Training Module for Hearing Device Use for Children with Developmental Disabilities

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OBJECTIVE
To create a training module that aims to help increase hearing device use among children with developmental disabilities in an audiovisual format. The training module will be available for access through the University of Colorado Leadership Education in Neurodevelopmental Disabilities (LEND) Program website listed below:
https://medschool.ccuanschutz.edu/lk-partners/resources

INTRODUCTION
In the United States, it is estimated that 1 to 3 out of 1000 children have hearing differences. 1 Children who are deaf and/or hard of hearing (DHH) show improved developmental changes in auditory behaviors and speech intelligibility when they use their hearing devices.2-4 For families who are interested in pursuing a spoken language method of communication, the use of deaf children is important to facilitate language acquisition. Newborn hearing screening has helped clinicians identify children with hearing differences at an earlier age. Earlier identification of reduced hearing and intervention increases likelihood of successful outcomes.5 Children with hearing differences may also have co-occurring developmental disabilities such as autism spectrum disorder (ASD), cerebral palsy, or intellectual disability.6 Literature suggests that children with hearing differences and developmental disabilities may experience sensory sensitivities, parental stress and depression, poor device fitting and verification, and lack of perceived benefit.7,8 There are several factors that may contribute to reduced device use including sensory sensitivities, parental stress and depression, poor device fitting and verification, and lack of perceived benefit.9,10 Efforts are made to support typically developing children improve hearing device use through parent education and intervention. Additional supports informed by a developmental, family systems, and behavioral perspective are needed to improve device use and outcomes for children with developmental disabilities.11

APPROACH
An initial review of literature was conducted regarding hearing device use among children with developmental disabilities. Through this literature search, a lack of research focused on supporting hearing device use for children with developmental disabilities was identified. The search was conducted on several databases including EBSCO, PubMed, and Google Scholar using the initial search terms “hearing aid”, “cochlear implant”, “bone conduction hearing device”, “children”, “developmental disabilities”, “autism”, and “Down syndrome”. Peer-reviewed articles including human subjects that were published in English from 2000-2023 were included in the literature search. Limited articles discussed the frequency of hearing device use for children with developmental disabilities and focused on strategies contributing to hearing device use. There was also a lack of articles that discussed strategies to improve hearing device use for children with developmental disabilities. As a result of these findings, a caregiver-focused training module to support hearing device use for children with developmental disabilities was developed.

RESULTS
The themes distilled from the secondary literature review were: sensory sensitivities, systematic desensitization, the use of visual schedules in daily routines, and behavior management strategies for children with developmental disabilities. These concepts were included in the training module for caregivers to help support hearing device use.

Children with developmental disabilities may experience sensory sensitivities such as sound sensitivity and tactile sensitivity. Sound sensitivity can be a factor that contributes to lower hearing device use for this population. Abnormal auditory functioning may lead to hypersensitivity to sound for children with developmental disabilities. In addition, loudness recruitment experienced by individuals with hearing differences can impact hearing device usage due to a quick growth of loudness.12 Tactile sensitivities can also reduce hearing device usage if an individual has particular tactile sensitivities with their head or ears making contact with objects.

The literature review included studies that utilized in vivo exposure and systematic desensitization methods along with social stories, distraction, and positive reinforcement. Systematic desensitization is used for individuals with developmental disabilities to complete various tasks such as ambulatory polysomnography and electrophysiological testing.13,14 The use of systematic desensitization may help children with developmental disabilities overcome their aversion to hearing devices.15 In addition, in vivo exposure can be utilized to desensitize children to certain sounds and situations that typically cause a negative reaction.16 These strategies paired with an antecedent strategy such as priming the child with a social story may help lessen aversion to wearing hearing devices. Additionally, the use of distraction or a competing sensory experience can be utilized by caregivers when putting on their child’s hearing devices. The training module summarizes these strategies and gives families examples of how to apply them to their child’s situation.

Children with developmental disabilities often have difficulties adjusting to changes in their routine and consistent routines can help increase predictability and reduce anxiety.17 Therefore, a potential strategy that may improve hearing device use is the incorporation of visual schedules that include putting on and taking off hearing devices. Visual schedules are a helpful tool that families have used to communicate daily routines and tasks.18 The training module includes examples of visual schedules and icons that families may use for their own visual schedules at home.

The final section of the training module discusses behavior management strategies for children with developmental disabilities. The first strategy uses positive reinforcement to increase the likelihood of favorable behaviors, such as wearing their hearing devices, by providing wanted items, actions, or reactions. It is important to keep in mind that positive reinforcement for children with developmental disabilities may be different than what some children may find reinforcing. The training module also includes an example of a “listening scavenger hunt” that may be a fun activity for children while they wear their hearing devices. Another behavior management strategy discussed in the module is the use of negative reinforcement, which takes away aversive things in order to promote wanted behaviors. This is not to be confused with punishment, which removes favorable items to decrease the likelihood of unwanted behaviors. Antecedent strategies are also utilized to maximize the probability of success by removing any potential barriers. A combination of these behavior management strategies may help improve hearing device use for children with developmental disabilities. Research is needed to empirically validate which strategies are most effective in promoting hearing device use for children with developmental disabilities.

IMPLICATIONS
A review of the literature revealed that little has been outlined about why children with hearing device use differences have more difficulty than their peers with wearing their hearing devices consistently. Even less information is provided regarding strategies to help increase hearing device use. Intervention informed by the strengths and needs of children with developmental disabilities has promise to increase hearing device use for children in this population. This training module serves as a knowledge foundation for families to understand factors that may impact their child’s hearing device use and strategies to overcome these barriers.

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REFERENCES