Developing a Questionnaire to Assess Noise Exposure in Children and Teens

Abstract:
Until recently, children and teenagers were not thought to be at-risk population for noise-induced hearing loss (NIHL). As MP3 players have grown in popularity, there has been increased awareness of possible noise exposure and hearing loss in children and teens. NIHL is a cumulative hearing loss that is due to repeated exposure to noise. Concerns about NIHL in children and teens are raised due to the opportunities for noise exposure that they may encounter in their daily environments. Children and teens can be exposed to potentially dangerous levels of noise during activities at school, part-time work, recreational activities, and even household chores (e.g., musical instruments, lawn mowers, dirt bikes, and vacuums). The need to identify, diagnose, and treat hearing loss, as close to the onset is crucial, especially for children. Hearing loss in children and teens impacts their speech perception, learning, self-image, and social skills. NIHL is virtually 100% preventable; therefore identifying any risk of NIHL as early as possible can stop its progression and severity. The present study attempts to develop a questionnaire to help identify children and teens at highest risk for NIHL. Mandated hearing screenings in schools provide an opportunity to reach those at risk. A noise exposure questionnaire may be a useful companion tool for the hearing screenings. Research about questionnaire development was completed to determine what survey format would be most effective. Items on the questionnaire were selected based on research regarding current concerns of NIHL and sources of noise exposure in children and teens. Five experts in the field of hearing conservation reviewed the questionnaire to address face validity. Comments provided by the experts were taken into consideration and the questionnaire was revised. In the future, a field trial of the questionnaire should be completed in order to correlate the results of the questionnaire to behavioral audiometric test results.
In Sweden about half a million children in the age between 1–5 years attend preschool. The noise exposure at preschools is intermittent and unpredictable and levels reach up to 84 dB LAeq (time indoors) with maximum levels of 118 dB LAF, mostly due to child activity. The noise exposure at preschools is intermittent and unpredictable and levels reach up to 84 dB LAeq (time indoors) with maximum levels of 118 dB LAF, mostly due to child activity.

For the quantitative analysis, explanatory factors were derived from questionnaire items describing loudness and annoyance of occupational noise exposure (three items), preschool related factors (two items), and age of respondents (one item). Children’s exposure to ambient noise was calculated in front of their bedrooms (L den) and schools (L Aeq,day) using noise prediction modeling. Questionnaires were distributed to the families to collect potential confounding factors. Among the 746 respondent children, 586 were included in multilevel analyses. On average, the L Aeq,day at school was 51.5 dB (SD = 4.5 dB; range = 38–58 dB) and the outdoor L den at home was 56.4 dB (SD = 4.4 dB; range = 44–69 dB). Children, from infancy experience a number of behavioral health problems. The objective of the study was to assess the knowledge of parents regarding behavioral problems, to find out the association between the knowledge of parents regarding behavioral problems with the selected socio-demographic variables, to develop and validate an information booklet reg