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Refereed paper

Providing a Spanish interpreter using low-cost videoconferencing in a community health centre: a pilot study using tablet computers

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ABSTRACT

Background The advent of more mobile, more reliable, and more affordable videoconferencing technology finally makes it realistic to offer remote foreign language interpretation in the office setting. Still, such technologies deserve proof of acceptability to clinicians and patients before there is widespread acceptance and routine use.

Objective We sought to examine: (1) the audio and video technical fidelity of iPad/Facetime™ software, (2) the acceptability of videoconferencing to patients and clinicians.

Methods The convenience sample included Spanish-speaking adult patients at a community health care medicine clinic in 2011. Videoconferencing was conducted using two iPads™connecting patient/physician located in the clinic examination room, and the interpreter in a remote/separate office in the same building. A five-item survey was used to solicit opinions on overall quality of the videoconferencing device, audio/video integrity/fidelity, perception of encounter duration, and attitude toward future use.

Results Twenty-five patients, 18 clinicians and 5 interpreters participated in the project. Most patients (24/25) rated overall quality of videoconferencing as good/excellent with only 1 'fair' rating. Eleven patients rated the amount of time as no longer than in-person, and nine reported it as shorter than in-person. Most patients, 94.0% (24/25), favoured using videoconferencing during future visits. For the 18 clinicians, the results were similar.

Conclusions Based on our experience at a single-site community health centre, the videoconferencing technology appeared to be flawless, and both patients and clinicians were satisfied. Expansion of videoconferencing to other off-site healthcare professionals should be considered in the search for more cost-effective healthcare.

Keywords: interpreter perspective, language access, medical interpretation, remote interpretation, videoconferencing

What is already known about this subject
- The best way to provide foreign language interpreter services is through a certified in-person translator. However, access to interpreter services can be difficult and expensive.
- Previous studies of videoconferencing for medical interpretation were hampered by obsolete, faulty, and bulky technology that undermined usability.

What this paper adds
- Based on experience at this single-site community health centre, more mobile, more affordable videoconferencing technology is acceptable for routine office-based encounters and should be considered an alternative to in-person medical interpretation.
- Expansion of videoconferencing to off-site healthcare professionals should be considered in the search for more cost-effective healthcare. Office-based practices should take advantage of this available, affordable technology.

Introduction

Increasing linguistic diversity of the US population challenges the American healthcare system in many ways.[1] A language barrier that hampers simple communication can adversely affect patient safety, medication compliance and adherence, patient satisfaction, and may prevent the clinical encounter from ever occurring in the first place.[2–5] The costs of not having a language interpreter include subsequent emergency department visits, additional outpatient appointments, more frequent use of diagnostic resources or invasive procedures, and medication overprescribing.[6,7]

Despite these costs, the expense of providing language interpreters for clinical encounters is inescapable. More efficient ways of providing interpreter services from trained and certified interpreters could improve the quality and decrease the cost of healthcare services.[8] While remote telephonic interpreters are available in most healthcare institutions, both patient and provider satisfaction are diminished for interpersonal aspects of communication compared with simple, face-to-face information exchange.[9,10]

Videoconferencing has advantages over telephonic interpretation. In a 2009 randomised study, Locatis *et al* showed that patients had no clear preference for communication method (in-person, telephonic or videoconferencing) over another for Spanish language interpretation.[11] In that study, providers and interpreters were more critical of remote telephonic and videoconferencing methods, but preferred videoconferencing to the telephone as a remote method.

What has dramatically changed since this 2009 landmark study is the availability of less expensive and more mobile videoconferencing. Moreover, both patients and clinicians are increasingly more comfortable with videoconferencing and computers. The ability to videoconference is commonplace with 'smart' cellular phones, and the Internet-connected computer. Software such as Google Plus™, Skype™ and Facetime™ have made videoconferencing accessible and inexpensive to the point that it is finally realistic to envision videoconferencing as part of routine clinical care.

With this pilot study, we explore the use of videoconferencing for the purposes of the foreign language interpretation. Our specific objectives were to: (1) examine the feasibility of a specific technical platform (audio and video technical fidelity), and (2) demonstrate the acceptability of videoconferencing to patients and clinicians.

Methods

Population/setting

The Downtown Health Plaza, an outpatient clinic of Wake Forest Baptist Health, is located in Winston-Salem, North Carolina. The adult medicine clinic (DHPAMC) logs more than 28,000 clinic visits each year and serves a large number of Medicaid and uninsured patients. This urban community health centre clinic has long been viewed as a safety net clinic for the Winston-Salem community. The clinic is staffed by physicians and mid-level practitioners from the Wake Forest University Baptist Medical Center.

Approximately 10% of patients seen in the adult medicine clinic are Spanish-speaking. The clinic employs 5–10 full-time Spanish interpreters. Two designated interpreters were initially chosen to lead the pilot project and use the videoconferencing devices. By the end of the project, most of the full-time interpreters had used the technology for clinical encounters. The convenience sample for this pilot project included all adult Spanish-speaking patients (Spanish was their first language, and they did not

speak English as a second language) who presented to the adult medicine clinic for routine or urgent clinic appointments during August 2011. Patients were recruited by investigators (CC, JW) who also served as attending physicians in the clinic. This project was approved by the Institutional Review Ethics Board (IRB) of the Wake Forest Baptist Health that approves and monitors biomedical and behavioural research involving humans.

Intervention

Videoconferencing was accomplished using Facetime™ videoconferencing software on Apple iPads™ (version 2.0, Cupertino California). The wireless network within the clinic ran using 2.0 Mps bandwidths on a Cisco router. No external speakers were used.

Encounter orientation

At the beginning of the pilot project, the interpreter introduced herself personally and demonstrated the videoconferencing device to the patient. The patient was then given the option of using the videoconferencing devices or an in-person interpreter. As clinicians and interpreters became more comfortable with the technology, the initial introduction to the patient by the interpreter took place over the videoconferencing device rather than in person. During the clinical encounter, the interpreter was seated in a quiet, private office on the same floor of the building. In every case, the interpreter spoke with the patient in-person at the end of the clinical encounter, at least to administer the survey. The clinician was oriented by one of the investigators to the device (rationale, computer positioning) and instructed to proceed with the clinical interview as usual with minimal special instructions.

Patient and clinician survey

The same survey tool was used to query the patient and clinician immediately after the videoconferencing encounter. In most cases, the interpreter who performed the actual interpreting during the clinical encounter was the same interpreter who surveyed the patient. A registration label with information on gender, age and insurance status was placed on the back of the data collection card. Similarly, the clinician was asked the same survey questions regarding the quality of the videoconferencing encounter.

Survey instrument

The survey card was devised to be short in length and easy to administer in order to be practical for a busy clinic setting, much like past surveys were conducted in this clinic.[12] The survey card contained a total of five questions, one on overall quality, two focused on audio and video integrity/fidelity, one about the amount of time it took to communicate using the device, and one on likely future use of the device.

1 How would you rate the overall quality of this computer interpretation device (circle one) (very bad, poor, fair, good, excellent)?
2 Could you hear the interpreter well enough (circle one) (too difficult, difficult but adequate, satisfactory, no different from in person, better than in person)?
3 Could you see the interpreter well enough (circle one) (too difficult, difficult but adequate, satisfactory, no different from in person, better than in person)?
4 Rate the amount of time it took to communicate through the computer screen (circle one) (took too long, did not take any longer, made it shorter)?
5 Would you be in favour of using this remote computer interpretation during future visits (circle one) (yes, no, maybe, unsure)?

Statistical analysis

Demographic characteristics were presented as mean age and proportions (gender). For the question of overall quality, we collapsed response categories (very bad, poor, fair, good, excellent) to reflect a category of patient satisfaction (good, excellent versus other). For the question related to audio and video fidelity, we collapsed response categories (too difficult, difficult but adequate, satisfactory, no different from in-person, better than in-person) to reflect a convincing category of patient satisfaction (no different from in-person or better than in-person versus other). After each encounter the clinician was debriefed to identify areas of uncertainty or areas for improvement. Remarks from post-encounter interviews were collected and categorised by salient themes.

Results

The 25 patient/participants were mostly female (20/25, 80%), and relatively young (mean age 42.3 $\pm$ 5.1), compared with our general clinic population (predominantly African-American, 68% vs 27% white, 3%

Latino) and female (65% female). Ninety percent (23/25) of patients were self-pay, and two patients had Medicaid. Three patients refused to use the devices during the course of the project, for reasons that were not determined. Eighteen clinicians (14 resident physicians, 1 physician assistants, 2 attending physicians and 1 medical student) participated in the project. By the end of the project, a total of five interpreters had used the videoconferencing devices.

Most patients rated the overall quality of this videoconferencing device as good or excellent (24/25), and only one patient rated the experience overall as fair (1/25). The technical quality of audio and video was rated as good/excellent by 72.0% (18/25) and 72.0%, respectively. Eleven (44%) patients rated the amount of time as no longer than in-person, and nine (36%) reported it as shorter than in-person, equivalent to 80% (20/25), as costing no more time than in-person. Most patients, 94.0% (24/25), were in favour of using videoconferencing during future visits.

For the 18 clinicians, the results were similar; 94% (17/18) of clinicians found the overall experience acceptable, and the audio/video fidelity acceptable, with only one 'fair' rating. Twelve clinicians rated the amount of time as no longer than in-person, and four as of shorter duration than in-person. Fourteen (of 18) clinicians favoured using the device again in the future.

Several salient themes emerged from post-encounter debriefing and group discussions

1 Positioning of the computer in the examination room was important enough that orientation of the patient and clinician before the clinical counter was necessary. A special swivelling computer stand was necessary to accommodate the patient's movement about the examination room. Placement of the device next to the physician's computer table had the advantage of actual physical proximity to the patient but changed the traditional strategy of the interpreter standing behind the clinician, or forming a triangle with the clinician and patient. The one attempt to have the patient hold the device while undergoing a pelvic examination had the advantage that the interpreter did not need to be in the room but was otherwise awkward with regard to attention of direction and worry about dropping the device. In other cases, the microphone and audio functioned well from across the examination room (when the clinician was at the computer table and the patient was seated on the examination table), and even when the camera was positioned to face the wall (a circumstance required for patient privacy).
2 The importance of the physical presence of the interpreter promoting trust and supporting the patient–interpreter relationship surfaced several times during the project. Traditionally, it is assumed that patients feel more comfortable having a language-concordant person in the room with them. Whether patients can feel the same trust through videoconferencing technology was indeed one of the issues we attempted to study. The idea that multiple trust relationships (patient–interpreter, patient–clinician) need attention deserves exploration but was beyond the scope of the project.
3 Ambient noise is a known challenge for audio communication. With multiple family members in the room, multiple physicians involved in interviewing the patient, or simply multiple simultaneous conversations in the examination room, it became confusing to the remote interpreter to the point that it undermined successful and efficient communication.
4 Using the videoconferencing strategy compared with face-to-face interpretation offered no obvious savings in manpower, space or time in this pilot, as it took place in one practice and on a small scale, and the time expended by the clinician and the interpreter was no different than in-person. The advantage of remote interpretation would be more evident with large enough demand to justify a bank of interpreters in dedicated office space. Even with this small pilot project, the need for private and quiet space in a busy clinic was a challenge. Concerns over privacy for the interpreter also raised the issue of security of the device and remote interpreter's location. Despite the fact that both the network and the software are encrypted, the patient would still need to be convinced that unintended ears are not receiving the audio (even with headphones for the interpreter), or perhaps more importantly, seeing the video.

Discussion

Previous studies have shown that in-person language interpretation by a certified interpreter has many advantages, and is almost always preferable.[11,13–15] However, there are times when a qualified interpreter is not available. Even in our own clinic where interpreter staffing is adequate, wait times can be long. This pilot study should be reassuring that patient and clinician perceptions of quality of the communication device and the clinical encounter need no longer be compromised by inadequate technology. In contrast to previous studies such as the study by Price *et al*[10] in 2008 where participants had to deal with faulty and bulky equipment that is already obsolete, demonstration of the audio and video fidelity in this pilot

project was near flawless, as far as the pilot study would allow.

With the technical issues of videoconferencing more acceptable for routine use, attention should focus on the quality of the patient and clinician experience. The increasing emphasis on patient satisfaction and efficiency in health care elevates the psychology surrounding a 'disruptive technology' in the examination room to a higher priority. Based on our survey findings, patients found the experience acceptable and were willing to use it again for future clinical encounters. Surprisingly, a few patients remarked that the clinical encounter seemed shorter in duration and seemed better than with in-person interpretation. While this perception is not unreasonable, our methods did not allow us to tease out the significance of this finding.

Despite the success of our pilot study, some caveats are worth mention. First, our study included a small number of patients and clinicians, and was limited to one community health centre adult medicine clinic. We did not have enough experience in our paediatrics clinic where there are often multiple family members and conversations in the paediatric clinical encounter, or in the obstetrics/gynaecology clinic where the need to undress patients would prove awkward without clinicians who are familiar with the technology. Second, generalisability is, of course, also dependent on how fast the wireless network is in the clinic. We made no special changes to the network or connectivity, but older equipment might understandably compromise the communication. Third, while we solicited perceptions of the amount of time it took to use the videoconferencing device, we did not measure actual wait times or encounter times. Fourth, the post-encounter survey was often administered to the patient by the same interpreter as the one who interpreted for the clinical encounter. Using different personnel for the survey would have diminished the possibility of bias in interpreting the patient's opinions.

The use of videoconferencing technology is accelerating to the point that it is already becoming commonplace in social interactions. What is surprising is that such applications have not yet been harnessed for routine patient care activities. Our findings seem most applicable to settings where interpreters are not plentiful and/or at a distance from the clinical setting, but should encourage further exploration with other healthcare professionals and other clinical settings. One attractive example is sign language interpretation where interpreters are even less available, and the interpretation is dependent more on the video communication channel, a challenge that would test the technology even more than in the case of foreign language interpretation. Beyond the domain of foreign language interpretation, having alternative access to other healthcare professionals such as diabetic educators, social workers, mental health professionals through videoconferencing would enhance any clinic encounter.

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