FACTORS INFLUENCING HEARING INSTRUMENT ADOPTION AND USE: LESSONS FROM THE HEALTH BELIEF MODEL

Louise Hickson
Communication Disability Centre
The University of Queensland
and
HEARing Cooperative Research Centre

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In Australia, 70% of older adults aged 70 years or older have hearing impairment (Chia et al., 2007).

If worn, hearing aids can:

• Reduce the communication difficulties associated with hearing impairment for the older person and significant others, improve quality of life (review by Humes & Krull in Evidence-Based Practice in Audiology, 2012)

In Australia, 39% of adults with hearing impairment have not consulted a health professional about hearing difficulties AND 58% do not own hearing aids (Hartley, 2005; Schneider et al., 2010).

Recent study shows improved outcomes with hearing aids (open fit, thin tube, directional mics) but still 13% of adults fitted with hearing aid/s for the first time never or rarely use them post-fitting (Dillon, Hickson & Lloyd, 2012).
• Recommendation 17
• The committee recommends that Australian Governments prioritise and fund research into the reasons for the under use of hearing aids, and develop practicable strategies for hearing health practitioners to help overcome the under use in the community.
THINKING ABOUT HEARING INSTRUMENT ADOPTION AND USE..

- General consensus that audiological factors do not prompt help-seeking (See Meyer & Hickson review in International Journal of Audiology, 2012)

- Help-seeking for hearing impairment requires a change in behaviour → Health Belief Model
HEALTH BELIEF MODEL

Demographic variables & psychological characteristics

Perceived susceptibility

Perceived severity

Perceived self-efficacy

Perceived benefits

Perceived barriers

Action

(Abraham & Sheeran, 2005)
THE RESEARCH STUDY

Retrospective study of 4 groups of adults:

- Non-consulters
- Consulters
- Unsuccessful HA owners
- Successful HA owners

Detailed assessment of each person.

Aim

- To determine factors associated with consultation and hearing instrument uptake
- To determine factors associated with success with hearing aids

The research team:

University of Queensland: Carly Meyer, Nerina Scarinci, Karen Lovelock, Paul Bunn

National Acoustic Laboratories – David Hartley, Emma van Wanrooy

Macquarie University – Michelle Lampert, John Newall

With thanks to....
RESEARCH AIMS

To determine which combination of factors are important for:

- Deciding to seek help for hearing impairment
- Achieving success with hearing aids
INCLUSION CRITERIA

All participants:
• 60+ years of age
• Average PTA threshold (.5, 1, 2, 4 kHz or 2, 3, 4 kHz) >25 dB in 1 or 2 ears
• Functional English abilities
• Residing in the community
• No obvious cognitive impairment (≥ 23 on Mini-Mental State Examination)

Hearing aid owners:
• Hearing aid fitting for the first time in the previous 2 years
DEFINING SUCCESS

1. A minimum of 1 hour of daily hearing aid use reported on the International Outcome Inventory.

“Think about how much you used your present hearing aid(s) over the past two weeks. On an average day, how many hours did you use the hearing aid(s)?”

Response options: none, <1 hour/day, 1-4 hours/day, 4-8 hours/day, 8+ hours/day

AND

2. At least moderate benefit from hearing aids reported on the International Outcome Inventory.

“Think about the situation where you most wanted to hear better, before you got your present hearing aid(s). Over the past two weeks, how much has the hearing aid helped in those situations?”

Response options: not at all, slightly, moderately, quite a lot, very much
THE PARTICIPANTS (N = 307)

Group 1
Non-Consulters 55

Group 2
Consulters 92

Group 3
Unsuccessful HA owners 75

Group 4
Successful HA owners 85

PTA - BEA

<table>
<thead>
<tr>
<th>Frequency (kHz)</th>
<th>Group 1</th>
<th>Group 2</th>
<th>Group 3</th>
<th>Group 4</th>
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<tbody>
<tr>
<td>0.5</td>
<td></td>
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<td>1</td>
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AUDIOLOGIC REHABILITATION IN AUSTRALIA

• **Funding**
  • Those receiving a government pension are eligible for free or subsidized hearing services, including hearing aids e.g., retirees on a low income and war veterans
  • Those not receiving a government pension pay for their hearing aids. Those with private health insurance can receive some financial contribution.

• **Clinicians**
  • Audiologists have a Masters’ degree
  • Audiometrists have vocational training
# Participants (N = 307)

<table>
<thead>
<tr>
<th>Gender</th>
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<tbody>
<tr>
<td>Female</td>
<td>111 (36%)</td>
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<tr>
<td>Male</td>
<td>196 (64%)</td>
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<table>
<thead>
<tr>
<th>Age</th>
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<tbody>
<tr>
<td>Mean</td>
<td>73 years</td>
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<tr>
<td>SD</td>
<td>7.2 years</td>
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<table>
<thead>
<tr>
<th>Education status</th>
<th></th>
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</thead>
<tbody>
<tr>
<td>Primary</td>
<td>24 (8%)</td>
</tr>
<tr>
<td>Secondary</td>
<td>113 (37%)</td>
</tr>
<tr>
<td>Tertiary</td>
<td>170 (55%)</td>
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<table>
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<tr>
<th>Employment Status</th>
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<tbody>
<tr>
<td>Retired/House Duties</td>
<td>256 (83%)</td>
</tr>
<tr>
<td>Employed (FT or PT)</td>
<td>51 (17%)</td>
</tr>
<tr>
<td>Pension Status</td>
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<tr>
<td>------------------------</td>
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<tr>
<td>Age Pension</td>
<td>141 (46%)</td>
</tr>
<tr>
<td>Veteran’s Pension</td>
<td>21 (7%)</td>
</tr>
<tr>
<td>Other Pension</td>
<td>17 (6%)</td>
</tr>
<tr>
<td>No Pension</td>
<td>128 (42%)</td>
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<thead>
<tr>
<th>Living Status</th>
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<tbody>
<tr>
<td>No one</td>
<td>77 (25%)</td>
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<tr>
<td>Spouse/Family/Friend</td>
<td>230 (75%)</td>
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<thead>
<tr>
<th>Degree of Hearing Impairment in Worse Ear</th>
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<tbody>
<tr>
<td>26 – 40 dB HL</td>
<td>157 (51%)</td>
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<tr>
<td>41 – 55 dB HL</td>
<td>85 (28%)</td>
</tr>
<tr>
<td>56 – 70 dB HL</td>
<td>18 (6%)</td>
</tr>
<tr>
<td>71+ dB HL</td>
<td>14 (4%)</td>
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Hearing aids (n = 160)

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<tbody>
<tr>
<td>Bilateral</td>
<td>138 (86%)</td>
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<tr>
<td>Behind-the-ear aids</td>
<td>128 (80%)</td>
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</table>
Information collected in the clinic:
- Demographic information
- Vision questionnaire
- Schedule of Life Events
- General Health Questionnaire
- Hearing test
- Hearing aid insertion gain
- Cognitive test (Cognistat)
- Manual dexterity test (Grooved Pegboard)

Questionnaires completed by client prior to appointment:
- Hearing Handicap Questionnaire
- Self-Assessment of Communication
- Attitudes Towards Hearing Aids
- Measure of Audiological Rehabilitation
- Self-efficacy for Hearing Aids
- Coping Strategy Indicator
- Locus of Control Scales
- Auditory Lifestyle and Demand Questionnaire
- Social Activities Checklist
RESULTS
HELP-SEEKING FOR HEARING IMPAIRMENT
STATISTICAL COMPARISONS

Group 1: Non-Consulters
Group 2: Consultants
Group 3: Unsuccessful HA owners
Group 4: Successful HA owners
HELP-SEEKING: IMPORTANT VARIABLES

- Attitude to hearing aids
- Hearing aid self-efficacy
- Pension status
- Support of significant others
- Based on the Health Belief Model
- 23-item questionnaire on Attitudes Towards Hearing Aids (adapted from van den Brink, 1995)

- Perceived benefits (9 items) e.g., My hearing aid makes listening less of a strain

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<tr>
<td>1</td>
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<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Strongly disagree</td>
<td>Disagree</td>
<td>Neither agree or disagree</td>
<td>Agree</td>
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Group 3
Groups 1 & 2
Group 4
How would you rate your general attitude to hearing aids?

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<tbody>
<tr>
<td>-5</td>
<td>-4</td>
<td>-3</td>
<td>-2</td>
<td>-1</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>very negative</td>
<td>neutral</td>
<td>very positive</td>
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Groups 1, 2 & 3

Group 4
PENSION STATUS

Percentage receiving pension

- Group 1 Non consulters
- Group 2 Consulters
- Group 3 Unsuccessful hearing aid owners
- Group 4 Successful hearing aid owners
HEARING AID SELF-EFFICACY

- Measure of Audiologic Rehabilitation Self-Efficacy for Hearing Aids (MARS-HA) (West & Smith, 2007)
- 24-item questionnaire
- Four factors:
  - Basic Handling (7 items) e.g., I can insert a battery into a hearing aid with ease
  - Adjustment (3 items) e.g., I could get used to the sound quality of hearing aids
  - Advanced Handling (5 items) e.g., I can stop a hearing aid from squealing
  - Aided Listening (9 items) e.g., I could understand a one-on-one conversation in a quiet place if I wore hearing aids

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<thead>
<tr>
<th></th>
<th>0%</th>
<th>50%</th>
<th>100%</th>
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<tbody>
<tr>
<td>Certain cannot do</td>
<td>Moderately certain can do</td>
<td>Certain can do</td>
<td></td>
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Groups 1, 2, 3

Group 4
Used 23-item Attitudes Towards Hearing Aids questionnaire (adapted from van den Brink, 1995)

- Negative support from significant others (3 items) e.g., People around me think a hearing aid has more disadvantages than benefits

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Groups 1 & 2

Groups 4 & 3
HELP-SEEKING SUMMARY

Demographic variables & psychological characteristics

Perceived susceptibility

Perceived severity

Perceived self-efficacy

Perceived benefits

Perceived barriers

Clients and significant others views of benefits and barriers

Action

Pension status
RESULTS

SUCCESS WITH HEARING AIDS
STATISTICAL COMPARISON

Group 1
Non-Consulters
55

Group 2
Consulters
92

Group 3
Unsuccessful HA owners
75

Group 4
Successful HA owners
85
SUCCESS WITH HEARING AIDS: IMPORTANT VARIABLES

- Support of significant others
- Self-reported hearing difficulties
- Insertion gain
23-item questionnaire (adapted from van den Brink, 1995)

**Positive Support Item Examples**

- People around me say I am not hearing well without my HA
- The people around me think I hear better with my HA
- The people around me think it was wise to obtain a HA

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<td>Disagree</td>
<td>Neither agree or disagree</td>
<td>Agree</td>
<td>Strongly agree</td>
</tr>
</tbody>
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Group 3  
Group 4
Hearing Handicap Questionnaire (Noble & Gatehouse, 2004)

**Item Examples**
- How often does your hearing difficulty restrict the things you do?
- How often do you feel worried or anxious because of your hearing difficulty?
- How often do you feel inclined to avoid social situations because of your hearing difficulty?

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<tbody>
<tr>
<td>Never</td>
<td>Rarely</td>
<td>Sometimes</td>
<td>Often</td>
<td>Almost always</td>
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</table>

Group 3

Group 4
MEAN INSERTION GAIN CURVES FOR SUCCESSFUL AND UNSUCCESSFUL HEARING AID USERS

- NAL-NL1 target left
- NAL-NL1 target right
- Unsuccessful left
- Unsuccessful right
- Successful left
- Successful right

Mean gain provided (65 dB)
Frequency (Hz)
HEARING AID SUCCESS SUMMARY

Insertion gain

Demographic variables & psychological characteristics

Perceived susceptibility
Perceived severity
Perceived self-efficacy
Perceived benefits
Perceived barriers

Clients and significant others views of benefits and barriers

Action
WHAT DOES THIS MEAN IN THE REAL WORLD?

To improve uptake and outcomes in hearing rehabilitation there is a need to address:

- **Support of significant others**
- **Attitudes to hearing instruments**
- **Self-reported hearing difficulties**
- **Perceived self-efficacy**

And with hearing aid fitting

- **Insertion gain matching target**
FUTURE DIRECTIONS

- Family members’ involvement in hearing rehabilitation (Nerina Scarinci)
- Evaluating an intervention aimed at improving self-efficacy - if improved, do uptake and outcomes also improve?
- Do hearing aid user guides optimally designed for health literacy improve hearing aid management?
- Patient-practitioner interaction and its relationship to uptake and outcomes
THANK YOU!

- My contact details: l.hickson@uq.edu.au

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