Critical Review:
Is Cognitive Behavioural Therapy (CBT) an effective intervention approach for adults who stutter?

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The following review explores the impacts of Cognitive Behavioural Therapy (CBT) on adults who stutter. Six studies were examined with the following research designs: one within groups design, three single subject designs, and two randomized clinical trials. Overall, evidence suggests that CBT is not consistently effective in reducing the frequency or severity of stuttering, but shows positive changes in stuttering-related thoughts, attitudes, and anxieties. The results of this review should be interpreted with caution due to the limitations of the studies and paucity of research evidence. Clinical implications and future recommendations are discussed.

Introduction

Stuttering, or *disfluency*, refers to an abnormal amount of interruptions to the forward flow of speech (Guitar, 2006). Although much research has delved into the causes of stuttering, the basis of stuttering continues to be relatively unknown. It has been suggested that stuttering may have a strong genetic basis, and may also be influenced by environmental factors (e.g., stressful childhood events, the birth of a sibling, etc.) (Guitar, 2006).

While stuttering characteristics vary between individuals, three main components are consistent among those who stutter. The first component consists of three core behaviours, including prolongations (sound or airflow continues but articulators are stopped), repetitions (a sound or syllable is repeated several times), and blocks (airflow, sound, and articulators are stopped) (Guitar, 2006). Individuals who stutter differ in the severity of these core behaviours. The second component involved in stuttering relates to the emergence of secondary behaviours. Secondary behaviours are individually learned strategies used to avoid or escape a moment of stuttering (e.g., tensing muscles, blinking eyes, stomping feet). The third and perhaps least emphasized component of stuttering includes the thoughts, attitudes, and anxieties associated with the stutter. Studies have shown that people who stutter frequently experience negative attitudes toward speaking, disabling anxiety in speaking situations, embarrassment, and reduced quality of life (Iverach et al., 2009; Blomgren, 2010). Treatment for stuttering often overlooks this component, focusing primarily on the reduction of the stuttering behaviours rather than on the modification of the emotions associated with the stutter. Given that many people who stutter experience higher amounts of emotional tension and social anxiety than non-stuttering peers (Kraaimaat, Vanryckeghem, & Van Dam-Baggen, 2002), and because high levels of anxiety can increase the frequency and severity of stuttering (Menzies, Onslow, Packman, & O'Brian, 2009), it is crucial that treatment place an emphasis on this component.

A therapy technique gaining recognition for this purpose in the field of speech-language pathology is Cognitive Behavioural Therapy (CBT). CBT was developed in the fields of clinical psychology and psychiatry, and teaches the clients to analyze, challenge, and reframe unhelpful thoughts and beliefs as they relate to stuttering. The application of this technique with people who stutter has not been widely researched but it is valuable to explore its potential impacts on stuttering.

Objectives

The primary objective of this paper was to critically evaluate existing literature regarding the effectiveness of CBT as an intervention technique for adults who stutter. The secondary objective was to provide evidence on which to base clinical decision making with regards to stuttering treatment.

Methods

Search Strategy

Computerized databases including PubMed, CINAHL, and SCOPUS were searched using the following keywords: ((stutter) OR (stuttering) OR (fluency)) AND ((cognitive) OR (cognitive behavioural) OR (therapy) OR (treatment)) AND ((anxiety) OR (social phobia)). The search was limited to articles written in English.

Selection Criteria

Studies selected for inclusion in this critical analysis were required to investigate the effects of CBT on

adults who stutter. No limitations were placed on the research design, participant demographics, or outcome measures.

Data Collection

Results of the literature search yielded six articles consistent with the aforementioned criteria: within groups design (1), single subject design (*n* of 3, 4, and 5) (3), and randomized clinical trial (2).

Results

Within Groups Design

Amster and Evelyn (2008) studied 5 males and 3 females aged 27 to 56 years to determine if a modified CBT approach, either alone or combined with a stuttering modification program, could help reduce perfectionistic tendencies and stuttering behaviours. The six-week study measured perfectionism, stuttering severity, and communication attitudes at four points in time. The first three weeks of the study focused solely on the CBT approach, which included goal setting, exploration of thoughts, and development of more rational responses. At 4 weeks, traditional Stuttering Modification Therapy was introduced and carried out in conjunction with CBT. Measures were readministered at 15 weeks follow-up.

Data were analyzed appropriately using a Wilcoxon Signed Ranks Test to compare changes in stuttering and perfectionism over time. This indicated that there was a significant decline in perfectionistic tendencies after the modified CBT program was implemented, most notably from the beginning to the mid-point of the study. Participants reported avoiding less frequently, becoming less upset about mistakes, reacting less negatively to perceived failure, and overall having more positive attitudes towards communication. The data also revealed significant improvements in speech fluency throughout both phases of treatment. At 15 weeks follow-up, there was a decrease in self-reported perfectionism, but no significant change in disfluency. Participants attributed this lack of change at follow-up to increased spontaneity of speech and decreased self-monitoring.

This study revealed significant changes in perfectionistic tendencies, fluency, and communication attitudes using a modified CBT approach both alone and in combination with stuttering modification. However, these suggestive results must be interpreted with caution due to a small sample size, lack of control group, and brief follow-up duration.

Single Subject Design

Blood (1995) completed a study using a single subject multiple baseline design. Four males between the ages of 20 and 25 with a history of stuttering participated in the study, dedicating approximately 60 hours over three weeks. The aim was to evaluate the efficacy of a behavioural-cognitive treatment program for adults who stutter. Subjects participated in a computer-assisted biofeedback program for reducing stuttering, a CBT component, and a relapse management program simultaneously. Measurements of stuttering severity and communication attitudes (self-reported emotions and thoughts related to speaking) were taken at five points throughout the study period. Results indicated that the percent syllables stuttered (%SS) for each participant decreased to less than 3%SS (from an average of 18%SS at baseline), and attitudinal measures showed positive changes over the course of the treatment. These gains were maintained at 6 months and 1 year follow-up. The significance of these results was not determined, as statistical analyses were not completed. This article provides equivocal evidence regarding the effectiveness of CBT as a therapy technique for stuttering, given that the study employed a small number of participants, and that the relative contribution of the CBT component alone could not be determined. However, it does provide suggestive evidence regarding the effectiveness of CBT with concurrent stuttering treatment.

Koc (2010) examined the effects of CBT on stuttering using a two-stage treatment. Three single subject experimental cases aged 19 to 27 participated in the study. During the first stage of the treatment, the thoughts and feelings relating to the stutter were identified, and alternative thoughts were discussed. Stuttering frequency was not measured during this stage. In the second stage, stuttering frequencies were recorded at ten intervals throughout stuttering therapy. Results indicated that all participants showed a decrease in stuttering frequency during the second stage, but statistical significance was not calculated. Because stuttering frequency was not recorded during the first stage, the relative contribution of CBT in isolation cannot be established. Therefore, this study provides equivocal evidence to support the effectiveness of CBT as a stuttering intervention due to the ambiguity of its methods, small sample size, and lack of control group. Consistent with Blood (1995), however, Koc (2010) provides some evidence to support the effectiveness of CBT combined with additional stuttering therapy.

Reddy, Sharma, and Shivashankar (2010) studied the effectiveness of CBT in reducing symptoms of stuttering and dysfunctional cognitions and in enhancing quality of life in 5 adult males who stutter. The

treatment consisted of two phases: the first phase of CBT involved relaxation techniques and the second stage focused on cognitive restructuring, problem solving, and assertiveness. After completing the 4 to 6 week intervention, stuttering was reduced in 3 subjects, and stuttering components (e.g., avoidance) were reduced for all 5 participants. CBT was effective in reducing the severity of dysfunctional cognitions, and both assertiveness skills and levels of satisfaction showed positive change. This study is suggestive that CBT is useful in reducing the severity of stuttering and related components. However, results must be interpreted with caution due to its brief treatment duration, small sample size, lack of control group, subjective self-report measures, and lack of statistical analysis description.

Randomized Clinical Trial

Menzies et al. (2008) conducted a study to examine the rate of social phobia among adults who stutter, the effects of speech restructuring treatment on social anxiety, and the effects of CBT on anxiety and stuttering. The study involved 30 adults who stutter (25 men and 5 women), who were randomly assigned to one of two groups. The first group received 10 weeks of CBT treatment followed by 14 hours of speech treatment, while the second group did not receive any treatment during the first 10 weeks followed by 14 hours of speech treatment. The CBT treatment incorporated cognitive restructuring, graded exposure, and behavioural experiments. Outcome measures were taken at four points during the study, which consisted of a speech evaluation (%SS), a blind assessment of social anxiety completed by a psychologist, and a battery of six psychological self-report measures.

The data was analyzed appropriately, using a two-sample *t*-test and ANCOVA to compare continuous outcome variables for the two groups. Chi-square and Fisher's exact test were used to compare categorical data. Bonferroni adjustments were made to control for multiple comparisons. Results of the clinical assessments revealed that 60% of the sample was diagnosed with social phobia at the beginning of the study. Data analysis revealed that speech restructuring in isolation did not have significant impacts on the social phobia status of the participants. However, participants who received CBT no longer met the diagnosis for social phobia at follow-up. Although positive changes were seen with regards to psychological measures, CBT did not reduce stuttering any more than speech restructuring alone. The authors speculated that the effectiveness of CBT on reducing negative cognitions may have lowered the motivation to reduce stuttering, which has also been postulated by Amster and Evelyn (2006).

This study did not include intention to treat data, despite having a deteriorating number of participants. The authors, however, provided ample detail describing the methods and analysis, and suggested areas of future research. This article provides compelling evidence supporting the effectiveness of CBT in treating stuttering-related anxieties, but is not indicative of any additional effects on reducing the stuttering itself.

Moleski and Tosi (1976) provided an early example of the impact of CBT on stuttering. The study examined the effects of rational-emotive therapy (a form of CBT) on stuttering compared to systematic desensitization. Subjects (15 adult males and 5 adult females) were randomly assigned to one of five groups for 8 sessions: rational-emotive therapy with and without in vivo tasks, systematic desensitization with and without in vivo tasks, and a control group. In vivo tasks involved making phone calls to acquaintances and having spontaneous discussions with strangers. A battery of psychological tests and a fluency assessment were administered prior to treatment, directly after treatment, and at one month follow-up.

Data analysis appropriately used a 2x2 factorial ANOVA and Dunnett's *t*-test. A significance level of .05 was used, but findings of less than .10 were considered to be clinically significant. Results indicated that rational-emotive therapy was more effective than systematic desensitization in reducing disfluency as well as accompanying anxiety and negative attitudes towards speaking. In vivo tasks influenced disfluencies and attitudes in the desired directions. These results support the use of a CBT approach over a traditional behavioural approach. Limitations of the study include having a small sample size, a brief therapy period and lack of follow-up beyond one month. As a whole, this study provides suggestive evidence that CBT is effective in reducing stuttering and associated anxieties.

Discussion

Each of the six studies examined demonstrated some beneficial outcomes with adults who stutter; however, they varied in their impact on the stuttering frequency itself. Of the six articles described, three studies found significant reductions in stuttering frequency using a CBT approach alone. Although these studies are suggestive and were designed with levels 1 and 2 evidence, they are limited by their small sample sizes, brief treatment duration, and insufficient follow-up duration. The remaining three studies either (a) could not determine CBT's relative contribution to stuttering reduction, or (b) did not find any reduction in stuttering after CBT.

It must be acknowledged that people who stutter have attitudes, thoughts, and anxieties related to the stutter. Any change in these concomitant behaviours can be clinically significant, given that they can influence one's psychological and social functioning (Kraaimat et al., 2002). To some, altering the client's feelings and attitudes is equally or more important than reducing the stuttering severity. When a person has a more positive view of him/herself as a communicator, the emotional impact of stuttering may be less profound. These clinically significant effects were seen in each of the six reviewed articles. After experiencing CBT, clients reported that accompanying anxiety, negative emotions (Moleski & Tosi, 1976), perfectionistic tendencies (Amster & Klein, 2007), and avoidance behaviours (Koc, 2010) were decreased, and engagement in everyday tasks (Menzies et al., 2008), quality of life (Reddy et al., 2010), and assertiveness (Blood, 1995) were improved. Several studies reported that an increase in stuttering was seen after CBT, due to an increased acceptance of stuttering moments (Amster & Klein, 2007) and more spontaneous speech production (Amster & Klein, 2007; Menzies et al., 2008).

Although this evidence is convincing, research addressing treatment effectiveness has a number of limitations. Firstly, it is primarily based on self-report measures, which are often subjective and difficult to measure accurately. Further, considering that the behaviour of each individual is unique and is shaped by personal experience, it may be difficult to generalize the findings to larger populations. Finally, it is difficult (and raises ethical issues) to create a study in which one group is instructed to opt out of treatment. Thus, few studies make direct comparisons between groups undergoing full treatment and no treatment. Given that research is limited in the area of CBT, it is suggested that future research consider the following variables:

1) Which clients (age, cognitive level, personality, severity, co-morbidities, etc.) are the most appropriate candidates for this combined therapy?
2) What intensity of therapy yields the most success?
3) What duration of therapy is the most effective?
4) What goals and hierarchies should be established?
5) Should the treatment be individualized or is one format effective for all clients?

Conclusion

While research in this area is limited, the six reviewed studies provide a foundation on which to base clinical practice. It is evident that CBT in isolation may not consistently result in changes to fluency, as the six articles demonstrated. However, by combining CBT with direct stuttering therapy, stuttering can be reduced and it can help contribute to an overall sense of well-being and an improvement in self-confidence. Further, by incorporating CBT into stuttering therapy, the potential for relapse may be minimized (Blood, 1995). Using this combined approach, clinicians may be able to target and change the stuttering itself and the anxieties, thoughts, and attitudes that may exacerbate it.

Clinical Implications

The examined evidence is supportive of the combined use of CBT and direct stuttering therapy in order to effect change in stuttering severity and overall sense of client well-being. However, caution is still warranted.

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