

Supplemental material, Mui et al., "Hearing Health Care Stakeholders' Perspectives on Teleaudiology Implementation: Lessons Learned During the COVID-19 Pandemic and Pathways Forward," *AJA*, [https://doi.org/10.1044/2023\\_AJA-23-00001](https://doi.org/10.1044/2023_AJA-23-00001)

## **Supplemental Material S1. Teleaudiology survey for hearing health care clients.**

### **Welcome page**

A warm welcome from the Hearing and Tinnitus Research Innovation Group at Flinders University, Adelaide, Australia.

We have developed this short survey to understand how teleaudiology (i.e., use of telecommunications and digital technology to provide access to audiological services for clients who are not in the same location as the clinician) is currently perceived by stakeholders involved in hearing healthcare including the general public, hearing healthcare clinicians, Audiology students, academics, and industry partners. Your opinions are extremely helpful for improving the existing hearing healthcare service delivery model and increasing the accessibility of hearing healthcare in the future.

This survey takes around 15 minutes to finish. If you are above 18 years old, we would value your response.

**Please note that this survey is intended for individuals from the general public who require hearing healthcare services (i.e., those with hearing loss, tinnitus, and other audiological conditions).**

Please click the arrow to read the participant information sheet.

### **Participant Information Sheet**

#### **PARTICIPANT INFORMATION SHEET**

**Study Title:** "Perspectives of Hearing Healthcare Stakeholders Towards Teleaudiology"

**What is this research about?**

In late 2019, a novel strain of coronavirus primarily affecting the respiratory system emerged (COVID-19). By early 2020, the situation had developed into a pandemic. In accordance with social restrictions and safety guidelines, most of the face-to-face audiological services were disrupted. In an attempt to provide continued care, some clinical practices started using/increased the use of teleaudiology to overcome such pandemic-related challenges.

It has been more than two years since the start of the pandemic and we want to understand how teleaudiology is currently perceived by stakeholders involved in hearing healthcare including the general public, hearing healthcare clinicians, Audiology students, academics, and industry partners and use this information to guide new, improved and accessible hearing healthcare.

This project is supported by Flinders University.

**What will I be asked to do?**

Complete a short (15 minutes) online survey.

**What benefit will I gain from being involved in this study?**

You will be providing a valuable contribution to scientific knowledge in this area. This knowledge will help educate future research and decisions made regarding improving current hearing healthcare. You will also have the option to register your interest to receive information via email about future research you may be eligible to take part in.

**Will I be identifiable by being involved in this study?**

No identifying information will be published, only collated responses will be presented. All information and results obtained in this study will be stored in a secure way, with access restricted to researchers listed below.

**Are there any risks of discomforts if I am involved?**

We do not expect the survey questions to cause any harm or discomfort to you. However, if you experience feelings of distress as a result of participation in this study, you can exit the survey at any time with no penalty. You can also contact the following services for support:

- Lifeline – 13 11 14, [www.lifeline.org.au](http://www.lifeline.org.au)
- Beyond Blue – 1300 22 4636, [www.beyondblue.org.au](http://www.beyondblue.org.au)

### **What will happen with the results of the study?**

Results from this study will be published in scientific journals, presented at conferences and a short summary of outcomes will be published on the Flinders University website. However, the privacy and confidentiality of individuals will be protected at all times. You will not be named, and your individual information will not be identifiable in any research products without your explicit consent. No data will be shared or used in future research projects without your explicit consent.

### **How do I agree to participate?**

Participation is voluntary. You are free to exit the survey at any time prior to completion with no effect or consequences. If you agree to participate, please read, and agree to the consent form on the next screen.

Thank you for taking the time to read this information sheet.

### **Researchers**

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This research study has been approved by the Flinders University Human Research Ethics Committee (Project ID: 2857). For queries regarding the ethics approval of this study, or to discuss any concerns of complaints, please contact the Executive Officer of the committee via telephone on +61 8201 3116 or email [human.researchethics@flinders.edu.au](mailto:human.researchethics@flinders.edu.au)

## Participant Consent Form

### CONSENT STATEMENT

1. I have read the participant information provided (previous screen).
2. I am 18 years or older.
3. Details of the study, study outcomes and risks have been explained to my satisfaction.
4. I understand that:
  - Participation is entirely voluntary, and I am free to exit the survey at any time with no effect or consequences.
  - I may not directly benefit from taking part in this research.
  - While the information gained in this study will be published as explained, my individual information will remain confidential.
  - Only the researchers on this project will have access to my research data and raw results.

Do you agree to participate in this research survey? By clicking yes, you agree to the above consent statement.

- ☐ Yes, I would like to participate in the survey
- ☐ No

### Introduction

#### Introduction

Teleaudiology is defined as “the use of telecommunications and digital technology to provide access to audiological services for clients who are not in the same location as the clinician” (Audiology Australia, 2020). It includes the delivery of all kinds of

audiological services via digital means such as phone calls, video calls, internet/smartphone applications (apps), emails, text messages, online instant messaging, and websites.

## Demographics

What is your age? (Years)

What is your gender?

☐ Male

☐ Female

☐ Other - please specify

Which country are you currently living in?

Which state or territory are you currently living in?

- ☐ NSW
- ☐ VIC
- ☐ QLD
- ☐ SA
- ☐ WA
- ☐ TAS
- ☐ NT
- ☐ ACT

Do you have hearing loss?

- ☐ Yes
- ☐ No

Do you experience tinnitus (ringing/buzzing/other sounds in the ears without any external sound)?

- ☐ Yes
- ☐ No

How long have you been having hearing loss? (Years)

### **Tinnitus characteristics (adapted from TSCHQ)**

How long have you been experiencing tinnitus? (Years)

Where do you hear your tinnitus?

- ☐ Right ear
- ☐ Left ear
- ☐ Both ears, worse in right
- ☐ Both ears, worse in left
- ☐ Both ears, equally
- ☐ Inside the head
- ☐ Elsewhere - please specify

Would you describe your tinnitus as:

- ☐ Intermittent - it comes and goes from time to time
- ☐ Constant - it is there all the time

How would you describe the pitch of your tinnitus?

Very low pitch (e.g., thunder)

Very high pitch (e.g., whistle)

0 ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8 ☐ 9 ☐ 10 ☐

### Chronic pain

Do you experience chronic pain condition?

- ☐ Yes
- ☐ No

How long have you been experiencing chronic pain condition? (Years)

What is the cause of your chronic pain condition? (Select all that apply)

- ☐ Neuropathy/nerve damage related condition
- ☐ Osteoarthritis/bone damage related condition
- ☐ Rheumatoid arthritis/autoimmune related condition
- ☐ Non-specific pain/multi-regional pain/fibromyalgia related condition (pain without an underlying observable cause)
- ☐ Migraine related condition

How would you describe your pain when you are NOT EXPERIENCING tinnitus?

No pain Painful as bad as it could possibly be

0 ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8 ☐ 9 ☐ 10 ☐

How would you describe your pain when you are EXPERIENCING tinnitus?

No pain Painful as bad as it could possibly be

0 ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8 ☐ 9 ☐ 10 ☐

Do you use any medication to treat your chronic pain condition?

- ☐ Yes - please specify
- ☐ No

**Knowledge & general telehealth experience**



Do you know what teleaudiology is?

- ☐ Yes
- ☐ No

Please describe what teleaudiology means to you:

Have you ever used any telehealth services APART FROM teleaudiology services, e.g., with general practitioners (GPs) and other health professionals OTHER THAN hearing healthcare professionals?

- ☐ Yes
- ☐ No - I have been offered telehealth services, but I didn't take it
- ☐ No - I haven't been offered any

When did you use telehealth services?

- ☐ Only before 2020 (before COVID-19 outbreak)
- ☐ Only since 2020 (since COVID-19 outbreak)
- ☐ Both before and since 2020

How positive was your previous experience with telehealth services?

- ☐ Very negative
- ☐ Somewhat negative
- ☐ Neutral
- ☐ Somewhat positive
- ☐ Very positive

Would your previous experience with telehealth services affect how you think about and make decision to use teleaudiology services?

Why/why not?

- ☐ Yes - please explain why
- ☐ No - please explain why not

Why didn't you use telehealth services? (Select all that apply)

- ☐ Prefer in-person appointments
- ☐ Lack of suitable devices (smartphone/tablet/computer)
- ☐ Insufficient internet connectivity
- ☐ My unfamiliarity with technology
- ☐ Clinician's unfamiliarity with technology
- ☐ Appointment not reimbursable
- ☐ Personal data security concern
- ☐ There is no need any more as lockdown has ended/social restrictions have been eased
- ☐ Services I need cannot be delivered online - please describe type of services
- ☐ Other - please specify

Would your hesitation in using telehealth services affect how you think about and make decision to use teleaudiology services?

Why/why not?

☐ Yes - please explain why

☐ No - please explain why not

### **Teleaudiology appointments**

Have you ever attended any teleaudiology appointments?

☐ Yes

☐ No

When did you attend those teleaudiology appointments?

☐ Only before 2020 (before COVID-19 outbreak)

☐ Only since 2020 (since COVID-19 outbreak)

☐ Both before and since 2020

What were the appointments about? (Select all that apply)

- ☐ Hearing assessment
- ☐ Discussion on hearing aid/cochlear implant/other hearing device options
- ☐ Hearing aid initial fitting
- ☐ Hearing aid review and finetuning
- ☐ Cochlear implant initial fitting
- ☐ Cochlear implant review and finetuning
- ☐ Other hearing devices fitting
- ☐ Other hearing devices review and finetuning
- ☐ Counselling on everyday communication strategies/Auditory training programs
- ☐ Tinnitus management
- ☐ Other - please specify

How were the appointments delivered? (Select all that apply)

- ☐ Phone call
- ☐ Video call
- ☐ App-based (internet/smartphone)
- ☐ Email
- ☐ Text message
- ☐ Online instant messaging
- ☐ Other - please specify

Other than you and the clinician, who also attended the appointments? (Select all that apply)

- ☐ A facilitator who assisted the clinician in conducting the tests and communication
- ☐ A significant other (e.g., spouse, family member, carer, friend)
- ☐ A clinician in another discipline (e.g., general practitioner (GP), Ear, Nose and Throat (ENT) specialist)
- ☐ Other clients (e.g., in a group hearing rehabilitation program)
- ☐ None of the above

How did the third party affect your experience during the teleaudiology appointments?

- ☐ They improved the experience - please explain
- ☐ They worsened the experience - please explain
- ☐ They didn't affect the experience

What do you like about the appointments?

What do you not like about the appointments?

What factors do you think make an ideal teleaudiology appointment?

How likely will you continue having teleaudiology appointments?

- ☐ Very unlikely
- ☐ Somewhat unlikely
- ☐ Neutral
- ☐ Somewhat likely
- ☐ Very likely

Compared to face-to-face appointments, how have teleaudiology appointments affected service quality?

- ☐ Significantly worsened
- ☐ Slightly worsened
- ☐ No change
- ☐ Slightly improved
- ☐ Significantly improved

Why would service quality be worsened by having teleaudiology appointments instead of face-to-face ones?

Why would service quality be improved by having teleaudiology appointments instead of face-to-face ones?

Compared to face-to-face appointments, how have teleaudiology appointments affected your relationship/interaction with the clinician?

- ☐ Significantly worsened
- ☐ Slightly worsened
- ☐ No change
- ☐ Slightly improved
- ☐ Significantly improved

Have you been offered a teleaudiology appointment and did you take it?

- ☐ Yes - I have been offered one, but I didn't take it
- ☐ No - I haven't been offered any

If you were offered a teleaudiology appointment, would you take it?

- ☐ Yes
- ☐ No

What hinders you from having teleaudiology appointments? (Select all that apply)

- ☐ Prefer in-person appointments
- ☐ Lack of suitable devices (smartphone/tablet/computer)
- ☐ Insufficient internet connectivity
- ☐ My unfamiliarity with technology
- ☐ Clinician's unfamiliarity with technology
- ☐ My hearing difficulty stops me from communicating well over the phone/online
- ☐ Appointment not reimbursable
- ☐ Unable to find service providers
- ☐ Personal data security concern
- ☐ There is no need any more as lockdown has ended/social restrictions have been eased
- ☐ Services I need cannot be delivered online - please describe type of services
- ☐ Other - please specify

### Teleaudiology apps

Have you ever used any smartphone/computer apps that are made specifically to provide audiological services including hearing test, hearing aid finetuning, tinnitus management, noise level monitor, etc. (i.e., not the generic apps for making video calls such as Skype, Zoom, Microsoft Teams, etc.)?

- ☐ Yes
- ☐ No



How did you discover those apps? (Select all that apply)

- ☐ Search in app store/internet
- ☐ Clinician's suggestion
- ☐ Family/friend's suggestion
- ☐ From an advertisement
- ☐ Other - please specify

When did you use those apps?

- ☐ Only before 2020 (before COVID-19 outbreak)
- ☐ Only since 2020 (since COVID-19 outbreak)
- ☐ Both before and since 2020

Which type of device did you use the apps on? (Select all that apply)

- ☐ Smartphone
- ☐ Tablet
- ☐ Computer

What kind of services do the apps provide? (Select all that apply)

- ☐ Otoscopy (taking pictures/videos of your ear canal and eardrum for examination)
- ☐ Hearing screening (test results are shown as pass/fail only)
- ☐ Hearing diagnostic test (test results determine type and degree of hearing loss)
- ☐ Hearing aid finetuning
- ☐ Cochlear implant finetuning
- ☐ Other hearing devices finetuning
- ☐ Tinnitus management e.g., sound generator, counselling, relaxation
- ☐ Auditory training programs
- ☐ Hearing loss prevention e.g., noise level monitor, hearing protection educational information
- ☐ Other - please specify

What are the names of the apps?

What do you like about the apps?

What do you not like about the apps?

What factors do you think make an ideal teleaudiology app?

How likely will you continue using teleaudiology apps?

- ☐ Very unlikely
- ☐ Somewhat unlikely
- ☐ Neutral
- ☐ Somewhat likely
- ☐ Very likely

Why wouldn't you continue using teleaudiology apps?

Why would you continue using teleaudiology apps?

What hinders you from using those teleaudiology apps?

- ☐ Unaware of any
- ☐ Lack of suitable devices (smartphone/tablet/computer)
- ☐ Insufficient internet connectivity
- ☐ My unfamiliarity with technology
- ☐ Clinician's unfamiliarity with technology
- ☐ Insufficient research evidence to support their effectiveness
- ☐ Personal data security concern
- ☐ Other - please specify

## Satisfaction

To what extent do you agree with this statement: I think teleaudiology services/apps should be promoted and used more often.

- ☐ Strongly disagree
- ☐ Slightly disagree
- ☐ Neutral
- ☐ Slightly agree
- ☐ Strongly agree

Why do you think teleaudiology services/apps shouldn't be promoted and used more often?

Why do you think teleaudiology services/apps should be promoted and used more often?

### Anything else

Is there anything else you would like to share regarding teleaudiology?

☐ Yes - please explain

☐ No

### Further contact

Would you be interested to further discuss your views and comments on teleaudiology with a member of the research team in a short one-on-one online chat?

☐ Yes

☐ No

Please provide an email address for us to contact you. (By answering this question, you consent to being contacted via email by the research team listed in the participant information sheet.)