Gender Difference in Nature of Disfluencies in Children with Stuttering

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Abstract

Gender difference in stuttering is a much debated issue. A lot of studies have been done on this, mostly in the western countries. Stuttering is not only reported to be less common in female compared to male children, with a 1: 4 ratio, but its onset, development and recovery characteristics are more in favor of females. The present study is aimed to explore the similarities and differences in nature of disfluencies, if any, in male and female children with stuttering (CWS), across the age groups in the Indian context. 24 male and 24 female CWS registered at the All India Institute of Speech and Hearing were followed up. An analysis of the nature of disfluencies in terms of age of onset, nature and type of onset, time since onset, type of stuttering, nature and duration of treatment, associated problems, etiology of stuttering, and recovery patterns was done. Across gender significant differences have been obtained in most of the parameters under study. The study confirms many of the earlier findings by other authors with regard to gender differences in stuttering. Female CWS are different in the nature of disfluencies and recovery characteristics of stuttering compared to male CWS.

Key words: stuttering, nature of disfluencies, gender difference

Stuttering, in its most basic sense is a disruption/break in the forward flow of speech and a term that is most commonly used/ recognized by most people. This disorder manifests itself predominantly in childhood, most often within 2-6 years of age. Hence, it has often been described as a disorder of childhood. Literature also depicts stuttering to be a disorder of males. There have been investigations carried out in various aspects of stuttering to arrive at such a conclusion. However, they reveal divided opinions and findings.

The earliest investigation into the gender difference in stuttering was from the early 1890's. Investigations into this ratio are being carried out since then. Van Borsel, Moeyart, Mostaert, Rosseel, VanLoo and Van Renterghem (2006), in agreement with past studies conducted, support that stuttering prevalence is higher in males than females and also reported the tendency for stuttering prevalence to decrease with increasing age. The difference in age of onset of stuttering (if any) across male and female children with stuttering (CWS) is an aspect of prime interest. Yairi and Ambrose (1992) reported the onset of stuttering in males to be 40.56 months and in females 34.21 months, with a 5 month difference in mean age at onset between males and females. However, Kent (1983) had discussed the fact that increased occurrence of stuttering in males is one of the few consistencies about the disorder and it appears that stuttering behavior begins with approximately equal frequency in young boys and girls. However, females are more likely to recover from stuttering during pre-school years than are males.

The research into the nature of stuttering in boys and girls reveals significant findings too. According to Yairi and Ambrose (1992), out of 87 children (59 boys and 28 girls), 44% (26 boys and 12 girls) had a sudden onset and 56% (33 boys and 16 girls) had gradual onset. Also, out of the 87 participants, 60 children were reported as having mild stuttering, 14 as moderate stuttering and 10 children (6 males and 4 females) were rated as having severe stuttering at onset. Another significant finding was that all the 6 male and 2 out of the 4 females had a sudden onset of stuttering. This study dictates a positive relationship between severity of stuttering and sudden onset. However, Yairi and Ambrose (2005), in a recent study reported that patterns of onset age are similar for both males and females.

Regarding the type of stuttering, clinically, the number of disfluencies, especially of certain types has been regarded as the most important index of stuttering severity. They include SLD (Stuttering like Disfluencies) and OD (Other Disfluencies) as stated by Young (1984) and Yairi and Ambrose (1992). Accordingly, sound repetitions, single syllable word repetitions, syllable repetition, prolongations and blocks are considered as SLDs. Multi syllabic word repetitions, phrase repetitions, interjections and revisions are classified as Other Disfluencies (ODs). This classification helps to determine whether a child can be classified as a CWS or not. In a very recent study, exploring the difference between the gender in relation to type of stuttering, Anjana and Savithri (2007) analyzed the speech sample of 10 boys and 10 girls in the age range of 5.1-6 years and found that majority of the children had almost all the disfluency types. The most prominent disfluency type was sound repetitions. Also, significant gender differences were obtained, with boys showing

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significantly higher percentage of SLDs than the girls. This also shows that boys are at a greater risk for stuttering than girls.

One consistent finding in the literature on stuttering is that a small but significant percentage of children who stutter exhibit concomitant speech/language disorders in addition to their stuttering. Making a comparison across gender, there have been reports that male CWS have more associated problems than female CWS. Kolk and Postma (1997) suggested that CWS are more prone to phonological encoding errors because they are continuously slower at this task. At young ages, male children are more prone to develop phonological deficits than female children. According to Yairi and Ambrose (1992), the later age of stuttering onset for boys may reflect a slower language/phonological development. There has been contradictory evidence too. Ryan (1992) examined the potential performance difference between 20 male and female preschool children with and without stuttering. There were no differences between the two groups on articulation proficiency, although 25% of the CWS group (all boys) later required articulation treatment.

The etiology of stuttering is one of the most investigated aspects. Various causes have been proposed to account for stuttering in boys and girls and more stuttering in boys. A difference in the reaction and responsiveness with favoritism exhibited on male children has been implicated widely in earlier literature. Silverman and Van Opens (1980) reported that boys are exposed to greater pressure to produce fluent speech than are girls. Current research considers females to be less susceptible to stuttering than male CWS or that they have equal chances of inheriting the disorder, but that female CWS recover faster, while male CWS tend to persist (Kidd, Kidd & Records, 1978; Ambrose, Yairi & Cox, 1993. Differences in language ability, reaction time, as well as the more recent differences in neuro-anatomical and functional changes of the brain have been implicated. Females have been considered to have an increased bilateral speech and language representation compared to males. The males are more likely to have a strong left hemisphere lateralization for speech and language.

There is a lot of debate about the onset, nature, development, type, associated problems, and cause of stuttering in male and female CWS. Valuable opinion is available in scattered texts but these available information need to be compiled and a comprehensive comparison is necessary to give a better picture of the difference in the nature of disfluencies between the male and female CWS. This in turn will help in understanding their problems in a better way, finding out the prognosis, help in early intervention and serve better in treating the male and female individuals with stuttering. The outlook towards the female CWS, their characteristics and needs can be understood better. In addition, most of the studies regarding gender and stuttering have been conducted in the western countries and such intensive studies have not been conducted in India. Further investigation into the cause of the condition will also be possible. With this need the present study was planned.

This study aimed to explore the difference in nature of disfluencies if any, in male and female CWS with regard to the age of onset, nature, development of the problem, type of disfluencies, time since onset of stuttering, etiology, associated problems, nature and duration of treatment. Also, to study the pattern of recovery/relapses and severity levels with regard to male and female CWS.

Method

Subjects: Participants for the study included Kannada and Telugu speaking, male and female CWS in the age range of 3-6 years, registered at the All India Institute of Speech and Hearing, Mysore. 27 male and 24 female CWS were considered as participants in the present study.

Materials: The following materials were used in the study: Stuttering severity instrument -SSI-3 (Riley, 1994), Language Assessment Checklist for children (Swapna, Prema & Geetha, 2010), Pictures for description from the fluency test (Nagapoornima, 1990; Yamini, 1990 & Rajendraswamy, 1991), Questionnaire, Set of questions for conversation sample, topic for monologue, A sample for writing (spontaneous and copying); Words and numbers for dictation, Video recorder (Digital video camera recorder-Sony model : HDR-TG-1E) and SPSS-16.

Procedure: The data was collected in two phases.
Phase 1: In Phase I case histories of all children registered at the All India Institute of Speech and Hearing (AIISH) with the complaint of stuttering were reviewed. A total of 84 case files of children diagnosed by a speech-language pathologist as children with stuttering, and who were within 3-6 years of age were selected. Of these, 51 were of male and 33 of female CWS.
Phase 2: In Phase 2, the selected CWS with complete address and/or telephone numbers were followed up through telephone/correspondence. A total of 80 CWS were followed up of which 51 children (27 male CWS and 24 female CWS) reported for assessment. Of these, 24 male and 24 female CWS who reported for the follow up were considered for the study. 3 male CWS were not considered for the study due to lack of adequate samples. Follow up included 10 CWS in mild

severity level, 10 in moderate and 4 in severe stuttering for both male and female CWS. In male CWS, available case file details of the remaining 6 children are also presented. The period of follow up ranged from 10 days to 2.7 years. On follow up, the questionnaire was administered to the parents/caregiver through an interview. A minimum of 150-200 word speech samples was video recorded during 30-45 minutes of interaction between the child, the parent and the investigator. Care was taken to ensure that the sample was no less than 5-minutes duration of the child's talking.

Data analysis: The recorded samples were transcribed verbatim. The samples obtained from each participant were analyzed for the frequency of total disfluencies per 100 words. Within this, the mean frequency of Stuttering Like Disfluencies (SLDs) (i.e, sound repetitions, single syllable word repetitions, syllable repetition, prolongations and blocks) and Other Disfluencies (ODs) (multisyllabic word repetitions, phrase repetitions, interjections and revisions) per 100 words were calculated. SSI-3 was administered to arrive at an overall score and severity of stuttering. The following percentages were computed: Percentage of total disfluencies/total words, Percentage of SLDs/total disfluencies, Percentage of ODs/total disfluencies. The data was tabulated and statistically analyzed using SPSS package to answer the research objectives.

Results and Discussion

The purpose of the present study was to explore the gender difference, if any, in male and female CWS with respect to parameters such as age of onset, nature and development of stuttering, type of stuttering, causative factors, associated problems, time since onset (TSO) and nature and duration of treatment taken. It also aimed to compare the recovery across male and female CWS (as a group and within each severity level) using SSI-3 severity ratings. Attempts were made to look into the percentage of SLDs vs. ODs. The results have been described under each category.

Age and onset across gender and severity: The data collected were grouped into 3 age groups, < 2; 2 - 4 and 4 - 6 years for the analysis of age of onset information. The results are shown in Table 1.

The age of onset of stuttering has been reported in literature to be within 2-6 years of age. The present study also obtained similar results. Most of the studies on onset of stuttering across gender suggest that female CWS have an earlier age of onset than male CWS (Yairi & Ambrose, 1992; Mansson, 2000). However, opposing results have been reported by Andrews, Craig, Feyer, Hoddinott, Howie and Neilson (1983) wherein, the authors reported the age of onset to be same for both genders. Data obtained from the present study supports their study results. 8.3% of female CWS had onset before 2 years compared to 6.6% of male CWS. Almost equal numbers of male and female CWS had onsets of stuttering between <2, 2-4 and 4-6 years. However, smaller intervals of age could have given a better insight.

Nature and development of stuttering across gender and severity:

Nature of onset: Figure 1 shows the nature of onset across the gender and different severity groups. In the present study 45% of CWS had a sudden onset of stuttering. With regard to gender, around 50% of both male and female CWS exhibited a gradual onset. Earlier literature reported that stuttering in children had a gradual onset 70% of the time and a sudden onset only 30% of the time. The present data obtained is in agreement with Yairi and Ambrose, (2003) that a significant number of preschool children exhibit sudden onset of stuttering. Analyzing the data in the present study, a correlation is also observed between sudden onsets and greater severity levels of stuttering.

Analyzing the data in the present study, a correlation is also observed between sudden onsets and greater severity levels of stuttering. For both male and female CWS, sudden onsets were associated with moderate and severe stuttering. This result supports the findings of Yairi, Ambrose and Nierman (1993) who reported that a significant number of preschool children exhibit a sudden onset of moderate to severe stuttering. Comparing the results across gender, the present data revealed that for male CWS, severe stuttering was associated with a more sudden onset (60%) than moderate stuttering (50%) whereas for female CWS, there was no such difference.

Current status: The current status of the condition was classified as progressive, static, regressive or fluctuating. Table 2 provides data regarding the current status data for different severity groups in male and female CWS. The present data indicate that among both male and female CWS more number of children were found to have a decline/regression in their disfluencies (Male CWS: 41.6%, female CWS: 54.16%). Several reports in the literature too indicate that in childhood the remission rates of stuttering are high (Mansson, 2000; Yairi & Ambrose, 2005).

The current status of the condition is a good indication of the recovery from stuttering. When a regressive/fluctuating condition of stuttering is noted, it is a better predictor of recovery than a static/progressive condition. This can be accounted to the fact that stuttering in children, in the initial stages, is highly variable and the child often fluctuates

Table 1. *Age of onset across gender and severity*

Gender	Severity of stuttering	Age of onset			
		<2 years	2-4 years	4-6 years	Total
Male	Mild stuttering	0 (0%)	7 (70%)	3 (30%)	10(100%)
	Moderate stuttering	2 (20%)	6 (60%)	2 (20%)	10(100%)
	Severe stuttering	0 (0%)	5 (50%)	5 (50%)	10(100%)
	Total	2(6.6%)	18(60%)	10(33.3%)	30(100%)
Female	Mild stuttering	2 (20%)	6 (60%)	2 (20%)	10(100%)
	Moderate stuttering	1 (10%)	5 (50%)	4 (40%)	10(100%)
	Severe stuttering	0 (0%)	1 (25%)	3 (75%)	4(100%)
	Total	2(8.3%)	13(54.16%)	9 (37.5%)	24(100%)

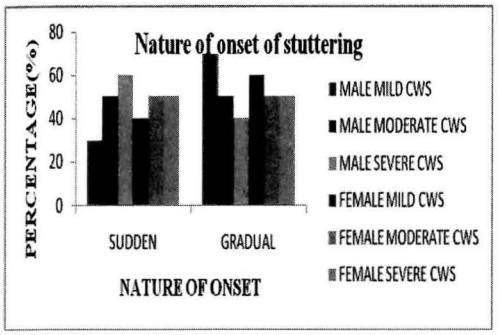

Figure 1. *Nature of onset of stuttering across gender and severity.*

between periods of normal fluency and mild stuttering (Van Riper, 1982). Several reports in literature support the finding that female CWS are found to recover earlier than male CWS (Felsenfeld, 1997; Yairi & Ambrose, 2004). The present study too agrees with the literature.

This is because, careful analysis of the results reveals that majority of the female CWS had a regressive (54.16%) and fluctuating (33.3%) condition of stuttering, with only a minority exhibiting static (8.3%) and progressive (4.16%) condition of stuttering. For male CWS too, majority of the children reported a regressive (41.6%) and fluctuating (25%) condition of stuttering, but the reported percentage was lesser than that obtained for females. Data analysis thus provides significant evidence that female CWS have a better chance of recovery than male CWS.

Time since onset (TSO) and first consultation: Previous literature findings report that the lag between the TSO of stuttering and the time for initiation of any treatment is greater for female than male PWS. This finding suggests that female CWS were bought for evaluation and treatment much later than male CWS. However, the present data indicate that majority of female CWS were bought for evaluation much earlier than male CWS. Figure 2 denotes the TSO and first consultation across the gender groups.

The results obtained indicate that, in female CWS, majority of children were bought within 3 and 3.6 months of stuttering onset (45.8% - within 3 months; 33.3% - within 3.6 months). Only a minor group of children were bought after 6 months of the onset (12.5% -within 6-12 months; 8.3% - after 12 months). In male CWS, the majority of the children were bought for initial evaluation after 12 months of the onset of stuttering (54.16%). 25% reported within 3-6 months and 16.6% reported within 3 months from the onset. A very minor group (4.16%) reported within 6-12 months of the onset of stuttering.

Table 2. *Current status of the condition across gender and severity*

Gender	Severity	Current condition				
		Static	Progressive	Regressive	Fluctuating	Total
Male	Mild stuttering	0 (0%)	2 (20%)	2 (20%)	6 (60%)	10 (100%)
	Moderate stuttering	2 (20%)	3 (30%)	5 (50%)	0 (0%)	10 (100%)
	Severe stuttering	1 (25%)	0 (0%)	3 (75%)	0 (0%)	4 (100%)
	Total	3 (12.5%)	5 (20.8%)	10 (41.6%)	6 (25%)	24 (100%)
Female	Mild stuttering	1 (10%)	0 (0%)	5 (50%)	4 (40%)	10 (100%)
	Moderate stuttering	1 (10%)	1 (10%)	4 (40%)	4 (40%)	10 (100%)
	Severe stuttering	0 (0%)	0 (0%)	4 (100%)	0 (0%)	4 (100%)
	Total	2 (8.3%)	1 (4.16%)	13 (54.16%)	8 (33.3%)	24 (100%)

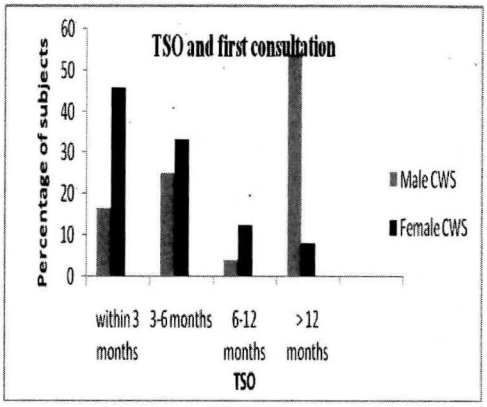

Figure 2. *TSO and first consultation across gender.*

These findings suggest that there is no gender bias in parents in seeking help i.e., the views and conceptions regarding stuttering in females has progressed a long way through the years with female CWS also being identified and brought early for treatment.

Associated problems with stuttering across gender and severity: A consistent finding in the literature of stuttering is that a small but significant percentage of children who stutter exhibit concomitant speech/language disorders in addition to their stuttering. There are also reports indicating that the occurrences of these problems are more in male CWS (Ryan, 1992; Blood, Ridenour, Qualls, & Hammer, 2003). Table 3 depicts the associated problems across gender and severity of stuttering. In the present study, male CWS had more associated problems (60%) than female CWS (40%). Male CWS often exhibited articulation problems (30%), followed by behavioral problems (20%) and language problems (10%). None of the male CWS had sensory impairments or learning problems. Female CWS exhibited more sensory problems (20%), followed equally by articulation and learning problems (10%). No behavioral or language problems were observed in female CWS.

Duration of therapy attended across gender and severity

Therapy for stuttering: Figure 3 provides the details of number of males and female CWS who did/did not attend therapy. Figure 3 depicts that majority of male and female CWS attended therapy. Making a comparison across gender, more male CWS (87.5%) than female CWS (78.16%) attended therapy. It can therefore be seen that there is an increasing awareness of stuttering among parents of CWS.

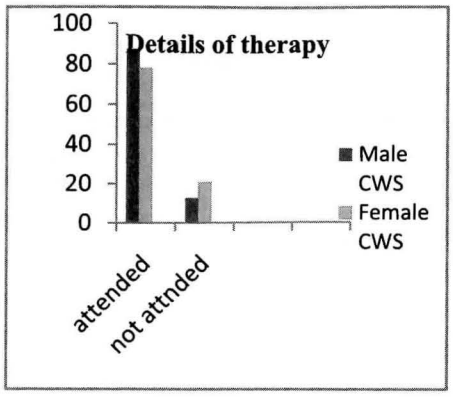

Figure 3. *Details of therapy attended across gender.*

Duration of therapy: Figure 4 provides the details of duration of therapy attended across gender and severity. The results obtained reveal that majority of CWS attended therapy for duration of less than 10 days and up to 1-3 months. Only few CWS attended therapy for 1-3 months. Summarizing the results across gender, Male CWS were found to have attended therapy for a longer duration (1-3 months) than female CWS.

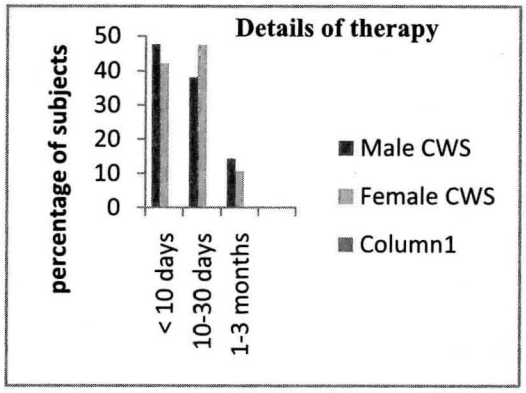

Figure 4. *Duration of therapy attended across gender.*

Causative factors across gender and severity: The causative factors for stuttering have long been investigated. In the present study, the factors have been grouped under 4 main headings- family history of stuttering, environmental, psychological, and others and are plotted in figure 5. During the past few decades, the research conducted in this area has revealed a strong genetic component contributing to stuttering (Andrews & Harris, 1964; Kidd, Kidd & Records 1978; Anjana,, 2004). In the present study too, positive family history dominates the causative factors in both, male and female CWS (40% and 41.6% respectively). Table 4 gives the details of

Table 3. *Associated problems across gender and severity*

Gender	Severity	Sensory problems	Articulatory Problems	Learning problems	Language problems	Behavioral problems	Total
Male	Mild stuttering	0 (0%)	2 (20%)	0 (0%)	1 (10%)	0 (0%)	3 (30%)
	Moderate stuttering	0 (0%)	1 (10%)	0 (0%)	0 (0%)	2 (20%)	3(30%)
	Severe stuttering	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)
	Total	0 (0%)	3 (30%)	0 (0%)	1 (10%)	2 (20%)	6 (60%)
Female	Mild stuttering	2 (20%)	1 (10%)	0 (0%)	0 (0%)	0 (0%)	3 (30%)
	Moderate stuttering	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)
	Severe stuttering	0 (0%)	0 (0%)	1 (10%)	0 (0%)	0 (0%)	1(10%)
	Total	2 (20%)	1 (10%)	1 (10%)	0 (0%)	0 (0%)	4 (40%)

Table 4. *Proximity of relationship in paternal and maternal sides under family history of stuttering*

Gender	Severity of stuttering	Paternal		Maternal		Sibling	Subjects with >1 relative with stuttering	Total
		1st degree	2nd degree	1st Degree	2nd degree			
Male	Mild stuttering	4(66.6%)	1(16.6%)	1(16.6%)	0 (0%)	0(0%)	0 (0%)	6 (100%)
	Moderate stuttering	2 (50%)	0 (0%)	2 (50%)	0 (0%)	0 (0%)	0 (0%)	4(100%)
	Severe stuttering	2 (40%)	0 (0%)	1 (20%)	0 (0%)	1 (20%)	1 (20%)	5(100%)
	Total	8(53.3%)	1 (6.6%)	4(26.6%)	0 (0%)	1 (6.6%)	1 (6.6%)	15(100%)
Female	Mild stuttering	1 (20%)	0 (0%)	3 (60%)	0 (0%)	1 (20%)	0 (0%)	5(100%)
	Moderate stuttering	1 (20%)	1 (20%)	2 (40%)	0 (0%)	0 (0%)	1 (20%)	5(100%)
	Severe stuttering	1 (100%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	1(100%)
	Total	3(27.2%)	1(9.09%)	6(54.5%)	0 (0%)	1(9.09%)	1 (9.09%)	11(100%)

proximity of relationship in paternal and maternal sides under genetic factor.

With respect to the family history of stuttering, the present study supports the findings of Ambrose, Yairi and Cox (1993) who found that male and female children who stutter had similar chances of having relatives who stuttered. Moreover, the current results revealed that stuttering was more frequent in first degree relatives (both maternal and paternal) than the second degree relatives. This study supports the recent findings of Anjana, (2004) that the first degree relatives have a higher percent of stuttering compared to second degree relatives.

There were more male relatives than female relatives with stuttering. This supports findings of Wingate (1964), Anjana (2004), who found greater number of males than females in the families of PWS. Results compared between gender reveal that majority of the male CWS were found to have male relatives of first degree (53.3%), whereas majority of the female CWS were found to have female first degree relatives (54.54%).

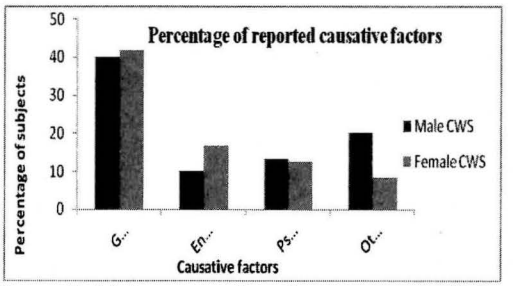

Figure 5. Major causatives factors reported across gender.

However, it is also true that genetic factors are not the sole cause of stuttering (Kidd, Kidd & Records 1978). The results obtained in this study too indicate the same. Figure 5 depicts the other causative factors, in addition to the genetic factors.

In male CWS, the second most reported causative factors included that of stuttering onset after illness and medication in the category of others (20%), and the third most reported factor was psychological (13.3%). Early literature reports

Table 5. *Types of stuttering across gender*

Gender	Percentage Mean (%)								
	SR	SSWR	SYR	PR	BL	MSWR	PHR	INT	REV
Male	26.46	8.30	17.84	7.38	11.38	11.07	3.69	6.46	7.38
Female	25.12	9.35	12.80	8.37	6.89	11.82	5.41	9.35	10.83

(Bloodstein & Smith, 1954; Goldman, 1967) indicated that male CWS were subjected to more environmental pressure. However, the present study does not support these findings. The current data indicated that environmental factors were the least implicated in male CWS (10%) and in female CWS, they were the second most reported causative factor (16.6%).

Type of stuttering: As shown in Table 5, the type of stuttering in male and female CWS indicate that there was not much difference between male and female CWS. Both the groups had similar types and frequency of disfluencies. Comparing SLDs in both male and female CWS, sound repetitions were found to be the most frequent disfluency type. In the category of ODs, multisyllabic word repetition was found to be the most frequent disfluency. This supports the results of the study by Anjana and Savithri (2007) who reported similar results.

Recovery between male and female CWS across severity levels and as a group

Estimation of recovery from stuttering was done in 2 ways.

Comparing the previous and current SS1-3 scores: To examine the recovery pattern in male versus females CWS, previous SSI-3 scores were compared with the current scores on SSI-3 (Riley, 1994). The results were compared between gender and across severity of stuttering. Mann-Whitney U test was carried out to obtain the significance, if any between male and female CWS, with respect to previous and current SSI-3 scores as a whole group (i.e, male CWS and female CWS) and within each severity level of stuttering (i. e, previous and present scores of male children with mild stuttering versus previous and present scores of female children with mild stuttering). This nonparametric test was used for the statistical analysis of these scores because the data were not normally distributed.

Table 6 depicts the previous and current SSI scores for children with mild (1-10), moderate (11-20) and severe stuttering (21-24), based on previous scores. For children with mild stuttering male subjects 3, 4 and 5 and female subjects 2, 3, 5, 7, 8 and 10 presently obtained a score of less than 10 on the SSI-3 (Riley, 1994). This indicated that they can be classified as children with no stuttering (CWNS) as suggested by Coulter, Anderson & Conture, (2009). Thus, better recovery was seen in female (6 out of 10) than male CWS (3 out of 10). However, statistical comparison of previous and present scores across gender within the category of mild stuttering using Mann- Whitney *U*-test indicated that there was no significant difference between gender on previous and current scores of SS1-3, in mild stuttering group ($z = -1.77$, $p > 0.05$), which could be due to the fact that both male and female CWS recover better when they have mild stuttering. For children initially classified as having moderate stuttering Table 8 clearly depicts the difference in scores between the male and female CWS. It can be seen that no male CWS obtained a score of 10 and lesser, to classify them as CWNS, whereas in female CWS, subjects 1, 2, 4, 5 and 7 obtained a score of 10 and less, indicating complete recovery in them. Male subjects 4, 5 and 7 previously diagnosed with moderate stuttering showed a steady decline in their scores, falling into the category of mild stuttering. Female subjects 3 and 10 also were found to have a regression in their scores, coming under the category of mild stuttering.

Therefore, summarizing the obtained results, it was found that more female CWS recovered than male CWS. Statistical analysis using Mann-Whitney revealed a significant difference between male and female children with stuttering with respect to the SSI-3 scores ($z = -2.58$, $p < 0.05$), further supporting that female CWS have better chances of recovery than male CWS. For children initially classified as severe stuttering it can be observed from the table that all female CWS had partial recovery. 3 female CWS were found to have moderate stuttering presently (subjects 1, 3 and 4) and one female was found to have only mild stuttering (subject 2). In male CWS, 3 of the subjects were found to have partially recovery, 2 recovered to a moderate severity level (1, 4 subject) of stuttering and 1 subject recovered better, having only mild stuttering currently (subject 2). 1 male subject was found to have no recovery (subject 3). Therefore, in the category of severe stuttering, it can be seen that there was partial recovery for both male and female CWS. Also, there was 100% recovery in females whereas only 75% in male CWS. Results of Mann-Whitney U test indicated that there was no significant difference ($z = 0.00$, $p > 0.05$) between male and female CWS on the basis of SSI-3 scores in the severe category. However, the results need to be interpreted with caution due to the less number of subjects considered in both groups.

Table 6. *Previous and current SSI scores across gender and severity*

Male	SSI scores		Female	SSI scores	
	Previous	Present		Previous	Present
1	16	20	1	16	12
2	15	16	2	14	10
3	13	10	3	12	6
4	12	6	4	14	12
5	16	10	5	14	8
6	16	12	6	16	12
7	16	14	7	14	8
8	16	12	8	14	10
9	14	12	9	16	12
10	16	15	10	16	6
11	25	25	1	18	10
12	20	18	2	23	10
13	23	21	3	18	12
14	24	15	4	23	8
15	23	14	5	22	10
16	26	23	6	20	17
17	22	17	7	17	8
18	19	17	8	19	14
19	25	24	9	21	17
20	20	18	10	22	14
21	27	22	1	28	25
22	28	20	2	27	18
23	30	28	3	29	25
24	30	25	4	27	22

In addition, a Mann-Whitney U test was carried out between gender on the previous and current SSI scores, as a whole, without dividing the subjects into different severity levels. The results indicated that there was a significant difference ($z = -3.01$, $p < 0.05$) between gender with respect to the previous and current SSI-3 scores. This implies that better recovery was observed in female CWS than male CWS. Therefore, the present study is in support of majority of the literature findings that female CWS recover better than male CWS (Felsenfeld, 1997; Yairi & Ambrose, 2004).

Type/frequency of disfluencies across gender and severity: The data was also analyzed to obtain the type and frequency of disfluencies across severity level (classified according to the previous SSI-3 scores) and gender. Frequency of SLD and OD in male and female CWS within the category of mild stuttering are shown in table 7. The results indicated that 3 male subjects (subjects 3, 4, and 5) had less than 2 SLDs per 100 words. Within female CWS, 6 subjects (subjects 2, 3, 5, 7, 8 and 10) had less than 2 disfluencies per 100 words of conversational speech. Therefore, these 3 male and 6 female CWS can be classified as CWNS (Pellowski & Conture, 2002). Frequency of SLD and OD in male and female CWS within the category of moderate stuttering are shown in Table 8. Within the moderate stuttering group, no male CWS were found to have less than 2 SLD per 100 words, whereas 5 female CWS were found to have so (subjects 1, 2, 4, 5 and 7). No male subjects with moderate stuttering was found to have recovered completely whereas 5 female subjects with moderate stuttering were found to have recovered completely, which supports the findings by Pellowski and Conture, (2002).

Table 7. *Frequency of SLD and OD in male and female CWS (mild stuttering)*

	Male	Disfluency		Female	Disfluency	
		SLD	OD		SLD	OD
MILD STUTTERING	1	7	4	1	9	2
	2	5	3	2	2	3
	3	2	3	3	1	2
	4	1	4	4	6	2
	5	2	3	5	2	4
	6	6	5	6	4	2
	7	8	4	7	2	3
	8	5	2	8	1	2
	9	6	2	9	6	3
	10	6	4	10	1	2

Table 8. *Frequency of SLD and OD in male and female CWS (moderate stuttering)*

	Male	Disfluency		Female	Disfluency	
		SLD	OD		SLD	OD
MODERATE STUTTERING	1	20	8	1	2	5
	2	16	4	2	2	6
	3	14	3	3	9	2
	4	9	3	4	2	3
	5	4	1	5	2	4
	6	22	5	6	11	2
	7	6	5	7	2	5
	8	14	4	8	7	2
	9	21	7	9	7	2
	10	7	3	10	4	2

Table 9. *Frequency of SLD and OD in male and female CWS (severe stuttering)*

	Male	Disfluency		Female	Disfluency	
		SLD	OD		SLD	OD
SEVERE	1	13	4	1	13	7
	2	9	2	2	11	3
	3	15	6	3	13	3
	4	14	4	4	8	5

Frequency of SLD and OD in male and female CWS within the category of severe stuttering are shown in Frequency of SLD and OD within the category of severe stuttering are shown in table 9 It was found that none of the male or female CWS had 2 or lesser disfluencies per 100 words of conversational speech and therefore, none of them can be classified as completely recovered.

Conclusions

The aim of the present investigation was to explore the gender differences, if any, in male and female CWS with regard to parameters such as age of onset, nature and type of stuttering, causative factors, associated problems, time since onset (TSO) and nature and duration of treatment taken. It was also aimed to compare the recovery rates across male and female CWS (as a group and within each severity level) using SSI-3 severity ratings and the percentage of SLDs vs. ODs. Analysis of the results revealed significant gender difference across all the parameters under study excluding the nature of onset.

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