Comparing In-Person, Video, and Telephonic Medical Interpretation

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BACKGROUND: Using trained interpreters to provide medical interpretation services is superior to services provided on an ad hoc basis, but little is known about the effectiveness of providing their services remotely, especially using video.

OBJECTIVE: To compare remote medical interpretation services by trained interpreters via telephone and videoconference to those provided in-person.

DESIGN: Quasi-randomized control study.

PARTICIPANTS: Two hundred and forty-one Spanish speaking patient volunteers, twenty-four health providers, and seven interpreters.

APPROACH: Patients, providers and interpreters each independently completed scales evaluating the quality of clinical encounters and, optionally, made free text comments. Interviews were conducted with 23 of the providers, the seven interpreters, and a subset of 30 patients. Time data were collected.

RESULTS: Encounters with in-person interpretation were rated significantly higher by providers and interpreters, while patients rated all methods the same. There were no significant differences in provider and interpreter ratings of remote methods. Provider and interpreter comments on scales and interview data support the higher in-person ratings, but they also showed a distinct preference for video over the phone. Phone interviews were significantly shorter than in-person.

DISCUSSION: Patients rated interpretation services highly no matter how they were provided but experienced only the method employed at the time of the encounter. Providers and interpreters were exposed to all three methods, were more critical of remote methods, and preferred videoconferencing to the telephone as a remote method. The significantly shorter phone interviews raise questions about the prospects of miscommunication in telephonic interpretation, given the absence of a visual channel, but other factors might have affected time results. Since the patient population studied was Hispanic and predominantly female care must be taken in generalizing these results to other populations.

KEY WORDS: telephonic; in-person; video; medical interpretation.
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INTRODUCTION

The 2000 United States Census found about one in five residents were non-English speakers, an increase from about one in seven a decade earlier, and that almost a quarter of these non-English speakers could not speak English well or at all.[1] This trend indicates an increasing need for interpretation when individuals in this population seek health care. It is not feasible for every hospital or clinic to have staff proficient in all languages and the only realistic options are to rely on ad hoc interpretation by an available conversant in the patient's language or to use remote interpretation services. The first option has risks because the interpreter's competency may be unknown and it may not be in compliance with national standards for providing health care.[2] The second option raises questions about how remote service should be provided.

In this study, two methods of providing remote medical interpretation, videoconference and phone, were compared with interpretation provided in-person. The study addressed the following questions: Does the communication method used for interpretation affect perceptions of encounter quality and do patient, provider, and interpreter perceptions of encounter quality vary when different methods are used? Are there differences in patient, provider, and interpreter preferences for different methods? Does communication method affect the amount of time it takes to provide interpretation service?

Benefits of providing medical interpretation with trained interpreters have been documented in three research reviews.[3–5] They show that patients with limited English proficiency (LEP) are underserved and do not receive the same level of health care as their English speaking counterparts. When interpretation services are provided, they most commonly have been performed on an ad hoc basis. The principal research finding from these studies is that trained interpreters out perform ad hoc ones[4] and can raise the level of clinical care

for LEP patients to the point where it approaches or equals the care given when there is language concordance.[3] The reviews identified a number of reasons why trained interpreters had superior performance. Ad hoc interpreters may not adequately understand technical information providers give and may unintentionally omit parts of the conversation or distort it out of embarrassment. Providers and patients rate the quality of communication higher with trained interpreters and fewer communication errors occur that could affect diagnosis and treatment. Use of trained interpreters is associated with increased use of health care services, higher preventative screening and prescription rates, reductions in medical tests, higher compliance, and greater patient satisfaction.

There are few studies of remote medical interpretation communication methods. One systematic review identified only nine,[5] most involving the phone and comparing remote simultaneous medical interpretation (RSMI) to proximate consecutive medical interpretation (PCMI). In RSMI, the interpreter is not physically present, the doctor and patient usually wear headsets, and technology directs their speech to the interpreter, not each other. The interpreter's speech is directed back to the doctor and patient allowing interpretation while they talk. In PCMI, the interpreter is usually physically present and responds after each person speaks. Hornberger et al.[6] compared RSMI to PCMI using trained interpreters and found that patients and providers preferred the direct interaction and privacy afforded by RSMI, while interpreters preferred visual contact afforded by PCMI. Most other telephonic studies compare RSMI to "usual and customary" care[7] or to ad hoc consecutive interpretation.[8,9] Results usually favor RSMI, except when interpretation is done by trained interpreters who are physically present.[10,11] There is some evidence that telephonic interpretation takes longer.[12]

Three studies of video interpretation were identified in this literature review. The only quantitative study compared patient satisfaction ratings on a general scale when interpretation was provided by video, phone, and in-person.[13] There were insufficient encounters to test for significant differences, only one interpreter and general practitioner participated, and the data transmission rate of only 128 kilobits per second, affected video quality. A qualitative study compared consecutive interpreting in-person, by video, and by speakerphone with a head set phone system allowing RSMI. Forty encounters were observed and structured interviews were conducted at the end of the two-week study with participating patients, providers, interpreters, and managers.[14] Physicians and interpreters preferred in-person interpretation and video to telephone but felt more time was needed for adequate comparison. Another qualitative study involved 115 video encounters.[15] Patients rated video 2.9 on a 3.0 scale, and all but one preferred it to the telephone. Those in focus groups felt video and in-person interpretation were similar. The 32 providers and 15 interpreters surveyed preferred in-person and video interpretation to telephonic.

METHOD

In contrast to an earlier quantitative video interpretation study,[13] the research reported here involved more clinical encounters, interpreters, and providers; used a Likert scale specifically devised to measure encounter quality; and entailed collecting ratings from providers and interpreters in addition to patients. Further, time data were collected because time savings have been hypothesized for remote interpretation.[12,14,16] Qualitative data were also collected by allowing all participants to write free text comments on their scales and by interviewing providers, interpreters, and a subset of patients. The research plan was approved by the Institutional Review Boards of the Medical University of South Carolina and the National Institutes of Health.

Seven interpreters and twenty four providers participated. The providers were two physicians, two obstetric and gynecology residents, three lactation specialists, thirteen registered nurses, three nurse technicians and a social worker. Patients were a convenience sample of 241 Spanish speakers that the Medical University of South Carolina post partum and pediatric clinics identified as needing interpretation services. Patient volunteers received a 25-dollar gift card and were randomly assigned to an interpretation communication method (in-person, video, phone) on a weekly, rotating basis. Rotation continued until the end of the seven-month study when some treatments were extended to equalize encounters. Eighty-six percent of the patients were from the post partum clinic.

Data were collected from 80 in-person, 80 telephonic, and 81 videoconference encounters. In the videoconference condition, portable equipment was moved into a patient's room in the post partum clinic or an examination room in the pediatric clinic. Video was transmitted wirelessly to each clinic's router and then over the wired network to the interpretation office at 384 kilobits per second, a rate sufficient to produce full screen, full motion video of the interpreter on a monitor at the encounter site and of the patient and provider on a monitor at the interpretation office. In the telephonic condition, a phone with dual patient–provider headsets or a speakerphone was moved into the room. The university's trained interpreters employed consecutive interpretation in all conditions. Although this varied from the normal practice of using phones for remote interpretation by an outside service, it controlled for variation between local and remote interpreters.

Patients, providers, and interpreters individually completed a five-point Likert rating scale after each encounter. Scales used in each encounter were assigned the same unique code to link ratings and ensure anonymity. Patient scales were translated into Spanish, an English version of which is shown in Fig. 1. Scales completed by providers and interpreters had core items identical to patients' but phrased from their perspectives. For example, patients responded to the statement "I felt my privacy was respected", while interpreters and providers responded to the statement "I felt the patient's privacy was respected'. The 12 core items about encounter quality were informed by several studies of health care satisfaction, none of which had instruments that could be adopted for this research because they asked questions about care going beyond the encounter.[7,8,17–23]

Patient scales had a place to enter gender and age and an extra question asking if a patient completed the scale before and, if so, what interpretation method was used. Interpreter scales had entries to record the time they were ready to provide the service, the times the provider started and ended the interview, and the communication method employed. The ready time and interview start time were used to compute wait time. Interview start and end times determined interview length. An interpreter recruiting patient volunteers at the

Patient Interview Assessment Questionnaire

Encounter Code _____ Age_____ Gender (circle one) M F

We are assessing the quality of our services to patients who do not speak English and we would appreciate your help. Please take a minute to respond to the statements below. Circle a number 1-5 that best indicates how strongly you disagree or agree with each statement as it relates to the interview with the medical professional that you just had. Think back on the interview that you just had before responding to each statement and feel free to write and any comments that you have at the end of this form.

	Strongly Agree	Agree	Unsure	Disagree	Strongly Disagree
1. I felt at ease talking with the medical professional ……..	5	4	3	2	1
2. I felt at ease talking with the interpreter…….....	5	4	3	2	1
3. I felt that the medical professional heard and understood me ……..	5	4	3	2	1
4. I understood what the medical professional was telling me …….	5	4	3	2	1
5. I felt my privacy was respected..……..... ……..	5	4	3	2	1
6. I felt the interpreter noticed when I had problems understanding ……....	5	4	3	2	1
7. I felt I had opportunities to ask questions ……....	5	4	3	2	1
8. I felt the medical professional collected enough information to help me……...	5	4	3	2	1
9. I feel confident that the medical professional understands my problem…….	5	4	3	2	1
10. I feel confident I was given sufficient information about my condition……...	5	4	3	2	1
11. I feel I had enough time with the medical professional …….……....	5	4	3	2	1
12. I feel overall that my meeting today was satisfactory …….....	5	4	3	2	1

13. Have you completed this questionnaire before? Yes No

If yes, how were interpretation services provided you? (Circle one) In person By phone By video

Please write any comments below or on the other side of this form. Thank you for helping.

Fig. 1. Patient interview assessment questionnaire-English.

clinic collected the scales and, about mid-way through the study, interviewed a subset of 30 patients, ten in each condition. This allowed providers and interpreters time to become habituated to the other research methods. An interview protocol was used asking if the communication method employed was distracting and, if so, why; if the patient had previous experience with any of the three interpretation methods; and, if the patient had to choose amongst methods, which they would choose and why. A similar protocol was used by the researchers at the end of the study to interview all seven interpreters and 23 of the 24 participating providers.

The primary test of between-method differences in ratings was a one-way analysis of variance (ANOVA) followed by multiple pairwise comparisons using the Scheffe test. Reliability coefficients were calculated for the scales used by each group and for combined groups. Calculations were done with the SPSS statistical package using a two-sided alpha level of 0.05 for all tests.

Table 1. Encounter Rating Means and Standard Deviations for Communication Methods

Method	Patient Mean/SD	Provider Mean/SD	Interpreter Mean/SD	Overall Mean/SD
In-person	4.80/0.30	4.90/0.28	4.84/0.30	4.85/0.18
Videoconference	4.85/0.23	4.58/0.55	4.64/0.36	4.69/0.25
Phone	4.82/0.29	4.58/0.57	4.50/0.52	4.63/0.32

Table 2. Analysis of Variance Satisfaction Between Communication Methods Overall and Within Groups

Method	Mean Difference	Significance
In-person vs. Videoconference (overall)	0.15738	0.001[a]
Patients	−0.04713	0.553
Providers	0.32288	0.000[a]
Interpreters	0.19641	0.009[a]
In-person vs. Phone (overall)	0.21492	0.000[a]
Patients	−0.01638	0.931
Providers	−0.32176	0.000[a]
Interpreters	0.33938	0.000[a]
Videoconference vs. Phone (overall)	0.05754	0.360
Patients	0.03077	0.777
Providers	−0.00112	1.00
Interpreters	0.14296	0.083[b]

[a]*Significance>0.05* [b]*Approached significance> 0.05*

Table 3. Number of Satisfaction Form Comments/Word Counts for Communication Method by Group

Method	Patient	Provider	Interpreter	Total
In-person	26/514	24/291	22/263	72/1068
Videoconference	32/616	46/778	46/877	124/2271
Phone	32/603	47/938	34/799	113/2340
Total	90/1733	117/2007	102/1939	309/5679

RESULTS

Rating instruments were highly reliable (Cronbach's alpha 0.93 for interpreter, 0.96 for provider, 0.87 for patient, and 0.94 for combined scales). The means and standard deviations of patient, provider, and interpreter ratings of encounter quality are shown in Table 1 and mean differences and significance levels are depicted in Table 2. Ratings were high across treatments and were significantly higher for in-person than remote methods. This difference was due to provider and interpreter ratings, since patients rated encounters in the three methods similarly. Encounter ratings for remote methods were not significantly different, although interpreter ratings of video encounters approached significance. Ninety-four percent of the patients were female, and there were too few males to analyze gender differences. Patient age ranged from 14 to 40 with a median age of 26. Patient age (median=26) showed no significant association with ratings. Only four patients indicated that they had completed the scale before so no sub-analysis was done of ratings by patients exposed to more than one method.

Comments on the scales and from interviews supported the general quantitative finding concerning in-person interpretation superiority and indicated stronger preferences for video, even though the ratings in the video and telephonic conditions were not significantly different. The number of comments made on scales and their associated word counts are shown in Table 3. Providers and interpreters offered more commentary overall and more for remote methods. Patients frequently commented on the quality of care or interpretation services with statements such as "I am very grateful for your understanding and for the services you give to patients," and "I think this interpretation was very satisfactory now that I have no doubt about my care of my baby..." Of the ninety encounters with patient comments, only 11 referred to communication method, six positive from patients having video interpretation, three negative from patients having telephone interpretation, and two positive from patients having in-person interpretation.

In contrast, most provider and interpreter comments were about communication method (60 out of 117 and 99 out of 102, respectively). Providers often made direct comparisons, such as "The [phone] system works, but face to face has better..." and "It was easy to hear the interpreter and speak with the patient. [Video is] much better than the phone!" Providers also commented on implementation issues. For example, "I had to direct my voice to the video...so I couldn't look at the patient" or "It was difficult to position everyone appropriately." Interpreter comments sometimes compared methods, but mainly focused on implementation and technical problems. For example, "The video cut out a few times so I had to ask to repeat" and "I feel the providers are not used to adequately position themselves...." Most other provider and interpreter comments were short assessments of the overall encounter (e.g., "Went well.") or comments about the patient (e.g., "Patient was shy."; "Patient spoke very fast.").

None of the 10 in-person patients interviewed considered the method distracting and only three of the 20 patients using remote methods did (videoconference=2; phone=1), mostly because of technical problems. All of the 30 patients said they preferred in-person interpretation most. Nine indicated a preference for both in-person and video, and six of these were in the phone condition. None cited a telephone preference. The common reasons in-person interpretation was preferred were that it was more personal, that they could understand better, and that they could see the interpreter.

Twenty two of the 23 providers preferred in-person interpretation, while one liked in-person least and the phone most because it took less time. Providers considered the phone the more distracting remote method (phone=13; videoconference=7) and they liked it least (phone=14; videoconference=8). Seventeen providers cited the need for visual communication as the reason they preferred video as a remote method, while only six preferred the phone. The most frequent reasons providers felt the phone was distracting were poor audio, its lack of a visual channel, and movement and/or use of hands were restricted. The most frequent reasons video was considered distracting was loss of eye contact (patients tended to watch the monitor), set up time, and technical issues. Six of the seven interpreters interviewed cited video as distracting either because of set-up time or poor audio. Four cited the phone as distracting because of poor audio or the absence of visual communication. Six liked the phone least and preferred video as a remote method because of its visual channel; one had no preference.

The means and standard deviations for wait time and interview time for each method are shown in Table 4; mean differences and significance levels are shown in Table 5. Wait times were low, but there were significant differences between

Table 4. Wait Time, Interview Time Means and Standard Deviations (Minutes)

Method	Wait Time Mean/SD	Interview Time Mean/SD
In-person	2.20/2.43	20.30/23.52
Videoconference	4.70/6.01	14.98/11.43
Phone	3.75/6.52	12.90/8.47
Total	3.55/5.39	16.06/16.11

Table 5. Time Differences (Minutes)

Method	Wait Time Mean Difference	Wait Time Significance	Interview Time Mean Difference	Interview Time Significance
In-person vs. Videoconference	−2.500	0.013[a]	5.325	0.108
In-person vs. Phone	−1.500	0.184	7.400	0.014[a]
Videoconference vs. Phone	.950	0.528	2.075	0.711

[a]*Significance>0.05*

those for in-person and video interpretation. Only in-person and phone interpretation had significantly different interview times. There were no significant time differences between the remote conditions. Interview time was shorter in the remote conditions and shortest in the phone condition.

DISCUSSION

This study confirms earlier research indicating preferences for in-person medical interpretation and video as compared to telephone services[14,15] and adds quantitative evidence that communication mode affects perceptions of encounter quality. Most patients were only exposed to the one communication method used in their encounter. Since providers and interpreters used all three methods, they may have been more sensitive to remote method limitations. Although patients tended to rate encounters the same regardless of communication method, their preferences in interviews were similar to the other groups. In-person encounters were rated significantly better by providers and interpreters and all groups expressed a preference for this interpretation method. Interpreter ratings of video encounters approached significance and interview data from all groups showed a distinct order of preference from in-person, to videoconference to phone.

Both remote methods had technical problems, but there were more complaints about telephone quality than video (fifteen versus eleven). There was no control for the two types of phones used (dual headset and speakerphone) and there were cases when one would be substituted for another when problems occurred. Most video technical problems were attributable to wireless networking because signal strength degrades with distance from the wireless router. Placing a monitor nearer the provider might have mitigated the problem of eye contact, but positioning options were limited because providers often moved about the room.

Travel time was not analyzed because the distances between the clinics and interpretation office were short. Greater distances would have shown travel time advantages for remote methods. The significantly longer wait time for video interpretation versus in-person is not surprising given the time needed to set up video equipment and the non-significant difference between video and phone wait times is probably because phone equipment also needed set up. There are three possible reasons for the significantly shorter interview time for the phone versus in-person. First, although local interpreters were used, routine phone interpretation at the clinics involves an outside service and additional expense. Providers may have been habituated to asking fewer open ended questions and employing other time saving tactics. Second, there may have been more interpreter-provider side talk about patient understanding in the in-person condition that is not possible with remote methods. Finally, any questions that came up once remote interpretation concluded might have been addressed by the interpreter physically present to recruit patients and collect forms. There were no call backs during this study and the on-site interpreter was consulted, but the extent and frequency of the consultation was not documented.

The lack of interview transcripts and documentation of on-site interpreter use after remote interviews concluded are study limitations. This data would have helped better explain the unexpected shorter interview times for the telephone, the longer times for in-person, and why these results differ from an earlier study.[12] Transcripts also would have allowed more granular analysis of communication and encounter quality. Another limitation is the small homogenous sample of predominately Hispanic, post partum female patients unrepresentative of the entire population needing interpretation services. Future research on medical interpretation communication methods should target a wider range of patients and accommodate transcription to identify differences in content that may affect patient outcomes. Additional research on technology also is needed. Bandwidth is still an issue affecting video. There are technologies enabling full motion, but not full screen video with lower bandwidth that need to be clinically tested.

CONCLUSION AND RECOMMENDATIONS

Although the study was limited, its findings, when considered with those of related research, clearly indicate that when possible in-person interpretation services should be provided by trained interpreters. The results are not as strong in distinguishing among remote methods, but they do suggest that, if feasible, video should be used, especially if it can be implemented in a controlled environment where camera and monitor placement do not intrude on patient and provider eye contact and interpersonal interaction.

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