Implementing Visual Supports to Aid in the Audiologic Evaluation of Children with Developmental Disabilities: A Case Study

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INTRODUCTION

Traditional audiological assessment, which is based on assumptions of typical development, can be challenging with children with developmental delays, resulting in inability to obtain accurate or complete audiological testing and potentially delaying intervention. Visual supports help prepare children by demonstrating what to expect and allow for repeated exposure to new environments and activities, which eases anxiety and stress.

Previous studies (Roberts, M., et. Al, 2020,), have investigated the effectiveness of visual supports in testing compliance in toddlers with developmental disabilities and reduction of caregiver stress. McTee and colleagues (2019) created visual models and supports to facilitate audiology appointments for obtaining behavioral measures for children with developmental disabilities. The supports included images and videos of audiology testing to alleviate caregiver and patient stress. The study conducted by Roberts and colleagues, evaluated the effectiveness of visual supports in supporting audiologic testing for children 24-36 months. The study found that although there was no significant improvement in testing compliance, caregiver stress was reduced.

This case study's aim is to evaluate the effectiveness and perceived satisfaction with use of the visual supports created by McTee et al. (2019) to facilitate obtaining a complete hearing test for children ages 30 months to 7 years with and without developmental delays. We hypothesize that use of visual supports in audiology appointments will reduce parental stress and assist in obtaining additional audiometric information when compared to the use of no visual supports.

METHODOLOGY

A case study analysis of 8 children (n=8) evaluated through the Audiology Department at Children's Hospital of Colorado for a comprehensive audiologic evaluation was completed. Participants ages 3 years to 17 years were included. The case study author utilized the static visual support created by McTee and colleagues (https://osf.io/b23ux/) during the audiologic evaluation and reported on clinical observations and audiologic data collection. Participants were included if: a full audiologic evaluation (sound field pure tones, ear specific speech thresholds, otoacoustic emissions and tympanometry) had been unable to be obtained at previous appointments, the child's chart mentioned concerns for developmental delay, and/or if upon entrance to the appointment, the child needed reinstruction of the requested task.

RESULTS

- 3 out of 8 participants had increased audiologic data collected when using the visual support when compared to previous testing.
- 5 out of the 8 participants had an improved testing experience, demonstrating less anxiety and engaged with the clinician more than previous appointments.
- Children who had experience with visual supports in outside therapies demonstrated understanding of the visual support in relation to requested testing tasks when compared to children who had not received interventions or had received a developmental delay diagnosis.
- Visual supports can be used universally for all children regardless of developmental disability. One participant was typically developing and was unable to complete testing previously due to anxiety. The visual support provided structure and guidance for the child and helped to relieve nerves that may interfere with testing. When leaving the appointment that child stated, "Mom, I did it."
- The visual support assisted in reducing patient and caregiver stress and anxiety of the appointment. Parents would report on how well their child was engaging with the environment and improvements they were seeing in interactions.
- Tympanometry and otoacoustic emission testing were unable to be obtained for children (n =4) who were resistant to ear touching when including the visual support and modeling. Behavioral testing results were inconsistent across the 4 participants as some responded to speech stimuli in the sound field while others did not.

CLINICIAN PERSPECTIVE

- Utilizing the visual support provided structure to the appointment for both the patient and clinician. It facilitated a team focused approach where both the patient and the clinician could discuss next steps. Some participants enjoyed having autonomy in choosing the next activity rather than going in the order that was presented.
- The support worked the best when presented at the beginning of the appointment and when the child was allowed to help in removing the completed tasks before transitioning to the next activity. Pairing the support with showing the participant the equipment that would be used seemed to reduce patient apprehension.
- The visual support was more difficult to use for participants that had difficulty with eye contact and focus between transitions. Many times the support was left in a different portion of the clinic room and needed to be retrieved before transitioning to the next activity. It may be helpful to make the support smaller for easier implementation and/or placing it in a central location that is referred back to before starting new activities.

DISCUSSION

When implementing visual supports in audiologic evaluations, 3 out of 8 participants had increased audiologic data collected when using the visual support when compared to previous tests. 5 out of the 8 participants had an improved testing experience and demonstrated less anxiety toward the testing environment and engaged with the clinician in a more relaxed way. The visual support showed evidence of being most effective clinically for patients who either had utilized a visual support/visual schedule in the past and/or developmentally understood the visual support. Majority of participants were a chronological age that was appropriate for behavioral testing. Visual supports can be useful in obtaining more information for audiologic appointments and reducing patient and caregiver anxiety. Visual supports are a helpful tool that can be implemented as universal design to support children regardless of disability status who demonstrate symbolic understanding of pictures. We hypothesize that visual supports would be most effective when used in conjunction with other strategies (modeling, desensitization, pre-teaching).

FUTURE DIRECTIONS

- Further research directions should evaluate patient satisfaction and effectiveness of visual supports in obtaining a full audiologic evaluation through formal questionaries and data collection of pre/post audiologic information.
- Some patients understood the concept of a visual schedule and were able to move images representing each requested task. However, future studies should evaluate if video modeling is more effective than utilizing a static visual support in regard to conceptualization of the requested tasks.
- In order to benefit from visual supports, children need to have symbolic representation skills developed which emerges developmentally around the age of 2. Therefore, all children included in this study were a chronological age that was appropriate for visual support use and completing the conditioned play task. However, future research should define for whom use of visual supports is developmentally appropriate. In this study, it was unclear whether cognition and developmental age had an impact on effectiveness of utilization of tools and whether the child developmentally understood the task. Inclusion was based on chronological age, not developmental age.
- Given that some participants did not understand the concept of the visual support, future studies should evaluate whether administration of instructions with the visual support facilitate a more effective use of the tool or whether pairing the visual support with modeling the requested activity is more effective.
- The visual support did not seem to work for children who were visiting audiology for the first time and/or had not received a diagnosis or intervention services. This presents an area for future research on whether pre-teaching/showing the visual supports before the audiology appointment would be more beneficial.

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This project was supported in part by the Health Resources and Services Administration (HRSA) under the Leadership Education in Neurodevelopmental Disabilities (LEND) Grant T73MC11044. This information or content and conclusion are those of the author and should not be construed as the official position or policy of, nor should HRSA, HHS or the U.S. Government infer any endorsements.