School of Sport, Exercise and Health Sciences

A systematic review and meta-analysis assessing the effectiveness of physical activity interventions in adults with hearing loss

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Background and Aims

- Growing epidemiological evidence indicates that hearing loss in adults is associated with declines in physical function and health [1]
- Adults with hearing loss have also been found to engage in less physical activity than those with normal hearing [2]
- Low physical activity and hearing loss are associated with increased risks of developing noncommunicable diseases (e.g. cardiovascular-diseases, diabetes, dementia).

Aim: To synthesise existing literature assessing interventions that aim at to improve physical function/ activity in adults with hearing loss.

Methods

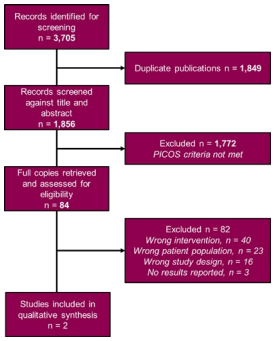
- The study followed the Preferred Reporting Items for Systematic reviews and Meta-analyses (PRISMA) [3].

PICOS	Inclusion Criteria
Participants	≥18 years, no upper limit Established mild-to-moderate hearing loss Bilateral and unilateral sensorineural, conductive, and mixed hearing losses
Intervention	Any behaviour change intervention that aimed to increase the level (intensity) or amount (frequency) of physical activity
Comparators	Passive (e.g. no intervention) or active (e.g. alternative intervention)
Outcomes	Level and/ or amount of activity Functional fitness Adverse effects Physiological measures Cognition Psychosocial wellbeing Hearing-specific health-related quality of life General health-related quality of life. Feasibility Behaviour change techniques
Study Designs	Retrospective or prospective studies Randomised/ non-randomised controlled trials Before and after studies

Included studies

Only two studies were included in the review:

1. **Jones et al** [4]
   Older adults were randomised to a 10-week intervention consisting of group auditory rehabilitation, exercise and walking sessions, and socialization/ health education or a group auditory rehabilitation control group
2. **Bruce et al** [5]
   Older adults were randomised to a six-week intervention involving both aerobic exercise and cognitive dual-task training, which were undertaken simultaneously (intervention) or sequentially (control).

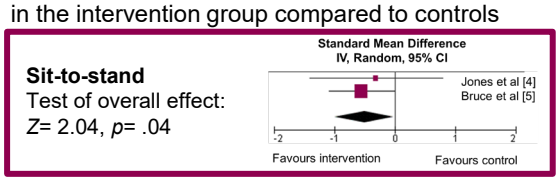


Summary and Conclusions

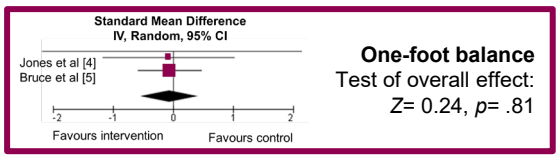
Primary Outcome

Functional Fitness

- Meta-analysis revealed that chair **sit-to-stand**, but not **one-foot balance** time improved significantly for those in the intervention group compared to controls



Sit-to-stand
Test of overall effect:
Z= 2.04, *p*= .04



One-foot balance
Test of overall effect:
Z= 0.24, *p*= .81

- Jones et al [4] also showed that performance on **gait speed** and the **back-scratch** tests improved significantly in the intervention group only
- No other measures (**get up and go**, **grip strength**, **sit and reach**) differed significantly between groups.

Secondary Outcomes

- No significant differences between groups for **cognition** [5], **psychosocial wellbeing** [4], **hearing-specific health-related quality of life** [4], **general health-related quality of life** [4].
- Overall, the intervention was rated favourably [4]
- **Behaviour Change Techniques** included goal setting, review of behaviour goals, self-monitoring, social support, and problem solving were used [4].

Summary and Conclusions

Summary of main findings

- Limited existing research has assessed physical activity interventions in adults with hearing loss
- Evidence is mixed in terms of whether physical activity interventions improve outcomes
- Available evidence is of low quality and subject to bias due to study design limitations
- Further high-quality research is needed to determine whether interventions that aim to improve physical activity should be incorporated into aural rehabilitation.

Future research

- This systematic review will be used to inform further research assessing associations between hearing loss, physical activity, and general health.

REFERENCES

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3. Moher et al. (2009). BMJ, 339, b2535.
4. Jones et al. (2019). BMJ Open, 9, e026169.
5. Bruce et al. (2019). Gait and Posture, 67, 262-268.5

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