Critical Review:
Is PROMPT an effective treatment method for children with speech production disorders?

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This critical review investigates the effectiveness of PROMPT for children with speech production disorders. Five articles, which include expert opinion papers, a case study, and single subject designs, were retrieved that met the specific selection criteria. Findings suggest that additional empirical support is required in order to confidently state that PROMPT is an effective treatment program due to the inconsistencies in the available research and the limited number and types of studies published. Recommendations for further research are provided.

Introduction

PROMPTs for Restructuring Oral Muscular Phonetic Targets (PROMPT) was originally introduced in 1984 by Chumpelik and has continued to evolve into a complete philosophy, system, approach and technique. The theoretical framework that guides the PROMPT program is the Motor Speech Hierarchy that includes seven stages of intervention that are all interdependent (Hayden, 1994). Central to PROMPT is the idea that active touch is one of the most important organizing factors in human development and it is through this that the motor speech system can be re-integrated and re-structured. The technique used in PROMPT involves the clinician providing active tactual-kinesthetic-proprioceptive sensory input to the child's articulators to facilitate speech production, (Hayden, 2006).

The PROMPT system of therapy has been commonly used by practicing Speech Language Pathologists for children with speech production disorders. Due to the increase in popularity of this treatment program, it is important to examine the empirical evidence available and determine its effectiveness.

Objectives

The primary objective of this paper is to critically evaluate the evidence available for the PROMPT system of therapy and its effectiveness for children with speech production disorders. A secondary objective is to develop evidence based clinical recommendations regarding the use and application of PROMPT therapy for speech language pathologists in every day practice.

Methods

Search Strategy

The articles were found using the following computerized databases: Scopus, PubMed, and CINAHL. The search terms used were as follows:

[[PROMPT] OR [prompt therapy] OR [prompt treatment] OR [prompt program] OR [prompt system] OR [PROMPTs for Restructuring Oral Muscular Phonetic Targets]] AND [[motor speech disorders] OR [motor speech impairment] OR [motor skills disorder] OR [motor skills impairment] OR [speech disorder] OR [speech impairment] OR [apraxia] OR [apraxia of speech] OR [developmental apraxia of speech] OR [childhood apraxia of speech] OR [articulation disorder] OR [articulation impairment] OR [phonological disorder] OR [phonological impairment] OR [communication disorder] OR [communication impairment] OR [language disorder] OR [language impairment] OR [childhood developmental disorder] OR [dysarthria]]

In order to ensure that a comprehensive search was performed, the citations provided in the articles retrieved were explored and examination of the official website for PROMPT therapy was completed.

The search was limited to articles written in English.

Selection Criteria

Articles providing information on the effectiveness of PROMPT therapy were included. Studies were limited to those that included children as participants since PROMPT was originally developed to treat children with motor speech disorders. However, no limits were placed on the

type of diagnosis the participants possessed (e.g. autism, developmental apraxia of speech, phonological disorder, etc.) provided that the child had difficulties with speech production.

Data Collection

The following search results yielded five articles that met the selection criteria. The studies found included single-subject multiple baseline designs, expert opinion papers, and a case study.

Results

Expert Opinion Paper

The opinions and knowledge obtained from respected experts and professionals can be valuable when assessing the efficacy of a treatment program. Deborah Chumpelik (Hayden) is one of the founders of the PROMPT system of therapy and is a respected professional in her field. She has contributed several papers, published and unpublished, that describe the theoretical framework of the PROMPT program and how it is applied to children with developmental apraxia of speech and mixed phonological-motor impairments.

Chumpelik (1984) discusses the PROMPT system of therapy and how it can be applied for children with developmental apraxia of speech. This paper describes the theoretical framework associated with this therapy in extensive detail and its observed effectiveness within this expert's practice. The information included suggests that the PROMPT system is a useful tool for clinicians in that it enables the reduction of phonetic errors under multiple conditions and has been shown to "work" in controlled, behavioral conditions, or in unstructured group situations in which language treatment is the focus (Chumpelik, 1984). However, data describing the effects of the program are not provided and the research the author refers to that support her claims failed to reach publication. Due to the inability to provide the reader with objective data and use supportive research that has been peer reviewed, the opinion provided by this expert is subject to debate and only provides suggestive evidence for the effectiveness of the PROMPT program.

In 2006, Hayden published an additional paper outlining the PROMPT program in an evolved form and how it may be applied to a particular case study. Hayden discusses the ten core elements that are essential when implementing the PROMPT program in great detail and applies this information to the case of Jarrod, a seven year old male with mixed phonological-motor impairment. The author reports that this case study clearly illustrates the connection between speech motor control and phonological-linguistic growth and how they may interact and influence the development of social and literacy skills (Hayden, 2006). A disadvantage and weakness of this paper is that the PROMPT program is applied to a specific case in theory and no objective data can be provided due to the fact that the individual discussed did not undergo the aforementioned treatment program and was not assessed by the expert herself. Due to these issues, it is difficult to confidently predict whether or not the PROMPT program would elicit any significant changes in speech production or if it could be effectively applied to the case of Jarrod.

Although expert opinion papers are valuable sources of information, they are also highly subjective and only provide suggestive evidence. Therefore, alone these papers do not provide enough evidence to suggest that the PROMPT program is effective for treating children with speech production disorders.

Single Subject Designs

Single subject designs can provide compelling evidence and are essential when conducting research with populations where withholding treatment would be considered unethical. This is particularly true when researchers collect multiple baseline data. If no change is seen through multiple baseline measures then subjects can essentially act as their own control. Additionally, the validity of the results increases when multiple subjects replicate the same results.

Nonverbal children with autism and PROMPT

In 2006, Rogers, S., Hayden, D., Hepburn, S., Charlifue-Smith, R., Hall, T., & Hayes, A., conducted a single subject (A-B-A) design investigating the effectiveness of the Denver Model and PROMPT with nonverbal children with autism. PROMPT uses a naturalistic communicative framework based on joint activity routines with toys, and relies on therapists' use of manual facilitation of speech motor movements. The language module of the Denver model emphasizes a specific curriculum involving social-affective development, motor imitation, receptive language, development of nonverbal communicative behaviors, shaping speech from vocalizations, and object representation (Rogers et al, 2006). Each child, regardless of the treatment condition, took part in twelve weekly one

hour sessions. Treatment conditions were chosen based on random assignment. Both treatments required parent involvement. However, the Denver Model required parents to be active and present in every session and homework was given. PROMPT required the parents to observe each session via video and provide opportunities for the child to practice their targets at home without providing the physical manipulations.

The participants included ten males between the ages of 20-65 months that were diagnosed with autism, spontaneously used less than five functional words per day, a developmental quotient of at least 30, and no co-morbidities. Cognitive and language functioning, adaptive behavior, and autism symptoms were assessed pre and post treatment using the *Autism Diagnostic Observations Scales (ADOS)*, *Social Communication Questionnaire (SCQ)*, *Mullen Scales of Early Language*, *Vineland Adaptive Behavior Scales-Interview*, *MacArthur Communicative Development Interview*. Baseline probes for the number of words and phrases produced were collected during a five minute play to establish a baseline. Speech samples were collected during every session by randomly selecting a ten minute sample from video recording and were coded for the number of novel words or approximations produced and the number of novel phrases produced. Following treatment the same assessment was conducted again and additional speech probes were collected at a three month follow-up.

Results demonstrated that eight out of ten children demonstrated the use of five novel words or more by the completion of treatment. However, the use of functional speech during play/generalization sessions was markedly less frequent. Both treatment programs demonstrated some gains and the most gains were observed in the children with better readiness skills and attention prior to commencing treatment.

Rogers et al. (2006) provides supportive evidence for the effectiveness of PROMPT. However, many advantages and disadvantages are evident within this study. Some of the advantages include the authors' consideration for the individual differences in the amount of previous therapy each child has received and maturation effects. These issues were dealt with by collecting multiple baseline probes that indicated that therapy outside of the study did not produce change in functional speech. It is also unlikely that maturation produced any outside effects because of the absence of improvement seen in the baseline data. Additionally, the authors ensured that certain fidelity measures were taken while conducting the study. Since the Denver Model and PROMPT require trained professionals to implement the interventions in order for them to be effective, the authors ensured that experts in both programs reviewed each therapy session in order to certify proper implementation. However, it is important to note that fidelity measures decreased from 85% to 25% as the study progressed. Disadvantages were also evident within this study. When addressing special populations it is often difficult to control for individual variability that may have a large impact on how each child responds to treatment. Due to the small sample size and the poor generalization observed, it is difficult to generalize the results into contexts outside of the research study and across children. It is important to be cautious about the results reported because the authors did not report any significant improvements and did not report any effect sizes.

Developmental phonological disorders and PROMPT

Dodd, B., & Bradford, A. (2000) conducted a single subject multiple baseline study on children with three different types of phonological impairment. The phonological impairments included consistent use of developmental and non-developmental rules (TS), inconsistent errors (MC), and developmental errors (TN). The study included three boys with moderate to severe phonological impairments. The treatment methods implemented in this study were phonological contrast therapy (targeting phonological processes), core vocabulary (targeting consistency of word production), and PROMPT (targeting articulation). The order in which the treatments were implemented was randomly assigned for each child. All participants were referred by the Regional Health Authority Speech Language Pathologist who chose three children between three and five years of age with moderate to severe phonological disorders. No additional limitations were placed on selection so that the participants would closely resemble children on a typical caseload. Assessment was conducted by an experienced Speech Language Pathologist and included a speech sample elicited in free play, the *Goldman-Fristoe Test of Articulation*, the 25 word test of inconsistency, and the *Test for Auditory Comprehension of Language-Revised.* Additionally, the oral and speech motor control protocol, the movements in context, and

sequenced oral movements tasks were administered to assess integrity of the motor system. Percentage consonants correct, a phonetic inventory, and inconsistency tests were taken from the speech sampled and used to measure severity. Baseline data was collected during a break of four weeks from therapy prior to the study, treatment one was then implemented after initial assessment followed by a three week break, then treatment two, a three week break, and finally treatment three. Each child received twelve thirty minute individual therapy sessions in each six week treatment block.

Reported results demonstrated consistent baseline data prior to the implementation of the treatment programs for all participants. Each child received treatment in the following order: TS- phonological contrast therapy, core vocabulary, PROMPT; MC- core vocabulary, phonological contrast therapy, PROMPT; TN- core vocabulary, PROMPT, phonological contrast therapy. Data collection occurred while the treatment program was being implemented and a final assessment was conducted three weeks post-treatment. It was not clearly stated whether or not the assessors were blinded to which treatment condition the child had most recently undergone. TS demonstrated benefits from the phonological contrast therapy that were maintained at follow-up, a decrease in consistency with the core vocabulary treatment, and no benefit from PROMPT. MC demonstrated improvements in consistency with core vocabulary treatment, showed benefits with phonological contrast therapy, and no benefit from PROMPT. TN demonstrated benefits from core vocabulary treatment, and no benefits from phonological contrast therapy, and PROMPT.

The aforementioned research study suggests that PROMPT is not effective for treating phonological disorders in children. It can be argued that since the authors did not mention the expertise of the therapists implementing the PROMPT program, the therapists may not have possessed the skill this program requires to be implemented effectively. Additionally, the results were not reported in terms of significance for the other treatment programs, possibly indicating that the benefits attained may not have been significant. Overall, single subject designs can be very powerful and since the results for PROMPT remained consistent across all three participants, it can be seen as a compelling piece of evidence with some reservation.

Cerebral palsy and PROMPT

Ward, R., Leitao, S., & Strauss, G. (2009) are currently working towards publication of a single subject multiple baseline design that examines the effectiveness of PROMPT for children with cerebral palsy. Six participants met the inclusion criteria: diagnosis of CP, age three to fourteen years, stable head control, spontaneous use of 15 words or more, speech impairment, no hearing loss, and a developmental quotient of greater than or equal to 70. The study consisted of two intervention phases that occurred over a ten week period. Phase B of the intervention targeted each participant's first priority level of the PROMPT Motor Speech Hierarchy and phase C targeted one level higher. Weekly speech probes for trained and untrained vocabulary were collected and were analyzed for perceptual correctness and for the motor speech movement parameters (MSMP).

Reportedly participants demonstrated significant positive changes on the MSMP targets for phase B and phase C, generalization for untrained vocabulary was observed, changes were maintained at follow-up for five participants, and improvements in intelligibility were evident in five participants. The authors report that these changes were not due to maturation or chance.

The aforementioned research study was retrieved from the official website for PROMPT. Since the article was retrieved from a potentially biased source and has not yet completed peer revision, it needs to be interpreted with caution. In addition, it is difficult to properly critique the article since the full article could not be located. Without the original article, data could not be viewed and analyzed critically.

Discussion

Researchers in the area of speech and language disorders face many issues when conducting research. These include ethical concerns regarding withholding treatment for control groups, limited sample sizes, individual differences that may act as confounding variables, etc. In order to conduct a well-formulated study it is important to consider all of these factors. Randomized Controlled Trials can be a challenge due to many of these issues. Thus, single subject designs can be used as powerful alternatives. This critical review has yielded a number of single subject designs. However, the results provided in these studies remain inconsistent and focus on a variety

of populations making it difficult to generalize across participants. Future research should include additional studies in the areas previously discussed (e.g. cerebral palsy, autism, phonological disorders, and developmental apraxia of speech) as well as with individuals who have articulation disorders.

It cannot be assumed that PROMPT will be effective for all individuals. As the empirical evidence suggests, the benefits of PROMPT vary from individual to individual. For developmental apraxia of speech, further research is required that includes specific participant data in a well-formulated study. With the autism spectrum disorder population, it is suggested that PROMPT may increase the number of functional words used however replications of studies with this population and with a larger sample size will be necessary in order to make more accurate conclusions. Due to the high variability in characteristics of children with autism, a large sample size is required in order to assume generalization across individuals. Compelling evidence found that PROMPT is not effective for individuals with phonological disorders nevertheless future research replicating these results is required. For children with cerebral palsy, the findings suggest significant improvements with PROMPT however without critical review of the full article and peer review, one must be cautious when interpreting this research. Overall, future research is required in order to determine the effectiveness of PROMPT for children with speech production disorders.

Critical analysis of the literature available for the effectiveness of PROMPT with adults should also be completed. This will provide clinicians with information on the effectiveness of PROMPT with acquired speech production disorders and whether or not the adult demographic responds better to this treatment.

Conclusion

Upon review of the available empirical evidence, further investigation is required in order to reach a conclusion on the effectiveness of PROMPT for children with speech production disorders. The limited amount of research and the inconsistency in the research available further validates this need. In addition to research with children the adult demographic should also be explored.

Clinical Implications

Despite the inconsistencies in the research, many practicing clinicians have found it useful to implement PROMPT or to utilize concepts from PROMPT when correcting articulation disorders in children. The tactile cues may provide the additional support needed for a child struggling with the production of certain sounds. Further research should continue to be conducted on PROMPT as it does appear to have some practical application for Speech Language Pathologists.

References

Chumpelik, D. (1984). The prompt system of therapy: Theoretical framework and applications for developmental apraxia of speech. *Seminars in Speech and Language, 5*(2), 139-156.

Dodd, B., & Bradford, A. (2000). A comparison of three therapy methods for children with different types of developmental phonological disorder. *International Journal of Language & Communication Disorders, 35*(2), 189-209.

Hayden, D. (2006). The PROMPT model: Use and application for children with mixed phonological-motor impairment. *Advances in Speech Language Pathology, 8*(3), 265-281.

Hayden, D. A., & Square, P. A. (1994). Motor speech treatment hierarchy: A systems approach. *Clinics in Communication Disorders, 4*(3), 162-174.

Rogers, S. J., Hayden, D., Hepburn, S., Charlifue-Smith, R., Hall, T., & Hayes, A. (2006). Teaching young nonverbal children with autism useful speech: A pilot study of the denver model and PROMPT interventions. *Journal of Autism & Developmental Disorders, 36*(8), 1007-1024.

Ward, R., Leitão, S., & Strauss, G. (2009). The effectiveness of PROMPT therapy for children with cerebral palsy. *Developmental Medicine and Child Neurology, 51*(s5), 76. Retrieved from: https://promptinstitute.com/uploads/images/rward_CP.jpg.