

Effect of Stuttering Intervention on Depression, Stress and Anxiety among individuals with Stuttering: Case Study

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Abstract

Previous literature has reported that stuttering is linked with lowered life quality across a wide range of domains such as vitality, social presentation, significant risks of social anxiety disorder and emotional functioning. The aim of the present study was to assess the status of the psychological variables mainly depression, anxiety and stress in two clients diagnosed with stuttering, who had attended regular intensive therapeutic sessions. Both of them exhibited negative emotional states regarding their problem and were feeling highly stressed due to stuttering. The severity of stuttering was assessed using Stuttering Severity Scale (SSI-4) and negative emotional states of depression, anxiety and stress were measured by DASS (Depression Anxiety Stress Scale) in two stages i.e. pre- and post-stuttering intervention. The outcome of the present study revealed reduction in depression, anxiety and stress after stuttering therapy. The finding of the present study highlighted on the fact that evidence based stuttering therapy techniques must be followed and implemented during the therapeutic sessions based on the client's severity of stuttering. This study also proves very strong correlation between speech behavior and emotional aspects among stutterers. The findings also showed that intensive stuttering modification therapy techniques can be effective in reducing severity of stuttering as well as reducing the psychological issues such as depression, stress, anxiety and attitude due to stuttering; thus improving quality of life in persons with stuttering.

Keywords: DASS; Stuttering; SSI; Psychological variables

Introduction

The capacity of an effective human being is to communicate in a smooth rhythmic pattern in order to maintain healthy interpersonal relationships, occupational success, and lead a better quality of life. Stuttering comes under fluency disorder that mostly becomes apparent in childhood, and with an global estimated prevalence of 0.72% of the population [1]. It is a common fluency disorder with many probable subtypes [2] in which the individual who stutters generally exhibit unintentional interruptions to the fluency of their speech, comprising mostly of syllable repetitions, prolongations and blocking of sounds, replacements and escaping of words [3]. In addition, most of the researchers indicate neurological deficit as a probable cause for stuttering [4]. Because of its involuntary and possibly socially incomprehensible by nature, stuttering has been found to have an adverse impact on emotional and mental health wellbeing of an individual [2,5]. Most of the research studies predominantly recommends that stuttering relates to significantly higher levels of trait and social anxiety [2,6]. Most of the studies have reported that due to the higher level of stress and strain of continuously coping with stuttering, individuals who stutter have been found to be susceptible of developing psychosocial and social anxiety problems [7].

In most of the instances, it has been seen that stuttering is linked with lowered life quality across a wide range of domains such as vitality, social presentation and emotional functioning [8]. significant risks of social anxiety disorder, [9] negative affectivity, [10] a potential negative impact on educational attainment [11] avoidance of employment opportunities as it requires efficient communication skill [12]. Additionally, there are other conclusion measures which indicates

that individual with stuttering are at higher risk of experiencing negative mental and social health. Importantly, studies have also mentioned that individuals with stuttering can have significant experience difficulties with employment due to their stuttering [3,13]. Relapse followed by the treatment in individuals with stuttering has also been a source of difficulty and anxiety [14,15]. The individual with stuttering have been found to have negative stereotypes regarding themselves [16,17].

Stuttering has been shown to be related not only to high risk of anxiety, but also to depression. However, research has yielded indecisive findings [18,19]. According to the DSM-IV [20] depression has been defined as a pervasive feeling of unhappiness. In stuttering, self-reported depressive indications seems to be higher among persons who stutter than control group [21-23]. Individuals who stutter showed a huge array of psychological problems associated with stuttering, which includes reports of challenge, anxiety, increased amount of stress which leads to depression, and heartache [24]. A study done by Conture et al. [25] had suggested that the psychosocial processes of people who stutter are complexly related to their speech production behavior.

Researchers have mentioned that professionals dealing with stuttering need to know the life context of individuals who stutter, in terms of their family and society [3]. Therefore, the purpose of this study was to assess the consequences of stuttering in both the individuals who had stuttering; and simultaneously also understand its impact on various domains of psychological factors mainly depression, anxiety and stress and their respective quality of life. The stuttering treatment options considered for both the cases showed positive outcomes which had traditionally focused primarily on reducing the speech dysfluencies through behavior modification. Criag [26] used

relaxation, speech-prolongation technique and observed that these treatment approaches were effective in reduction impact of stuttering. More integrated interventions were manifested that served in mitigating the effect of stuttering, such as Camperdown program [27] Bothe et al. [28] in their review article revealed that the most important management of stuttering for adults, with respect to both speech outcomes and psychological outcomes, seem to combine variants of prolonged speech, self-management, response contingencies and other infrastructural variables.

Though the literature review indicates that intensive therapeutic interventions can vary from 3 months to 3 years with variable number of sessions which have a positive impact in reducing the psychological behaviors and dysfluencies resulting in better educational attainment in children with stuttering [29,30]. Thus, the present study was to assess the status of the psychological variables mainly depression, anxiety and stress in two clients who had attended regular intensive therapeutic sessions, had negative emotional states regarding their problem and were feeling highly stressed due to stuttering. Based upon the previous research studies being conducted, it has been observed that there is a lack of literature that can show the correlation between speech behavior and psychological aspect among individuals with stuttering. The main objective of the present study was to study the correlation between speech behavior and psychological aspect among individuals with stuttering.

Materials and Method

Two participants diagnosed with severe stuttering under the opinion of two qualified speech and language pathologists were selected from the outpatient services of Department of Audiology and Speech Language Pathology, Amity University Gurugram, Haryana respectively. Assessments were carried out in 2 phases i.e. pre-therapy and post-therapy. Informed consent was taken from both the participants. Microsoft excel 2016 and SPSS 2.0 was used to analyze the data.

Tools

One standardized questionnaire (DASS-42) and one standardized test material (SSI-4) was used in the present study. The severity of stuttering was assessed using Stuttering Severity Scale (SSI-4) [31] and negative emotional states of depression, anxiety and stress was measured by DASS (Depression Anxiety Stress Scale). The DASS questionnaire consists 42-item designed to assess the three related undesirable emotional states of depression, anxiety and tension/stress [32]. Each item has four point rating scale i.e. did not apply to me at all (score 0) to applied to me very much (score 3). DASS has 14 items each for depression, anxiety and stress (14+14+14=42). The score for each of the respondents over each of the sub-scales (depression, anxiety and stress), are then estimated as per the severity-rating index i.e. normal, mild, moderate, severe and extremely severe.

Procedure

Therapeutic and assessment program consisted of 40 sessions in total, with 35 to 36 session intensive sessions for therapeutic intervention and the remaining sessions were used for assessments. The duration of an individual session was 45-50 min. The sessions were carried out over a period of 20 weeks. Modified airflow, prolongation, pull-outs and cancellation techniques were used to address both the core and secondary behaviors including feelings and attitudes with

respect to stuttering in both the participants. Pre-therapy assessment of DASS was conducted one day before the commencement of therapy sessions. Therapy sessions were carried out in 2 stages. Stage 1 of the therapy sessions initially consisted of motivating both the individuals and thus focusing on reducing their negative attitude towards the problem and simultaneously observing the types of dysfluencies which was present in both the clients in three different situational contexts *viz.*, speaking, reading, monologue and spontaneous speech. In stage 2, clinician demonstrated the modified airflow technique and then instructed the clients to follow in the same manner. Initially it started from the relaxation phase and then slowing moving on to prolongation, pullouts and cancellation phase in different context *viz.*, speaking, reading, monologue and spontaneous speech. They were also instructed to speak slowly by initiating tapping, so as to reduce their rate of speech. After a period of 36 intensive therapy sessions, a post-therapy assessment of the administer questionnaire (DASS) was done on both the clients in order to analyze the psychological status (depression, anxiety and stress) in both the subjects. Post therapy stuttering evaluation was also done on both subjects.

Case Report

Case I

A 22-year-old male (university student) belonging from an Indian urban background, accompanied with caregiver presented with complaints of increased severity of stuttering which increased in last 1 year. The onset of the problem was from childhood, but no significant treatment was taken to reduce the stuttering due to lack of awareness, reported, the severity increased more while talking to strangers and higher authorities like teachers. Initially a detailed case history was taken wherein the caregiver mentioned that as a child, the individual was temperamentally shy and reserved. Stuttering had a very negative impact on the individual's personal and social domains, thus affecting quality of life of the individual. The caregiver also mentioned that the individual experienced autonomic arousal such as sweating, palpitation and tremor when the severity increased while speaking resulting in severe stress and anxiety.

At the time of assessment, it was seen that the subject usually avoids conversation in order to anticipate his stuttering. The severity of stuttering was being measured using SSI-4. The speech samples were recorded in English using Sony Open Box ICD-PX333 Digital Voice Recorder device for speaking, reading, monologue and spontaneous speech separately and were analyzed later by two well-qualified speech language pathologists. The types of dysfluencies which were basically observed was blocks, repetitions of initial syllable repetition like for e.g: "p-p-p-p-pen" for the word "pen", whole word repetitions like "I will-will-will go home t-t-t-mmorrow" for the sentence "I will go home tomorrow" along with fast rate of speech.

While speaking the subject's physical concomitants such as facial grimaces (tensioning of jaw muscles), movement of the extremities (continuous leg movement and foot tapping), getting tensed while speaking was very evident. Based on SSI-4 score obtained the subject was diagnosed with severe stuttering. The individual was then counseled and then was recommended for stuttering therapy sessions thrice in a week. DASS was administered before the commencement of therapy sessions. The score obtained were suggestive of severe emotional state for depression, severe for anxiety and extremely severe for stress.

The participant attended regular 36 intensive sessions of fluency shaping therapy. Post-therapy assessment was administered using SSI-4 and DASS. The scores obtained indicated that there was significant improvement between pre- and post-assessment phases. The Improvement Criteria Analysis was carried out calculating clinically significant changes (50% and above) based on pre-therapy. Post therapy data [9] was used to assess the efficacy of therapeutic intervention. Therapeutic change between pre- and post-assessment was calculated in terms of percentages using the formula (Shivshankar et al.): $\text{Pre score-Post Score/Post Score} \times 100$.

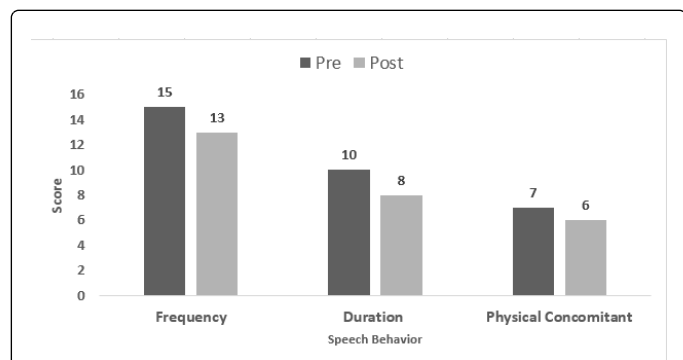


Figure 1: The graphical representation of the scores obtained for SSI-4 based on pre and post therapy assessment.

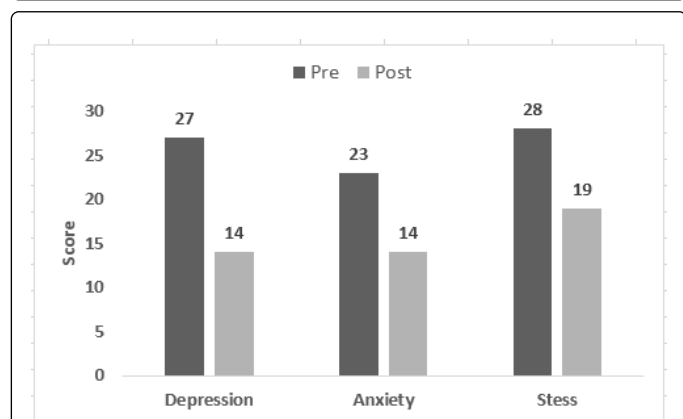


Figure 2: The graphical representation of the scores obtained for DASS based pre and post therapy assessment.

The frequency of dysfluencies observed during spontaneous speech had decreased subsequently. The outcome of the stuttering therapy showed better (lower) SSI-4 and also in DASS. In SSI-4, the frequency score reduced from 15 to 13, duration score reduced from 10 to 8 and physical concomitant score reduced from 7 to 6. Overall, the severity of stuttering reduced from severe to moderate. Similarly, the outcome of stuttering therapy also showed reduced (better) DASS scores compared to pre-therapy scores. After, 36 therapy sessions, the score of depression reduced from 27 (severe) to 14 (moderate), the score of anxiety reduced from 23 (extremely severe) to 14 (moderate) and the score of stress reduced from 28 (severe) to 19 (moderate). Figures 1 and 2 represents the responses in the form of graphical representation obtained for each section of SSI-4 and DASS after pre and post-therapy assessments respectively. Overall findings indicate there is a good

amount of improvement in the emotional state of the participant after attending intensive therapy sessions. The individual was feeling motivated and desired to continue the therapy sessions.

Case-II

A 20-year-old Indian female (university student) accompanied with her mother presented with complaints of stuttering and anxiety since past 01 years. The onset of stuttering was during childhood, which was static in nature. As mentioned by the subject's mother and teacher, the subject finds difficulty to pronounce a word; or would miss out words in between sentences; sometimes would repeat the same letter of a single word, especially while speaking to higher authorities, strangers or sometimes in front of friends. However, her friends with the college campus are very supportive. The client was self-motivated and had interest towards extracurricular activities.

SSI-4 and DASS was administered to assess the types of dysfluencies in speaking, reading, monologue and spontaneous speech separately along with to examine the present emotional state of the subject owing to stuttering. During assessment it was observed that the individual doesn't make eye contact and looks around whenever the event of stuttering occurs while speaking. SSI-4 scores suggested moderate level of stuttering and DASS scores also revealed that the subject had moderate state of depression, anxiety and stress in respect to stuttering. The speech samples were recorded in English using Sony Open Box ICD-PX333 Digital Voice Recorder device and based upon the analysis it was observed that the subject used mostly interjections like prolonged "uuuummmm", "liiiiikeeeee", silent pauses and blocks (p----pen) which were seen mostly during reading and spontaneous speech. After the completion of the detailed assessment procedure, the speech language pathologists diagnosed her with severe stuttering. The participants were also recommended for thrice a week intensive stuttering therapy sessions as per the client's feasibility.

Post-therapy assessment was done using SSI-4 and DASS which improved the assertiveness of the client. The scores obtained indicated that there was significant improvement between pre- and post-assessment phases. The Improvement Criteria Analysis was carried out calculating clinically significant changes (50% and above) based on pre-therapy and post therapy data [2] was used to assess the efficacy of therapeutic intervention. Therapeutic change between pre- and post-assessment was calculated in terms of percentages using the same formula as applied for the above participant [7]. After attending 35 sessions of therapy, there was a change in severity of stuttering and psychological aspects i.e. depression, anxiety and stress. SSI-4 scores for frequency was reduced from 14 to 11, duration score was reduced from 6 to 4 and the score physical concomitants reduced from 5 to 3. Thus, the overall severity of stuttering reduced from moderate to mild. Similarly, DASS scores for depression reduced from 19 (moderate) to 10 (mild), anxiety score reduced from 14 (moderate) to 8 (mild) and score for stress reduced from 20 (moderate) to 15 (mild). The lower DASS score at all subscales showed reduction in depression, anxiety and stress. The percentage of stuttering events observed during reading and spontaneous speech had decreased followed by improvement also seen in the emotional state of the subject. Figures 3 and 4 represent the responses in the form of graphical representation obtained for each section of SSI-4 and DASS after pre and post-therapy assessments respectively.

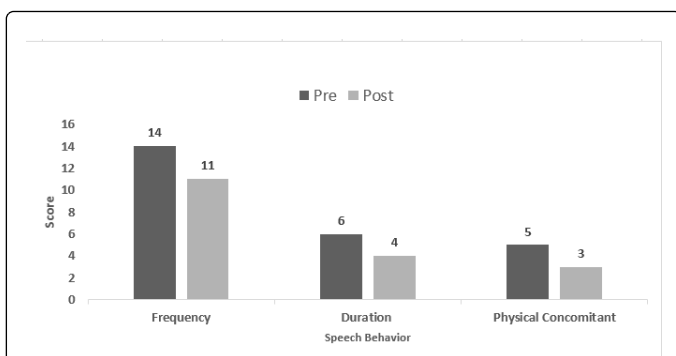


Figure 3: The graphical representation of the scores obtained for SSI-4 based on pre- and post-therapy assessment.

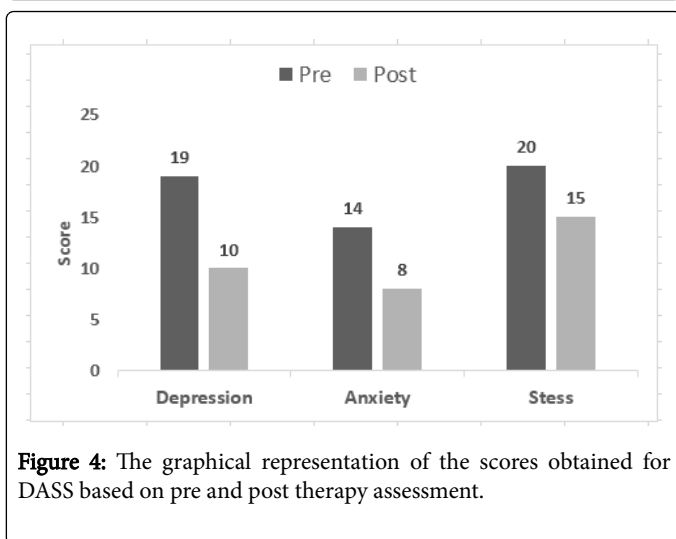


Figure 4: The graphical representation of the scores obtained for DASS based on pre and post therapy assessment.

Correlation of speech behavior and psychological aspect

Correlation of speech behavior (frequency, duration and physical concomitant) and psychological aspect (depression, anxiety and stress) was analyzed using spearman correlation (SPSS 20). Spearman correlation showed very strong correlation between frequency and depression ($r=1$, $n=4$), frequency and anxiety ($r=0.9$, $n=4$), frequency and stress ($r=1$, $n=4$). Similarly, spearman correlation showed very strong correlation between duration and depression ($r=0.8$, $n=4$), duration and anxiety ($r=0.9$, $n=4$), duration and stress ($r=0.8$, $n=4$). Spearman correlation showed very strong correlation between physical concomitant and depression ($r=0.8$, $n=4$), physical concomitant and anxiety ($r=0.9$, $n=4$), physical concomitant and stress ($r=0.8$, $n=4$). In general, the gross findings of pre and post therapy assessment findings indicate that there is a significant improvement in the emotional state of the participant after attending intensive stuttering therapy sessions.

Discussion

The outcome of the present study revealed reduction in depression, anxiety and stress after stuttering therapy. The finding of the present study also proved that clinicians must follow evidence based stuttering therapy techniques and implement the most effective, proven, and efficacious techniques available based on the client's severity of stuttering [33-35]. The current study also revealed very strong

correlation between speech behavior and emotional aspects among stutterer. The results of the present case study indicated that intensive stuttering modification therapy techniques can be effective in reducing severity of stuttering as well as reducing the psychological variables like depression, stress, anxiety and attitude thus improving the quality of life among individuals with stuttering. Blomgren et al. [36] also had mentioned that for the people who have stuttering, a well-defined stuttering management program results in decreasing some anxiety-related symptoms of the disorder among the individuals.

Similar to present study, Eichstädt et al. [37] also revealed changes in speech behaviors and depression of a different group of 5 participants who attended intensive sessions of stuttering intervention program. As, per the study conducted by Boberg and Kully [38] mentioned that long term intensive stuttering therapy proved to be significantly beneficial as it lead to decrease in stress and anxiety among the adults and adolescents who participated in the study, which is in consonance with the outcome of the present study. Recently, Boyle [39] also studied the relationship between causal attributions for stuttering and psychological health in adults who stutter. The finding of the study showed higher perceptions of personal control of stuttering were connected to significantly lower ratings of self-stigma and higher ratings of hope as well as self-esteem/self-efficacy. Recently, a growing body of research has established a relationship in school going children between being bullied effecting their emotional, academic and even physical difficulties. Results indicate that children who are being bullied at school due to their stuttering have a tendency of lower self-esteem, depression, stressed, lonely, worried, and apprehensive [40,41]. Anxiety disorders, in particular, are one of the predictable causes which can result in substantial increase danger for depression and to frequently precede its onset. Both anxiety and depression as a cluster are being considered to share several common features and symptoms, some of the common indicators are sleep disturbance and fatigue, cognitive malfunctioning [42].

Menzies et al. [43] suggested that anxiety is most commonly observed psychological consequences of stuttering among individuals who stutter. Many similar kind of studies also have showed that and a good proportion of individuals who stutter may experience clinically severe levels of social anxiety which can lead to social phobia, if left untreated [44,45]. In the present study, on investigation of results with individual cases, performances assessed using SSI scores of individuals revealed that there was enhancement observed between pre- and post-assessment phases indicating regular therapy sessions are mandatory to bring about changes in severity of stuttering. The second objective was to study the efficacy of modified airflow technique and stuttering modification techniques in reducing negative emotional state resulting in depression and stress among the participants. The individual analysis shows a positive trend in reduction of dysfunctional assumptions on scales of DASS. However, there was significant clinical and statistical improvement (>50). The finding on DASS suggests that the therapy techniques was efficacious in reducing the severity of depression, stress and anxiety by making the clients feel relaxed and speak slowly by reducing the rate of speech. The results of the present study are suggestive of the usefulness of intensive therapy sessions in reducing severity of stuttering, decreasing depression, stress and anxiety. There were qualitative changes reported subjectively by participants. Results of the present study are to be interpreted with caution; it requires further replication, validation and follow-up sessions with similar kind of therapy techniques so as to reduce the effect of stuttering and confirm its efficacy along with its usefulness in the treatment of psychological disorder. Outcome was assessed based

on clinically significant changes and statistical tests. In individual cases, results at post-therapy assessment indicate reduction of stuttering in both the patients between pre- and post-therapy time points. Stuttering components such as struggle avoidance, struggles were also reduced. Clinically significant reduction in depression, anxiety and stress was seen in both the clients. The limitations of the study include difficulty in generalization of the results due to the small sample size. Follow-up and long-term effects could not be assessed due to time constraints and therefore long-term efficacy could not be established. Control measures could not be exercised up to the desired standard. Future research includes more comprehensive study, including inquiries of other related variables. Long-term effectiveness of the stuttering management program should be established by follow-up over long periods. Research should be done with better experimental and control to improve the confidence in the validity of the outcome.

Conclusion

The outcome of the present study revealed reduction in depression, anxiety and stress after stuttering therapy. The finding of the present study also proved that clinicians must follow evidence based stuttering therapy techniques and implement the most effective, proven, and efficacious techniques available based on the client's severity of stuttering [34,35] The current study also revealed very strong correlation between speech behavior and emotional aspects among stutterer. The results of the present case based study showed that intensive stuttering modification therapy techniques can be effective in reducing severity of stuttering as well as reducing the dysfunctional depression, stress, anxiety and attitude and also improving quality of life of individuals with stuttering.

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