



Gabrielle Saunders, Ph.D., M. Samantha Lewis, Ph.D. & Anna Forsline, M.A.
VA RR&D National Center for Rehabilitative Auditory Research, Portland, Oregon

Introduction

People wait many months between learning they have a hearing loss and acquiring a hearing aid. Presumably during this time they formulate expectations about hearing-aid use.

These pre-conceived notions (expectations) affect reported outcome, hearing-aid satisfaction, and the frequency with which the hearing aids are worn. Data show higher expectations result in better overall outcome. Some, however, suggest that unrealistically high expectations may result in disappointment and poor outcome.

This begs the question as to whether it is beneficial to address unrealistic expectations prior to fitting a hearing aid. The limited data available are mixed on whether pre-fitting counseling changes expectations and improves outcome.

In this study we addressed the following questions: (a) Does pre-fitting counseling alter the expectations of new hearing-aid users? (b) Is pre-fitting counseling supplemented with demonstration of real-world listening more effective than verbal-only counseling at changing expectations and outcome?

Study Methods

Overview

- Participants were new hearing-aid users (18 female, 42 male), aged 55-81 years with symmetrical sensorineural hearing loss, who were fitted with binaural Beltone OriA BTE digital hearing aids.
- 40 received pre-fitting counseling and auditory demonstration of real-world listening situations with the Beltone AVE™ system; 20 received verbal-only pre-fitting counseling.
- Expectations were measured at initial contact and following pre-fitting counseling
- Reported outcome was measured after eight to ten weeks of hearing-aid use.

Questionnaire Measures

Client-Oriented Scale of Improvement (COSI): Expected Consequences of Hearing aid Outcome (ECHO) to determine 3-5 listening situations participants most wanted improved. *Initial section used as basis for pre-fitting counseling (see below), final section used as outcome measure.*

Hearing Handicap Inventory for the Elderly/Adults (HHIE/A) to evaluate social and emotional hearing handicap. *Completed for unaided and aided listening*

Abbreviated Profile of Hearing Aid Benefit (APHAB) to measure hearing disability for Ease of Communication (EC), Reverberation (RV), Background Noise (BN) and Aversiveness (AV). *Completed pre- and post-counseling and following hearing-aid use to assess aided impacts.*

Satisfaction with Amplification in Daily Life (SADL) to assess satisfaction. *Completed after 8-10 weeks of hearing-aid use*

Psychosocial Impact of Assistive Devices Scale (PIADS) to assess the psychosocial impact of assistive devices for Competence, Self-esteem, and Adaptability. *Completed pre- and post-counseling and following hearing-aid use to assess aided impacts.*

Counseling Groups

Group 1: Pre-fitting counseling plus auditory demonstration of listening situations with the Beltone AVE™ system. Hearing aids fine-tuned at follow-up if requested.

Group 2: Pre-fitting counseling plus auditory demonstration of listening situations with the Beltone AVE™ system, but no fine-tuning.

Group 3: Pre-fitting verbal-only counseling, but no fine-tuning.

Beltone Audio Verification Environment (AVE™)

- An interactive multimedia system that uses 'real-world' recordings made on location with a multi-microphone system.
- Signals presented from 4 broadband speakers and a subwoofer
- Signal-to-noise and signal levels can be adjusted independently, and mixed as desired
- Patient sits in the calibrated sound-field listening to the 'real-world' recordings

Study Counseling Content

Counseling focused on situations identified by participant in initial section of the COSI as being those he/she most wanted improved.

Rigid counseling protocols were developed to ensure between-subject uniformity.

Groups 1 and 2: Beltone AVE™ simulations of COSI situations presented to the aided participant. Participant and experimenter then discussed the experience, addressing issues such as 'Did things sound as expected with hearing aids?', 'How did it differ?', 'How did it differ from not wearing hearing aids?', 'Were the hearing aids helpful? If not what was the problem?' The potential benefits and difficulties of hearing aids in each listening situation were discussed. Listening strategies for each situation were suggested.

Group 3: Participants received verbal-only counseling. The participant was prompted to discuss his/her expectations about hearing aids, the potential benefits and difficulties of wearing the hearing aids in each situation were discussed. Listening strategies for each situation were suggested.

Protocol by Visit

Visit	General	Hearing aid-related	Questionnaires
Pre-study	Informed consent, case history, audiometry, otoscopy, tympanometry.	Ear impressions	COSI – initial section, HHIE/A-U APHAB-U & E ECHO PIADS-E
Day 1	Random assignment to Counseling Groups	Hearing-aid fitting and counseling	APHAB-E ECHO PIADS-E
Week 1-2		Hearing-aid check. Fine tuning for Gp. 1 as req'd.	
Week 8-10		Hearing-aid check	HHIE/A-A APHAB-A SADL PIADS-A COSI – final section

Results and Discussion

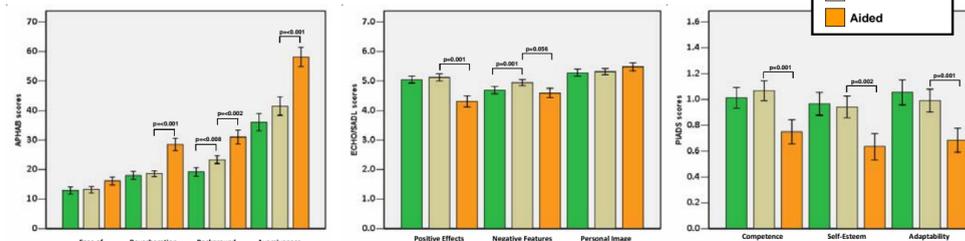
Demographic data: No significant group differences in age or hearing thresholds.

Unaided Questionnaire data: No significant group differences in pre-counseling expectations or baseline unaided APHAB and HHIE/A scores.

Hearing Aid Benefit: No significant group differences in hearing-aid benefit.

Effect of Counseling on Expectations and Outcome: Repeated-measures ANOVAs showed no significant group differences on pre- and post-counseling scores, and aided scores on any questionnaire. Data were therefore combined for next analyses.

Graphs show pre- and post-counseling APHAB, ECHO and PIADS scores and aided scores on APHAB, SADL and PIADS for all data combined.



- Lower scores on APHAB = fewer expected/reported difficulties
- Higher scores on SADL/ECHO = greater expected/reported satisfaction
- Higher scores on PIADS = higher psychosocial expectations/better psychosocial outcome

Pre- vs. post-counseling scores: Counseling lowered expectations for listening in background noise (BN) and raised expectations about negative features (NF).

Post-counseling vs. aided scores: Participants reported significantly more aided disability than expected on RV, BN and AV scales of the APHAB, significantly less satisfaction than expected on PE and NF scales of ECHO/SADL, and significantly poorer psychosocial outcome than expected on all three PIADS scales

Relationships between Expectations and Outcome: The table below shows Pearson r-values for correlations between post-counseling expectations and aided outcome scores

APHAB	EC r = 0.151	RV r = 0.339**	BN r = 0.203	AV r = 0.422**
ECHO/SADL	PE r = 0.373**	NF r = 0.123	PI r = 0.381**	
PIADS	Competence r = 0.427**	Adaptability r = 0.533**	Esteem r = 0.529**	

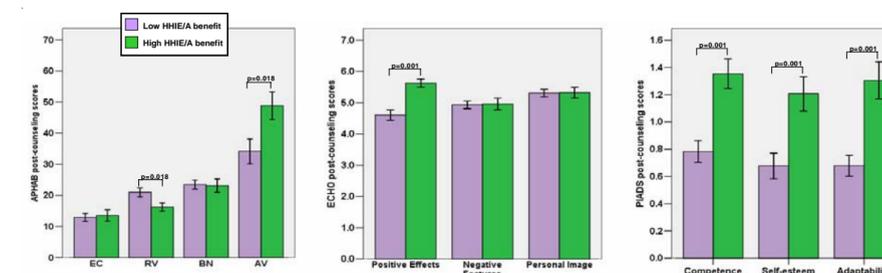
*p<0.05
** p<0.01

Positive correlations suggest that higher expectations result in better aided outcome, and vice versa. Note that the correlations between expectations are higher for the PIADS scales than for scales from hearing-specific questionnaires.

Comparison of high-benefit versus low-benefit participants: The graphs below show the expectations of individuals who obtained low-benefit versus high-benefit as measured by HHIE/A.

Low benefit = aided HHIE/A score did not improve over unaided score by >95% critical difference

High benefit = aided HHIE/A score improved over unaided score by >95% critical difference



High-benefit group (green bars) had significantly higher expectations than the low-benefit group (purple bars) on RV scale of the APHAB, PE scale of the ECHO and on all three PIADS scales.

Summary and Conclusions

- Pre-fitting counseling had significant effects on expectations for hearing in adverse listening conditions.
- Pre-fitting psychosocial counseling was not addressed, hence no effects were seen on psychosocial expectations.
- Although AVE counseling did not alter outcome, the patients reported enjoying the experience and the audiologist found demonstrations easy made counseling more concrete.
- Positive expectations resulted in better outcome.

It seems that high psychosocial expectations are more important for a positive outcome than high expectations specific to hearing. i.e. hearing-impaired individuals need to want hearing aids to change their life not simply to alter their ability to hear in specific situations. Presumably audiologists can change hearing-specific expectations, but can psychosocial expectations be changed with counseling?

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