Critical Review:
Is extended bandwidth in hearing instruments associated with improved auditory skills, compared with limited bandwidth, for the pediatric population?

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Data Collection

Results of the literature search yielded five articles consistent with the selection criteria: four within-group studies with repeated measures and one mixed study.

Results

Within-group Studies

Kortekaas and Stelmachowicz (2000) wanted to examine the detection and clarity of word final /s/ morpheme for children and adults with normal hearing. To measure detection ability of /s/, psychometric functions were taken as bandwidth varied. Bandwidth varied between 0.25 and 9.25 kHz, with a starting bandwidth of 6.25 kHz. Participants were asked to indicate which word in a set of three was in plural form. The answer increased or decreased the bandwidth until the step size of 375 Hz was reached. Clarity ratings were measured on a scale of 1 (not clear) to 5 (very clear). Each word was presented three times at each bandwidth, ranging from 0.25 to 7.75 kHz.

Non-parametric tests indicate that a significant difference in the bandwidth detection threshold is present between all age groups. Clarity ratings only produced a significant difference for correlation between younger children and adults. A few considerations need to be made about the results. Words were presented by a male speaker, whose speech falls within a lower bandwidth. Only two words (drink and truck) were used, which can limit the generalizability to other words and phonemes. All the participants have normal hearing, making it difficult to extrapolate the results to hearing impaired people. The results do not provide sufficient evidence to infer that extended bandwidth improves detection or clarity due to the type of participants and the presence of nuisance variables.

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