandemic, have you participated in a patient's telephone visit with a healthcare professional?
   - □ Yes □ No

5a. If yes, how did you participate in the patient's telephone visit?
   - □ In-person, I was present with the patient during the televisit
   - □ Connected remotely, using a three-way call with the patient and healthcare professional
   - □ Connected remotely, on a separate call with the patient
   - □ Other (please specify) _____

5b. If yes, what technical problems did you encountered during your telephone visit(s)? Please check all that apply:
   - □ The healthcare professional was not on time
   - □ Unable to reach the healthcare professional and/or patient
   - □ Unable to hear the healthcare professional and/or patient
   - □ The healthcare professional and/or patient was unable to hear me talking
   - □ Other (please specify) _____
   - □ None, I did not encounter any technical problems

6. Since the start of the COVID-19 pandemic, have you participated in a patient's videoconference visit with a healthcare professional?
   - □ Yes □ No

6a. If yes, which videoconference platform(s) did you use? Please select all that apply:
   - □ Facetime video

- □ Skype video
- □ Zoom or Zoom Health
- □ Microsoft Teams
- □ Google Hangouts
- □ React
- □ Other (please specify) _____
- □ I don't know

6b. If yes, how did you participate in the patient's videoconference visit?
- □ In-person, I was present with the patient during the televisit
- □ Connected remotely, using a three-way videoconference call with the patient and healthcare professional
- □ Connected remotely, on a separate call or videoconference with the patient
- □ Other (please specify) _____

6c. If yes, what technical problems did you encounter during your videoconference visit(s)? Please check all that apply
- □ I was unable to install the application
- □ I did not understand how to use the application
- □ The healthcare professional was not on time
- □ Unable to reach the healthcare professional and/or patient
- □ Unable to hear the healthcare professional and/or patient
- □ The healthcare professional and/or patient was unable to hear me talking
- □ Unable to see the healthcare professional and/or patient
- □ The healthcare professional and/or patient was unable to see me
- □ Poor signal/connection
- □ Other (please specify) _____
- □ None, I did not encounter any technical problems

7. Please check the response that best indicates to what extent you agree or disagree with the following statement.

I feel comfortable assisting the patient with the following steps which may be required during a televisit:

	1	*2*	*3*	*4*	*5*
	Strongly Disagree	*Disagree*	*Neutral*	*Agree*	*Strongly agree*
Downloading and installing videoconference software					
Entering basic information to setup the videoconference					
Troubleshooting problems with the audio or video without help					
Contacting a technician to get help with audio or video problems					

8. Please check the response that best indicates to what extent you agree or disagree with the following statement. It is important for me to be present during a televisit:

	1	*2*	*3*	*4*	*5*
	Strongly Disagree	*Disagree*	*Neutral*	*Agree*	*Strongly agree*
To provide emotional support					
To better understand the patient's condition					
To help the patient better understand their condition					
To help with translation (language barrier)					

9. Please check the response that best indicates to what extent you agree or disagree with the following statement. The benefits of participating in televisits with the patient are:

	1	*2*	*3*	*4*	*5*
	Strongly Disagree	*Disagree*	*Neutral*	*Agree*	*Strongly agree*
Decreased travel time and cost					
Less time spent in the waiting room					
Easier to accommodate my schedule					
Improved access to medical professionals					
Easier to be involved and monitor the patient's care					
Reduced risk of contracting COVID-19					
There are no benefits					

10. Please check the response that best indicates to what extent you agree or disagree with the following statement.

	1	*2*	*3*	*4*	*5*
	Strongly Disagree	*Disagree*	*Neutral*	*Agree*	*Strongly agree*
It is very important for me to participate in televisits with the patient					

12. How frequently would you be interested in accompanying the patient to televisits?
    - □ Every visit
    - □ Only to very important visits
    - □ Half of the visits
    - □ Never
    - □ I don't know

13. Please indicate any barriers or issues that would prevent you from participating with the patient in a televisit? Please list a maximum of 3 barriers or issues.

    1. _____
    2. _____
    3. _____

APPENDIX C. Health-care professional (HCP) survey

Research Survey Title:	Personalized Telehealth: Redesigning complex care delivery for the 65+
Protocol number:	XXXXXX
Researcher responsible for the research survey:	Dr. Suzanne Morin
Co-Investigators:	Dr. Sofia Nene Dr. David Bélanger Dr. José Morais Dr. Gregory Berry Dr. José Morais

Dear Sir/Madam,

You are invited to take part in a research survey about the perceptions, barriers and facilitators to the transition towards medical consultations administered by telephone or videoconference (also known as a televisit). As a healthcare professional, your answers will help the research team develop user-friendly tools and interventions to provide support for each step of the televisit. To be eligible to participate, you must:

- **Live in Canada**
- **Be a healthcare professional employed at the McGill University Health Centre (MUHC)**

This survey should take you no longer than 20 minutes to complete. There are no known risks associated with completing this survey. By agreeing to participate in this research survey, you are not waiving any of your legal rights.

This survey is completely anonymous. We do not ask for your name, and there are no questions that allow you to be identified by your answers. REDCap is compliant with Canadian privacy and accessibility standards (W3C) and will not collect any information (such as your IP address) that would allow your computer to be identified. The results of the survey may be published or shared during scientific meetings; however, it will not be possible to identify you.

We truly appreciate your time and participation in this survey. Completing this survey indicates that you Live in Canada and are a healthcare professional employed by the MUHC.

The McGill University Health Centre Research Ethics Board reviewed this survey and is responsible for monitoring it at all participating institutions in the health and social services network in Quebec.

Contact Information:

If you have questions, you may communicate with the researcher responsible for the survey or with someone on the research team at the following number: 514-934-1934 ext. 45742.

For any question concerning your rights as a research participant taking part in this survey or if you have comments, or wish to file a complaint, you may communicate with:

The Patient Ombudsman of the McGill University Health Centre at the following phone number:
514 934-1934, ext. 44285.

Healthcare Professional Questionnaire

This questionnaire explores the perceptions, barriers, and facilitators of televisits from the perspective of a healthcare professional.

Patient refers to the person who is receiving a medical consultation/examination.

A televisit is a virtual meeting with a healthcare professional through telephone or a video conference platform.

Please answer all questions from your personal perspective.

1. What is your age (years)? _____

2. Which best describes how you self-identify?
   - □ Man
   - □ Woman
   - □ Other
   - □ Prefer not to say

3. Please indicate your professional role:
   - □ Physician
     - □ Internal Medicine
     - □ Geriatrics
     - □ Orthopedics
   - □ Physician Trainee
   - □ Nurse
   - □ Other (please specify) _____

4. What type of training have you received on how to conduct televisits? Please check all that apply.
   - □ Theoretical lectures
   - □ Practical training
   - □ Written material
   - □ None
   - □ Other (please specify) _____

5. What equipment/services do you have access to at work to conduct televisits? Please check all that apply.
   - □ Telephone without hands-free capability
   - □ Telephone with hands-free capability
   - □ Computer (other than a personal computer) with a camera, speaker, and internet access
   - □ IT (information technology) technical support
   - □ Tablet or iPad device with wireless internet access
   - □ Other (please specify) _____

6. Over the past 6 months, which modalities have you used to conduct televisits with your patients?
   - □ Telephone
   - □ Videoconference
   - □ Both
   - □ Neither (please go to Question #14)

7. If telephone, would you have preferred to conduct the visit using videoconference?
   - □ Yes, but the patient did not have the necessary skills/equipment
   - □ Yes, but I do not have access to the necessary skills/equipment
   - □ No, I would not have preferred a videoconference

8. If telephone, which technical problems have you encountered during your telephone visit(s)? Please check all that apply.
   - □ Unable to reach the patient
   - □ Unable to hear the patient talking
   - □ Patient unable to hear me talking

- □ Poor signal/connection
- □ Unable to connect a three-wall call with a caregiver
- □ Other (please specify) _____
- □ None, I did not encounter any technical problems

9. If videoconference, which platform(s) have you used to conduct televisits with your patients? Please check all that apply.
   - □ Facetime video
   - □ Skype video
   - □ Zoom
   - □ Zoom Health
   - □ Microsoft Teams
   - □ Google Hangouts
   - □ React
   - □ Other (please specify) _____

10. If videoconference, which technical problems have you encountered during your videoconference visit(s)? Please check all that apply.
    - □ Unable to reach the patient
    - □ Patient had not installed the application
    - □ Patient did not understand how to use the application
    - □ Unable to hear the patient talking
    - □ Patient unable to hear me talking
    - □ Unable to see the patient
    - □ Patient unable to see me
    - □ Internet bandwidth/connectivity
    - □ Unable to connect a three-wall call with a caregiver
    - □ Other (please specify) _____
    - □ None, I did not encounter any technical problems

11. Please check the response that best indicates how frequently you obtain the following types of consent when you conduct televisits.

	1	*2*	*3*	*4*	*5*
	Never	*Rarely*	*Sometimes*	*Often*	*Always*
Written consent					
Verbal consent, consigned in note					
Verbal consent, not consigned in note					

12. Please check the response that best indicates how frequently the following statements apply when you conduct televisits.

	1	*2*	*3*	*4*	*5*
	Never	*Rarely*	*Sometimes*	*Often*	*Always*
I inquire about the patient's physical location during a televisit					
It is planned ahead of time when additional people are present during televisits					

13. Other than the patient, which additional people have participated in the televisits you have conducted? Please check all that apply.
    - □ No one, only the patient has been present
    - □ Patient's spouse or other family member
    - □ Patient's friend(s)
    - □ Patient's paid caregiver(s)
    - □ Patient's legal representative
    - □ Professional translator
    - □ Other healthcare team members (please specify) _____
    - □ Other (please specify) _____

14. If translation was required, who performed the translation? Please check all that apply.
    - □ Family/Friend
    - □ Health Professional
    - □ Professional Translator
    - □ Other _____
    - □ No one was available for translation
    - □ Not applicable

15. Please check the response that best indicates to what extent you agree or disagree with the following statements. In my clinic, I receive adequate support for

	1	*2*	*3*	*4*	*5*
	Strongly Disagree	*Disagree*	*Neutral*	*Agree*	*Strongly agree*
Triaging whether a visit should be in person or if a televisit can be conducted					
Scheduling televisits					
Making sure the patient has all the information required for the televisit					
Making sure the patient has the proper technology to join the televisit					
Troubleshooting technical difficulties that occur during the televisit					

16. Please check the response that best indicates to what extent you agree or disagree with the following statements.

	1	*2*	*3*	*4*	*5*
	Strongly Disagree	*Disagree*	*Neutral*	*Agree*	*Strongly agree*
I am knowledgeable about videoconference platforms in general					
I am knowledgeable about conducting a videoconference consultation					
I feel sufficiently prepared to conduct a videoconference consultation					
I want to incorporate videoconference consultations into my practice for the duration of the COVID pandemic					
I want to continue offering videoconference consultations to my clinic patients after the COVID pandemic has ended					

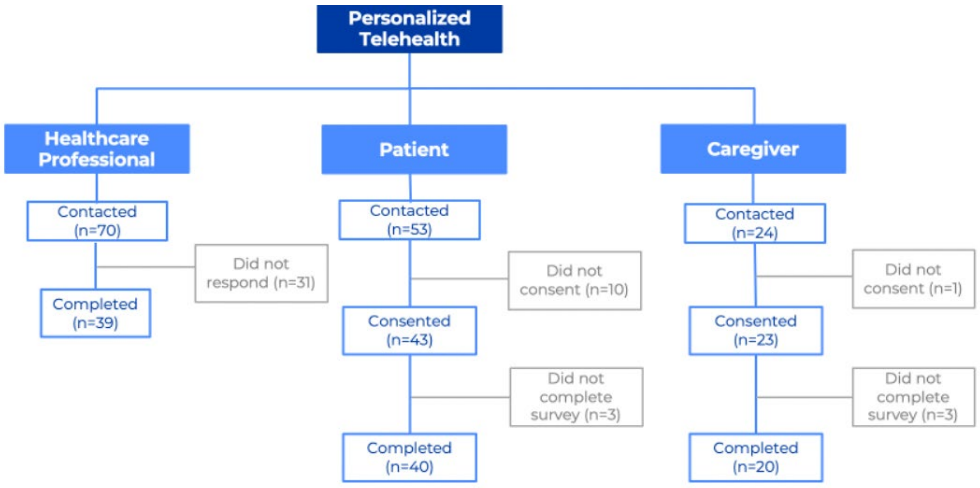
17. Please check the response that best indicates to what extent you agree or disagree with the following statements. The following are important barriers for healthcare professionals to conduct videoconference consultations:

	1	*2*	*3*	*4*	*5*
	Strongly Disagree	*Disagree*	*Neutral*	*Agree*	*Strongly agree*
Lack of technological skills by patient/family					
Lack of technological infrastructure					
Poor Internet bandwidth/connectivity					
Excessive number of options and platforms (lack of uniformity)					
Data security, confidentiality, and protection					
Lack of adequate administrative support to manage the videoconference consultations					
The level of technological skills of the healthcare professional					
Pre-existing opinions about videoconference consultations					
The workload required to implement videoconference consultations in the existing setting					
Resistance to change, i.e. the transition towards a routine that is new and unfamiliar to professionals					
Different interests, concerns, and priorities of professionals who have to implement videoconference consultations compared to those promoting the implementation					

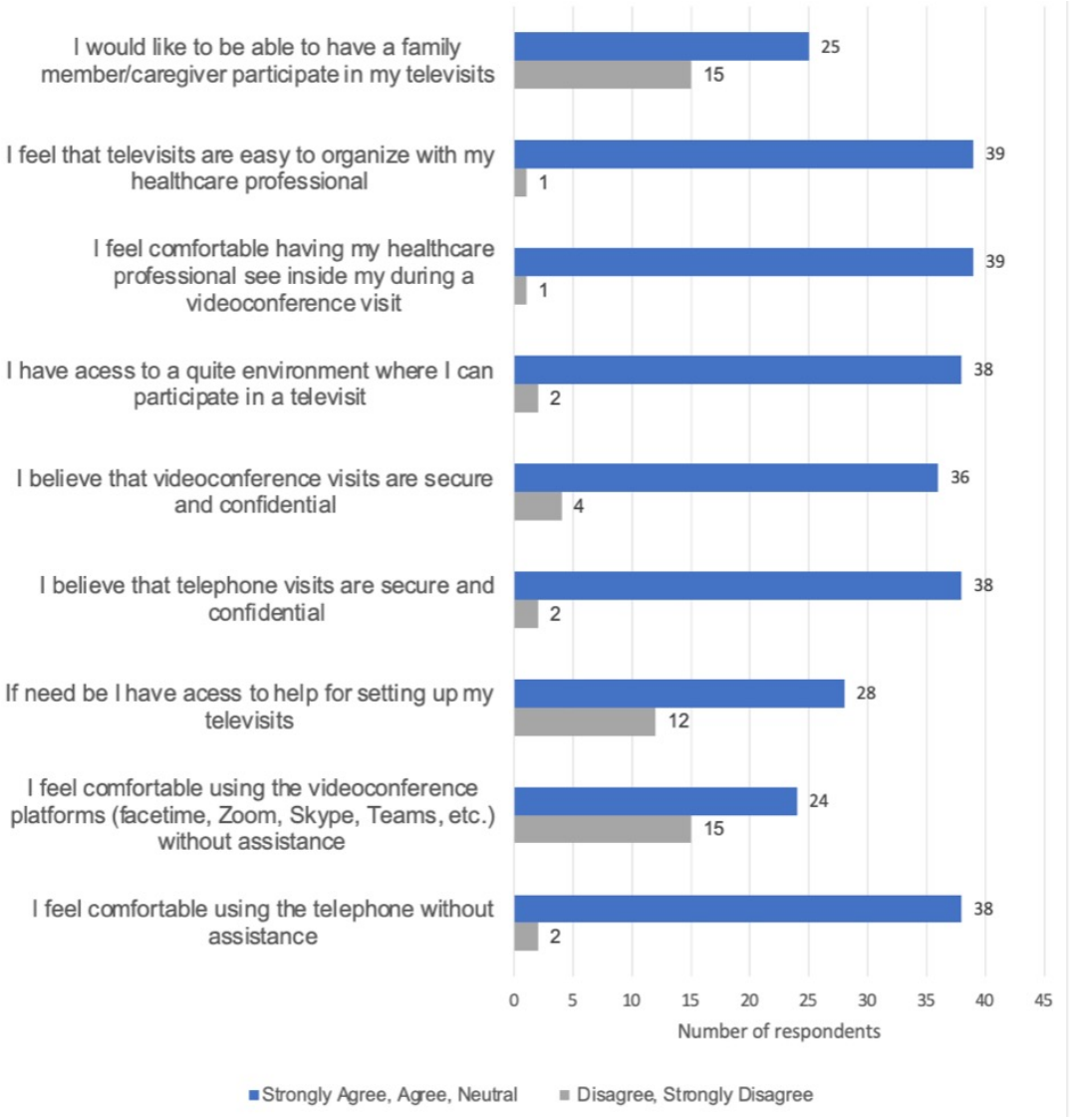
18. What are the most important suggestions or comments you have in regard to implementing televisits in your area of work? Please list a maximum of 3 suggestions or comments.

    1. _____
    2. _____
    3. _____

APPENDIX D. Flow diagram of study selection process



APPENDIX E. Patients' beliefs regarding televisits

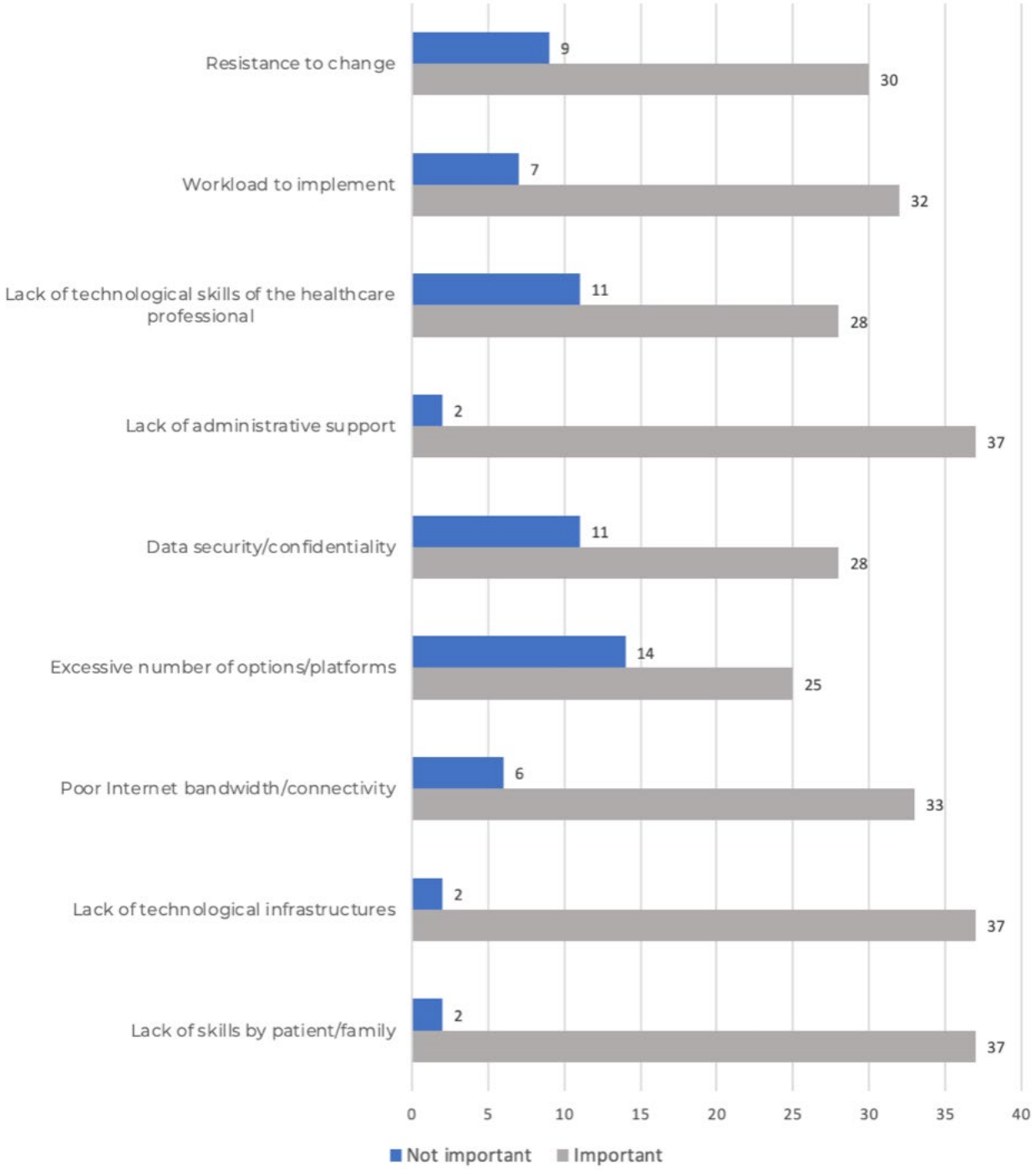


APPENDIX F. Patient and caregiver barriers to participation in televisits

Barrier	*Patient*[a] *N=24*[b]
Televisits perceived as inferior to in-person visits	9
Technology-related barriers (hardware and software)	8
Patient not comfortable with technology	6
Poor internet bandwidth	1
Technological cost (i.e. videoconference platforms, speaker, etc.)	1
Health-Related Barriers	5
Patient cognitive impairment	3
Patient sensory impairment (vision, hearing)	2
Lack of privacy (ex: having a roommate)	1
Administrative Barriers	1
Time It takes schedule an online appointment	1
Barrier	*Caregiver*[a] *N=14*[b]
Health-Related Barriers	5
Patient advanced cognitive impairment	3
Caregiver health limitations	2
Televisits perceived as inferior to in-person visits	4
Technology-related barriers (hardware and software)	3
Patient not comfortable with technology	2
Poor internet bandwidth	1
Administrative Barriers	1
Conflict with work schedule	1

[a]Patients and caregivers could list up to three barriers.
[b]Not all participants indicated barriers.

APPENDIX G. HCP barriers to providing televisits



APPENDIX H. Health-care professional suggestions

Barrier	*HCP[a] N=72*
Administrative Support	29
Setting up visits	10
General	6
Assistance with “paperwork”	5
Scheduling visits	4
Information gathering prior to visit	4
Technology	17
Proper equipment (“hardware”)	6
IT support	5
Dedicated platform	3
Adequate internet bandwidth	3
Guidelines & Organization	16
Guidelines to determine visit type	6
Ensure confidentiality	3
Screening patient’s ability to participate	2
Plan additional time to set up	2
Offer training/toolkit for MD/patients	2
Partnership with community resources	1
Other	10

[a]Each participant could give up to 3 ideas: 1 reference = 1 idea.