



Slight Hearing Loss in School-Age Children: Impacts and Interventions

Meredith D. Braza, B.S., Jenna Duerr, B.A., Amy Spicer, B.S.

The University of North Carolina at Chapel Hill, NC, USA

Introduction

Approximately 15% of children ages 6 to 19 years in the United States are identified with some degree of hearing loss (Niskar et al., 1998). When not identified or properly managed, hearing loss may adversely affect children's language, learning, and psychoeducational development (Davis et al., 1986).

While routine pure tone hearing screenings readily identify significant hearing loss in children, these screenings are not often sensitive to slight hearing loss, defined by thresholds between **16-25 dB HL**. Children with slight hearing loss face listening challenges, especially in noisy classroom environments (Anderson, 1999). Evidence suggests that these difficulties may not be obvious to parents, teachers, and other professionals, resulting in many children with slight hearing loss going unidentified (Goldberg & Richburg, 2004).

Unfortunately, the long-term impact of these listening challenges is unclear, and clinicians often have difficulty pinpointing management strategies for children with these losses (Schlauch & Carney, 2012). The purpose of this systematic review was to compile answers from the literature for these clinical uncertainties.

Research question

For school-age children, what are the impacts of slight hearing loss, and what interventions are recommended for this type of loss?

Methods

Search strategy

- The bibliographic databases PsychInfo, PubMed, Education Full Text, and CINAHL were searched using the keywords "children" and "slight/mild/minimal hearing loss" and their derivatives, resulting in the identification of 224 unique articles.

Inclusion and exclusion criteria

- Inclusion:** Slight hearing loss (16-25 dB HL, unilateral or bilateral), 5-17 years of age, native English-speaking, reported outcomes and/or interventions, typical development, original studies, expert opinions, conference proceedings.
- Exclusion:** Comorbid conditions, 18+ years of age, case studies, systematic reviews, book chapters, book reviews.
- Thirty-three percent of the articles were blindly double reviewed in a title/abstract screening and full-text review, resulting in 95.3% and 96.7% reliability, respectively.

Article appraisal

- Expert opinion articles were appraised using Cincinnati Children's Hospital's LEGEND Expert Opinion tool (2012a) and controlled clinical trial articles were appraised using Cincinnati Children's Hospital's LEGEND CCT/RCT tool (2012b).
- Thirty-three percent of the articles were blindly double-appraised.
- No articles were excluded for poor evidence quality.

Results

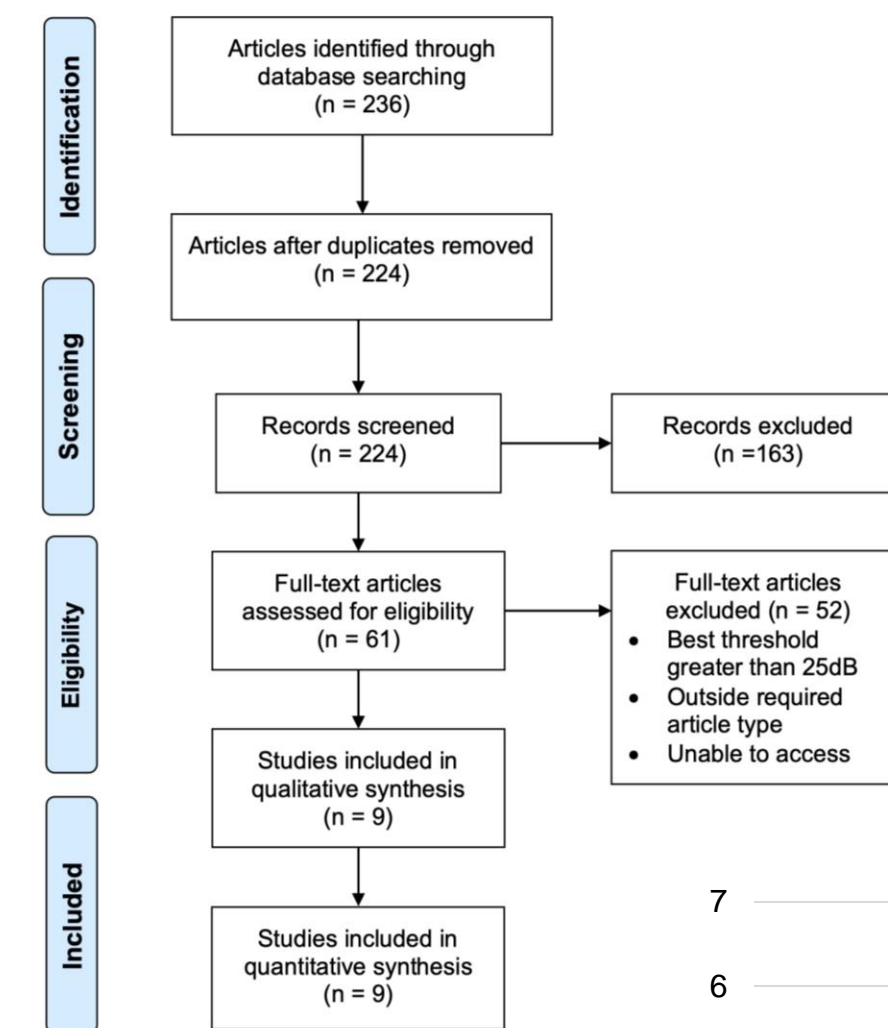


Figure 1. PRISMA diagram.

Methodological information

- Out of the 9 articles included for quantitative synthesis, 6 were expert opinions and 3 were controlled clinical trials.

Controlled Clinical Trials	N	Age Range of Sample	Slight Hearing Loss Definition
Moore et al. (2019)	245	6-11 years old	16-20 dB HL based on 1kHz and/or 4kHz
Idstad et al. (2019)	470	Grades 1, 4, and 7	16-25 dB HL based on bilateral PTA of 0.5, 1, 2, and 4kHz
le Clercq et al. (2019)	4,779	9-11 years old	16-25 dB HL based on 0.5, 1, 2, 3, 4, 6, and 8kHz

Table 1. Methodological information: Controlled clinical trials.

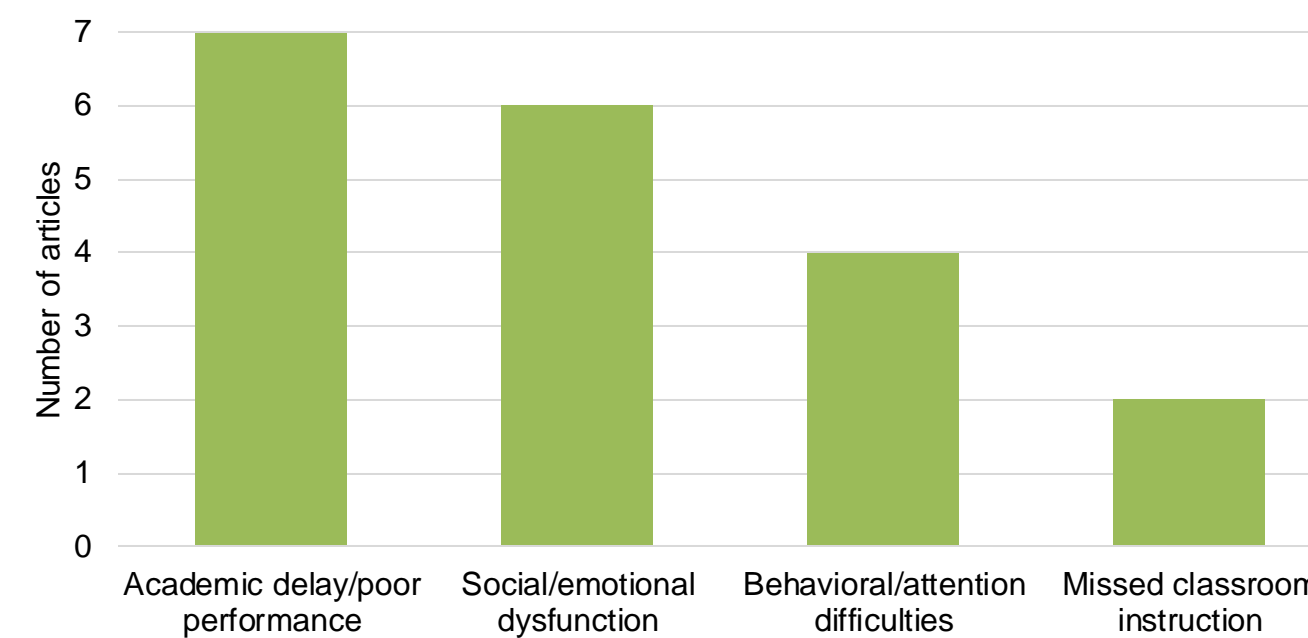


Figure 2. Educational impacts of slight hearing loss.

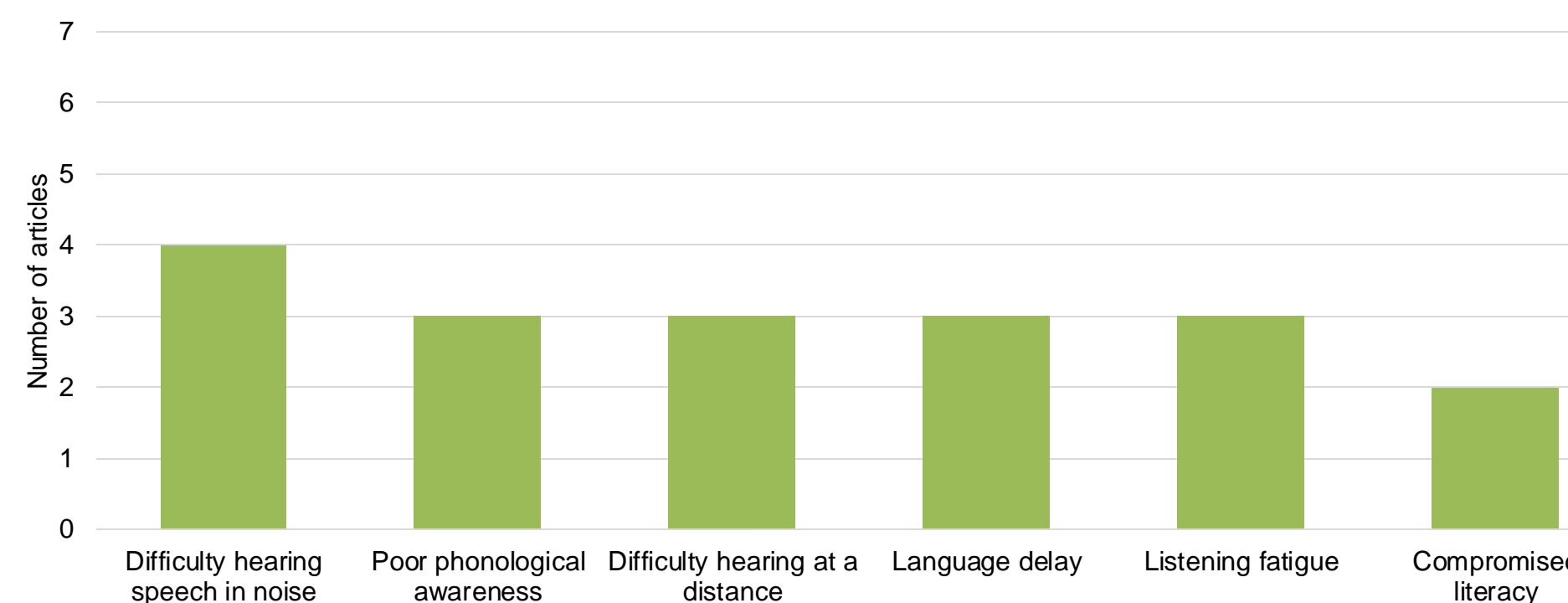


Figure 3. Speech and hearing impacts of slight hearing loss.

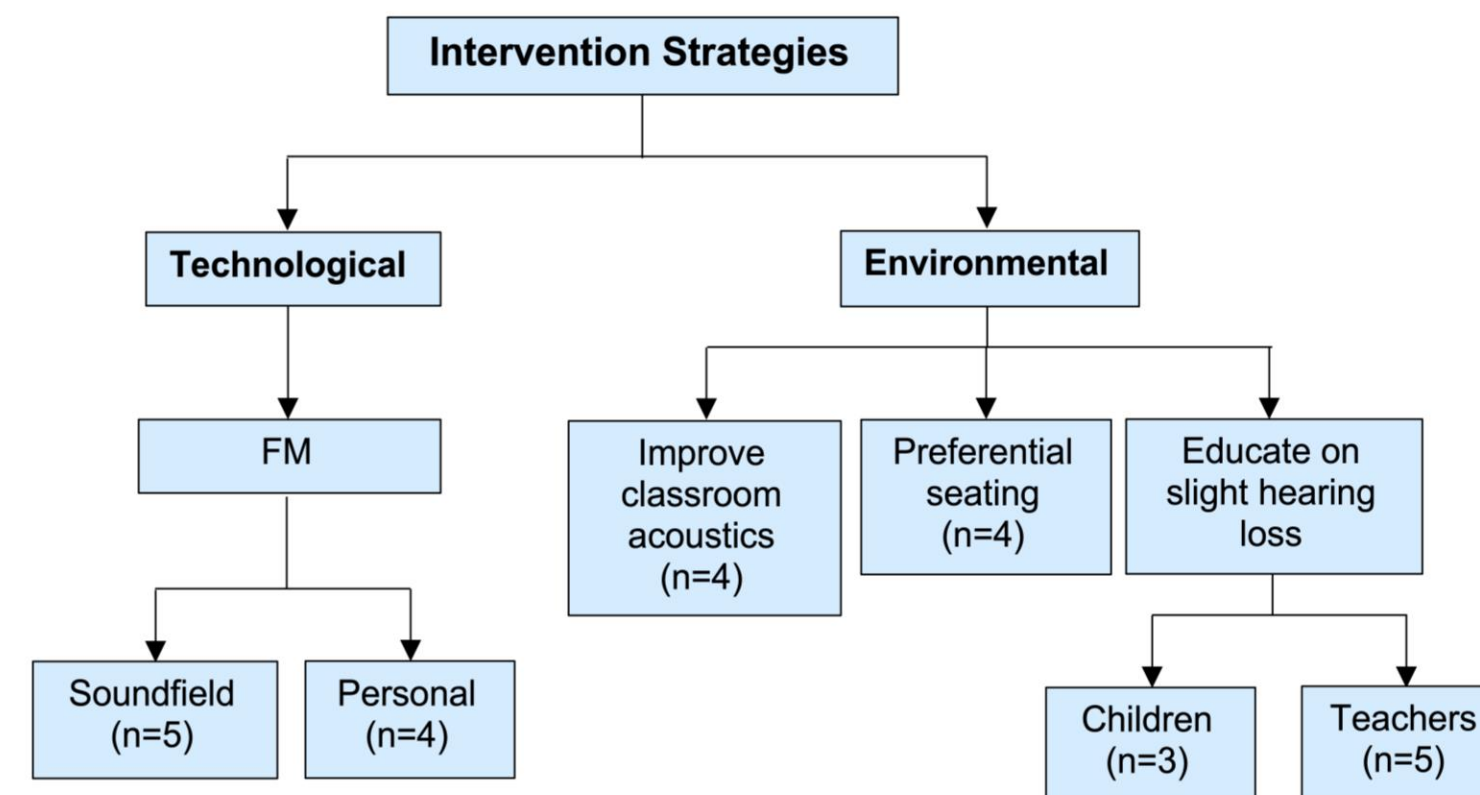


Figure 4. Suggested intervention strategies.

Conclusions

Impacts of slight hearing loss

- Children with slight hearing loss face challenges related to speech, hearing, and education that are both direct and indirect consequences of their hearing threshold levels.
- School-age children may be at larger risk for these challenges given the complex listening environment in classrooms.

Interventions for slight hearing loss

- Both technological and environmental interventions are recommended to improve the signal to noise ratio (SNR) of classroom environments for school-age children with slight hearing loss.
- All articles discussing interventions stated that just one intervention was not enough; in the classroom, children need multiple tools to access sound in the same ways typically hearing peers do.
- Soundfield FM systems are the most frequently cited technological intervention for these children, and teacher education is the most frequently cited environmental intervention.

Other emerging themes

- There is no consensus on the definition of slight hearing loss and is often used interchangeably with the terms minimal and mild hearing loss.
- Children with slight hearing loss may pass hearing screenings and may only be identified if they significantly struggle to hear in the classroom.
- A slight hearing loss is often misunderstood by parents, teachers, and policy makers. It is crucial to educate this group so that any interventions made for a child are consistent and supported.

Clinical implications

- Audiologists should be aware of the impacts of a slight hearing loss on a child's life so that they can effectively counsel families and school personnel in order to support the child in accessing services required for academic and social success.

Limitations

- Grey literature and articles in languages other than English were not included.

Future directions

- Stricter protocols for classroom SNRs are needed to provide all children, particularly those with slight hearing loss, with optimal auditory access.
- There is a need for more controlled clinical trials to identify the most effective approach in treating this population.

References

References available upon request.