A systematic review of health-related quality of life hearing aids: final report of the American Academy of Audiology Task Force on the Health-Related Quality of Life Benefits of Amplification in Adults


CRD summary
This review concluded that hearing aids improve the health-related quality of life of adults. The quantity and quality of the included studies was limited, and some aspects of the review process were not reported. Despite this, the conclusions are likely to be reliable since the direction of effect was similar across studies, with larger effects reported in the better quality studies.

Authors' objectives
To evaluate the effect of hearing aids on health-related quality of life (HRQoL) in adults with sensorineural hearing loss (SNHL).

Searching
ComDisDome was searched from 1980, and CINAHL, EBM Reviews, the Cochrane CENTRAL Register and the Cochrane Database of Systematic Reviews from 1996 to July 2004; the search terms were reported. Only studies reported in the English language were included.

Study selection
Study designs of evaluations included in the review
Randomised controlled trials (RCTs), quasi-randomised trials and uncontrolled observational studies were eligible for inclusion.

Specific interventions included in the review
Studies evaluating hearing aids, regardless of the style, signal processing circuitry, microphone or fitting strategy, were eligible for inclusion. Information relating to the hearing aids actually evaluated was not provided.

Participants included in the review
Studies of adults (over 18 years) with SNHL, from mild to profound, who were new or previous hearing aid users and lived independently or in assisted accommodation were eligible for inclusion. The participants were predominantly male, new hearing aid users, and had a mean age across subgroups ranging from 54 to 74.3 years. None of the studies included people with profound hearing loss.

Outcomes assessed in the review
Studies had to use a validated generic, disease-related HRQoL instrument, or disease-related self-report instrument, to be included. The outcome measures used were the Hearing Handicap Inventory for the Elderly, EuroQoL (EQ-5D), EuroQoL-Visual Analog Scale, Auditory Disability Preference Index-Visual Analog Scale, Quantified Denver Scale of Communication Function, Short Portable Mental Status Questionnaire, Geriatric Depression Scale, Self-evaluation of Life Function, Hearing Handicap Inventory for adults and the Medical Outcomes Study Short Form 36 (MOS SF-36).

How were decisions on the relevance of primary studies made?
Two reviewers independently selected the studies; a third reviewer resolved any disagreements.

Assessment of study quality
Study quality was assessed in terms of the use of a control group and power calculations, comparability at baseline, details of the inclusion and exclusion criteria, the fit of the hearing aid and verification, statistics used, and the reporting of drop-outs. The authors did not state how many reviewers performed the quality assessment.

Data extraction
The authors did not state how the data were extracted for the review, or how many reviewers performed the data extraction. Changes in HRQoL scores after treatment or difference compared with the control were extracted from each study, and Cohen's d and 95% confidence intervals (CIs) calculated for each outcome measure reported. Funnel plots were used to evaluate publication bias.

**Methods of synthesis**

How were the studies combined?
Mean Cohen's d effect sizes (ES) and CIs were calculated for the RCTs and quasi-experimental studies combined, and the correlational study and pre-test post-test studies combined, using a random-effects model. Thresholds of 0.2, 0.5 and 0.8 were used for small, medium and large effects in experimental studies, and 0.48, 1.21 and 1.95 for such effects in observational studies.

How were differences between studies investigated?
Differences between the studies were discussed in the text, study details tabulated, and study results presented graphically.

**Results of the review**

Sixteen studies (n=1,557) were included in the review: 2 RCTs, 5 quasi-experimental studies, 1 correlational study and 8 pre-test post-test studies.

Three studies used a control group, 12 reported adequate details of the inclusion and exclusion criteria, 9 reported on hearing aid fit and/or verification of fit, and one on the use of a power calculation. All 16 studies used appropriate statistical analyses. Where applicable, all studies had groups comparable at baseline, and 50% discussed drop-outs. The authors stated that there was no evidence of publication bias in the review.

Generic HRQoL instruments: the mean ES from RCTs and quasi-randomised trials was 0.28 (95% CI: 0.09, 0.48), and 0.02 (95% CI: -0.04, 0.07) when observational studies were included.

Disease-specific HRQoL instruments: the mean ES from RCTs and quasi-randomised trials was 2.07 (95% CI: 0.51, 3.63), and 1.01 (95% CI: 0.76, 1.26) from observational studies.

Cohen's d values and 95% CIs were provided for each domain of the EQ-5D and MOS SF-36 HRQoL measures from the 3 studies that reported them.

**Authors' conclusions**

Hearing aids improve adults' HRQoL by reducing the psychological, social and emotional effects of SNHL.

**CRD commentary**

The review addressed a clear research question, with clearly defined inclusion criteria. Several relevant sources were searched, thereby reducing the potential for publication bias. However, only English language studies were included, therefore there is a potential for language bias. Although the study selection was conducted in duplicate, it was not clear whether similar methods to reduce error and bias were employed during the data extraction and quality assessment phases. The included studies did not include people with profound hearing loss, therefore the results may not be generalisable to that group. The authors did not investigate heterogeneity between the studies, stating that a random-effects meta-analysis negated the need for this. There were limitations to the evidence available in terms of both the numbers of studies evaluating each HRQoL measure and the quality of the included studies. Despite this, and the lack of reporting of some of the review methodology, the conclusions are likely to be reliable since most of the studies reported the same direction of effect, with the larger effects from better quality studies.

**Implications of the review for practice and research**

Practice: The authors did not report any implications for practice.

Research: The authors suggested that future studies should use an RCT design, include a heterogeneous population, focus on the effect of hearing aid treatment on generic HRQoL, use new outcome measures that are sensitive to the
consequences of hearing loss and interventions to treat it, and derive contextually appropriate benchmarks to use in audiologic treatment.

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