Comparing Objective and Subjective Measures of Hearing Aid Use:
Systematic review protocol

Review objective

To quantify differences in reported hearing aid use measured via subjective and objective tools and to characterize patient variables associated with hours of daily hearing aid use and subjective over-report.

Searches

A comprehensive search strategy developed in consultation with an academic librarian will be used to identify potentially relevant articles. Published studies will be identified from the following databases: PubMed, Web of Science, Scopus, Embase, PsycINFO, CINAHL, ClinicalTrials.gov, and Cochrane Central Register of Controlled Trials (CENTRAL).

Search queries will be conducted using Boolean operators and controlled vocabulary (e.g., Medical Subject Headings or MeSH) terms (if applicable). Search terms will be informed by prior systematic reviews and other reviews on hearing aid use and user outcomes. Search terms include the following main concepts: “hearing aids” *and* “adults” *and* “outcomes” *and* “compliance” *or* “non-compliance.”

Searches will also be conducted in the reference lists of included studies for other potentially relevant studies.

Types of study to be included

All experimental, quasi experimental, and observational studies that describe outcomes in adult hearing aid users and report at least one measure of hearing aid use.

Condition or domain being studied

Adults fit with air-conduction hearing aids

Participants/population

Studies will be included which include adults participants (18 years or older) with sensorineural hearing loss and digital air-conduction hearing aids. Studies whose participant populations include those with a known cognitive impairment will be excluded. Studies will be included which include a subjective or objective measure of hearing aid use. Studies that use both types of measures will be categorized separately.

Intervention(s)/exposure(s)

Digital hearing aids

Comparator(s)/control

Average hearing aid use will be aggregated and compared according to demographic factors and type of tool used to measure hearing aid use

Context

Published articles from the years 1990-2020 with no restriction on language or country of origin will be included.

Main outcome(s)

- Quantitative differences in objective and subjective measures of hearing aid use
- Predictors of hearing aid use
- Predictors of subjective over-report of hearing aid use
- Relationships between hearing aid use and other patient-reported outcomes

Data extraction (selection and coding)

In accordance with Cochrane Collaboration guidelines for conducting systematic reviews, two researchers will conduct an independent title and abstract screening in Rayyan using a decision tree for inclusion and exclusion criteria. Two researchers will then conduct a blind title and abstract screening in Rayyan and meet to resolve any discrepancies. Full-text will be located and independently reviewed for eligibility. The researchers will compare their full-text review and discrepancies will be resolved using a consensus-based approach.

Two researchers will divide and independently extract data using a data extraction form in Research Electronic Data Capture (REDCap). The data extraction form will include: details about the study (e.g., aims and objectives, intervention characteristics, behavioral theory, study design, population characteristics, and sample size), measures (e.g., hearing aid use, outcomes, and other measures), data collection methods and scales used, as well as the application of hearing aid use measurement in the article.

Risk of bias (quality) assessment

For RCTs, risk of bias will be assessed using the Cochrane Collaboration tool for assessing risk of bias and will be categorized as low, unclear, or high risk of bias. For non-RCTs, risk of bias will be assessed using the Risk Of Bias In Non-randomized Studies—of Interventions (ROBINS-I) and will be classified as low, moderate, serious, or critical risk, or no information based. Depending on the number of articles included in the review, the two researchers will independently code risk of bias for all articles and disagreements will be resolved by discussion.

Strategy for data synthesis

If possible, an analysis of aggregate hearing aid usage by demographic factors and type of hearing aid measurement tool will be conducted by pooling studies using mixed-effects models with 95% confidence intervals. The heterogeneity of the included studies will guide the choice of model. Significant heterogeneity will necessitate a narrative/descriptive review of included studies. Authors will be contacted for additional data if needed.

Contact details for further information

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Organizational affiliation of the review

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Review team members and their organizational affiliations
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Type and method of review
Systematic review

Anticipated or actual start date
September 2020

Anticipated completion date
January 2021

Funding sources/sponsors
Northwestern University The Graduate School

Conflicts of interest
Alexandra Brockner: none known, Jasleen Singh: none known

Language
English

Country
United States of America

Subject index terms
Hearing loss, hearing aids, hearing aid, adults, compliance, non-compliance, datalogging

Stage of review
Review ongoing

Date of registration in DigitalHub
August 2020

Stage of review at time of this submission	Started	Completed
Preliminary searches	Yes	No
Piloting of study selection process	No	No
Formal screening of search results against eligibility criteria	No	No
Data extraction	No	No
Risk of bias (quality) assessment	No	No

Data analysis	No	No