Critical Review:

[(stuttering) OR (fluency disorders) OR (disfluency] AND [(telehealth) OR (telemedicine) OR (distance intervention)]

The search was limited to articles written in English.

Selection Criteria: Studies selected for review were required to report on clinical applications of high- or low-tech telehealth adaptations of traditional fluency interventions. No limits were placed on the subject demographics or specific intervention program designs.

Data Collection: Results of the literature search yielded 8 articles that met the selection criteria. These included the following study designs: expert opinion (2), case study (1), replicated single subject experimental design (3), and randomized controlled trials (2). The intervention programs reflected in the studies included the following: Parent-delivered Lidcombe Program for children (3), Camperdown speech-restructuring program for adults (2), and Unspecified (3).

Results

There are inherent differences in treatment approaches for young children versus older children or adults who stutter. Therefore, whenever possible, the parent-delivered Lidcombe program will be considered separately from speech-restructuring programs.

Expert Opinion

Respected experts in the field can make valuable judgments about the efficacy and feasibility of new treatment options

to reduce the potential influence of recording on speaking performance. Each sample was quantified by a blinded rater, and a portion were independently verified for reliability.

Although the single subject results were replicated across 4/5 cases, data is missing for the 5th participant beyond one week into treatment. There was an unusually high number of families (13/18) recruited for the study who dropped out prior to the start of data collection, indicating decreased desirability of this format for some clients. Additionally, preliminary examination of treatment efficiency suggested that telehealth delivery required more clinician time than standard intervention.

Overall, these results are highly suggestive of treatment efficacy. However, the clinical importance may be limited by the decreased treatment efficiency.

Randomized Control Trial (RCT)

RCTs are the most powerful of all study designs as they allow comparison between groups. However, conclusions can be constrained by threats to validity or reliability of the study design.

Lewis, Packman, Onslow, Simpson and Jones (2008) provided further evidence to support the efficacy of their Lidcombe adaptation. They reported on the results of a parallel group RCT with multiple blinded outcome measures. At 9-months post randomization, their

delivery of the Camperdown Program. Eight adults took part, and although there was considerable individual variability, they showed an average 82% reduction in %SS immediately post-treatment. This reduction remained at 74% at 6-month follow up. O'Brian *et al* also gathered data regarding speech rate, showing an average Syllables Per Minute (SPM) increase from 184 SPM to 228 SPM. Self-rated severity ratings improved for the majority of clients in most situations. Finally, "naturalness ratings", as judged by naïve listeners, were comparable to a control group of speakers who had not undergone speech restructuring.

O'Brian *et al* provided excellent descriptions of their participants and the adaptations made to traditional Camperdown program. All participants completed the trial. Sampling was thorough and considerable effort was made to reduce the influence of the clinician on speech performance during collection. The authors also took care to include holistic outcome measures designed to capture many facets of fluency; % SS in naturalistic situations, self-ratings of severity for 5 different scenarios, and naïve-listener perceptions of naturalness. Samples were quantified by blinded judges, and a portion were re-checked for inter and intra-judge reliability. Informal analysis of clinician contact time revealed that telehealth delivery of the Camperdown program was *more* efficient than face-to-face therapy.

This trial had only a small number of participants, and no comparison was made either to t intra