ACCESSING SIGN LANGUAGE INTERPRETER SERVICES IN A HEALTH CARE SETTING USING INTERNET VIDEO

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INTRODUCTION

The ability to communicate clearly is essential for effectively interacting with people who are accessing health care services. A percentage of our population use a signed language as their primary communication language. American Sign Language (ASL) and Langue des Signes Quebecoise (LSQ) are visual languages in use in Canada. This project investigated a technological solution that can alleviate some of the communication barriers encountered by these individuals when accessing health related services. The effectiveness of the solution was evaluated using simulations of real life scenarios encountered by people who are Deaf.

The use of a sign language interpreter is often the only way non-signing individuals can communicate effectively with people who are Deaf [1]. Accessing interpreters in an emergency situation is often difficult in rural areas. Interpreter accessibility for people who communicate using LSQ outside of Quebec and for people who communicate using ASL in the province of Quebec is also difficult to arrange in a timely manner. Internet based interactive video has the potential to provide an equivalent or better picture quality, be less expensive, and more convenient than some of the dedicated videoconferencing systems that use dedicated telephone lines [2] [3]. These concepts are modified and refined in this project to investigate the provision of sign language interpretation services to people who are Deaf using the services of a remote interpreter via the internet.

METHODS

Two different video communication systems were used in the project. Polycom SP128 Viewstation systems and Polycom ViaVideo systems were used in a variety of combinations to evaluate their effectiveness in simulated situations. The SP128 Viewstation systems were used with 27" televisions and resembled typical videoconferencing equipment. The Polycom ViaVideo systems were used with Pentium 4 based computers. Two of the ViaVideo based systems were mounted on infusion pump stands (see Fig. 1) to allow them to be moved around and adjusted for effective viewing by the patient in a medical setting. The systems connected to the internet via ADSL connectivity rated capable of up to 640 kbps upload and 2Mbps download.

Fig. 1 – ViaVideo based system on an infusion pump stand.

The equipment was used to access the services of a sign language interpreter located in another city. The remotely located sign language interpreter facilitated communication between the person who is Deaf and the hearing person who were located in the same room. The technological solution was evaluated using questionnaires that were completed following simulated sessions of typical encounters between people who are Deaf and hearing participants when accessing health related services (Fig 2). All three participants involved in the simulated sessions completed the questionnaires immediately following the sessions.

Fig. 2 – ViaVideo based system in a simulated session.

The project simulations were held at a number of different sites (Fig. 3) including Saint John, Moncton, Fredericton, and Bathurst in New Brunswick, as well as a site in Montreal in the province of Quebec.

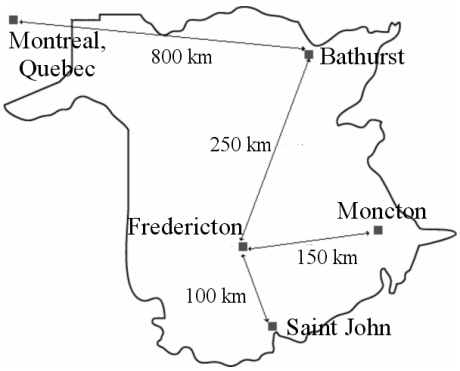

Fig. 3 – Locations where the simulated sessions were held.

RESULTS

The results from the technology aspects of the questionnaires, mean and standard deviation, are displayed in table 1. There were 40 simulated sessions in which data was collected. The participants in the simulated sessions had a distribution of 23 different patients / clients, 14 different health professionals / information providers and 4 different sign language interpreters. ASL was the sign language used in 36 sessions while LSQ was used in 4 sessions. A six point linear scale was used for items marked with a * which assigns a value of 6 for best and 0 for worst.

Table 1. Tabulated results from questionnaires

Question	Patient / client	Health professional / information provider	Interpreter
Session length (in minutes)	13.33 (8.53)		
Picture quality*	4.67 (1.30)	NA	3.15 (1.72)
Sound quality*	NA	5.40 (0.87)	4.50 (1.09)
Used finger spelling	71%	NA	80%
Quality for finger spelling*	4.63 (1.36)	NA	3.68 (1.27)
Position of system when sitting*	5.10 (1.14)	5.43 (0.90)	4.94 (1.55)
Position of system when lying down*	5.56 (0.73)	5.89 (0.33)	5.2 (1.79)
Ease of communication with patient / client	NA	5.30 (0.99)	3.03 (1.37)
Ease of communication with health professional / information provider	5.13 (0.95)	NA	3.50 (0.88)
Ease of communication with sign language interpreter	5.10 (1.14)	5.10 (1.03)	NA
Comfort level with system*	5.31 (1.00)	5.38 (0.90)	2.78 (1.42)
Suitability of system for task*	4.90 (1.21)	5.35 (0.86)	4.80 (1.29)

DISCUSSION

The participants involved in the data collection process included typical future users of such systems. The sessions simulated typical sessions such as communicating with health professionals when sitting or laying on a hospital bed, communicating with mental health counselors, communicating with social and employment counselors, and communicating in employment situations.

The performance of the technology used during the project proved to provide a quality communication channel for the participants. All patients / clients indicated they understood the health professionals / information providers and thought the health professionals / information providers understood them. All health professionals / information providers indicated they understood the patients / clients and thought the patients / clients understood them. The results shown in table 1 indicate the users were quite satisfied with the performance and usage of the

system in most instances although there is a noticeable difference between the assessments by the sign language interpreters and the others involved in the sessions.

The participants who are Deaf were impressed with the video quality and that they could use the system to communicate effectively in sign language with people at another location. Varying opinions were expressed by the Deaf participants including preferring to access live interpreters at all times, seeing the technology as a needed communication option until a live interpreter could be present during an emergency, preferring the remote interpreter to a live interpreter for privacy reasons, and some expressed no preference between a live or remote sign language interpreter.

Health professionals indicated the system worked well but indicated technical support personnel would need to be readily available in case of technological problems. Training or sensitization to the use of the technology during medical evaluations will need to be provided to the health professionals. Health professionals stated it gets easier after each session. One health professional stated she thought the remotely located sign language interpreter was less distracting for her than when the interpreter is present in the room with her and the patient.

The results in table 1 show that the sign language interpreters were more critical of the system and its performance than the other participants. This may be as a result of their professionalism and concerns about what they view as shortcomings of the system compared to their standard method of live interpretation service. Their lower assessment may also be due to the fact that they were the only remote participant in the session. The sign language interpreters had concerns about not being able to see the vocal participants in some sessions which they indicated was important although they indicated this was less of a problem for sessions of short duration. The interpreters were concerned about jerky and pixelated video images that would occur at times during sessions which we attributed to network QOS problems. Some interpreters felt like they were missing out on information when items outside their range of view were being shown or demonstrated to patients such as assistive rehabilitative aids.

Other issues that need consideration when considering using interactive video technologies to access remotely located sign language interpreters include the environment in which the equipment is located, Internet connectivity issues, equipment selection, and type of health service needed.

CONCLUSION

This project demonstrated that the provision of sign language interpretation services from a remote site using telehealth technology with high bandwidth internet connectivity is possible. An effective implementation of a remote sign language interpreter service can be used to provide timely access to a distant sign language interpreter when a patient who is Deaf and a health professional need to communicate. This new way of providing sign language interpretation services should lead to a better quality of life for people who are Deaf when they access health services due to easier and timelier access to interpreters. Sign language interpreters will also benefit from reduced travel and the potential of providing more services to more people in a timely manner. There are still challenges such as internet quality of service issues and excessive packet delays that need to be considered when considering the implementation of such systems.

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REFERENCES

[1] Harmer, L., (1999) Health care delivery and deaf people: practice, problems, and recommendations for change. *Journal of Deaf Studies and Deaf Education,* Vol. 4(2), p. 73-110.

[2] Biden, E., Lovely, D. F., Hudgins, B., Brown, D., LeBlanc, K. (1999). Internet based interactive video in rehabilitation. *Canadian Medical and Biological Engineering Society Conference Proceedings 1999*; p. 21-22.

[3] Hughes, G., Hudgins, B., Hooper, J. E., Wallace, B. (2003). User satisfaction with remote rehabilitation services using Internet video. *Journal of Telemedicine and Telecare,* Vol. 9(3), p. 180-183.