Using m-health technologies to increase access and benefits of hearing-related education interventions for hearing aid users

Melanie Ferguson1,2, David Maidment1,3a, William Brassington2, Heather Wharrad3b
1National Institute for Health Research Nottingham Hearing Biomedical Research Unit; 2Nottingham University Hospitals NHS Trust; 3University of Nottingham •Division of Clinical Neuroscience •School of Health Sciences

Background

Research Question
Do video tutorials supplement advice and information provided by audiologists resulting in enhanced benefit and use for first-time hearing aid users?

Aims
I. To develop a series of interactive multimedia video tutorials, or reusable learning objects (RLOs), that provide a broad range of auditory rehabilitation advice for first-time hearing aid users
II. Assess the benefits and cost-effectiveness of RLOs.

Phase I: Development of RLOs
RLO content was defined by
a) a delphi review of hearing experts
b) focus groups and workshops:
hearing aid users (n=35) and audiologists (n=11).
RLOs (total duration ~1h) included learning objectives, a range of visual imagery (illustrations, video clips, animations, photos, testimonials), and an interactive multiple-choice quiz with feedback. All were submitted.

Phase II: Clinically registered randomised control trial1,2
• N=203 first-time hearing aid users recruited at fitting appointment
• Arms: (i) received RLOs (RLO+; n=103) (ii) waitlist control group (RLO-, n=100)
• Delivery: DVD for TV (61.9%), PC (15.2%), and internet (32.9%).
• Evaluation: 6 weeks post-fitting
• Participants: Age =67.9 years; BEA, 5-60dBHL females=37.7%.

Hearing aid use
• No group difference in overall GHABP use (p=.48)
• In suboptimal users (use <70%), significantly higher use in the RLO+ group, large effect (df=.88).

Knowledge of hearing aids and psychosocial issues

Knowledge of hearing aids and hearing aid use (GHABP)

Increasing research shows that communication partners are an important factor in aural rehabilitation2.

Practical hearing aid skills
• RLO+ group had significantly better practical hearing aid skills (p=.001)
• Telephone use and cleaning earmould were significantly better in the RLO+ group (p=.01)
• Significant effect of age (p=.04), but not gender or hearing threshold.
• Greater internet competency predicted greater practical hearing aid knowledge and handling skills.
• Greater hearing aid handling skills were associated with greater hearing aid satisfaction (I0I-HA) and patient activation (PAM) (p=.05). However, practical hearing aid knowledge mediated this relationship.

Hearing handicap inventory for the elderly (HHIE)

Glasgow Hearing Aid Benefit Profile (GHABP)

References
1. Clinical Trials Registration (registered retrospectively): ISRCTN11486888.

Future research
An NIHR research grant will fund research planned to start early 2017.

Aims
I. To develop a theoretically-driven user-centred personalised intervention that goes beyond the ‘one size fits all’ approach of C2Hear.
II. Establish feasibility of the intervention by evaluating delivery, accessibility, usability, acceptability, and adherence in first-time hearing aid users.

Methods
Further development and refinement of C2Hear to produce mobile-enabled RLOs (m-RLOs) for use with mobile technologies (e.g. smartphones) and the internet.

We will use the COM-B1 health behaviour change model to:
- develop a user-centred intervention that aims to increase hearing aid use in first-time hearing aid users
- enable a personalised approach to knowledge acquisition and exchange that meets the needs of the individual
- introduce self-evaluation of an individual's progress based on their specific needs.

Phase I: Repurpose C2Hear RLOs
- Identify the individualised components of the m-RLOs using:
(i) a theoretical approach based on the COM-B model
(ii) an ecological approach using a Think Aloud analysis involving existing hearing aid users.

Phase II: Development of m-RLOs
- Following a user-centred design, a panel of hearing aid users will review and advise on aspects of usability, to ensure the m-RLOs are aligned to the end-users needs.

Phase III: Feasibility
- Assessment of the intervention in first-time hearing aid users using a mixed-methods approach to evaluate delivery, accessibility, usability, acceptability, and adherence.

Next steps
Developing a web-based app suitable for delivery on multiple mobile platforms aimed at communication partners/public, that will enable greater interactivity.

Three RLOs will be evaluated using semi-structured interviews:

1. Communication tactics in different environments
2. Psychosocial consequences of hearing loss
3. Understanding the technical aspects of hearing loss.

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