Teleaudiology: Are patients and clinicians ready for it?

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“I do tech support for a HA manufacturer. I have fit patients over a telephone/internet connection several provinces away. I have been able to sort out their issues in less than 30 min without travelling. Weird at first but wonderful!”

Audiologist with 28 years of experience
“I am located in Northern Ontario. Many of my patients see telehealth and telemedicine as very advanced and a regular part of life. Access to video conferencing and remote diagnostics is very welcome and accepted.”

Audiologist with 22 years of experience
“I believe testing and fitting aids via [the] internet will reduce [the] position of audiology to that of a technician.”

Audiologist with 15 years of experience
“I think that the whole concept of teleaudiology is horrible! Why not just invent robots to take over the profession???”

Audiologist with 7 years of experience
Introducing the various prototypes currently in development…
Why study teleaudiology?
Why study teleaudiology? A number of possible benefits…

- Increasing access to healthcare
- Reducing wait times
- Reducing medical travel
- Minimizing caregiver stress/time off paid work
- Facilitating a rapid response
- Reducing CO₂ emissions
- Reducing costs of delivering healthcare
- More comfort when discussing stigmatizing issues
- Improved adherence to treatment
Ratio of Audiologists to General Population: Developed World

= 1000 people
Ratio of Audiologists to General Population: **Developing World**

[Diagram showing ratio of Audiologists to General Population]

= 1000 people

*Swanepoel et al., 2010*
Ratio of Audiologists to General Population: Developing World (optimistic estimate)

Swanepoel et al., 2010

= 1000 people
Ratio of Audiologists to General Population: 
**Developing World (pessimistic estimate)**

= 1000 people

Swanepoel et al., 2010
The number of broadband wireless subscriptions in the US has exceeded the number of people in the US.
Today’s research

Survey current attitudes toward teleaudiology

- Clinicians
- Pediatric clinicians
- Patients
- Parents of children with hearing loss

How attitudes shift with telemedicine experiences

- Patients
Why study attitudes?

Berg (1999) found that 75% of telemedicine interventions ultimately fail.

To understand why, Broens et al. (2007) and Hailey & Crowe (2000) conducted meta-analyses of telemedicine interventions:

- Reliable technological systems that support the intervention
- *They also found that it is critical to understand attitudes of key stakeholders toward the intervention*
I initially assumed that the attitudes of patients toward teleaudiology mattered most.
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The broader literature in telemedicine

Acceptance by clinicians is a key factor in determining success with telemedicine interventions

(Al-Qirim, 2007; May, 2006; Wootton & Herbert, 2001).

The practitioner is described as:

“the most important initial gatekeeper for success with telemedicine interventions”...

(Whitten & Mackert, 2005)
Study I
Study I: Qualitative Study

- Interview-based qualitative study exploring attitudes toward teleaudiology
- Potential participants were nominated by a panel of 3 experts, with the goal of inviting hearing health care professionals with varied but relevant work histories
- 60-100 minute long interviews of 11 hearing health care practitioners (data saturation was obtained) were conducted
- Interviews were transcribed and coded by 2 independent coders

Singh et al. (submitted)
A total of 97 codes emerged, clustering into core themes:

- Advantages & disadvantages of teleaudiology

Singh et al. (submitted)
Principal disadvantage: Teleaudiology could pose a threat to patient-practitioner relationship quality.
Discomfort...

...it's a gut feeling....

....the in-person experience is richer...
“You almost need to be in [the client’s] presence to understand their body language and eye contact and their tone. I’m not exactly sure what it is. It’s almost an intangible thing to me. In order to feel comfortable with someone and trust them, I would prefer to have built that in person.”

-Audiologist (public setting)  
18 years of experience

Singh et al. (submitted)
Study II
Study 2: Survey of Attitudes

Goal: To survey attitudes toward teleaudiology in a large sample of hearing health care practitioners

Participants:

- Recruited through electronic mailing lists and postings at conferences
  - 202 practitioners ($M = 39.3$ years age; $SD = 11.0$)
    - 28: Owned their own clinic(s)
    - 109: Worked in a private practice
    - 53: Worked in a non-profit environment

Singh et al. (in review)
Perceived effect of teleaudiology on hearing health care

Singh et al. (in review)
Willingness to use Teleaudiology: Clinical tasks

Singh et al. (in review)
Willingness to use Teleaudiology: Patient groups

Singh et al. (in review)
Willingness to use Teleaudiology: Age groups

Proportion of respondents

Age group (years)

Extremely willing

Moderately willing

Not at all willing
On average, it is believed that teleaudiology will increase accessibility, but will likely have a minimal effect on hearing health care.

However, there are significant proportions of clinicians who have opposing attitudes toward teleaudiology.

Willingness to conduct teleaudiology appointments was dependent on the clinical task to be performed and the patient group receiving service.

Singh et al. (in review)
Study III
Study 3: Pediatric vs. Non-pediatric Practitioners

Goal: To better understand the observed reluctance of using teleaudiology with pediatric populations

Original sample: Only 15 of the 202 participants indicated that pediatrics comprised their primary clientele

Collected data on 30 additional practitioners who indicated that pediatrics comprise their primary clientele
Study 3: Pediatric vs. Non-pediatric Practitioners

We compared the results of practitioners who indicated that:

• Pediatrics comprise their primary clientele \((n = 55)\)
• Adults comprise their primary clientele \((n = 126)\) from Study 2
Pediatric vs. Non-pediatric Practitioners
Willingness to use teleaudiology: Tasks

- Extremely willing
- Moderately willing
- Not at all willing

Tasks:
- Answer questions
- Counseling
- HA adjustments
- Screening
- 1st fit: Returning pt
- Assessments
- 1st fit: New pt

Comparison between Adults and Pediatrics.
Pediatric vs. Non-pediatric Practitioners
Willingness to use teleaudiology: Age groups

Extremely willing
Moderately willing
Not at all willing

Years of Age

0-2  3-6  7-12  13-17  18-30  31-64  65-79  > 80

Adults
Pediatric vs. Non-pediatric Practitioners Willingness to use teleaudiology: Age groups

Years of Age

Extremely willing
Moderately willing
Not at all willing

Adults
Pediatrics
Reluctance of practitioners to conduct teleaudiology appointments with pediatric populations may be due to a practitioner’s familiarity conducting audiology appointments with children.
Study IV
What are the attitudes of audiology patients toward teleaudiology?
Patient attitudes toward teleaudiology

- Questionnaire design
- Postings at 50+ audiology clinics (electronic or paper copies)

224 respondents

- All had experienced at least one audiology appointment
- 129 males; 95 females
- Mean age = 67.1 years ($SD = 15.3$)
Patient attitudes toward teleaudiology

Patient Willingness to use Teleaudiology

- Not at all willing
- Moderately willing
- Extremely willing

% of respondents
Examined 27 factors that contribute to willingness to participate in a teleaudiology appointments

MORE likely to have a teleaudiology appointment

LESS likely to have a teleaudiology appointment
Factors MOST LIKELY to motivate a teleaudiology appointment

- Access to specialists
- Flexible appointment times
- Meeting with practitioner in emergencies
- Minimize time in waiting room
- Obtaining appointments quickly

Does not impact my decision

Much more likely
Factors LEAST LIKELY to motivate a teleaudiology appointment

The bond I have with my practitioner
Change in eye-contact
Being in the same room
Lack of social contact
Can not examine my hearing aid
Can not examine me

Much less likely

Singh et al. (in preparation)
Study V
What are the attitudes of parents of hard-of-hearing children toward teleaudiology?
Attitudes of parents of hard-of-hearing children toward teleaudiology

- Questionnaire design
- On-line survey: Consisting of 450 respondents
- Reported being the parent of at least 1 HI child
- Mean age = 31.4 years ($SD = 7.1$)
- Mean age of child = 6.3 years ($SD = 4.2$)

Singh et al. (in preparation)
Willingness to have a teleaudiology appointment: Parents of hard-of-hearing children

![Bar chart showing proportions of sample willing to have a teleaudiology appointment.]

- **Not at all willing**: Low proportion
- **Moderately willing**: Moderate proportion
- **Extremely willing**: High proportion
Study VI
Motivation

• Purpose: Investigated short-term audiological outcomes when using an internet-based tool for the purpose of conducting follow-up adjustments to hearing instruments.
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Conclusion
Why are there such fervent beliefs for and against the use of teleaudiology in hearing health care?

In part, practitioners may be adopting different frames of reference regarding:

- Clinical tasks to be performed
- Patient populations being served
- Previous experience with telemedicine/audiology applications
Thank you!
Questions?
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