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The Good, the Bad, and the Ugly:

A Review of Evidence-Based Practice within Communication Sciences and Disorders

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Abstract

The usage of evidence-based practice (EBP) within the field of Communication Sciences and Disorders (CSD) is highly important. It includes three main factors: external evidence, internal evidence, and client preferences (Dollaghan, 2007). External evidence represents contributions from high quality research, internal evidence is based on clinician knowledge and experiences, and client preferences consider clients personal beliefs, fears, and goals. By combining these factors, clinicians make sound decisions within the field of CSD. The American Speech-Language Hearing Association (ASHA) endorses the need for EBP within this field (Robey, et al. 2005). This review investigated the usage of EBP across the 9 major areas of CSD. These areas are dysphagia, fluency, communication modalities, social/pragmatics, hearing, cognition, speech sound disorders, voice, language. This review contrasts treatment methods well supported by evidence, with treatments that have less evidence to support their effectiveness. This review concludes that the usage of EPB is present within this field, however unsound treatment methods without supporting evidence are still being used.

Keywords: evidence-based practice, communication sciences and disorders (CSD), dysphagia, fluency, communication modalities, social/pragmatics, hearing, cognition, speech sound disorders, voice, language
Introduction

Communication Sciences and Disorders (CSD) is a field that assists people with communication disorders. Communication disorders are defined as an impairment in the way that people communicate and can affect many different processes, including hearing, speech, and language (Block et al. 1992). The American Speech-Language Hearing Association (ASHA) is a national organization that provides accreditation for speech language pathologists (SLPs) and audiologists, while creating guidelines for practice and advocating for “scientifically based professional practice [that] advances the discipline of human communication sciences and disorders” (ASHA n.d.).

Communication disorders have many different subgroups that encompass the many different areas that SLPs and audiologist treat; ASHA has divided them into the following 9 major categories:

1) *Dysphagia* is the area of CSD regarding the functions of swallowing and feeding.

2) *Fluency* pertains to the production of speech that sounds smooth and natural, which includes stuttering and cluttering.

3) *Communication modalities* refers to using other ways to communicate rather than using speech, this includes augmentative and alternative communication (AAC).

4) *Social disorders/pragmatics* is the area that focuses on non-verbal communication difficulties.

5) *Hearing and aural rehabilitation* focuses on communication skills impacted by hearing loss.

6) *Cognition* is the area that focuses on cognitive processing skills, such as attention, memory, and executive functioning.
7) *Speech sound disorders (SSD)* focuses on the production of speech and includes either organic or functional speech sound disorders.

8) *Voice* focuses on the vocal quality, pitch, or loudness of an individual’s speech.

9) *Language* focuses on the acquisition and use of language skills; this includes both written and spoken language forms.

Evidence-based practice (EBP) includes three main factors: external evidence, internal evidence, and client preferences (Dollaghan, 2007). External evidence represents contributions from high quality research, internal evidence is based on clinician knowledge and experiences, and client preferences consider clients’ personal beliefs, fears, and goals (Dollaghan, 2007). ASHA states that all clinicians should incorporate EBP into their care to create high quality care for their patients (Robey, et al. 2005). To properly use EBP, one must use high quality external evidence, which includes randomized controlled trials, meta-analysis/systematic reviews, and a sound conclusion drawn by the researchers. These factors are important when including research into clinical practice. However, an issue that is present is that some treatment methods do not have proper evidence to support their effectiveness. Lacking supportive evidence may be due to poorly designed studies, studies with inconclusive results, or few or no empirical studies. The purpose of this research is to investigate good and bad treatment methods within the 9 major categories. The good/effective treatment methods are supported by high quality evidence, while the bad/non-effective treatment methods have little to no evidence or have low quality research methods. This review will then apply the findings in terms of the usage of EBP within the field of CSD.
Methods

The procedures for identifying both supporting and limited evidence consisted of several steps. First, treatment methods for each of the nine categories set forth by ASHA were identified by reviewing ASHA’s Practice Portal and Evidence Maps (ASHA, n.d.). Second, preliminary treatments for each category were labeled as (a) having supporting evidence (good), or (b) having limited/no evidence (bad). Finally, searches were conducted to further conclude whether these treatment methods were in fact good or bad.

The search engines that were used were Google Scholar and ASHA’s Evidence Maps. Specific search terms included the disorder category and common related terms (e.g., “dysphagia,” “swallowing”) along with the name of the treatment method of interest and related terms (e.g., “electrical stimulation,” “e-stim”). Articles were limited to those that had quality evidence about the effects of the treatment methods. Both randomized control trials (RCT) and systematic/meta-analytic reviews were included. Further, articles were selected based on availability thus eliminating a considerable number of articles. Treatment methods were changed if articles with sound evidence and availability were not located. There was possible bias when selecting the individual studies treatment methods, due to the availability of the article playing a large role in the selection process. Twenty-four articles were located that fit all the relevant search criteria, consisting of 2 – 4 articles related to each category area. Data was collected by writing summaries for each of the studies.

Results

This research examined 18 total treatment methods, two treatment methods for each of the nine aforementioned categories. In total there were 24 articles collated and reviewed. Each of the treatment methods chosen either were considered a good treatment option or a bad treatment
option, within one of the nine categories. The following are the results of the investigation into the selected treatment methods, organized into their relevant category.

**Dysphagia**

The treatment methods investigated for treating dysphagia in children were neuromuscular electrical stimulation (NMES) and oral motor intervention (OMI). Two systematic reviews reported the finding of using NMES of children (Epperson & Sandage, 2019; Propp et al., 2022). One review found that NMES could be beneficial in treating dysphagia in children, but the quality of the research was not good enough to say outright that this is a viable treatment method (Propp, et al., 2022). This review also stated that there needs to be further research, with a well-designed RCT, to conclusively state whether this treatment method is effective for treating dysphagia in children (Propp, et al. 2022). Epperson and Sandage (2019) researched NMES in children, found that in preterm infants whose neuromuscular development is not well understood, using NMES can have adverse effects on their muscular development. This review mentioned that most SLPs do not understand the implication of NMES treatment on children and some SLPs do not know whether this treatment is effective in treating dysphagia (Epperson & Sandage, 2019). One systematic review was found investigating the usage of OMI in preterm infants (Chen et al., 2021). This review investigated the effects of OMI in hospitals on transitions time to oral feeds, length of time in hospital, weight gain, and feeding efficiency. This meta-analysis concluded that recipients of OMI showed improvements on each of these measures compared to the control group. Chen et al. (2021) concluded that implementing OMI in hospitals will promote oral feeding and be better for pre-term infants overall.
Fluency

The treatment methods investigated for fluency were delayed auditory feedback (DAF) and behavioral treatments. Pollard et al. (2009) examined the long-term effectiveness of using DAF to alleviate stuttering symptoms. This trial had a small sample size and concluded that there were no improvements from the participants baseline and they mixed feelings on the usage of the device as well (Pollard et al., 2009). Herder et al. (2006) examined behavioral treatments to alleviate stuttering. Although this review did not focus on any specific treatment, common behavioral treatments used to treat fluency disorders include rhythmic speech, prolonged speech, and conditioning (Herder et al. 2006). Herder et al. (2006) concluded that receiving behavioral treatment showed greater improvement than receiving no treatment at all and that no single treatment approach is better than another.

Communication Modalities

The treatment methods investigated were facilitated communication (FC) and aided augmentative and alternative communication (AAC) input. Two reviews were selected about FC and one review was selected about aided AAC input (O’Neil et al., 2018; Schlosser & Prabhu, 2014; Schlosser et al., 2024). Schlosser et al. (2014) systematically examined the research studying the effectiveness of FC and concluded that there was no evidence supporting FC as a communication method. In 2024, Schlosser and Prabhu discussed how the usage of FC takes away the voice of people with non-verbal autism and does not allow them to communicate. They emphasized that no study has proven that FC is not the facilitator communicating and that FC and other similar methods are still being used even though there is no supportive evidence (Schlosser & Prabhu, 2024). Aided AAC input occurs when a language-proficient individual provides a model of using the AAC system for the learner (O’Neill et al., 2018). O’Neill et al. (2018) concluded that aided AAC input is an effective way to instruct people with
communication difficulties to use AAC. The review also concluded that it improves language abilities and aids in comprehension of pragmatics, semantics and morphosyntax (O’Neill et al., 2018).

Social Disorder/Pragmatics
The treatment methods that were investigated were Social Thinking and social skills groups. Leaf et al. (2010) investigated the effectiveness of Social Thinking and the possibility of it being a pseudoscience. Leaf et al. (2010) concluded that there was not quality evidence supporting the claims that this treatment method works, because the evidence in support was anecdotal. Reichow et al. (2012) reviewed five RCT studies conducted on the effectiveness of social skills groups. This review concluded that people with autism spectrum disorder (ASD), will make social gains and have friendships when participating in a social skills group (Reichow et al. 2012).

Hearing
The treatment methods investigated were computer based auditory training (CBAT) and aural rehabilitation (AR). Two reviews were found that looked at CBAT, one focusing on adults and the other focusing on children (Nanjundaswamy et al. 2018; Reis et al. 2021). Reis et al. (2021) conducted a study on the effectiveness of CBAT on adults with cochlear implants. The study concluded that on-task improvement was shown while doing the computer training, but it did not contribute to real world and post study effects (Reis et al. 2021). A meta-analysis was performed to evaluate the effectiveness of CBAT on children (Nanjundaswamy et al. 2018). This review located one study that fit the search criteria and concluded that there was not enough evidence to support using CBAT (Nanjundaswamy et al. 2018). Basura et al. (2023) conducted a meta-analysis of AR and concluded that AR provides a way to improve communication skills and
other important outcomes, in addition to supporting use of amplification devices (i.e., hearing aids or cochlear implants) (Basura et al., 2023). Basura et al. (2023) concluded that the four areas that were the most effective were: sensory management, informational counseling, perceptual training, and personal adjustment training; these were proven to be effective alone or together.

Cognition

The two treatment methods investigated were Fast ForWord and functional communication training (FCT). Gillam et al. (2008) investigated auditory temporal processing and language skills by comparing children using Fast ForWord and other nonspecific speech therapy methods. This study concluded that Fast ForWord was not effective at improving temporal auditory processing skills nor showed improvements in language skills from the other speech therapy methods (Gillam et al. 2008). Two reviews, one a literature review and the other a meta-analysis, were located about the usage of FCT (Gerow et al. 2018; Heath et al. 2015).

Gerow et al. (2018) investigated 215 studies and concluded that there was ample evidence to say the FCT is an applicable treatment for school-age children with ASD, intellectual disability, other health impairments, and multiple other disabilities. The review also concluded that FCT was not applicable for certain people with other types of disabilities, for example, hearing impairment and traumatic brain injury. (Gerow et al. 2018). Heath et al. (2015), examined the effectiveness of FCT throughout ages and disabilities. This meta-analysis concluded that FCT is an evidence-based practice, and that it is an effective treatment method for younger children (Heath et al., 2015). Heath et al (2015), concluded that FCT was more effective for people with ASD than people with an intellectual disability, however, the reviewers concluded that it is an effective treatment method for an intellectual disability (Heath et al. 2015).
Speech Sound Disorder (SSD)

The two treatment methods that were investigated were non-speech oral motor treatment (NSOMT) and the minimal pairs approach. One review was located about NSOMT, which investigated the effectiveness of NSOMT on treating SSD (Lee & Gibson, 2015). Lee and Gibson (2015) concluded that NSOMT does not have enough evidence to support its usage within the treatment of SSD. Baker and McLeod (2011) compared all treatment approaches for SSD. This study could not conclude which treatment approach would be better for treating SSD, but the general conclusion was that a child with SSD is better off receiving treatment, then no treatment at all (Baker & McLeod, 2011). Crosbie et al. (2005) conducted a comparison study on the effectiveness of minimal pairs approach compared to core vocabulary therapy. The minimal pairs approach showed greater improvement with the children with consistent SSD and core vocabulary therapy resulted in greater improvement in the children with inconsistent SSD (Crosbie et al. 2005). Overall, the participants of the study did show improvement even if they received different treatments (Crosbie et al. 2005).

Voice

The two treatments that were investigated were vocal hygiene treatments and voice therapy, specifically stretch and flow therapy. Rodríguez-Parra et al. (2011) conducted a study that compared vocal hygiene treatments alone with voice therapy. This study concluded that voice therapy is overall better than vocal hygiene treatment alone (Rodríguez-Parra et al., 2011). Barsties v. Latoszek et al. (2020) conducted a meta-analysis comparing all voice therapy treatment methods. In total nine were concluded to be effective but stretch and flow was shown to be the most effective out of all the therapies investigated (Barsties v. Latoszek et al. 2020). Watts et al. (2015) conducted a study investigating the effectiveness of stretch and flow voice therapy. This study compared no treatment versus the treatment using an RCT, the conclusion
was that the usage of stretch and flow therapy to treat dysphonia showed improvement within the participants (Watts et al. 2015).

Language

Language being such a broad topic, therefore the investigation into treatment methods focused solely on written language, specifically dyslexia. The two treatment methods investigated were colored lenses/visual theories, and phonemic awareness. A review was located about the visual theories and usage of colored lenses (Handler et al., 2011). Handler et al. (2011) investigated the relevant evidence and concluded that none of the theories such as vision therapy, training glasses, colored lenses, and magnocellular deficit theory had any quality supporting evidence (Handler et al., 2011). As a result, Handler et al. (2011) concluded that visual issues do not cause dyslexia and it is solely related to language. Suggate, (2016) conducted a meta-analysis investigating the long-term effects of different reading interventions: phonemic awareness, and phonics. The analysis concluded that phonemic awareness had the most long-term effect on reading skills (Suggate, 2016). The analysis concluded that phonics does work in the short term, in addition to that fact short and long-term effectiveness for reading skills are vital (Suggate, 2016).

Discussion

The results indicate that there are many treatment methods that have supporting evidence. The results also indicate that there are plenty of treatment methods that are being used that have little to no evidence supporting their usage. Overall, the positive treatment methods from each of the nine categories had the highest quality and supporting evidence backed by RCTs and meta-analysis. Whereas the more negative treatments within each of the nine categories concluded that more research was needed to draw a sound conclusion or stated that there was no evidence
supporting its usage. The most common evidence supporting the negative treatment methods was anecdotal evidence or not well-designed research methods. A portion of the studies investigating negative treatment methods did have RCTs or meta-analysis, but they concluded that there was no supporting evidence or not enough evidence in support. One common aspect of positive treatment methods is that some studies found that receiving treatment was better than no treatment at all, specifically for fluency and SSD, where there are many different treatment methods. Overall, the results conclude that the treatments that were deemed positive, were supported by high quality evidence and those deemed negative did not have high-quality evidence supporting them.

The implication of this research is that clinicians are still using treatment methods with little to no supporting evidence when incorporating external evidence into their clinical practice. This research also implies that clinicians are using treatment methods that have high quality supporting evidence in their clinical practice as well. Another noteworthy observation is that the positive treatment methods are person centric, meaning that the treatment is conducted between a clinician and their client. In contrast some of the negative treatment methods are based on technology, such as DAF, CBAT training and Fast ForWord. These negative treatment methods eliminate the clinician and client interaction common throughout the positive treatment methods.

The limitation of this study was that only certain treatments methods were investigated rather than an exhaustive examination of all the treatment methods that are being used by clinicians. By only focusing on the selected treatment methods, it can be difficult to extend these conclusions to other types of treatments that are being used. Overall, there does need to be more research to investigate the effectiveness of other common treatment methods. More research is needed to further discredit the negative treatment methods that are being used. Implementing
more research on the usage of EBP will help eliminate the possibility of clinicians using negative treatment methods. Clinicians themselves need to be aware of what treatments they are using so that they can offer the best and most effective treatment for their individual client. Clinicians also need to understand that each person being treated is an individual and that external evidence is only a small part of the usage of evidence-based practice.
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