Table. Respondent Characteristics: Adult Patients With a Scheduled Primary Care Video Visit (n = 1274)*

Characteristic	Patients, *n* (%)
Age	
19–44 y	658 (51.6)
45–64 y	432 (33.9)
≥65 y	184 (14.4)
Male sex	492 (38.6)
Race	
White	642 (50.4)
Black	57 (4.5)
Hispanic	166 (13.0)
Asian	243 (19.1)
Other	166 (13.0)
Education	
Less than college	505 (39.6)
College graduate	392 (30.8)
Graduate school	346 (27.2)
Household income	
<$40 000	217 (17.0)
$40 000–$99 000	418 (32.8)
≥$100 000	485 (38.1)
Health status	
Excellent or very good	613 (48.1)
Good	427 (33.5)
Fair, poor, or very poor	220 (17.3)
Access to any video-enabled device†	1234 (96.9)
Any prior experience with a video call‡	1151 (90.3)

* All participants could choose to answer the same survey questions by mail, online, or in a telephone interview. Starting in December 2015, we mailed and e-mailed a study letter to potential participants, including a paper questionnaire (mail) and electronic survey link (e-mail). Until August 2016, trained interviewers contacted patients who had not yet responded. At the end of data collection, we remailed the survey to remaining nonresponders. All participants received a $10 gift card. Respondents were not eligible for the study if a language barrier, hearing problem, or cognitive problem prevented use of an English-language survey (n = 47); if they had incorrect contact information; or if they left the health plan (n = 61). A total of 235 potential participants could not be reached. Overall, 1274 of 1634 eligible patients (78%) participated in the study: 43% by Internet survey, 36% by telephone, and 21% by mail. Respondents were slightly older than nonparticipants (median age, 44 vs. 38 y; $P < 0.05$) but did not differ by sex. Age and sex were extracted from electronic health records, and all other information was collected from the survey. Percentages may not sum to 100 if responses were missing; <3% of values were missing for all variables except household income (12% missing).
† Computer, laptop, tablet, or smartphone.
‡ Could include for personal or professional use.

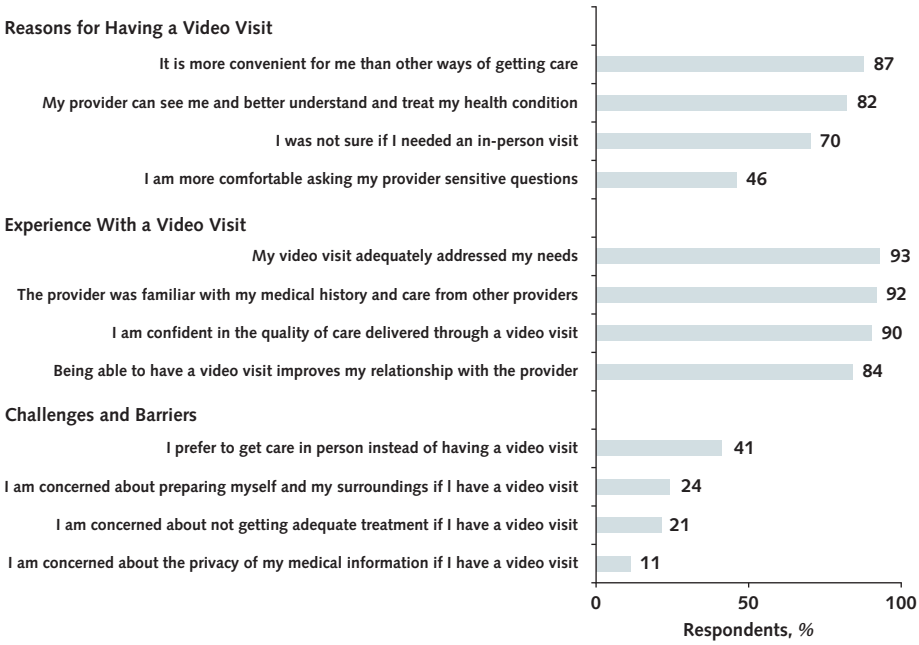
Patient–Provider Video Telemedicine Integrated With Clinical Care: Patient Experiences

Background: Real-time patient–provider video visits have the potential to engage patients by allowing them to access a clinical encounter without arranging transportation, taking time off from work, or spending time in a waiting room (1). Although millions of U.S. patients have used direct-to-consumer telemedicine services without in-person facilities, these services may lack integration with electronic health records and with clinicians from whom patients receive ongoing care (2). Evidence is limited from large-scale implementation of "house call" video visits integrated with ongoing health care delivery and providers in community primary care.

Objective: In an integrated delivery system that was newly offering video telemedicine capability for patient–provider encounters to all primary care providers, we surveyed patients with a scheduled video visit to examine their experience, including convenience, quality, patient–provider relationship, and impact on in-person visits.

Methods and Findings: We examined patient experiences with video telemedicine visits in Kaiser Permanente Northern California, which uses an electronic health record integrating outpatient and inpatient data and offers a patient portal Web site with mobile applications. In late 2014, new technology enabled all primary care providers to have video visits with patients; these visits have been described previously, and 70% are with the patient's own primary care provider (2). Through Internet-connected and video-enabled computers or mobile devices, patients can join video visits from anywhere, and available clinicians include their own providers. Clinical

Figure. Patient self-reported experiences with primary care video visits.



Video visits were accessible through any Internet-connected and video-enabled computer or mobile device. Patients joined video visits from their home or elsewhere in their daily lives. As with in-person visits, a video visit could be scheduled by a patient or physician (although routine physical examination was ineligible). Documentation was integrated with ongoing patient history within the existing electronic health record. Bars represent the percentage of respondents who indicated that they either "agree" or "strongly agree" with each statement (vs. "disagree" or "strongly disagree"). Percentages are shown among patients with a scheduled primary care video visit and nonmissing values (<3% of values were missing for all statements, except 6% for preference for an in-person visit).

documentation is integrated directly into the electronic health record.

Our survey source population included all adult patients (aged ≥18 years) who had a scheduled video visit with a primary care provider in September through December 2015. We surveyed patients about their in-person visit barriers, technology access and experience, visit experience, and sociodemographic characteristics. We describe respondent characteristics and rates of patient-reported experiences.

Overall, 1274 patients participated in the study (response rate, 78%) (Table); 67% generally needed to make 1 or more arrangements to attend an in-person office visit (55% time off from work, 29% coverage for another activity or responsibility, 15% child care or caregiving, and 10% another person to accompany them). The Figure shows patient-reported reasons for scheduling a video visit (87% reported convenience), visit experiences (92% reported provider familiarity with their history and 84% an improved patient–provider relationship), and barriers (11% had privacy concerns, and 41% generally preferred in-person care). Overall, including those who did not complete the video visit, 89% of patients reported interest in a future video visit.

Of the 1163 respondents who self-reported a scheduled video visit (111 participants did not), 82% (n = 957) completed the visit. Among those who did not complete the visit, 62% communicated with the clinician in some other way (52% by telephone, 8% in person, and 2% through secure messaging), 12% changed their mind or their health issue resolved, and 26% reported technical barriers (such as setup issues, Internet signal, or audio or video quality).

Among patients who completed a video visit, 33% reported that it decreased in-person office visits for the same condition, 53% reported no change, and 5% reported an increase. Video visits were reported to reduce office visits by 35% of participants who would need to make other arrangements for in-person appointments and by 25% of those who would not need to make such arrangements.

Discussion: In a system that had a newly implemented capability for telemedicine integrated with in-person primary care, patients reported that video visits were convenient and of high quality and that clinicians were familiar with their medical history. Despite calls to prioritize telemedicine use within established patient–physician relationships, research evidence from primary care has been scant (3). To our knowledge, this is the first large study of patient experiences with video visit telemedicine integrated into primary care with existing providers.

Arrangements for traditional in-person visits can be substantial barriers for patients (1). We found that two thirds of patients needed to make other arrangements for in-person visits, and most confirmed that video visits were convenient. More patients who needed to take time off from work or other responsibilities for in-person visits reported that the video visit reduced office visits.

Although patients had some technical issues, it is reassuring to note that most who did communicated with a clinician in some other way. We surveyed only patients who scheduled a video visit, but other patients may face greater barriers. Telemedicine must complement broad access to in-person health care. Findings may differ in other settings, including

different payment models or telemedicine modalities (4). These cross-sectional, self-reported surveys cannot be interpreted causally, and further research is needed to examine the effects of video visits on care quality, health, and health care use (2, 4).

In video telemedicine integrated into primary care, we found that patients valued convenience and quality and reported that the visit strengthened the patient–provider relationship; video visits had the potential to reduce in-person visits if patients needed to take time off from work or other responsibilities. Integrated video telemedicine may be a transformative tool in increasing patient-centered access to health care.

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