# Homebound Patients' Perspectives on Technology and Telemedicine: A Qualitative Analysis

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**Scholarly Report submitted in partial fulfillment of the MD Degree at Harvard Medical School**

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**Scholarly Report Title:** Homebound Patients' Perspectives on Technology and Telemedicine: A Qualitative Analysis

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**Abstract**

Telemedicine holds promise in bridging the gap between homebound patients and high quality health care, but uptake of such technology remains limited. Qualitative interviews conducted with 17 homebound patients found two major barriers to telemedicine. First, participants who lack familiarity with technology are hesitant about telemedicine, as baseline use of technology in the home is limited, participants did not feel capable of learning, and the advantages of telemedicine were unclear. Second, homebound patients place a high value on in-office visits due to therapeutic benefit, face-to-face communication, and the social aspect of medical appointments.

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**Description of Contribution**

Scholarly Project Question: What is the opportunity for telemedicine among homebound patients?

I was the lead for this project and was the main contributor for project conception, project design, project execution, analysis, and manuscript writing. I worked closely with Dr. Kristin Huang, who was a resident at Brigham and Women's hospital at the time.

Project conception: Dr. Huang was interested in studying homebound patients, a segment of patients often overlooked. I was interested in technology, telemedicine, and medical humanities. We combined our interests to create a project that would film homebound patients at their homes while asking them questions about their daily lives and their interactions with and attitudes towards technology.

Project design: Dr. Mostaghimi helped Dr. Huang and I with project design. Together we came up with the scope (~20 homebound patients, 2 hour interviews each) and the interview question guide.

Project execution: I reached out via phone to homebound patients provided by Upham Home Health Care to schedule all the patient home visits. I personally conducted most of the ~20 patient interviews, with Dr. Huang conducting a few. I had a student videographer with me to help film the sessions.

Analysis: Dr. Huang and I individually coded all the patient interviews, and then cross-matched our codes to produce a set of common themes that emerged. These themes were shared with Upham Health Care staff as part of a set of quality improvement initiatives (compiled and delivered by me), and are further discussed in our manuscript.

Manuscript: The manuscript was written by Dr. Huang and I, who are co-first authors of the accepted manuscript. Dr. Mostaghimi helped serve as mentor and helped edit our manuscript. Our manuscript was accepted to Home Health Services Quarterly.

**Accepted Manuscript**

## Abstract

Telemedicine holds promise in bridging the gap between homebound patients and high quality health care, but uptake of telehealth technologies remains limited. Qualitative interviews conducted with 17 homebound patients found two major barriers to telemedicine. First, participants who lack familiarity with technology are hesitant about telemedicine, as baseline use of technology in the home is limited, participants did not feel capable of learning, and the advantages of telemedicine were unclear. Second, homebound patients place a high value on in-office visits due to therapeutic benefit, face-to-face communication, and the social aspect of medical appointments.

**Keywords:** Home health care, community and home care: service delivery/utilization, technology, technology: engaged, technology: literacy

## Introduction

**Homebound Patients**

In 2011, approximately 20 percent (over 7 million adults) of community-dwelling Medicare patients in the U.S. were considered semi- (15%), mostly (4%), or completely (1%) homebound, as defined by frequency of leaving the home and whether leaving the home presents great difficulty or requires assistance (Ornstein et al., 2015). In the same year, three million people received Medicare home health care services (Centers for Medicare & Medicaid Services, 2012). These patients are often isolated, medically frail, and incur high costs of care, while facing burdensome medical conditions, financial stressors, and difficulties in access to care (U.S. Department of Health and Human Services, 2012).

**Telemedicine in Homebound Patients**

Given homebound patients' challenges in accessing care and high burden of disease, telemedicine is well-positioned to address gaps in homebound health care by providing care without requiring transportation to a clinical setting. Recent randomized controlled trials of homebound patients have shown that telehealth interventions can improve outcomes in depression as well as reduce emergency room visits in chronic obstructive pulmonary disease and heart failure (Choi et al., 2014b; Gellis et al., 2012; Gellis, Kenaley, & Ten Have, 2014). Observational studies have found promising results in telemonitoring of chronic wounds in homebound patients, in providing dental consults and education to the homebound elderly over computers, and in depression management of both English- and Spanish-speaking homebound patients with therapy via videoconference (Rees & Bashshur, 2007; Sheeran et al., 2011; Tomuro, 2004). Several of these studies have demonstrated that once homebound patients experience telehealth, they have very high rates of acceptance and approval (Choi et al., 2014c; Finkelstein et al., 2014; Gellis et al., 2012).

While telehealth interventions are well-accepted and efficacious in patients who are willing to use them, a substantial proportion of homebound patients – up to 80 to 90 percent – remain resistant to even trying to use these types of technology (Choi, Wilson, Sirrianni, Marinucci, & Hegel, 2014a; Finkelstein et al., 2014). Currently, only 21% of home health agencies offer telehealth services (National Association for Home Care and Hospice, 2008).

Without greater widespread willingness to participate in telemedicine interventions, the benefits of increased access, improved outcomes, and cost savings of telehealth will remain limited.

The goal of this study was to use qualitative interviews to investigate the attitudes of homebound patients towards technology and telemedicine in order to identify and characterize impediments to telehealth acceptance.

## Methods

### Participants

Participants were recruited from patients receiving visiting nurse services from Upham's Home Care (a home care agency affiliated with a community health center) or from patients receiving services at Brigham and Women's Angiogenesis and Wound Healing Center. Inclusion criteria included patients who were 18 or older, met the Medicare definition of homebound, had received home care services for at least 1 month, and were English-speaking (Centers for Medicare & Medicaid Services, 2013). Patients who were unable to participate in interviews due to cognitive impairment were excluded. Participants were recruited from a pool of homebound patients identified by partner organizations. Other than a consideration for gender balance patients were selected randomly from this pool. A total of 17 participants were recruited.

A quality improvement IRB exemption was granted from the Harvard Medical School and the Partners Healthcare IRBs. All participants gave verbal and written consent to be interviewed and to have their interviews recorded.

### Study Design

An interview guide was constructed around major themes for exploration, including homebound patients' views on communication with their healthcare providers and technology. The guide served as a template for each participant interview, with flexibility to pursue relevant topics important to patients in more depth. We refined the questions and adjusted the guide iteratively as new themes of interest emerged. Two trained interviewers conducted the interviews jointly from May to July 2015. Each interview lasted approximately 45 to 90 minutes and was recorded. Interviews were mostly conducted in patients' homes, though some were conducted at the Brigham and Women's Angiogenesis and Wound Healing Center in tandem with an office visit per patient preference.

### Analysis

After each interview, the two interviewers debriefed to identify key themes. Each interview was transcribed. Two of our researchers independently and inductively created coding categories to capture the major themes. Each transcript was coded using the immersion/crystallization technique to iteratively extract and describe the main points from each interview (Crabtree & Miller, 1999). We jointly reviewed the coded transcripts and reconciled the codes by consensus. During this process, we identified new codes as well as subthemes. We organized the transcript segments as well as the corresponding codes and subthemes in Microsoft Excel 2013. For the purpose of this analysis, one of us identified all the segments pertaining to technology or communication, and using the immersion/crystallization technique, analyzed the transcripts for the main learning points related to telemedicine (Crabtree & Miller, 1999). These were then reviewed by our team until consensus was reached.

## Results

**Patient Characteristics**

Of the 17 participants, seven were male and ten were female, ranging in age from 25 to 86 years old. Thirteen were recruited from Upham's Home Care and four were recruited from Brigham and Women's Dermatology Chronic Wound Clinic. Of the participants, ten were African American, six were Caucasian, and one was Latino.

**General Attitudes**

Overall, nine participants had a largely negative view towards telemedicine, while five were open to using telehealth methods. Three had mixed opinions, with negative views towards videoconferencing and positive views towards telemonitoring devices.

**Barriers to Telemedicine in Homebound Patients**

**Concerns about technology.** One broad area of concern participants had regarding telemedicine were the challenges associated with using technology paired with uncertain advantages.

***Lack of familiarity with technology.*** Only 6 of the 17 participants had a computer in the house and only 2 owned smartphones. Three patients with computers reported that they did not use them. For example, one participant who lived with her extended family mentioned her children and grandchildren used the computer, but she did not know how to use it, and she preferred a regular "flip" cell phone to the smartphone that her daughter had given her.

Participants voiced that one large concern with regards to communicating with clinicians using smart phones, videoconferencing, or computers was that they did not own the appropriate devices and were not familiar with how to use these types of technology. This baseline disconnect with technology seemed to perpetuate further disengagement: "I don't know how to use a computer; I'm not interested."

***Perceived inability to learn.*** Even if the necessary telemedicine equipment were provided, several participants expressed doubts in their ability to learn how to use them: "I am totally idiotic with computers. I have a friend who used to work with me. He said, 'I'm going to teach you how to use that computer if I die.' I said okay. He spent days and days and I can't even open the stupid computer."

Many of the older participants mentioned their age as they accounted for their discomfort with technology. One participant protested, "I'm an old man, not a young man; if I'm young, I'd need that" while another dismissed cell phones, computers, and other technology as belonging to "a different age…a different generation." Functional accessibility of technological devices was also an issue given patients' physical constraints. Two participants mentioned their inability to use a cell phone or smartphone as the numbers were too small for them to see or feel, and another stated her disease-ridden hands prevented her from using a computer.

*Unclear advantages of telemedicine.* Many participants stated they had no interest in learning to use new technology. Several stated that they would not want telehealth monitoring equipment because it would take too much effort to learn and to use regularly when their visiting nurse could measure the same parameters for them; some patients mentioned they'd rather just go to the doctor's office. Many patients voiced skepticism that telemedicine could bring benefits over conventional health care with comments such as "I'm not sure about that" and "I don't need that."

**Value of in-person clinical encounters.** The second major reason that many participants were not keen on telemedicine was due to a strong preference to see their health care providers in person, despite the difficulties in getting to appointments.

*Benefits of in-person evaluation, diagnosis, and therapeutic interventions.* Several participants stated that being seen in person would facilitate a more thorough evaluation, including undergoing a physical examination "to make sure everything is working properly" and receiving appropriate diagnostic testing such as an electrocardiogram or laboratory tests. Participants appreciated the therapeutic touch that an in-person visit to their clinician provides: "[With videoconferencing], they couldn't touch me – I think that's important. They can't treat me that well just from a TV." Participants also mentioned specific therapeutic procedures, such as wound debridement, that could only happen in person.

*Preference for face-to-face communication.* Participants also valued on face-to-face communication: "I'd rather prefer to talk personally to people, because I think talking to people you have an interaction that you cannot have if you see a screen." Others posited that videoconferencing would be "kind of mechanical; too impersonal."

Participants felt that clinicians would be less rushed in person than over the phone or over videoconferencing. They did not think that doctors had enough time to conduct a visit over the phone, and expressed that sitting down face-to-face across from a clinician would ensure that the clinician would not rush them.

***Clinic visits as relationship building.*** Interestingly, some participants expressed that doctor's appointments, rather than being an inconvenience, were a good excuse to get out of their house. Most participants had a system for finding transportation to and from medical visits, and seemed to view them as a social outlet. One participant explained, "I have time."

## Positive Attitudes Towards Telemedicine

**Baseline familiarity with technology.** Participants who expressed positive attitudes towards telemedicine were much more likely to be those who had some baseline level of comfort with technology, such as using email, Skype, YouTube, or online support groups. Some had prior positive experiences with telemedicine such as using a patient portal to view test results and contact their clinicians. Participants who already felt comfortable using the phone to consult with the doctor (for example, to obtain advice about whether to go to the emergency room) were most open to conducting a clinical visit over the phone.

**Convenience of telemedicine.** Those who were most strongly in favor of using telemedicine mentioned the benefits in terms of convenience and saving time. Participants appreciated that they would be able to avoid transportation hassles, and one stated that he only wanted to go into the doctor's office for in-person visits "if it's really necessary." Other participants were eager to use telehealth monitoring technology that automatically sends their physiologic parameters to the doctor's office so that they would not have to keep track of those measurements themselves. Some participants felt that telemedicine options would be particularly favorable during the wintertime, when traveling to clinic visits is especially burdensome.

Of note, some participants did mention that they would only be comfortable with telemedicine consults if they occurred in the context of a long-term relationship with a clinician.

**Discussion**

Telemedicine has shown remarkable promise in increasing access, improving outcomes, and reducing costs in the care of homebound patients. However, a large portion of homebound patients refuse to use telemedicine as part of their health care (Choi et al., 2014a).

Our study employed qualitative interviews to investigate the underlying reasons behind homebound patients' hesitance in accepting telemedicine. The majority of participants were unenthusiastic about telemedicine approaches. This study is in keeping with other research that has described patients' largely negative attitudes towards telemedicine, but builds upon prior work by focusing on homebound patients, who stand to benefit the most from telehealth interventions, and by describing in detail the barriers towards telemedicine adoption (Call et al., 2015; Eikelboom & Atlas, 2005).

Prior studies have shown that once patients are exposed to telemedicine, their acceptance increases and they express interest in continuing in telehealth programs (Choi et al., 2014c; Cranen, Veld, Ijzerman, & Vollenbroek-Hutten, 2011; Finkelstein et al., 2004; Gellis et al., 2014; Mair & Whitten, 2000). However, patients who have deeply held beliefs that using these types of technology is too troublesome may be reluctant to even try telemedicine. One solution may be to perform in-home or peer-to-peer demonstrations of simple videoconferencing, telemonitoring equipment, and other telemedicine interventions to show patients what is entailed before asking patients to adopt them. Harnessing a patient's pre-existing trust in a visiting nurse by training the nurse to teach the patient to use the new technology may also help encourage adoption. Studies have shown that patients are often surprised by the convenience, ease of use, and in-person-like qualities of interacting with a clinician through videoconferencing (Choi et al., 2014b).

Participants placed a very high value on in-person office visits. While other studies have reported patient preference for in-person clinical encounters, this has not been described before in the homebound population, and is especially compelling considering the substantial burden and effort it takes for them to arrange transportation and get out of the house (Bürmann Genannt Siggemann, Mensing, Classen, Hornberg, & Terschuren, 2013; Call et al., 2015; Turner, Thomas, & Reinsch, 2004). In order to address homebound patients' desire for continued in-person interaction with their

clinicians, it may be beneficial if telemedicine approaches were incorporated into pre-existing relationships of the patient's care team. As trust and rapport have already been established during in-person visits, communicating over unfamiliar means may be more acceptable and possibly more effective. It may also be helpful to emphasize to patients that telemedicine can create more connections (with greater access to specialists and therapists and more frequent access to primary care providers and telehealth nurses), rather than erode existing ones.

We also found that participants who were already technologically savvy were those with the most positive attitudes towards telemedicine. While this is anticipated, it highlights the underlying technology gap that may be driving many of the reservations homebound patients have towards telemedicine. Addressing this fundamental digital divide, such as by offering computer classes or discounted tablet devices, may help not only increase acceptance of telehealth interventions, but also give homebound patients new skills and a means of connecting with the outside world. While home care agencies and clinicians may not be the ones to tackle the technology gap themselves, the health care community can raise awareness about how this type of disparity affects patients' health and support measures to reduce the divide as our patients' advocates.

These results must be interpreted in the context of the study design. Although the number of patients in this study is limited, prior work in qualitative analysis has found saturation of themes at 12 participants, and we feel confident that our interviews with 17 participants captured the breadth of patient attitudes towards telemedicine (Guest, Bunce, & Johnson, 2006). Another limitation of our study is that the majority of our participants were referred by one of our partner home care agencies, which serves a mostly inner-city population in Boston. Thus, there was likely an overrepresentation of patients who are minorities and who are of low socioeconomic status. Many of our participants may be technologically disadvantaged at baseline, and populations with greater resources may have different opinions regarding telemedicine. Future studies in different patient populations may help elucidate an even broader range of perspectives on this topic.

There is great potential for telemedicine to positively impact homebound patients' lives, health, and finances. However, uptake of telehealth programs by patients and home care agencies remains lower than it could be (Bashshur, Shannon, Krupinski, & Grigsby,

2013). Through qualitative interviews, our study probed the attitudes of homebound patients towards technology and telehealth, and found two main barriers – lack of familiarity with technology and desire for in-person clinic visits – to participants' acceptance of telemedicine. Addressing these concerns will be critical to pave the road for broad adoption of telemedicine as a routine part of the care of homebound patients.

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