

Critical Review:
Is telepractice an effective service delivery model for Auditory-Verbal Therapy for infants with hearing loss?

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This critical review examines the evidence regarding delivering Auditory-Verbal Therapy via telepractice. Study designs include randomized control, retrospective study, and a case report. Overall, the evidence gathered from this review is positive, however, the overlapping reason for success was parental involvement in the therapy sessions. Recommendations for future research and clinical practice are provided.

Introduction

Telepractice is the use of two-way video conferencing to deliver speech language pathology services at a distance by linking clinicians to clients for assessment, intervention, and/or consultation (ASHA, 2013). Technologically, telepractice is a viable alternative to traditional service.

Approximately 3 in one thousand newborns are born deaf or hard-of-hearing (DHH), making it the most frequent birth defect in the United States (White, 2004). With the introduction of Newborn Hearing Screening protocols, these infants are not only being identified earlier, but they are receiving hearing and language interventions as early as 2 months of age (McCarthy, Muñoz, & White, 2010) allowing these children to progress at age-appropriate rates (Moeller, 2000). As Speech-Language Pathologists seek to meet the diverse needs of these children and their families, telepractice is a service delivery model that can provide access to rural and remote locations and provide the opportunity to have qualified practitioners reach these children and families using technology (McCarthy, et al. 2012).

Auditory-Verbal Therapy (AVT) is an early intervention approach for teaching listening and spoken language (Constantinescu, et al., 2014). This type of therapy requires parents to take an active role to develop their child's spoken language through listening. Listening occurs during every waking hour and parental participation and 'buy-in' is crucial to success in AVT.

However, rural communities often lack the infrastructure required for telepractice therapy, and most notably, internet speeds. The overlapping disqualification of participants in many studies is the lack of technology knowledge, lack of adequate facility, and lack of acceptable broadband.

An appraisal of the existing literature that evaluates AVT using telepractice would be valuable to determine the efficacy of this service delivery model to treat patients regardless of their geographical location.

Objectives

The primary objective of this paper is to critically evaluate existing literature regarding the effectiveness of delivering AVT via telepractice for DHH children.

Methods

Search Strategy

Articles related to the topic of interest were found using the following computerized databases: PubMed, NCBI, and SagePub. Keywords used for the database search were as follows:

(tele\$ AND infants) AND (deaf
OR hearing loss) AND (AVT
OR Auditory Verbal Therapy)
AND (outcomes)

The search was limited to articles written in English.

Selection Criteria

Studies selected for inclusion in this review paper were required to investigate outcomes related to using telepractice for AVT with children under the age of 3.

Data Collection

Results of this literature search yielded three articles congruent with the aforementioned selection criteria: One randomized control, one retrospective study, and one case report.

Results

Blaiser, Behl, Callow-Heusser, & White, (2013) conducted a randomized control study to compare the effects of telepractice to traditional in-person therapy. A group of 27 families with DHH infants were randomly assigned to one of the intervention methods. Results of the study indicated that while there was some variability in technology experiences, the telepractice group scored significantly higher on standardized expressive language measures and on parent engagement surveys than the in-person group. The most significant benefit reported by parents in the telepractice group was family engagement and feeling comfortable

providing therapy that supported natural environments.

The participants in each group were well matched according to age, degree of hearing loss, communication modality, and geographic location. The nine providers involved delivered service to both groups, and received a 2-hour training session on the use of technology prior to the study. However, the authors acknowledged limitations of this study to include the small sample size, short duration, and reduced intensity of intervention.

The language progress reported in this study is a valid and reliable measure of developmentally-appropriate expressive and receptive language abilities, however only one measure was used, which reduces the impact of their findings. A parental self-report was used pre-and post test, providing congruent subjective results. The study also has limitations in that several families discontinued with therapy due to technology challenges, including connectivity issues.

The study would have been strengthened further, if evaluation methods were used during the therapy phase to determine improvements from session to session. Statistical analyses are appropriate for this study. There is a moderate level of evidence provided which lends support for the effectiveness of delivering telepractice AVT.

Constantinescu, et al. (2014) conducted a retrospective study comparing the 2-year outcomes of children receiving AVT in person with those receiving AVT via telepractice.

The participants in both groups were well-matched according to chronological age, hearing age, degree of hearing loss, and type of amplification. However, inclusion criteria

for this study was very specific, and the children had to have been identified at birth with a hearing loss, optimally amplified with hearing aids and/or implants, and already been enrolled in AVT before 12 months of age. The standardized test reported in this study is a well-established valid measure of child language development.

Language outcome scores in the telepractice group matched normal hearing peers. The telepractice groups' mean scores for total language, auditory comprehension and expressive communication were within the normal range for hearing peers. The authors concluded that delivering AVT over telepractice is just as effective as in-person services, and that telepractice allows more children to receive services than otherwise would due to geographic location.

The authors acknowledge difficulty in generalizing the study findings due to the small sample size and single assessment results, and they were also unable to control for the environment in which AVT was conducted, potentially introducing bias, or noise in the data.

Appropriate statistical tests were conducted. However, confidence intervals were not reported for the data. There is a moderate level of evidence offered by this study.

Stitch, Stredler-Brown, Greenway, and Kahn (2013) investigated telepractice AVT with a 3-year-old fitted with cochlear implants at 2.5 years of age.

While there are inherent limitations of a single case report design, the strength of evidence could have been improved by incorporating multiple single case reports. Subject selection in this case report is problematic. Primarily, there is a lack of baseline speech and language

abilities. The authors reported that the subject did not have enough language to administer a test of articulation, so any gains recorded are equivocal at best. Furthermore, the study required the subject's family to secure funding for therapy and upgrade technology and internet services at home, skewing the ultimate findings to include highly-motivated parents as a factor for success.

The methodology of this case report has strengths, including controls for therapy providers, which increase reliability. However, the same criteria and standards are not met for the measurement of expressive and receptive language. The patient's expressive and receptive language was assessed by clinical observation, which has reduced reliability. The validity of this study could have been further improved with the selection of matched controls. Statistical analysis was not included.

Based on the authors' assessment and clinical observation, it was concluded that this child made remarkable gains in her receptive language and adequate gains in expressive language and articulation undergoing telepractice AVT.

Discussion

While the findings indicate that telepractice is an effective service delivery model of AVT, the commonality between the results was parental involvement. In order for telepractice to be successful, parents have to take on the primary role. In addition to parental involvement, early identification and intervention are key factors to success. Moeller (2000) found that high levels of family involvement correlated with positive language outcomes at 5 years of age, and the most success was achieved when early identification is paired with early interventions that actively involve families.

A selection bias may skew results since only highly motivated and supportive families tend to be selected for this type of treatment.

However, along with being more cost-effective, there is evidence of stronger expressive language outcomes and higher parental engagement when AVT is administered through telepractice (Blasier, et al, 2013).

Research is lacking in this area, and there are inherent limitations to single subject case reports. Statistical analysis along with adjustments made to the methodology and subject selection could have strengthened the validity of the case report, the level of evidence, and thus the clinical relevance obtained from this study.

Conclusion

Telepractice AVT is cautiously recommended because although it may be more cost-effective, promotes stronger expressive language outcomes, and has higher parental engagement, larger and better designed studies are needed.

Early identification, early intervention, and high levels of parental involvement indicate the highest success rates with telepractice AVT.

Clinical Implications

Although the level of evidence provided by the articles reviewed has moderate strength, caution should be used when applying the findings clinically until further research is completed. Based on the impact of early intervention on language acquisition and development, it is imperative to continue studying alternative treatment options for those unable to obtain traditional in-person therapy.

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