Factors related to Recovery and Relapse in Persons with Stuttering Following Treatment: A Preliminary Study

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ABSTRACT

Purpose: *The aim of the study was to investigate and compare factors related to recovery and relapse outcomes after treatment, among adults with stuttering.*

Method: *The participants were 24 adults who underwent fluency therapy and reported for follow-up 6 months after cessation of treatment. Pre, immediate post and 6-months post-treatment follow-up evaluations were done using stuttering severity instrument SSI-3. On the basis of total scores and severity obtained, participants were then grouped as either recovered or relapsed persons with stuttering. A questionnaire was administered to obtain their ratings for the different domains of factors that contributed to treatment outcomes.*

Results: *A significant difference was found between both the groups with respect to factors contributing to recovery and relapse. The four domains which were found to be more responsible for treatment outcomes in persons with stuttering were: individual related, therapy related, environment related, and behaviour and personality related factors.*

Conclusion: *The study was conducted with fewer participants, and it is possible that there could be many other pre-treatment and post-treatment factors such as attitude, anxiety, and speech naturalness which may influence the treatment outcomes in persons with stuttering. Future research should include these other factors.*

Key words: *stuttering, treatment, follow-up, recovery, relapse*

INTRODUCTION

Stuttering has been defined by Yaruss and Quesal (2001) in terms of disability (the functional communication difficulties experienced in the speaker's everyday life), impairment (the observable characteristics of the speech difficulty), and handicap

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(the impact of the stuttering disorder on the speaker's overall quality of life). Further, it has been reported that the manifestations of impairment, disability and handicap vary from person to person. There are behavioural treatments available based on variants of prolonged speech, which have proved helpful in aiding recovery by showing significant immediate reductions in stuttering. In therapeutic terms, it can be stated that recovery is a structured plan for treatment that builds a basis upon which an individual can function effectively and comfortably. This basis enables the person to avoid circumstances which might hamper recovery. The resultant improved fluency following treatment has been shown to generalise to non-clinic contexts (Boberg et al, 1986). There are very few studies which have looked into the issue of treatment outcomes in stuttering after a certain follow-up period. There is even less information about long-term treatment outcomes.

Any restoration to a former or better condition can be termed as recovery. Persons with stuttering recover and show improvement soon after their therapy, though they may later relapse to various degrees, sometimes to almost pre-therapy baseline levels. Andrews et al (1980) reported that the improvement in fluency generally remains intact for up to 6 months following successful treatments. However, stuttering seems to increase significantly after this time. Craig et al (1987) reported that smooth speech is maintained in about 70% of persons with stuttering, for 6 to 18 months following therapy. As reported by Finn (1997) support from family and friends, proper rest, moderate exercise, nutrition, therapy, proper supervision, and psychiatric/psychological support are all vital components in maintaining recovery from stuttering. Relapse has been broadly defined as the recurrence of symptoms after a period of improvement (Webster, 1979). However, there is a paucity of research and few objective controlled studies that explore relapse in stuttering following treatment (Guitar, 1976; Boberg, 1981; Craig & Howie, 1982; Craig & Andrews, 1985; Andrews & Craig, 1988). There could be many reasons for this. Firstly, relapse has been a difficult phenomenon to define, whatever the field of study (Hall, 1980). Secondly, most studies which explore stuttering outcomes are short-term, and perhaps reflect the difficulties in conducting research on long-term treatment outcomes (St. Louis & Westbrook, 1987).

Stuttering is a phenomenon that is usually associated with overt symptoms and the characteristic affective components associated with speaking. Some overlapping factors related to recovery and relapse in persons with stuttering are:

Factors related to recovery and relapse in stuttering

Wampold (2001) in a study indicated that for successful outcome of treatment clinician allegiance, competence and the client-clinician alliance are the common factors. According to Manning (2006) the most critical factors are readiness of the speaker for change, the competency and experience of the clinician, and the point in time when there is convergence between speaker and clinician. According to a study done by Seider et al (1983), sex type is the significant variable in the distributions of recovery and persistence of stuttering. Female persons with stuttering reportedly tend to recover earlier than males. Ambrose et al (1997) reported that those who had a positive family history of recovered stuttering tended to recover early. The speech modifications along with motivation to change, acquiring positive attitudes towards self or the speech problem, speaking more slowly, and self-monitoring were reported as few of the major factors which contribute to the recovery of persons with stuttering (Quarrington, 1977). The other important factor that seemed to make a difference was the severity of stuttering (Finn, 1997). Ingham et al (2005) suggested that to identify the limits of recovery from a persistent disorder, a behavioural, cognitive and neurophysiologic framework could represent a benchmark for evaluating recovery in stuttering treatment for adolescents and adults.

Boredom and/or failure to maintain fluency may lead to relapse. Relapse could also result from the physiological basis of the disorder, the influence of the post-treatment environment, and the lack of effective rewards operating in the lives of treated persons with stuttering. Another important factor that could contribute to relapse is the client's difficulty in adjusting to the new role of a fluent speaker. Clients may have self-efficiency doubts and may rely too much on the clinician and the therapy programme, instead of developing confidence in their own abilities. The failure to maintain recovery achieved from stuttering treatment is high (Craig, 1998). Specifically, while a reduction in stuttering following such treatments is considered to be achievable in the short-term, long-term treatment success is somewhat less assured (Andrews et al, 1980; Craig & Hancock, 1995). Some of the common factors contributing to relapse, as given by Sheehan and Martyn (1966) and supported by Kamhi (1982), include weak establishment and transfer of new speaking modes, failure to develop or to use self-monitoring adequately, the client's dissatisfaction with the new speech mode, failure to eradicate social avoidance behaviour, and variability in the speech production mechanisms. Previous research has shown that stuttering severity prior to

treatment is a consistent factor in determining treatment outcome (Andrews et al, 1983; Ladouceur et al, 1989; Block et al, 2006). In other words, more severe pre-treatment stuttering is typically associated with poorer treatment outcomes, including smaller reductions in stuttering and heightened vulnerability to relapse (Andrews & Craig, 1988; Block et al, 2006).

The determination of factors or subtypes of stuttering that influence responsiveness to treatment and relationships between them, is of critical importance to clinicians as this would enable them to plan more effective intervention (Yairi, 2007). The best way to determine such factors is by investigating the variables that may contribute to recovery and relapse.

The review of literature by the authors indicates that there are no recent scientific studies that have compared recovered and relapsed persons with stuttering across factors related to their treatment outcome. The reason for this may include a significant proportion of persons treated who experience relapse (Craig & Calver, 1991). Due to the lack of objective and controlled studies on the subject, this study aimed to investigate and compare the factors contributing to recovery and relapse in persons with stuttering following treatment.

METHOD

Participants: A total of 24 persons with stuttering (23 male and 1 female), ranging in age from 18 to 38 years (mean age 22.8 years, SD= 4.9 years), participated in the study.

Inclusion criteria: Adults diagnosed with developmental stuttering (mild to severe) by a qualified speech and language pathologist were included in the study. All the participants underwent fluency therapy using non-programmed prolonged speech technique at All India Institute of Speech and Hearing, Mysore during the year 2011-2013, and only those who had shown a marked improvement with a score of 10 or lower (i.e. equal to or less than 5 percentile dysfluency) in SSI-3 on immediate post-treatment evaluation, were considered for the study. This criteria was adopted from the study done by Coulter et al (2009), where a participant was classified as 'recovered' if he or she had fewer stuttering-like disfluencies and a score of 10 or lower (with 1- 4 percentile and a severity rating no higher than 'very mild') on the SSI-3. Persons who reported acquired stuttering or any positive history of neurological, psychological, audiological or other associated problems were not included in the study.

Materials: The researchers prepared a checklist and questionnaire to gather information from the participants regarding the age of onset of problem, cause of problem, family history, type of speech therapy, duration of therapy, and maintenance of improvement. Five major domains related to recovery and relapse such as Patient related (PR), Therapy related (TR), Clinician related (CR), Environment related (ER) and Behaviour and Personality related (BPR), were included in the questionnaire (see Appendix I). The prepared questionnaire was first given to three experienced speech and language pathologists for validation, and for feedback and suggestions if any. It was administered to the participants after suitable modification. The Stuttering Severity Instrument or SSI-3 (Riley, 1994) was administered to evaluate stuttering frequency, duration and physical concomitants, total scores, percentiles and severity ratings. The SSI-3 is a measure of stuttering severity and all the participants who stutter scored 13 or higher. The 13-point criterion equates approximately to 1–5% stuttered syllables in the speaking and reading tasks, an average dysfluency duration of less than 1 second and physical concomitants rated as ''barely noticeable unless looking for it''. For instance, if a person with stuttering obtained a score of 18 (with 12-13th percentile on SSI-3), it was rated as mild stuttering. Though SSI-3 is a measure of severity of stuttering rather than a way of differentiating between fluent speakers and speakers who stutter, it has been used in a similar manner in other studies (Arnold et al, 2005; Davis et al, 2007). Riley's instrument is thought to provide a more complete analysis than that which is provided by percentage of stuttered syllables, which is a measure of stuttering frequency only (Miller & Guitar, 2009).

Procedure: Initially, 32 adults who fulfilled the inclusion criteria were selected and a pre-treatment evaluation was done. Thereafter, 4 participants were excluded as 3 of them discontinued therapy after a few sessions, and 1 did not show marked improvement (less than 5 percentile on SSI-3) on immediate post-treatment evaluation. The 28 persons with stuttering who remained were asked to come for a follow-up 6 months after discharge from therapy. They were contacted through follow-up letters and telephone calls. Of the 28 persons, only 24 (mean age 22.8 years, SD= 4.9 years) reported for follow-up. Hence, this study was conducted with 24 participants who were re-evaluated using SSI-3 on 6-months post-treatment follow-up.

Participants were asked to speak on a given topic (related to daily routine, hobbies or work) in order to collect spontaneous speech samples. Speech samples were audio-video recorded. Also, the questionnaire was administered to all the

participants and they were instructed to respond to the researchers' questions. Participants were then divided into two groups, namely, 'recovered' and 'relapsed' persons with stuttering, on the basis of their immediate post-treatment and follow-up percentile severity and total scores in SSI-3.

Analysis and Scoring: Mean of percentage syllable stutter (% SS) as a measure of frequency of stuttering, was calculated from spontaneous speech samples of each participant, using the following formula adopted in studies by Yaruss (1998), and Bloom and Cooperman (1999):

$$\% \text{ SS} = \frac{\text{Total number of syllables stuttered} \times 100}{\text{Total number of syllables spoken}}$$

The researcher read out the questionnaire and participants had to respond with a 'yes' or 'no' to each question under different domains of factors related to recovery and relapse. Responses were marked with a '0' for 'No' and '1' for 'Yes' responses in the questionnaire. Questions were formed in such a way that the score '1' was obtained if the participant was reported to being more inclined towards recovery. Total scores ranged from 0 to 37 as the sum of all domains. Total scores for each domain were calculated separately for both the groups. Data was entered into SPSS 18 software and the statistical analysis was done.

Reliability: The questionnaire was administered twice, over two weeks, to 8 randomly selected participants who reported for follow-up. A Cronbach's alpha value of 0.97 was obtained, which indicates the reliability of the participants' scores.

RESULTS AND DISCUSSION

The study aimed to identify and compare the factors contributing to treatment outcomes in recovery and relapse. Descriptive analysis was done to obtain demographic and therapeutic details of the participants. As shown in Table 1, from among 24 persons with stuttering, 50% (n=12) of the participants experienced recovery and 50% (n=12) experienced relapse on SSI-3 scores obtained during a 6-month post-treatment follow-up evaluation. Similar results were noted by Silverman (1992) who reported relapse rates for stuttering at over 50% for older children and adults, and less than 50% for those who acquired normal sounding fluency during treatment and remained fluent permanently. In another study, Craig and Hancock (1995) reported a relapse rate in excess of 70%.

Table 1: Demographic and Therapeutic details of Participants

Demographic details					Pre treatment		Immediate post treatment		6 months post treatment	
PWS	Age	Gender	FH	Duration	Percentile	Severity	Percentile	Severity	Percentile	Severity
A1	23	F	-ve	4month	41-60	Mod	1-4	V.Mild	1-4	V.Mild
A2	18	M	+ve	1month	24-40	Mild	<1-4	?Normal	1-4	V.Mild
A3	18	M	+ve	2month	61-67	Mod	<1-4	?Normal	<1-4	?Normal
A4	26	M	-ve	2month	24-40	Mild	<1-4	?Normal	<1-4	?Normal
A5	26	M	-ve	1month	12-23	Mild	1-4	V.Mild	<1-4	?Normal
A6	24	M	-ve	2month	61-67	Mild	<1-4	?Normal	<1-4	?Normal
A7	20	M	-ve	1.5month	24-40	Mild	1-4	V.Mild	1-4	V.Mild
A8	18	M	+ve	2week	12-23	Mild	<1-4	?Normal	<1-4	?Normal
A9	20	M	+ve	2month	41-60	Mod	<1-4	?Normal	<1-4	?Normal
A10	20	M	-ve	1.5month	41-60	Mod	1-4	V.Mild	1-4	V.Mild
A11	21	M	-ve	2month	61-67	Mod	<1-4	?Normal	<1-4	?Normal
A12	18	M	-ve	3.5month	78-88	Severe	<1-4	?Normal	1-4	V.Mild
B1	21	M	-ve	1month	24-40	Mild	1-4	?Normal	24-40	Mild
B 2	23	M	+ve	1.5month	12-23	Mild	1-4	V.Mild	5-11	V.Mild
B 3	18	M	+ve	2month	24-40	Mild	<1-4	?Normal	5-11	V.Mild
B 4	21	M	-ve	4month	78-80	Severe	1-4	V.Mild	24-40	Mild
B 5	22	M	+ve	3month	41-60	Mod	1-4	V.Mild	12-23	Mild
B 6	27	M	-ve	2month	24-40	Mild	<1-4	?Normal	61-67	Mod
B 7	25	M	+ve	2month	41-60	Mod	1-4	V.Mild	12-23	Mild
B 8	26	M	+ve	3 month	78-88	Severe	1-4	V.Mild	89-95	Severe
B 9	38	M	+ve	2month	24-40	Mod	<1-4	?Normal	41-60	Mod
B10	33	M	+ve	2 week	12-23	Mild	<1-4	?Normal	24-40	Mild
B11	24	M	-ve	3month	41-60	Mod	<1-4	?Normal	5-11	V.Mild
B12	18	M	+ve	1.5month	41-60	Mod	<1-4	?Normal	41-60	Mod

A-recovered, B-relapsed, PWS-Persons with stuttering, M-male, F-female, FH-Family History, V.Mild-Very Mild, Mod-Moderate, + ve- positive, -ve- negative.

Table 2: Result of paired t-test comparing mean % SS of two groups across three evaluations

Groups (N=24)	Pairs	Mean	SD	df	t	Sig
Recovered (n=12)	Pre-Immediate post treatment	7.91	4.66	11	5.88	.000**
	6months post-Immediate post	0.83	1.52	11	1.89	.085
	Pre-6 months post treatment	8.75	5.11	11	5.92	.000**
Relapsed (n=12)	Pre-Immediate post treatment	5.0	5.20	11	3.32	.007**
	6 months post-Immediate post	5.0	2.76	11	6.26	.000**
	Pre-6 months post treatment	0.0	4.24	11	0.00	1.000

** mean difference is significant at 0.01

A. Frequency of stuttering at pre, immediate and 6-months post-treatment follow-up

Paired t-test was done to compare % syllable stuttered (SS) at pre, immediate post and 6-months post-treatment follow-up of recovered and relapsed persons with stuttering. As shown in Table 2 and Figure 1, results suggested that there was a significant difference ($p<0.05$) between mean % SS of pre-treatment and immediate post-treatment for those who had recovered and those who had relapsed. While there was a significant difference ($p< 0.01$) found between the pre-treatment and 6-months post-treatment group of recovered persons with stuttering, there was no significant difference ($p> 0.05$) found between the immediate post and 6-months post-treatment follow-up group of recovered persons. The difference in the mean % SS of pre-treatment and immediate post-treatment of all the participants may be attributed to the success of the therapy technique (prolongation) used. This reduced dysfluency in all the participants who showed a marked improvement in immediate post-treatment evaluation. In contrast, the relapsed group showed a significant increase in dysfluency at the 6-months post-treatment follow-up. Thus, there was a significant difference ($p< 0.01$) in mean % SS scores found between pre-treatment, immediate post and also between immediate post and 6-months post-treatment levels. However, there was no significant difference ($p> 0.01$) in mean % SS scores found between pre-treatment and 6-months post-treatment follow-up in the relapsed group of persons with stuttering.

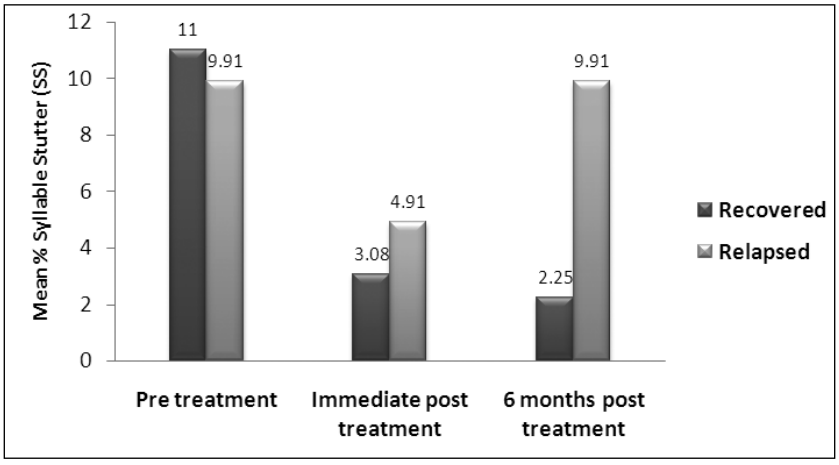

Figure 1: Mean % SS of two groups of PWS across pre, immediate post and 6 months post treatment conditions

The differences in the mean stuttering severity scores of the recovered and relapsed groups across pre-treatment, immediate post-treatment and follow-up may be related to certain factors which were found to have contributed to treatment outcomes:

a. Pre-treatment severity: As shown in Table 1, during pre-treatment evaluation of the relapsed group (n=12), 7 persons were diagnosed with more severe stuttering (5 moderate and 2 severe) and the other 5 with mild stuttering. During pre-treatment evaluation of the recovered group (n=12), 6 participants were diagnosed with mild stuttering, 5 with moderate and 1 with severe stuttering. From the results it is observed that the severity of the problem does not appear to be a factor which contributes to determining treatment outcomes. These results are contradictory to the results reported by Guitar (1976), Andrews and Craig (1988), and Craig (1998), all of whom suggested that the greater the severity of stuttering, the less effective the treatment was likely to be, at least in terms of eliminating stuttering.

b. Family history: Table 1 shows that 8 (67%) of the 12 relapsed persons with stuttering reported that they had a positive family history, whereas only 4 (33%) of the 12 recovered participants reported the same. This suggests that having a positive family history could be related to relapse following treatment, and thus it may be a factor contributing to long-term treatment outcome. Similar results were reported by Ambrose et al (1997) who found that stuttering tended to persist in individuals with a positive family history of persistent stuttering, while those with a positive family history of recovered stuttering also tended to recover.

c. Gender: It is evident from literature that the incidence of stuttering is less among females than among males. Table 1 shows that there were 23 males and only a single female participant (N=24) in the study. Due to the limited number of female participants, it is difficult to discuss whether gender difference could be related to treatment outcome. However, from the results of the study it is observed that the single female participant maintained improvement and had recovered after treatment. This could be related to results reported by Ambrose et al (1997), which found that girls were much more likely to recover than boys.

d. Duration of therapy: The present study considered duration of therapy to mean the time from the beginning of therapy till discharge after successful recovery and attaining fluency (less than 5 percentile dysfluency) as per SSI-3. As shown in Table 1, all the participants attended fluency therapy for a minimum of 2 weeks

and up to a maximum of 4 months, depending on the severity of their problem. At the 6-months post-treatment evaluation, no relation was observed between duration of treatment and recovery and relapse. This may be due to the fact that the overall duration of therapy depends on the severity of the problem at the pre-treatment level and, to some extent, this varies from individual to individual.

B. The other domains contributing to recovery and relapse

Table 3: Result of one way MANOVA test comparing two groups of PWS across each domain

Factors	Recovered		Relapsed		F	Sig
	Mean	SD	Mean	SD		
Patient Related	8.75	1.86	6.16	1.46	14.2	0.001**
Therapy Related	5	0.00	4.58	0.66	4.6	0.042*
Clinician Related	5	0.00	4.83	0.38	2.2	0.152
Environment Related	4.58	0.79	3.5	0.79	11.1	0.003**
Behaviour and Personality Related	11.08	1.31	8.16	1.26	30.6	0.000**

* mean difference is significant at 0.05, ** mean difference is significant at 0.01

Multivariate analysis of variance - one way MANOVA test - was done to compare the two groups (relapsed and recovered persons with stuttering) across each domain, i.e., Patient related, Therapy related, Clinician related, Environment related, and Behaviour and Personality related. As shown in Table 3 and Figure 2, a significant difference (P< 0.05) was found between the two groups across most of these domains.

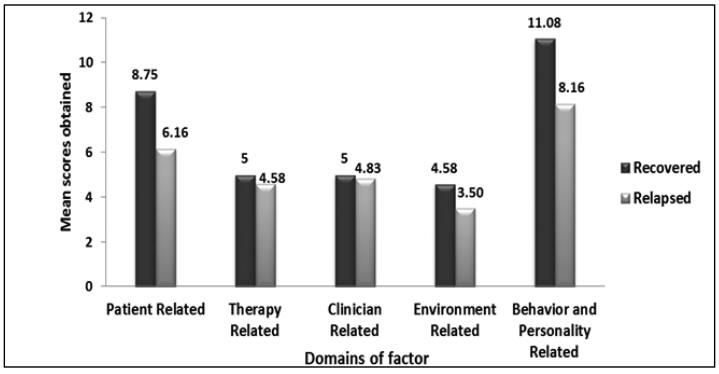

Figure 2: Mean scores of two groups of PWS across five domains of factors

1) Patient related (PR): For the patient related domain, the group of recovered persons with stuttering was found to have a higher mean (8.75) than the relapsed group (6.16), which was significant at ($P< 0.01$). The difference can be attributed to the regularity and punctuality with which participants in the recovered group practised the techniques taught in the therapy sessions. They reported that they felt responsible for maintaining acquired fluency and therefore practised techniques and used self-monitoring, self-correction strategies to sustain interest and motivation after treatment. In contrast, participants in the relapsed group reported irregularity, discontinuity and not practising techniques properly after treatment, which resulted in the lower mean score. Ingham (1982) used single-case multiple baseline experimental research to study the effects of self-evaluation on the fluency maintenance of young adults who stuttered, and reported that reductions in stuttering frequency occurred when self-evaluation techniques (such as scoring, monitoring and evaluating performance) were added to an intensive speech intervention.

2) Therapy related (TR): The manner in which the therapy is provided and the working relationship between the client and clinician are major factors contributing to treatment outcome. In Table 3 and Figure 2, the recovered group showed a higher mean than the relapsed group of persons with stuttering (5 and 4.58 respectively), and statistically there was a significant difference ($P < 0.05$) found for the therapy related domain. The result indicates that the therapy related factors may be responsible for recovery and relapse in persons with stuttering. According to many authors (Andrews et al, 1980; St. Louis & Westbrook, 1987), there exists effective treatment which can significantly reduce the frequency of stuttering, especially if it incorporates active maintenance procedures. While there is disagreement about acceptable treatment outcomes from stuttering therapy, Jane and George (2008) have argued that an ideal treatment outcome is one that involves satisfaction on the part of the person with stuttering, both with his communicative performance and the therapy procedure.

3) Clinician related (CR): Table 3 and Figure 2 show that the relapsed and recovered groups obtained 5 and 4.83 scores respectively, and statistically there was no significant difference ($P> 0.05$) found between both groups. Majority of the participants from both the groups reported satisfaction with the clinician providing therapy to reduce dysfluencies. Wampold (2001) in a similar study indicated that for successful outcome of treatment, clinician allegiance, competence and the client-clinician alliance are the common factors.

4) Environment related: As shown in Table 3, the recovered group was found to have higher mean (4.58) than the relapsed group (3.5) for the environment related factors. There was a significant difference (P< 0.01) found between both groups. The higher mean score and the difference between relapsed and recovered groups with respect to environmental factors can be attributed to the positive reactions from families after treatment, encouragement from friends, and listeners' positive reactions to changes in speech during and after therapy. This was reported by the individuals in the recovered group. Boberg et al (1979) also reported that relapse could result from the physiological basis of the disorder, the influence of the post-treatment environment, and the lack of effective rewards operating in the lives of treated persons.

5) Behaviour and Personality related (BPR): As shown in Table 3 and Figure 2, the recovered group obtained higher mean (11.08) than the relapsed group (8.16) for BPR factors. The significant difference (P< 0.01) found between the groups for factors related to the behaviour and personality domain indicates that recovered persons show more positive changes in behaviour and personality following therapy compared to relapsed persons with stuttering. This finding is supported by Sheehan (1970) who reported that for treatment to be successful, the client must eventually make the adjustment of viewing himself as something beyond an individual who stutters. The new fluency may sound good but may not always feel comfortable, at least immediately following treatment. Ingham et al (2005) suggested that those who have recovered could constitute a behavioural, cognitive benchmark for evaluating stuttering treatment for adolescents and adults.

CONCLUSION

The main aim of this study was to compare factors related to treatment outcomes that may lead to recovery or relapse following treatment. A significant difference was found between mean % SS scores of pre, immediate post and 6-months post-treatment follow-up. Also, the relapsed group showed lower mean as compared to the recovered group on all the domains. However, since there was no significant difference found between recovered and relapsed persons with stuttering for the clinician related (CR) domain, it is concluded that the other domains - patient related (PR), therapy related (TR), environment related (ER), and behaviour and personality related (BPR) - are more responsible for treatment outcomes, whether relapse or recovery, after a certain period of cessation of

therapy. Thus four domains (PR, TR, ER, and BPR) out of the five considered in the present study were found to be related to treatment outcomes, and showed significant difference between the recovered and relapsed groups of persons with stuttering.

Limitations

One limitation is that the study was conducted with fewer participants, due to attrition of selected persons. Also, there could certainly be many other pre-treatment and post-treatment factors such as attitude, anxiety, and speech naturalness which may influence the treatment outcomes in persons with stuttering. Future research should compare other domains that could contribute to treatment outcomes in persons with stuttering, over a long-term follow-up period.

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REFERENCES

Ambrose N, Cox N, Yairi E (1997). Genetic basis of persistent and recovered stuttering. Journal of Speech and Hearing Research; 40: 567-580.

Andrews G, Craig A (1988). Prediction of outcome after treatment for stuttering. British Journal of Psychiatry; 153: 236–240. http://dx.doi.org/10.1192/bjp.153.2.236. PMid:3255438

Andrews G, Craig A, Feyer AM, Hoddinott S, Howie P, Neilson M (1983). Stuttering: A review of research findings and theories circa. Journal of Speech and Hearing Disorders; 48: 226–46. PMid:6353066.

Andrews G, Guitar B, Howie P (1980). Meta-analysis of the effects of stuttering treatment. Journal of Speech and Hearing Disorders; 45: 287–307. PMid:7412224.

Arnold H, Conture E, Ohde R (2005). Influence of phonological density on picture naming responses of young children who stutter. Journal of Fluency Disorders; 30: 125-148. http://dx.doi.org/10.1016/j.jfludis.2005.01.001. PMid:15949541.

Block S, Onslow M, Packman A, Dacakis G (2006). Connecting stuttering management and measurement: IV, Predictors of outcome for a behavioural treatment for stuttering. International Journal of Language & Communication Disorders; 41(4): 395–406. http://dx.doi.org/10.1080/13682820600623853. PMid:16815808.

Bloom CM, Cooperman DK (1999). Synergistic stuttering therapy: A holistic approach. Andover, MA: Butterworth-Heinemann.

Boberg E (1981). Maintenance of fluency. In E. Boberg (Ed.). Maintenance of fluency. New York: Elsevier: 71-111.

Boberg E, Howie P, Woods L (1979). Maintenance of fluency: A review. Journal of Fluency Disorders; 4: 93-116. http://dx.doi.org/10.1016/0094-730X(79)90009-3.

Coulter C, Anderson J, Conture E (2009). Childhood stuttering and dissociations across linguistic domains: A replication and extension. Journal of Fluency Disorders; 34: 257-278. http://dx.doi.org/10.1016/j.jfludis.2009.10.005. PMid:20113770. PMCid:2818587.

Craig A (1998). Relapse following treatment for stuttering: A critical review and correlative data. Journal of Fluency Disorders; 23: 1-30. http://dx.doi.org/10.1016/S0094-730X(97)00027-2.

Craig A, Andrews G (1985). The prediction and prevention of relapse in stuttering. The value of self-control techniques and locus of control measures. Behaviour Modification; 9: 427-422. http://dx.doi.org/10.1177/01454455850094002. PMid:4074292.

Craig A, Calver P (1991). Following up on treated stutterers: Studies on perceptions of fluency and job status. Journal of Speech and Hearing Research; 34: 279-284. PMid:2046352.

Craig A, Feyer A, Andrews G (1987). An overview of behavioural treatment for stuttering. Australian Psychologist; 22: 53-62. http://dx.doi.org/10.1080/00050068708256197.

Craig A, Hancock K (1995). Self-reported factors related to relapse following treatment for stuttering. Australian Journal of Human Communication Disorders; 23: 48-60.

Craig A, Howie P (1982). Locus of control and maintenance of behavioural therapy skills. British Journal of Clinical Psychology; 21: 65-66. http://dx.doi.org/10.1111/j.2044-8260.1982.tb01429.x. PMid:7126947.

Davis S, Shisca D, Howell P (2007). Anxiety in speakers who persist and recover from stuttering. Journal of Communication Disorders; 40: 398-417. http://dx.doi.org/10.1016/j.jcomdis.2006.10.003. PMid:17157866.

Finn P (1997). Adults recovered from stuttering without formal treatment: Perceptual assessment of speech normalcy. Journal of Speech, Language, and Hearing Research; 40: 821–831. PMid:9263946.

Guitar B (1976). Pre-treatment factors associated with the outcome of stuttering therapy. Journal of Speech and Hearing Research; 18: 590-600.

Hall SM (1980). Self-management and therapeutic maintenance: Theory and research. In: P.Karoly & J.J.Steffen, (Eds.). Improving the long-term effects of psychotherapy: Models of durable outcome. New York: Gardner Press: 263-300.

Ingham RJ (1982). The effects of self-evaluation training on maintenance and generalisation during stuttering treatment. Journal of Speech and Hearing Disorders; 47: 271–280. PMid:7186562.

Ingham RJ, Finn P, Bothe AK (2005). "Roadblocks" revisited: Neural changes and recovery from stuttering. Journal of Fluency Disorders; 30: 91–107. http://dx.doi.org/10.1016/j.jfludis.2005.01.004. PMid:15949540.

Jane EP, George EK (2008). Stuttering: An overview. American Family Physician; 77(9): 1271-6.

Kamhi A (l982). The problem of relapse in stuttering: Some thoughts on what might cause it and how to deal with it. Journal of Fluency Disorders; 7: 459 469. http://dx.doi.org/10.1016/0094-730X(82)90021-3.

Ladouceur R, Caron C, Caron G (1989). Stuttering severity and treatment outcome. Journal of Behaviour Therapy and Experimental Psychiatry; 20: 49-56. http://dx.doi.org/10.1016/0005-7916(89)90007-4.

Manning WH (2006). Therapeutic change and the nature of our evidence: improving our ability to help. In N. Bernstein Ratner and J. Tetnowski, Current Issues in Stuttering Research and Practice. Mahwah, NJ: Lawrence Erlbaum, Inc. Chapter 9: 125-158. PMid:16368965. PMCid:1346648.

Miller B, Guitar B (2009). Long-term outcome of the Lidcombe Programme for early stuttering intervention. American Journal of Speech-Language Pathology; 18: 42–49. http://dx.doi.org/10.1044/1058-0360(2008/06-0069).

Quarrington B (1977). How do the various theories of stuttering facilitate our therapeutic approach? Journal of Communication Disorders; 10: 77–83. http://dx.doi.org/10.1016/0021-9924(77)90017-X.

Riley GD (1994) Stuttering severity instrument for children and adults. (3rd edn.), Pro-Ed; Austin, TX.

Seider RA, Kidd KK, Gladstein KL (1983). Recovery and persistence of stuttering among relatives of stutterers. Journal of Speech and Hearing Disorders; 48: 402-409. PMid:6645435.

Sheehan JG (1970). Stuttering: Research and therapy, New York, Harper & Row: 312-351.

Sheehan JG, Martyn MM (1966). Spontaneous recovery from stuttering. Journal of Speech and Hearing Research; 9: 121-135. PMid:5960191.

Silverman FH (1992). Stuttering and other fluency disorders. Englewood Cliffs, NJ: Prentice-Hall.

St. Louis KO, Westbrook JB (1987). The effectiveness of treatment for stuttering. In L. Rustin, H. Purser, & D. Rowley (Eds.), Progress in the treatment of fluency disorders. London: Taylor & Francis: 235-257.

Wampold BE (2001). The great psychotherapy debate: Models, methods, and findings. Lawrence Erlbaum Associates, Mahwah, NJ.

Webster RL (1979). Empirical considerations regarding stuttering therapy. In H. H. Gregory (Ed.), Controversies about stuttering therapy. Baltimore, MD: University Park Press: 209-239.

Yairi E (2007). Subtyping stuttering I: A review. Journal of Fluency Disorders; 32: 165–196. http://dx.doi.org/10.1016/j.jfludis.2007.04.001. PMid:17825668.

Yaruss JS (1998). Real-time analysis of speech fluency: Procedures and reliability training. American Journal of Speech Language Pathology; 7: 25-37.

Yaruss JS, Quesal RW (2001). Developing instruments for documenting stuttering treatment outcomes. In H. G. Bosshardt, J. S. Yaruss, & H. F. M. Peters (Eds.), Fluency disorders: Theory, research, treatment, and self-help. Proceedings of the Third World Congress on Fluency Disorders: 227–231.

Appendix I

QUESTIONNAIRE

Instructions: Please give 'yes' or 'no' as response for each question.

Sl. No.	Particulars	NO	YES
I.	**Patient related**		
1	Were you regular to the therapy sessions?		
2	Were you punctual & utilised the given therapy time completely?		
3	Did not discontinue therapy in between for short or long duration?		
4	Were you able to practice/perform the technique without much effort?		
5	Were you comfortable using the technique outside clinical settings?		
6	Were you prepared for any fluency breakdown after success in therapy?		
7	Did you show enough responsibility to maintain acquired fluency by practicing the technique?		
8	Did you use the self-monitoring and self-correction strategies?		
9	Did you maintain motivation and interest after therapy?		
10	Did you try not to use stuttering as excuse/escape behaviour in life?		
II.	**Therapy related**	**NO**	**YES**
1	Was the time allotted for therapy sufficient?		
2	Was the technique taught adequate?		
3	Was the language used in the session familiar?		
4	Was the counselling/guidance provided adequate?		
5	Were you satisfied with your therapy treatment and its outcome?		
III.	**Clinician related**	**NO**	**YES**
1	Did the therapist seek information in making decisions?		
2	Did the therapist teach self-monitoring and self-correction strategies?		
3	Was sufficient instruction given regarding maintenance of fluency?		
4	Was sufficient instruction given regarding generalisation of fluency?		
5	Did the clinician explain the techniques adequately?		
IV.	**Environment related**	**NO**	**YES**
1	Were you allowed to speak slowly without being pressurised?		
2	Were you allowed to complete saying what you wanted without interruption?		
3	Did listeners patiently listen when you spoke?		

4	Were you encouraged by your peers/colleagues for using techniques?		
5	Were you comfortable in communicating with others?		
V.	**Behaviour and Personality related**	**NO**	**YES**
1	Do you feel calm and relaxed while speaking?		
2	Do you find it easy to talk with almost everyone?		
3	Do you find it easy to look at your audience while speaking to a group?		
4	Do you find it easy to talk when you meet new people?		
5	Do you prefer interacting with people than being alone?		
6	Do you feel confident of your ability to communicate?		
7	Do you like to talk often and socialise?		
8	Do you feel comfortable to discuss your fears and concerns openly?		
9	Do you feel that you are as capable as others without stuttering?		
10	Do you feel that you can overcome your stuttering?		
11	Do you feel that your stuttering does not interfere in your achievements?		
12	Did your motivation level increase throughout the therapy durations?		