



An investigation into the relationship between anxiety and stuttering

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Abstract

The aim of the present study was to investigate the anxiety levels in persons with stuttering. Clinical group consisted of 20 persons with stuttering (PWS) in the age group of 15 to 30 years which was further divided into two groups, based on attainment of intervention program. These two groups were further subcategorized into three groups (mild, moderate and severe) based on their severity of stuttering. The control group comprised of age matched 24 adult males (persons with no stuttering, PWNS). A 'Self Analysis Form', a subjective scale for anxiety measurement was administered on both the groups. The data obtained was subjected to statistical analysis and the results revealed that there was no variation in degree of anxiety across stuttering severity as well as with attainment of intervention. It can be concluded that anxiety does not lead to stuttering since higher levels of anxiety was present in both the groups.

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Introduction

Stuttering is probably the most researched speech disorder and is best described as a disorder of fluency accompanied by a host of psychological problems such as anxiety, depression, social stigma, frustration, embarrassment, shyness etc. These psychological problems are seen consequent to the difficulties faced by the persons with stuttering (PWS) when trying to speak in different situations which in turn adversely affect social and emotional functioning, relationships, quality of life, and mental health (Craig, Blumgart & Tran, 2009). Anxiety amongst these is the most frequent emotional problem which is seen in PWS. It is a feeling of uneasiness towards an anticipated situation, which in turn causes various behavioral and physiological responses within an individual. Anxiety can be considered a blend of several emotions, with fear being the overpowering emotion.

Anxiety in general has been studied by different investigators using numerous measures. These include physiological measures such as measuring blood volume, heart rate, skin conductance etc. and self report or behavioral measures. However, the results of physiological measures vary across individuals, thereby making it difficult to interpret the findings of such evaluations. They are also poorly correlated with the verbal-cognitive and behavioral components of anxiety (Menzies, Onslow & Packman, 1999). Similarly, Ingham (1984) suggested that "physiological evidence of anxiety is not a necessary evidence that proves that the subject

actually experiences anxiety". Menzies et al. argued that the use of physiological measures of anxiety reduced the likelihood of clearly identifying anxiety. They further stated that the self-report and behavioral measures may provide more sound indications of anxiety. Some behavioral measures developed to evaluate anxiety are uni-dimensional measures that assess anxiety as a single or global construct, such as the State-Trait Anxiety Inventory (Spielberger, Gorsuch, Lushene, Vagg & Jacobs, 1983), and multidimensional measures that regard anxiety as composed of numerous components, such as the Endler Multidimensional Anxiety Scales (Endler, Edwards & Vitelli, 1991). State and trait anxieties are two different kinds of anxiety that are commonly tied to stuttering. The state anxiety refers to the anxiety that occurs during specific situations or certain conditions and the trait anxiety refers to the overall level of intrinsic anxiety within an individual (Craig, Hancock, Tran & Craig, 2003; Ezrati-Vinacour & Levin, 2004).

Several studies have investigated the relationship between anxiety and stuttering using the above mentioned measures. However, the results of these studies are varied. There is an ongoing controversy between the relationship of anxiety and stuttering. Many investigators describe a clear role of anxiety in the development or maintenance of stuttering with evidences of increased anxiety level in people who stutter. For instance, Mahr and Torosian (1999) compared anxiety and fear of negative evaluation in a sample of 22 adults who stuttered with

non stuttering controls. They found that adults who stuttered demonstrated significantly increased anxiety symptoms, social avoidance and distress than controls.

Kraaimaat, Vanryckeghem and Van Dam Baggen(2002) administered a social anxiety inventory to a sample of 89 adults who stuttered and 131 non stuttering controls. In their study, the stuttering group demonstrated significantly higher emotional discomfort in social situations than the controls did, and the stuttering group also reported significantly less social response than controls.

Messenger, Onslow, Packman and Menzies(2004) explored the relationship between stuttering, social anxiety, and negative social expectancies. They found that scores on the Fear of Negative Evaluation Scale(FNE; Watson & Friend, 1969)and Endler Multidimensional Anxiety Scales-Trait (EMAS-T; Endler, Edwards & Vitelli, 1991) and the New/Strange Situations subtests of theEMAS-T were significantly higher for a sample of 34 adults who stuttered in comparison to the 34 controls. These findings confirmed the socially evaluative nature of anxiety in stuttering.

Blood, Blood, Maloney, Meyer and Qualls (2007) also investigated the relationship between anxiety and self-esteem in a sample of 36 adolescents who stuttered and who did not stutter. The Revised Children's Manifest Anxiety Scale (RCMAS; Reynolds & Richmond, 2000) was administered. The results revealed that the RCMAS scores were within the normal range for the large majority of participants in both the stuttering and control groups;however the stuttering group demonstrated significantly higher levels of anxiety when compared with the controls.

In a similar study by Mulcahy, Hennessey, Beilby and Byrnes (2008)adolescent stutterers exhibited significantly higher trait and state anxiety and significantly higher fear of negative evaluation than non stuttering controls. The results suggested that the increased anxiety and fear of negative evaluation for those who stutter have the potential to commence during the "socially difficult adolescent years" (Huber, Packman, Quine, Onslow & Simpson, 2004). Blumgart,Tran and Craig (2010)investigated social anxiety in a large sample of 200 adults who stuttered and 200 non stuttering adults by administering a variety of anxiety measures,including the State-Trait Anxiety Inventory, Fear of Negative Evaluation Scale, and the Social Phobia and Anxiety Inventory. Results revealed that the adults who stuttered had significantly higher trait and social anxiety than the controls, with moderate to large effect sizes.

Although the above studies indicated a positive relationship between anxiety and stuttering, there are other studies that contradicted these studies.

For instance Weber and Smith (1990) studied the sympathetic activity between adults who stuttered and fluent adults. Nineteen PWS and 19 fluent individuals were tested using physiological measures during two speech tasks and two non speech tasks. Their results indicated no considerable differences between PWS and fluent speakers with respect to autonomic activity. A similar study was conducted by Watson and Miller (1992) and results refute the assertion that people who stutter are more anxious or depressed than those who do not. They concluded that anxiety and depression are not related to self-ratings of stuttering severity.

Dietrich and Roaman (2001) investigated the relationship between perceptions of speech-related anxiety and physiological arousal in specific speaking situations in a sample of 24 adults who stuttered. They found no correlations between participants' predictions of speech-related anxiety in 20 hypothetical speaking situations and actual skin conduction responses during enactment of four speaking situations.

Attempts have been made to compare the anxiety in individuals who have recovered from stuttering with those who have persistent stuttering. Davis, Shisca and Howell (2007) investigated state and trait anxiety in a sample of children and adolescents aged 10 to 17 years. The sample included 18 participants with persistent stuttering, 17 who had recovered from stuttering, and 19 non stuttering controls.To evaluate trait anxiety, the participants completed the State-Trait Anxiety Inventory (STAI;Spielberger, 2005) for children. State anxiety was assessed with a scale consisting of four different speaking-related situations. The results revealed that the trait anxiety did not differ significantly between groups, although the persistent group exhibited higher state anxiety on three of the four speaking situations than the recovered and control groups.

Malik and Geetha (2010) administered a questionnaire to investigate attitudes, avoidance behavior and coping strategies in persons with stuttering (PWS). Thirty participants regardless of age, gender, language and severity in the age range of 10-40 years without any associated disorders were selected including 10 new PWS who had not attended therapy earlier, 10 adults who had undergone therapy for at least a month and had improved and adult PWS who had undergone therapy and had a relapse. The results revealed that there was no significant difference in anxiety in PWS among the groups. Another important finding was that in PWS there was increased anxiety of speaking situations when meeting new people/superiors and hence they avoided speaking to new people/superiors.

In addition to the above, studies also contradict

on the influence of treatment on anxiety levels and the variation of the same with severity. Hancock, Craig and Campbell (1998) investigated the long-term effectiveness of three stuttering treatments in a large sample of children and adolescents aged 11 to 18 years. No significant differences in state or trait anxiety were found between groups or over time.

Craig, Tran, and Craig (2003) conducted a randomized population study of the prevalence of stuttering in 4,689 Australian households. Trait anxiety scores for 63 residents identified as people who stuttered were compared with scores from a sample of 102 matched controls from a previous study (Craig, 1990). Although trait anxiety scores for adults in the stuttering group who had not received stuttering treatment did not differ from non stuttering controls, scores for adults who had received previous treatment for stuttering did differ significantly from non stuttering controls. However, no significant differences in anxiety were found between stuttering adults who had received stuttering treatment and those who had not, or between those with more or less severe stuttering. Overall, Craig et al. concluded that assessments of anxiety in adults who stutter may be influenced by whether participants have received previous stuttering treatment or whether they are currently seeking treatment. Furthermore, anxiety associated with stuttering often reduces to normal levels following treatment that successfully reduces stuttering severity (Craig, 1990).

Blomgren, Roy, Callister and Merrill (2005) investigated the affective functioning of 19 adults who completed a 3-week intensive stuttering modification treatment program. Although significant improvements in psychical and somatic anxiety were found up to 6 months post treatment, trait and state anxiety as measured by the State Trait Anxiety Inventory was not found to decrease significantly over the same post treatment period.

Further, some studies also investigated the variation of anxiety with respect to different severities of stuttering. One such study by Blumgart, Tran and Craig (2010) who reported that stuttering severity was not associated with any anxiety measure or with increased symptoms of social anxiety disorders. Other studies have also reported of null relationship between stuttering severity and trait anxiety (e.g., Alm & Risberg, 2007; Ezrati-Vinacour & Levin, 2004), between stuttering severity and social phobia (Menzies, O'Brian, Onslow, Packman, St Clare & Block, 2008), and between pretreatment stuttering severity and the presence of mental health disorders (Iverach, Jones, O'Brian, Block, Lincoln, Harrison, et al., 2009). However, Ezrati-Vinacour and Levin (2004) reported that adults with severe stuttering exhibited higher state anxiety. Craig, Blumgart and Tran (2009) also sug-

gested that stuttering severity may increase the risk of poorer emotional functioning.

In sum, although it is commonly believed that anxiety is related to stuttering, the current research evidence regarding the relationship between anxiety and stuttering is largely inconclusive. In a recent review Craig and Tran (2006) identified 20 studies that investigated anxiety in people who stuttered in comparison with non stuttering controls. Of these 20 studies, 13 concluded that adults who stuttered were more anxious than controls, whereas seven studies did not find a significant difference in anxiety levels between groups. One of the possible reasons for this inconsistency could be the differences in the method adopted to evaluate anxiety. Further, although there are a large number of studies investigating the relationship between anxiety and stuttering, the studies pertaining to the effect of treatment and anxiety are limited; also there are restricted studies on anxiety in recovered versus persistent stutterers. The studies assessing the variation of anxiety across various stuttering severity (mild, moderate, severe) are also sparse. Most of these studies have been carried out in west. However, the research on similar lines in the Indian context is limited. Keeping this in view, the present study was planned with the aim of investigating the relationship, if any, between anxiety and stuttering.

The specific objectives of the study were to (1) to assess anxiety levels in individuals with stuttering and normal speakers, (2) to investigate the variation, if any, in the degree of anxiety across different severity levels of stuttering; and (3) to investigate the effect of intervention on persons with stuttering with respect to anxiety.

Method

Participants: Twenty participants with stuttering (PWS) in the age group of 15 to 30 years were considered for the study which comprised the clinical group. They were diagnosed as having stuttering by qualified speech-language pathologists. They were divided into two groups; clinical group I which included 5 males with stuttering who had attended an intervention program (speech therapy). The fluency shaping techniques including the prolongation and modified airflow techniques were used for this group for 15-20 sessions by qualified speech-language pathologists. The participants in clinical group I were required to exhibit less disfluencies compared to their earlier condition in their conversational speech based on Stuttering Severity Instrument (SSI; Riley, 1994). Out of the five individuals considered, two had very mild, one had mild and two had moderate degree of stuttering. The clinical group II included 15 males with stuttering who had not attended any intervention program for the

reduction of disfluencies. They were further subcategorized into three groups based on their severity of stuttering on SSI into mild (4 participants), moderate (9 participants) and severe (2 participants) (Table 1). The control group comprised of 24 normally speaking males (persons with no stuttering, PWNS) in the age range of 15 to 30 years. Participants regardless of their language spoken were selected for the study.

Inclusionary criteria: The participants who had no history of problems in language, speech, sensory, motor skills were included. Those with associated neurological, psychological or psychiatric problems were excluded. The participants who were literate with minimum qualification of SSLC; belonged to the middle socio economic status as ensured using the NIMH socioeconomic status scale developed by Venkatesan (2009); could understand conversational level English and able to read and write in English were considered for the study.

All ethical standards were met for subject selection and their participation. A written consent was obtained from the participants before administration of the questionnaire.

Material

This study involved the administration of a subjective scale for anxiety measurement, viz. the IPAT anxiety scale (Self Analysis Form; Krug, Scheier & Cattell, 1976). This is a self report scale which measures anxiety as a state or a temporary condition. The items have been divided into those that measure (a) covert, less obvious aspect of anxiety and (b) overt, manifest aspect of anxiety. The items on the scale are divided based on the primary components of anxiety (personality trait components) viz. apprehension, tension, emotional instability, suspiciousness, and lack of self control. It consists of 40 objective-type multiple choice questions to assess the degree of anxiety in adolescents and adults.

Procedure: The test was administered in a silent room with minimal visual distractions so that the participants could concentrate on the questions. Initially the Stuttering Severity Instrument (Riley,

1994) was administered for the clinical group to determine the severity of stuttering. An adequate rapport was established and later they were given the self analysis form. The participants were asked to read the items carefully and rate their feelings of anxiety after reading each item in the questionnaire. The questions which were not understood by the individuals were explained to the participants by the clinician by providing a relevant example. The participants were instructed to tick on an option which comes instantaneously in their mind after reading the item in the answer form provided. They were asked to tick the answer without taking much time for thinking. They were also instructed to attempt each question with honesty and were informed that there was no right or wrong answers. The total time taken for each participant was approx. 30 minutes.

Analyses: The scores were analyzed at three levels:

Total score: It is the total score obtained from 40 questions. This was converted to sten score based on the instructions provided in the manual. Sten scales are standard scores within a ten point range. Sten scores were interpreted as following- sten score of 4, 5, 6, or 7 indicated average level of anxiety, scores of 1, 2, or 3 indicated relaxed, secure individuals and a score of 8, 9, or 10 indicated high anxiety. The sten scores were averaged across all the participants separately for the three groups and the data was subjected to statistical analysis using SPSS software (version 10). Descriptive statistics was used to calculate mean and standard deviation. Independent t - test and Mann Whitney test were used to find out if any significant difference existed between the groups.

Factorscore: The score of items from 1 to 20 were totaled to identify unrealized covert anxiety (less obvious aspects of anxiety) which was then compared to the totaled score of items from 21 to 40 which indicated overt anxiety (manifests aspect of anxiety).

Personality trait components: Five personality characters associated with anxiety were measured and those were: (1) apprehension (sleep dis-

Table 1: Summary of subject information for PWS

Number of PWS in CG I Age Range: 15-30 years			Number of PWS in CG II Age Range: 15- 30 years		
Stuttering Severity	Gender	Subject No	Stuttering Severity	Gender	Subject No
Very Mild	M	2	Mild	M	4
Mild	M	1	Moderate	M	9
Moderate	M	2	Severe	M	2

*CG I = Clinical group I , CG II = Clinical group II

Table 2: Mean sten score and standard deviation (SD) in the control group and clinical groups

	Number of Participants	Mean	S.D
Clinical group I	5	6.40	2.881
Clinical group II	15	7.20	1.661
Control group	24	7.03	1.82

Table 3: Mean and standard deviation (SD) across different severity of stuttering in clinical group II

Severity	Number of Participants	Mean	S.D
Mild	6	7.00	2.45
Moderate	12	7.25	1.86
Severe	2	5.50	0.71
Total	20	7.00	1.97

turbances, easily gets downhearted, does not feel free to participate in group situation), (2) tension (frustration level), (3) low self-control (lack of self-control), (4) emotional instability (dissatisfied with the world, family, restriction of life and health and to feel unable to cope with life) and (5) suspicion (easily gets annoyed by things). All the characters were elicited by certain specific questions. The scores were totaled separately for each trait and were converted into percentage and all five traits were compared individually. Consequently, the mean of all the participants in the three groups was calculated.

Results and Discussion

The results obtained after statistical analysis for both the groups are presented and discussed under separate sections.

I. Assessing anxiety levels in different groups

Comparison between both clinical groups (I and II) and control group: The mean and standard deviation scores were computed and are depicted in Table 2. The mean sten score values were 6.8 and 7.03 for the two clinical groups and the control group respectively. This indicated that both the groups had average anxiety levels. These values were subjected to independent t-test which revealed no significant difference in the anxiety level between PWS in both the clinical groups and the control group ($t = 0.068, p > 0.05$).

These findings indicated that anxiety does not lead to stuttering and that there is no relationship between anxiety and stuttering since there is no significant difference in anxiety levels between the groups. The results of the present study that there was no significant difference between the anxiety levels of PWS and PWNS is in consonance with

the earlier studies by (Dietrich & Roaman, 2001; Gabel, Colcord, & Petrosino, 2002; Davis, Shisca & Howell, 2007; Craig, 2007; Blood, Blood, Maloney, Meyer & Qualls, 2007; Malik & Geetha, 2010). However, the results are not in agreement with some of the the studies (Mahr & Torosian, 1999; Kraaimaat et al., 2002; Mulcahyet al., 2008), in which they found a positive relationship between stuttering and anxiety. This could be because of the differences in the methods adopted to study anxiety levels and the small sample size considered in the present study.

An interesting finding was that the control group had slightly greater level of anxiety compared to the clinical groups. This could be because of the fact that this group comprised of greater number of participants who were enrolled for education in II PUC level than clinical group. The present day education system especially at PUC level involves a lot of stress and pressure on the individuals to perform their best. This is because the person's future in higher education and career gets decided. Further, the competitive spirit between the individuals is also on the higher side. This could have resulted in higher anxiety levels in them.

Further, the combined mean of clinical group I and II on covert anxiety and overt anxiety was 19.4 and 17.4 respectively. The control group obtained a mean of 19.04 under the covert anxiety section and a score of 17.75 in the overt anxiety section. This indicated that the participants of both the groups had higher covert anxiety than overt anxiety and the measures of overt and covert anxiety were comparable.

With respect to personality trait components associated with anxiety, the results revealed that the clinical group II had more of apprehension with mean score of 10.1 whereas clinical group I had more tension with mean score of 10. The control group also had more 'apprehension' with mean

score of 11.66. The control group and the clinical group II obtained higher scores for apprehension, i.e., they did not feel free to participate in group situations. Since the clinical group II did not undergo any intervention program, they had apprehension in socializing. In the control group too the apprehension was present which could be attributed to the fact that the present day youth prefer to indulge in nonsocial activities such as internet browsing, Television viewing etc. rather than participate in social activities. The clinical group I had higher scores in tension domain (anger and frustration) probably because they had stuttering and they had to constantly utilize strategies to remain fluent.

Comparison between clinical group II and the control group: The mean and standard deviation scores were computed using descriptive statistics and have been depicted in Table 2. The mean sten score value for the clinical group II and the control group was 7.2 and 7.03 respectively. This indicated that anxiety level in the clinical group II was towards higher level while the control group had average level of anxiety. These values were subjected to Mann whitney test which revealed no significant difference in the anxiety level between PWS in the clinical group II and the control group ($z=0.17$, $p>0.05$). The higher anxiety levels in the clinical group II could be attributed to their speech difficulties and frustration and failure they face in different speaking situations. This group had not attended any intervention program to reduce their disfluencies.

Further, it was found that the clinical group II obtained high mean score on covert anxiety (20.06) compared to overt anxiety (17.33). The control group obtained a mean score of 19.04 on covert anxiety and 17.75 on overt anxiety. This indicated that both the groups had higher covert anxiety levels, with the clinical group II exhibiting slightly higher levels of covert anxiety. With respect to personality characters associated with anxiety, clinical group II had maximum of apprehension (mean score-10.1) and minimum suspicion (mean score-4). Similar results were obtained for control group with mean scores (apprehension-11.66) and minimum suspicion (5.1).

These results are in consonance with Gabel, Colcord, and Petrosino (2002), Blood, Blood, Maloney, Meyer and Qualls (2007), Weber and Smith (1990), Dietrich and Roaman (2001) and Malik and Geetha(2010) which reveal no relationship between anxiety and stuttering. However, the sten score obtained for the clinical group II is of slightly higher level, which indicates that PWS do have higher levels of anxiety. Craig, Tran, and Craig (2003) and Watson and Miller(1992) reported that individuals who stutter often attach a negative attitude to speaking situations and thus anxiety often in-

creases during such situations. Similar results were obtained by Guitar (2006) who stated that adults who stutter in particular often receive their negative attitudes from years of dealing with stuttering in a variety of situations and frequently believe that listeners view them as anxious.

Comparison between clinical group I and the control group: Descriptive statistics was used to calculate the mean and the standard deviation in both the groups. The mean sten score and standard deviation of all the participants in both the groups have been depicted in the Table 2. The mean sten score of clinical group I was 6.4 and the control group was 7.03 which indicate average level of anxiety for both the groups. The clinical group had lesser sten score compared to the control group. The clinical group I had lesser anxiety level since they had undergone an intervention program to reduce their disfluencies. This would have led to increased confidence levels in these individuals especially in different speaking situations and a more effective control of their emotions. However Mann Whitney test revealed no significant difference in anxiety level between clinical group I and control group ($z=0.38$, $p>0.05$).

These results are in consonance with the studies by Hancock et al., (1998) and Blomgren et al., (2005) who reported that state and trait anxiety did not change following stuttering treatment. In contrast, Craig et al., (2003) concluded that assessments of anxiety in adults who stutter may be influenced by whether participants had received previous stuttering treatment or whether they are currently seeking treatment.

With respect to covert and overt anxiety, clinical group I obtained almost similar mean scores for both the anxiety types, i.e. the scores were 17.4 on covert and 17.6 on overt anxiety whereas, the control group obtained a mean score of 19.04 on covert and 17.75 on overt anxiety. This indicated that the control group had higher covert anxiety compared to the clinical group I. The results obtained with respect to the personality trait components show that the clinical group I had maximum mean score for tension (10) and minimum for suspicion (4) whereas, the control group had maximum mean scores for apprehension (11.66) and minimum for suspicion (5.1). The higher tension seen in the clinical group could be attributed to the need to perform well in all speaking situations following intervention program.

II. Effect of severity of stuttering on anxiety

The mean sten score and the standard deviation of the three different severities of stuttering have been depicted in Table 3. The mean sten score values indicated that the anxiety level was the greatest for the moderate group and the least for the severe

group. This points to the fact that anxiety level is not directly proportional to the stuttering severity. The overall anxiety level of all three categories of different severities of stuttering indicated average level of anxiety as per the interpretation in self analysis form. These values were further subjected to Kruskal Wallis test which revealed no significant difference in the anxiety level between PWS across severity ($df=2, p>0.05$).

People with severe stuttering may be habituated with their disfluencies occurring in every speaking situation and therefore they may not pay attention to their disfluencies or may not attempt to conceal their disfluencies. This could have led to decreased anxiety levels in them. On the other hand individuals with moderate and mild stuttering have two situations, one in which they speak relatively fluently and other in which they have greater disfluencies. The frequent fluctuation between the two situations may increase their anxiety level, wherein they may be in a constant attempt to overcome the disfluencies. The results obtained that there is no variation in degree of anxiety across stuttering severity is in consonance with studies by Ezrati-Vinacour and Levin, (2004) with regard to trait anxiety. Alm and Risberg, (2007) and Blumgart et al (2010) also reported similar findings. However, Ezrati-Vinacour and Levin (2004) reported that adults in their sample with more severe stuttering exhibited higher state anxiety. Craig et al., (2009) have also suggested that stuttering severity may increase the risk of poorer emotional functioning. Perhaps these inconsistent findings relate to the different strategies used by those affected to cope with stuttering (Plexico, Manning, & Levitt, 2009).

III. Effect of intervention on anxiety level

Descriptive statistics was used to calculate the mean and the standard deviation in both the clinical groups. The mean sten score of all the participants in both the groups (clinical group I and II) have been depicted in the Table 2. The mean sten score of clinical group II were higher than the clinical group I indicating that they had higher level of anxiety. The group I had attended the intervention program to reduce their disfluencies which could have led to increased confidence levels and a consequent reduction in anxiety levels. Mann Whitney test revealed no significant difference in anxiety level between the two groups ($z=0.57, p>0.05$). This could be attribute to the type of intervention program used in the clinical group I. The fluency shaping technique only improves fluency and does not tackle the negative emotions in the individual (Guitar, 2006). The present results are in agreement with the studies by Hancock et al. (1998) and Blomgren et al. (2005) who reported that state and trait anxiety did not change following stuttering treatment. In contrast, Craig

et al. (2003) concluded that assessments of anxiety in adults who stutter may be influenced by whether participants have received previous stuttering treatment or whether they are currently seeking treatment.

With respect to covert and overt anxiety, clinical group II obtained a mean score of 20.06 on covert anxiety and a mean score of 17.33 on overt anxiety whereas clinical group I obtained almost similar scores for both the types of anxiety and scores were 17.4 on covert and 17.6 on overt anxiety. This indicates that the clinical group II had more of covert anxiety compared to the clinical group I. The results obtained with respect to the personality trait components associated with anxiety shows that the clinical group I had a maximum of tension (mean score 10) and minimum of suspicion (mean score 4) whereas, clinical group II had maximum of apprehension (mean score 10.1) and minimum suspicion (mean score 4).

In sum, results indicated that clinical group II who had not attended the intervention program had the highest mean sten score (7.20) indicating higher anxiety level followed by the control group (7.03) and clinical group I (6.4) who had attended the intervention program. The interpretation of sten scores as per the test manual (self analysis form) revealed that both the control and the clinical group I had average anxiety levels, while the clinical group II had anxiety levels tending towards higher level. However Independent t-test and Mann Whitney test did not reveal any significant difference in anxiety level between the groups. Further, no variation in degree of anxiety across stuttering severity was observed. In addition, there was no significant effect of intervention between the two clinical groups. It was also found that all the groups had higher covert anxiety than overt anxiety levels. Further, amongst the five personality trait components, the control group and the clinical group II had the highest mean scores for apprehension and the clinical group I had highest scores for tension.

Conclusions

The findings of the present study support the fact that anxiety is an emotion commonly associated with all individuals since all the three groups considered in the study had anxiety levels towards the upper end of average level or higher levels. It can be inferred that anxiety does not lead to stuttering, but one cannot conclude that there is no relationship between anxiety and stuttering, especially in this age group. Also the results indicate slightly higher anxiety levels for the individuals with stuttering who had not undergone any intervention program. Further, it can also be concluded that the intervention had some influence on the anxiety levels although not significant

enough. Future research would benefit from explorations of the relationship between stuttering and the experience of anxiety indifferent social situations using larger samples.

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