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Investigating the Effectiveness of Cognitive Behavioral Therapy on Anxiety in Children with Stuttering in Yazd City

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ABSTRACT: Background and purpose: The present study aimed to investigating the effectiveness of cognitive behavioral therapy on anxiety in children with stuttering in Yazd city.

Research method: In this study, which was conducted as a quasi-experimental study with pre-test and post-test with a control group, 30 eligible children aged 10 to 12 years were selected from among children with stuttering in Yazd city and entered the study. 15 of them were randomly assigned to the intervention group and 15 to the control group. Anxiety variable scores were compared using the Spence Children's Anxiety Scale, parent version (SCAS-P) at two time points before and after cognitive behavioral therapy. Data analysis was performed using analysis of covariance using SPSS software version 23. The significance level of the tests was 0.05.

Findings: Data analysis showed that anxiety test scores in children with stuttering in the intervention group and after receiving treatment decreased significantly ($p<0.001$, $F = 186.253$) compared to the control group.

Conclusion: The results of this study showed that cognitive behavioral therapy can reduce anxiety in children with stuttering. Therefore, cognitive behavioral therapy can be used as an effective treatment protocol to reduce anxiety in children with stuttering.

KEYWORDS: COGNITIVE BEHAVIORAL THERAPY, ANXIETY, STUTTERING, CHILD

INTRODUCTION

Speech fluency disorder that begins in childhood and is called childhood stuttering is a neurodevelopmental disorder. It has been reported that 5% to 11% of preschool children stutter. This disorder begins in children on average at about 33 months of age. In terms of treatment, 75% to 80% of children with stuttering have shown a favorable prognosis in treatment within 15 months after the onset of stuttering (1). On the other hand, the recovery rate in children with stuttering at the age of 5 years shows a 50 to 60% decrease. Delaying the treatment of these children leads to a decrease in the likelihood of treatment in them. Therefore, early treatment is recommended for these children. Failure to treat stuttering in children leads to the development of negative communication attitudes and psychological distress in them, which can negatively affect their lives and make treatment more difficult for them, and may lead to the persistence of stuttering in them until adulthood (2). Children who stutter over the age of 7 are at significantly increased risk of chronic stuttering with potentially negative consequences for psychosocial development and academic and professional achievement (3).

The frequent and involuntary repetitions, prolongations, and blockages (abnormal pauses) of speech in people who stutter disrupt the normally smooth, rhythmic flow of speech. This disorder is characterized by frequent involuntary repetitions and prolongations of speech sounds, as well as producing speech with long pauses, and by avoidance and fighting behaviors (4). Problems in the neural systems that support executive function, language, and speech-motor control can be among the main factors that cause stuttering. People who stutter suffer from a great deal of anxiety during their speech and in communicating with others, making it more difficult to treat (5).

One important variable in stuttering is anxiety. Stuttering in children may be associated with emotional responses such as fear of speaking. Cognitive factors are also likely to develop over time in individuals who stutter, including attitudes and beliefs about stuttering and communication, such as anticipating stuttering and avoiding words and situations. Many individuals who stutter report negative peer attitudes, being bullied, and being teased about their speech (6). Fear of communicating verbally with others, reduced self-perception, and fear of negative evaluation have been reported in individuals who stutter in adolescence. These psychological stresses from stuttering and the negative memories they carry with them are associated with negative mental health outcomes in children who stutter, particularly anxiety about non-stuttering peers (7).

Investigating the Effectiveness of Cognitive Behavioral Therapy on Anxiety in Children with Stuttering in Yazd City

Speech therapy and psychotherapy can be used to treat the problems of children who stutter. Cognitive-behavioral consequences of stuttering, including negative communication attitudes or covert avoidance of communication situations, are common as hidden psychological complications of stuttering, even in very young children (8). Cognitive models of anxiety disorder have led to the development of cognitive behavioral therapy (CBT) for anxiety. CBT can reduce anxiety problems by identifying and challenging unhelpful cognitions and behaviors and replacing them with coping strategies (9). CBT is a type of psychosocial intervention that reduces various mental health symptoms, especially depression and anxiety disorders. The goal of cognitive behavioral therapy is to examine and challenge dysfunctional emotions and maladaptive behaviors, processes, and cognitive content through a number of systematic, explicit, and goal-oriented methods (10). Therapists in this method believe that there may be behaviors that cannot be controlled through rational thinking. CBT focuses on problem-solving in psychological problems, and in this approach, the therapist tries to help the client choose a specific strategy for dealing with the problem and reduce the problem through problem-solving (11). Leclercq et al. stated in a study that CBT can improve the negative attitude of stuttering children and improve their psychological quality of life (12). Ezabadi et al. reported that cognitive-behavioral play therapy has a significant effect on social anxiety and academic self-concept of elementary school students with stuttering (13). Toozandehjani et al. They stated that confrontation cognitive-behavioral skills were effective in increasing adaptation to stuttering in the subjects (14).

Children who stutter experience numerous psychological problems, including anxiety. Anxiety is a very determining factor in the treatment of stuttering. Research on the effect of cognitive behavioral therapy on stuttering is very limited. Therefore, conducting research in this field is necessary and essential. Treating anxiety in children who stutter can be of great help to the stuttering treatment team so that they can be more hopeful about the results of the treatment. However, no study has examined the effectiveness of cognitive behavioral therapy on the anxiety of children who stutter. Therefore, the purpose of this study was to determine the effectiveness of cognitive behavioral therapy on the anxiety of children who stutter in Yazd.

RESEARCH METHOD

In this study, which was conducted as a quasi-experimental study with pre-test and post-test with a control group, 30 eligible children aged 10 to 12 years were selected from among children with stuttering in Yazd city and entered the study. 15 of them were randomly assigned to the intervention group and 15 to the control group which is sufficient based on semi-experimental studies (15).

Parents of children selected for the study completed the Spence Children's Anxiety Scale-Parent Version (SCAS-P) at two time points before and after cognitive behavioral therapy, and children in the experimental group underwent CBT for 10 one-hour sessions.

Inclusion criteria included age range of 10 to 12 years, having stuttering disorder diagnosed by speech therapy and having been stuttering for at least two years, filling out the consent form to participate in the study by the parents and no other concomitant treatment. Exclusion criteria included missing more than one session in the therapy sessions and not completing the questionnaire by the parents at any stage of the study.

To collect data, the demographic and clinical information checklist and Spence Children's Anxiety Scale-Parent Version (SCAS-P) were used. The SCAS-P has 38 items and 6 subscales. Its subscales include fear and anxiety about open spaces (9 items), separation anxiety (6 items), fear of physical harm (5 items), social anxiety or phobia (6 items), obsessive-compulsive symptoms (6 items), and general anxiety (6 items). The SCAS-P is completed by the parents. The scoring of this scale is based on a Likert scale (never, sometimes, often, always) and ranges from 0 (never) to 3 (always). The range of scores for this scale is between 0 and 84. The sum of the subscale scores also provides a total score that indicates general anxiety and can be used for analysis. The scores for each subscale can also be analyzed separately (16). The validity and reliability of this questionnaire have been evaluated in previous studies with a validity coefficient of 0.874 and a reliability coefficient of 0.89 for the overall test (17). In Iran, Cronbach's alpha values for the entire scale were reported as 0.939, and for the dimensions of panic, market phobia, 0.812, generalized anxiety, 0.894, specific phobia, 0.803, social anxiety, 0.709, and separation anxiety, 0.801, respectively. The most appropriate cutoff point for the scale was calculated to be 5.24 (18).

CBT sessions were conducted three times a week for ten one-hour sessions for the experimental group. The protocol used in this study was adapted from Leclercq et al (12). These sessions were conducted by the researchers at the Armana Rehabilitation Center in Yazd for one month. A summary of the cognitive behavioral therapy sessions is presented in Table 1.

Table 1. Overview of CBT

sessions	Description of sessions
1	Communicating with clients, determining treatment goals, identifying anxiety-provoking situations and the child's reaction to them
2	Teaching different emotions, identifying symptoms created in anxiety-provoking situations, especially verbal communication with others

3	Teaching physical symptoms of anxiety, identifying physical reactions to anxiety, especially during speech.
4	Diaphragmatic breathing and relaxation training
5	Familiarity with self-talk in anxious situations, distinguishing between anxious and adaptive self-talk
6	Helping clients transform anxious self-talk into adaptive self-talk, teaching problem-solving skills for anxiety management
7	Familiarizing clients with the logic of exposure, designing fear hierarchies, and implementing exposure exercises in situations that cause little anxiety
8	Conducting exposure training in communication situations that cause moderate anxiety
9	Conducting exposure training in communication situations that cause a lot of anxiety
10	Practicing exposure to a highly anxious situation, designing a summary of therapy sessions in the form of a wall newspaper

Parents were informed about the children's therapy sessions. They were also assured that their child's information would remain confidential and a numerical code was assigned to each participant. Participants did not pay any fees, and the authors' rights to use printed and electronic sources, including ethical considerations, were respected. In this study, descriptive statistics such as mean and standard deviation were used to analyze the data, and multivariate
analysis of covariance (MANCOVA) was used for statistical inference. The significance level was $\alpha = 0.05$.

Statistical analysis

In this study, descriptive statistics such as mean and standard deviation (SD) were used to analyze the data, and multivariate analysis of covariance (MANCOVA) was used for statistical inference. The significance level was $\alpha = 0.05$.

RESULTS

The descriptive statistics from the study related to the research variable are reported in Table 2.

Table 2. the descriptive statistics of the anxiety variab

standard deviation	mean	maximum value	minimum value	frequency		anxiety
12.5632	38.5645	54.00	21.00	15	Per-test	Control group
12.3482	37.9494	55.00	20.00	15	Post-test	
12.8458	39.8346	57.00	22.00	15	Per-test	Test group
9.3475	28.4528	44.00	15.00	15	Post-test	

It should be noted that before performing the analysis of covariance test, the assumptions related to it were examined. The Kolmogorov-Smirnov test showed the normal distribution of anxiety variable scores in both experimental and control groups. In addition, according to the Levene test, the assumption of equal variances of anxiety scores of the two groups in the pre-test and post-test was not rejected. Also, the result of examining the interaction effect of group and pre-test slope of regression lines also rejected the assumption of homogeneity (P=0.368).

Table 3. the results of the analysis of covariance test

name of the test	value	F	sig	df of error	df of hypothesis
Pillais trace	0.423	8.254	0.001	25	**2**
Wilks Lambda	0.673	8.254	0.001	25	**2**
Hotelling's trace	0.649	8.254	0.001	25	**2**
Roy's largest Root	0.649	8.254	0.001	25	**2**

According to the data in Table 3, all tests have a significance level of $p<0.05$, which indicates that the analysis of covariance test can be used. The data indicate that there is a significant difference between the experimental and control groups in at least one of

the dependent variables. Also, the between-subjects effects test was used to examine the difference between the experimental and control groups, the results of which are presented in Table 4.

Table 4. the results of the between-subjects effects test for comparing the anxiety variables in the post-test stage between the experimental and control groups

Effect size	sig	F	Mean Square	df	Sum of Square	variables
0.976	0.001	1284/224	1296/658	3	3896/645	**anxiety**

As can be seen in Table 4, the F value obtained is significant. In other words, cognitive behavioral therapy has reduced the anxiety variable in stuttering children.

DISCUSSION

This study aimed to investigate the effect of music therapy on anxiety resulting from stuttering in children. The results of the research showed that the mean pre-test and post-test anxiety scores in the experimental group were 25.33 and 19.8, respectively. This indicates a decrease of 5.53 in anxiety scores. Furthermore, the results of the analysis of covariance demonstrated that music therapy is effective in reducing anxiety in children with stuttering .The finding aligns with those of (26) indicating the impact of music therapy in decreasing exam anxiety. Similarly (27) demonstrate the effectiveness of music therapy in reducing children's anxiety. Amini et al. (28) also illustrate how music therapy reduces anxiety related to Corona. Additionally (29-31) confirm the consistent impact of music therapy in reducing anxiety and stress.

Music therapy, with its pleasant and enjoyable imagery effects (32) can provide individuals with a sense of relaxation and emotional release. As Brocklehurst (2013) stated Music activities at various sensory and motor levels create a safe, stimulating, and enjoyable environment, facilitating therapeutic communication and increasing individual and group activities. Music has the ability to convey human feelings, emotions, perceptions, and cognition without the need for speech or language (33).Evidence suggests that rhythm, rhythmic chanting, and music sound can enhance speech flow in language impairment and reduce it (19). It also improves speech fluency in these individuals by helping them "let go of their fears and anxieties about stuttering or situations that increase stuttering" (20). Overall, music therapy helps individuals with language impairment regain their self-esteem and serves as an effective tool for identifying and exploring emotions (21).

According to the metacognitive theory of Wells (2000), the use of redirection techniques can shift individual attention from anxiety-provoking stimuli to external stimuli, and music therapy is used as a tool to redirect attention. In fact, music therapy can reduce the secretion of adrenaline and noradrenaline, thereby lowering blood pressure and heart rate (34) .According to various studies, music therapy is effective in promoting relaxation, reducing anxiety and stress, and treating depression (35) . Musical activities such as playing instruments, moving with music, and creating melodies allow individuals to express their emotions and transform undesirable motivations into socially acceptable behaviors. Additionally, activities involving singing, playing instruments, and group discussions help emotionally vulnerable children and adults in the following areas: 1) self-awareness, 2) improving communication skills, 3) appropriate emotional expression, and 4) increasing group cooperation(36).

In general, musical sounds and melodies can divert thoughts from anxiety and aid in stress adaptation (37). One of the calming effects of music is its ability to reduce anxiety levels and induce a sense of tranquility. Music helps with mental focus, improves mood, and prevents hallucinations and obsessive thoughts. Furthermore, certain musical notes can regulate heart rate, breathing patterns, muscle relaxation, and induce sleepiness. Therefore, the use of music therapy is effective in reducing anxiety in children with language impairment (38).

CONCLUSION

Based on the research findings, it can be concluded that music therapy, as a non-pharmacological method, has a significant impact on reducing anxiety caused by stuttering in children aged 4 to 12 years. When children are exposed to music and music therapy, it helps them become more self-aware and enhances their performance. Additionally, when they sing collectively in a music therapy group, they can identify and express their true feelings, momentarily detaching themselves from external and internal problems, and experience a sense of calm and liberation. By engaging in these activities in a group setting, children can experience emotional discharge and benefit from the positive feedback they receive, thereby reducing their anxiety. Rhythmic play integrated with music for children leads to increased serotonin production (the happiness hormone) in their brains, resulting in a sense of relaxation and ultimately reducing anxiety. Therefore, music therapy can be considered a complementary method for reducing anxiety in children.

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Investigating the Effectiveness of Cognitive Behavioral Therapy on Anxiety in Children with Stuttering in Yazd City

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Statements

Ethical approval and consent forms from the participants

All individuals received written information about the research and chose to participate if they wished. Participants were assured that all information would remain confidential and be used solely for research purposes. To ensure privacy, participants' names were not recorded.

Financial resources

The financial resources for this study were provided from personal expenses and not by any institution or organization.

Conflicts of interest

The authors declare that there are no conflicts of interest.

Author contributions

This article is based on a section of the results from the first author's master's thesis in clinical psychology at the Department of Psychology, Yazd University, with the code IR.ACECR.JDM.REC.1402.027 The second authors served as supervisors and the third author as a consultant. The first author was responsible for data collection, developing the therapeutic program, and preparing the report. The initial idea and conceptualization were done by the second author. The third author has helped in the interpretation of the result. All authors read and approved the final handwritten version.

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