

## Documents

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**Statistical properties of auditory behaviour outcome measures for children with hearing loss: a scoping review**  
(2024) *Medical Journal of Malaysia*, 79 (3), pp. 360-369.

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### Abstract

**Introduction:** Various evaluation tools have been developed to track the growth of auditory-related behaviours of children with hearing loss during intervention. However, the reliability and validity of currently available outcome measures remain uncertain due to the lack of information on their psychometric properties. A lack of reliable outcome measures may jeopardise intervention quality and affect these children's listening skills progression. This scoping review aims to explore the mechanics of producing or developing an outcome measure either completely new or adapted from the original version that is considered as having robust statistical properties. **Materials and Methods:** A scoping review was conducted across four databases (PubMed, ScienceDirect, Scopus and Google Scholar). The included articles were written in English, published between January 2010 and June 2023, and specific to predefined keywords. Two independent reviewers screened and selected the final papers using the PRISMScR checklist. A code framework was created to extract information about the publications and conducted by one reviewer. The results were reported using descriptive statistics and narrative synthesis. **Results:** The final analysis were conducted on 22 articles out of 452 articles screened. The review identified seven outcome measures presented in various languages. The outcome measures found were the Auditory Behaviour in Everyday Life (ABEL), Functional Listening Index for Paediatric (FLI-P), Infant-Toddler Meaningful Auditory Integration Scale (IT-MAIS), Integrated Scales of Development (ISD), LittEARS Auditory Questionnaire (LEAQ), Parent's Evaluation of Aural/Oral Performance in Children (PEACH), Parent's Evaluation of Aural/Oral Performance in Children Diary (PEACH Diary), Teachers' Evaluation of Aural/Oral Performance in Children (TEACH) and Parent's Evaluation of Aural/Oral Performance in Children Plus (PEACH+). A total of 13 studies focused on translating, adapting and validating an outcome measure while the remaining investigations validated either the translated or original version of the outcome measures. All original instruments were developed in English and among Western culture, except for the LEAQ which was designed in the German language and for the German population. The outcome measures identified were translated and adapted into Spanish, Turkish, Persian, Hebrew, Arabic, Malay, Yoruba, Polish, Swedish, Hindi, Portuguese, Kannada and Mandarin. **Conclusion:** All studies performed an extensive evaluation of psychometric properties and feasibility studies to produce an excellent quality of auditory-related behaviour outcome measure for clinical use with the intended population. A new outcome measure, FLI-P, was found to be clinically useful for the primary provider of learning to listen and spoken language training for children with hearing impairment in Malaysia, i.e., the speech-language therapists. © 2024, Malaysian Medical Association. All rights reserved.

### Author Keywords

audiological outcome; hearing impairment; hearing loss; infant; Paediatric; questionnaire; young children

### Index Keywords

checklist, child, feasibility study, female, hearing, hearing impairment, Hindi, human, infant, language development, language therapy, Malaysia, male, mandarin, meaningful auditory integration scale, peach, Polish citizen, questionnaire, reproducibility, review, scoping review, Spaniard, speech language pathologist, outcome assessment, pathophysiology, preschool child, psychology, psychometry; Child, Child, Preschool, Hearing Loss, Humans, Infant, Outcome Assessment, Health Care, Psychometrics, Reproducibility of Results

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**Publisher:** Malaysian Medical Association

**ISSN:** 03005283

**CODEN:** MJMLA

**PubMed ID:** 38817071

**Language of Original Document:** English

**Abbreviated Source Title:** Med. J. Malays.

2-s2.0-85195008381

**Document Type:** Review

**Publication Stage:** Final

**Source:** Scopus

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