

Extensive Stuttering Therapy in Turkish Children who Stutter

Ozgul Akin Senkal¹ and Muzeyyen Ciyiltepe^{2*}

¹Department of Education, Cukurova University, Turkey

²Department of Health Sciences Faculty Speech Language Therapy, Anadolu University, Turkey

ARTICLE INFO

Article history:

Received: 05 October 2017

Accepted: 01 December 2017

Published: 07 December 2017

Keywords:

Perceptual analysis;
Speech language therapy;
Communication skills

Copyright: © 2017 Ciyiltepe M et al,
J Otolaryngol Res

This is an open access article distributed under the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

Citation this article: Senkal OA, Ciyiltepe M. Extensive Stuttering Therapy in Turkish Children who Stutter. J Otolaryngol Res. 2017; 1(2):117.

ABSTRACT

Objective: In this study, the immediate and extended outcomes of the stuttering therapy program were investigated for the first time in Turkey. This paper reports the results of an eight-week extensive stuttering therapy program for 35 school- aged and adolescent who stutter.

Methods: Measurements were made immediately before and after treatment and again during the follow-up period, 6 months' post-treatment. The measures included percentage of stuttering, syllables spoken per minute.

Results: Turkish school- aged and adolescence children who stutter showed more Within-word dysfluencies than Between-word dysfluencies. In addition, stuttering characteristics included (in) audible sound prolongations (24%) and sound/syllable repetition (49%). The results indicated that substantial positive changes occurred and were maintained in speech performance with an eight-week stuttering therapy.

Conclusion: The present study examined the characteristics of dysfluencies in school- age and adolescence and then dysfluency characteristics were taking to account before and after Fluency Shaping Therapy of children and adolescence who stutter at moderate degree. Intensive therapy courses for children and adolescents who stutter and their families changed the stuttering behaviour of the participants.

Introduction

It is well known that stuttering represents communication disorder which affects speech fluency [1]. Developmental stuttering, or simply "stuttering", primarily influences the speaker's ability to produce fluent speech. Developmental stuttering is the most common form of dysfluency, with an onset generally between the ages of 2 and 5 years. Developmental stuttering is a temporary break in the fluency of speech that occurs when the child has a giant spurt in language development but lacks the motor coordination to keep up with increasingly complex verbal messages [2]. According to Yairi [3], stuttering is a complex and multidimensional disorder, and speech disruptions are defining aspects of this disorder [3]. According to Ambrose and Yairi [4] interruptions in the flow of speech, commonly referred to as dysfluencies, are the most obvious feature of stuttering [4]. Furthermore, dysfluent events are obligatory signs of stuttering and have been the most frequently used feature to describe, define, and measure this disorder.

Correspondence:

Muzeyyen Ciyiltepe,
Department of Health Sciences
Faculty Speech Language
Therapy, Anadolu University,
Turkey, Tel: 90 542 506 0130;
Email: mciyiltepe08@gmail.com

The differentiation between stuttered and non-stuttered speech can be achieved by measuring the difference between within- versus between-word disfluencies [5]. In other words, it might be possible to dichotomize stuttering and fluency into two separate categories by assessing differences in the type of speech dysfluencies. One typical way of doing this is to consider within-word dysfluencies as stuttered and between-word dysfluencies as normal dysfluencies [6]. Turkish school-aged children who stutter were determined as stuttered within word dysfluencies which is 37, 4% in a Turkish study [7].

In a disorder such as developmental stuttering it is also important to be able to evaluate the development of the disorder and establish the effectiveness of therapies that seek to alleviate its impact [8]. Previously studies documented the positive influence of treatment on stuttering frequency and behaviour, far less attention has been paid to the effectiveness of methods used to treat stuttering in school-age children and/or adolescent children who stutter. For example, in a 1995 issue of *Language, Speech, and Hearing Services in Schools* that focused on the treatment of fluency disorders, both articles addressing school-age children included a multi-factorial set of strategies for improving fluency, minimizing negative reactions to stuttering, and reducing the impact of stuttering on communication [9,10]. Stuttering therapy is any of the various treatment methods that attempt to reduce stuttering to some degree in an individual. There are many different methods used in the treatment of stuttering (Table 1) [11-16]. The therapeutic methods available can be roughly divided into those aiming to modify stuttering and those aiming to shape fluency [9,17]. Recently, treatments for stuttering in Turkey have focused on Stuttering Modification Therapy [18,19]. This therapy technique focuses on reducing stuttering severity by changing only the portions of speech where a person stutters. This approach attempts to reduce the severity and fear of stuttering, and to make fluency smoother, shorter, less tense, and less penalizing for the patient. Moreover, Stuttering Modification Therapy strives to teach stutterers to stutter with control, rather than making the stutterer completely fluent.

Another stuttering speech therapy (Fluency Shaping Therapy) is prolonged speech and trains stutterers to speak slowly with relaxed breathing, relaxed vocal folds, and relaxed articulation (lips, jaw, and tongue) muscles. Fluency shaping therapies first establish fluent, but abnormal-sounding speech in the speech clinic. This fluent speech is then shaped into normal-sounding speech. Lastly, stutterers transfer this fluent speech outside the speech clinic, to everyday conversations [9,17]. While there is disagreement about acceptable treatment outcomes from stuttering therapy [9], a wide range of methods have been developed to treat stuttering, and these have been successful to varying degrees. The purpose of this investigation was to determine the effectiveness of stuttering therapy for Turkish school-age children and adolescence who stutter. In this study has been determined that the outcomes of extensive stuttering therapy by measuring the difference within- and between-word dysfluencies before and after speech therapy.

Materials and Methods

1. Participants

From March 2010 to June 2012 totally 254 persons visited community based hospital department of Speech-Language Therapy at two different cities (Adana and Ankara, Turkey) as stutterer. Of those 254, 100 patients were child and/ or adolescence who presented themselves or their family for the first time at the speech therapy clinics with a "stuttering" problem were included in the subject selection. This was a retrospective and cross-sectional study.

Children were considered to be stuttering if they met two standard criteria [20]: (a) they produced 3 or more Stuttering-Like Disfluencies (SLD) (i.e. sound-syllable repetitions, sound prolongations, monosyllabic whole word repetitions) per 100 words of conversational speech; (b) their parents believed that the child stuttered. Thirty-five children and/ or adolescence who moderately stutter recruited (25 males and 10 females) to the extensive eight week stuttering therapy programme aged between 7- 17 with a mean age of $11 \pm 3,2$ years.

Table 1: Therapy options in school-aged children and adolescents who stutter (last 10 years).

Author	Therapy option	Problem	Subjects	Results
Harasym & Langevin [11]	Fluency shaping therapy	Down syndrome + stuttering	Case study	speech measures obtained at post-treatment and at 4 months follow-up reflected improvements in fluency of 89.0% and 98.6%
Andrews et al., [12]	syllable-timed speech (STS) treatment	stuttering	10 children, ages 6-11 years	>50% for half of the children, with 2 children attaining 81% and 87% reduction
Davidow & Ingham [13]	Chorus reading	stuttering	8 person, ages 16- 32 years	Speech rate did not have an effect on stuttering frequency during chorus reading
Koushik, Shenker and Onslow [14]	Lidcombe Program	Stuttering	12 children, ages 6- 10 years	mean percent syllables stuttered score pre-treatment was 9.2 and 1.9 at follow-up
Bakhtiar & Packman [15]	Lidcombe Program	Stuttering, bilingual	Case study 8 y 11m.	%SS was less than 1 during the last 3 clinic visits and severity ratings made by the parent indicated no stuttering (severity rating = 1) for all days of the final week
Laiho & Klippi [16]	stuttering modification treatments	stuttering	21 children/adolescents between the ages of 6.8 and 14.0 years	Stuttering severity became milder or did not change during the course. The percentage of syllables stuttered dropped with two-thirds of the participants

Table 2: Stuttering Severity classification used in this study (a modification of Van Riper [21]).

Variable	Mild	Moderate	Severe
Per cent of syllables stuttered	1.0- 2.4	2.4- 8.4	≥8.5
Length of moment of stuttering (s)	≤ 1.0	1.1-2.4	≥2.5
Avoidance (%)	<5.0	5.0- 20.4	>20.5
Escape	No, or only occasionally	Common, varying from mild to severe	Continuous extra movements of face or whole body

Table 3: Demographics of 35 children and adolescence who stutter at first assessment.

Variable	N	Mean	Minimum	Maximum	Std. Dev
Age	35	11	7	17	3.2
Total Words spoken per minute	200	77.3	65	98	12.4

Table 4: Scores on disfluency types immediately before, immediately after and 6 months following the speech therapy program.

	Disfluency type	Pre- (%)	Post- (%)	Follow- up (%)
Within word	(in)audible sound prolongation	24	11	19
	Sound/ Syllable repetition	49	34	36
Between word	Whole word repetition (poly)	16	10	11
	Whole word repetition (mono)	9	1	5
	Expression repetition	2	-	1

2. Measures

Participants were asked to read a phonetically balanced 200-word text in order to evaluate stuttering [20]. These samples recorded on camera (SONY Digital Handycam DCR-TRV17E). The videotapes of each participant were analysed qualitatively and quantitatively. The speech sample was analysed by a

certified Speech-Language Therapist (SLP). The same SLP assessed the severity of stuttering. Frequency of stuttering was calculated for each sample by determining the number of words stuttered in the sample and dividing by the total number of words spoken. Stuttering severity was categorized as being 1 (mild), 2 (moderate) or 3 (severe) points so the cumulative totals were 1- 4 (mild), 5-8 (moderate) and 9- 12 (severe)

Table 5: Characteristics of Stuttering which are Changing with Fluency Shaping Therapy.

	Disfluency type	Pre- therapy				Post- therapy				Follow- up			
		mean	sd	median	range	mean	sd	median	range	mean	sd	median	range
Within word	(in)audible sound prolongation	4,88	3,6	5	1-15	3	2,11	3	0-9	4,67	3,7	5	0-15
	Sound/ Syllable repetition	8,82	4,3	8	3-15	3,91	2,2	4	1-10	8,44	4,2	6,5	3-15
Between word	Whole word repetition (poly)	5,35	3,6	5	0-11	3,26	2,4	4	0-8	5,23	3,6	5	0-11
	Whole word repetition (mono)	9,11	3,9	9	3-15	3,82	2,8	4	0-10	8,82	4	8,5	3-18
	Expression repetition	0,64	0,3	0	0-2	0,14	0,3	0	0-1	1,25	0,7	0	0-2

Appendix 1: Stuttering Therapy Plan.

1. session: Breathing exercises (40 minutes).
Checking ability to move the diaphragm (supine position).
Diaphragmatic breathing exercises (supine position).
Repeating diaphragmatic breathing exercises (sitting position).
Repeating diaphragmatic breathing exercises (standing position).
2. session:
Repeating diaphragmatic breathing exercises (different positions) 15 minutes
Rhythmic body exercises (body shaking, arm shaking, rolling, lurching) (25 minutes) with diaphragmatic breathing.
3. session:
Repeating diaphragmatic breathing exercises (different positions) 15 minutes
Soft Phonation exercises (25 minutes)
4. session:
Repeating diaphragmatic breathing exercises (different positions) (10 minutes).
Soft Phonation exercises (15 minutes).
Reading syllables (15 minutes).
5. session:
Repeating diaphragmatic breathing exercises (different positions) (10 minutes).
Soft Phonation exercises (10 minutes).
Reading syllables (10 minutes).
Reading polysyllables (10 minutes).
6. session:
Repeating diaphragmatic breathing exercises (different positions) (10 minutes).
Reading syllables (10 minutes).
Reading polysyllables (10 minutes).
Reading poems (10 minutes).
7. session:
Repeating diaphragmatic breathing exercises (different positions) (10 minutes).
Reading polysyllables (10 minutes).
Reading poems (10 minutes).
Reading a story (10 minutes).
8. session:
Repeating diaphragmatic breathing exercises (different positions) (10 minutes).

[21] (Table 2). In this study characteristics of stuttering were assessed as a function of most common types of dysfluency:

1. Within-word dysfluencies
 - a. (in) audible sound prolongation
 - b. Sound/syllable repetition
2. Between-word dysfluencies
 - a. Whole word repetition (poly)
 - b. Whole word repetition (mono)
 - c. Expression repetition

3. Speech therapy

Participants were tested during the first assessment session prior to therapy by a SLP in community based hospital. Therapy was carried out at the same centre by the other SLP. This study followed 35 children and adolescence that moderate degree of stutterer completely through the eight-week program at the same centers two branch one is in Adana and the other is in Ankara, Turkey. All of the subjects completed the eight week stuttering program in which child meet for approximately 40 minutes per week. Subjects

progressed through a combination of stuttering therapy program. It was an extensive therapy programme.

It involves teaching children with moderate stuttering a combination of fluency skills and stuttering modification procedures. The first phase of our therapy might address breathing exercises to improve diaphragmatic breathing and second phase is to increase awareness as well as exploration and desensitization to stuttering. The next phase involves teaching the child to stutter easily and speak more fluently through the use of progressively longer and more complex linguistic units (i.e., single words, polysyllable words, sentences, poems, reading a short story and conversation) (Appendix 1).

The children were monitored over a 6-month period but received no direct intervention during that time. By the end of six months 35 children assessed again as a function of most common types of dysfluency.

Basic statistic parameters were calculated for each variable: mean, Standard deviation, minimum and maximum result, range of results. Paired two sample t-test was used for examination of differences in analysed variables. The Pearson product-moment correlation was used to evaluate the connections between different variables.

Results

Dysfluency types of Turkish children are more Within-word dysfluencies than Between-word dysfluencies. In addition, characteristics of their stuttering included (in) audible sound prolongations (24%) and sound/syllable repetition (49%). The findings of the Wilcoxon-test found to be statistically significant that stuttering in this study group more within - words dysfluencies than between-word dysfluencies ($p = 0.001$).

Pre- and post-treatment and follow- up speech measures had been done by within word and between word dysfluencies. After six months, stuttering severity indicate mild stuttering overall.

As seen in (Table 3&4), after 6 months of follow-up period children's stuttering sound/syllable repetition are still higher than other characteristics of stuttering (36%). Results of a t-test indicated that there were significant differences between pre-therapy and post-therapy

measurements and between post-therapy and follow-up measurements (Table 5).

1. Statistical measurements about within- word dysfluencies are:

a. (in) audible sound prolongation changed significantly between pre- therapy and post- therapy measurements ($t = -5.43$; $p < 0.0001$). However, there is no significant change between pre-therapy and follow- up measurements ($t = -1$; $p = 0.324$), but significant change determined between post-therapy and follow- up measurements ($t = 5.22$; $p < 0.0001$).

b. Sound/syllable repetition changed significantly between pre- therapy and post- therapy measurements ($t = -9.45$; $p < 0.0001$). However, there is no significant change between pre-therapy and follow- up measurements ($t = 1.43$; $p = 0.16$), but significant change determined between post-therapy and follow- up measurements ($t = 8.05$; $p < 0.0001$).

2. Statistical measurements about Between-word dysfluencies are:

a. Whole word repetition (poly) changed significantly between pre- therapy and post- therapy measurements ($t = -5.73$; $p < 0.0001$). However, there is no significant change between pre-therapy and follow- up measurements ($t = -1.27$; $p = 0.21$), but significant change determined between post-therapy and follow- up measurements ($t = 5.3$; $p < 0.0001$).

b. Whole word repetition (mono) changed significantly between pre- therapy and post- therapy measurements ($t = -10.93$; $p < 0.0001$). However, there is no significant change between pre-therapy and follow- up measurements ($t = -1.40$; $p = 0.168$), but significant change determined between post-therapy and follow- up measurements ($t = 10.76$; $p < 0.0001$).

Expression repetition changed not significantly between pre- therapy and post- therapy measurements ($t = -4.23$; $p = 0.0002$). There is also no significant change between pre-therapy and follow- up measurements ($t = -1.430$; $p = 0.168$), and not significantly changed between post-therapy and follow- up measurements ($t = 3.80$; $p = 0.0006$).

Discussion

The present study examined the characteristics of dysfluencies in school- age and adolescence and then dysfluency characteristics were taking to account before and after Fluency Shaping Therapy of children and adolescence who stutter at moderate degree. Data collected from a speech therapy-seeking population from a community based hospital. There were a large number of children between ages 7-17 years who sought speech therapy (64%) in this study despite of recently studies that has been reported lack of motivation as a characteristic of adolescence [22]. Having a stutter is not necessarily, in itself, sufficient reason to seek treatment. Rather, going to university or starting work may be what prompts some adolescents to seek treatment. Throughout the school years most children who stutter become increasingly aware of their speech difficulties and how others react when they do not speak fluently [23,24].

Stuttering was most often seen at a moderate degree (50%), but especially in boys (35%) at moderate degree. This finding presents same as stuttering literature [3,5,25]. Stuttering can be mild, moderate or severe. Children can't hide stuttering, but moderate and severe stutters can be willing to work hard at speech therapy. In contrast, mild stutters, who can hide stuttering, are hesitant to do speech therapy. Stuttering therapy is a reliable therapy method for children who have moderate degree of stuttering [26].

Stuttering is a multidimensional disorder, and thus a multidimensional approach is required to appropriately evaluate treatment outcomes. Yet it is possible to assess characteristics of dysfluencies for progress by a speech therapy. A study about school-aged children who stutter in particular of Turkey stated that Within-word dysfluencies which is 37, 4% audible sound prolongation, 18, 3% inaudible sound prolongation and 44, 3% syllable repetition. Percentages of (in) audible sound prolongations are 24% and sound/syllable repetition is 49% [27]. Similar to this study, present study shows that within- word dysfluencies are higher than between word dysfluencies. Turkish is an agglutinating

language, meaning that a fairly large number of affixes may be added to the root, each of which has only one meaning or grammatical function. Consequently, children who stutter in this study, speaking dysfluent more within word than between word and infrequently stutter at the end of words. In this study however, follow up scores on dysfluency types shows that still under limits of pre-therapy scores. Intensive stuttering therapy is improving fluency of Turkish children who stutter.

Intensive therapy courses for children and adolescents who stutter and their families changed the stuttering behaviour of the participants [16]. However, there are only few studies where the extensive therapy courses for children and adolescents who stutter. School- aged and adolescence children are not allocating enough time to attend intensive speech therapy courses at school time period. Public school speech and language therapists in USA sampled retrospectively reported very little therapeutic efficacy for treating children who stutter and implementing therapeutic protocols that allow these children to gain the ability to produce speech that is indistinguishable from the speech of those who do not stutter [28]. Therefore, extensive speech therapy courses will be a choice to treat school aged or adolescence children who stutter if there is not a public school speech and language therapist. In this study overall recovery data at follow- up period suggest that moderate degree of stuttering has reduced to mild degree of stuttering. As Kalinowski [28] stated that more experienced therapists can achieve a better result. Speech therapy for school-aged and adolescence who stutters has to be applied by those who are experienced in stuttering therapy.

This study involves large numbers of participants in an experimental group and describe the method in sufficient detail so that could be replicated by other investigators, and that practicing SLPs could implement the treatment with children on their caseloads, assuming the results were positive.

References

1. Bloodstein, Oliver. (1995). A Handbook on Stuttering, San Diego: Singular Publishing Group.

2. Anderson JD, Wagovich SA. (2010). Relationships among linguistic processing speed, phonological working memory, and attention in children who stutter. *Journal of Fluency Disorders*. 35: 216-234.
3. Yairi E. (1997). Speech Characteristics of Early Childhood Stuttering. In: Curlee R, Siegel G. (editors), *Nature and treatment of stuttering*. Needham Heights, MA: Allyn and Bacon.
4. Yairi E, Ambrose NG. (1999). Early childhood stuttering I: Persistency and recovery rates. *Journal of Speech, Language and Hearing Research*. 42: 1097-1112.
5. Conture EG. (2001). Stuttering: Its nature, diagnosis, and treatment.
6. Anderson JD, Conture EG. (2000). Language abilities of children who stutter: A Preliminary study. *Journal of Fluency Disorders*. 25: 283-304.
7. Kayikci ME, Belgin E. (2011). Stuttering types in Turkish school aged children. *Turkish Pediatrics Archive*. 45: 141-143.
8. Einarsdóttir J, Ingham RJ. (2005). Have disfluency-type measures contributed to the understanding and treatment of developmental stuttering? *American Journal of Speech - Language Pathology*. 14: 260-273.
9. Healey CE, Scott LA. (1995). Strategies for treating elementary school-age children who stutter: an integrative approach. *Language, Speech and Hearing Services in Schools*. 26: 151-161.
10. Ramig PR, Bennett EM. (1995). Working with 7-12 year old children who stutter: Ideas for intervention in the public schools. *Language, Speech and Hearing Services in Schools*. 26: 138-150.
11. Harasym J, Langevin M. (2012). Stuttering treatment for a school-age child with Down syndrome: a descriptive case report. *Journal of Fluency Disorder*. 37: 253-62.
12. Andrews C, O'Brian S, Harrison E, Onslow M, Packman A, Menzies R. (2012). Syllable-Timed Speech Treatment for School-Age Children Who Stutter: A Phase I Trial. *Language, Speech and Hearing Services in Schools*. 43: 359-369.
13. Davidow JH, Ingham RJ. (2013). The Effect of Speech Rate on Stuttering Frequency, Phonated Intervals, Speech Effort, and Speech Naturalness During Chorus Reading. *Journal of Communication Disorders*. 46: 202-216.
14. Koushik S, Shenker R, Onslow M. (2009). Follow-up of 6-10-year-old stuttering children after Lidcombe program treatment: a phase I trial. *Journal of fluency disorders*. 34: 279-290.
15. Bakhtiar M, Packman A. (2009). Intervention with the Lidcombe Program for a bilingual school-age child who stutters in Iran. *Folia Phoniatica et Logopaedica*. 61: 300-304.
16. Laiho A, Klippi A. (2007). Long-and short-term results of children's and adolescents' therapy courses for stuttering. *International Journal of Language & Communication Disorders*. 42: 367-382.
17. Conture EG, Guitar BE. (1993). "Evaluating efficacy of treatment of stuttering: School-age children. 18: 253-287.
18. Belgin E, Güven A. (1983). The place of stuttering and therapy rhythm method. *Turkish Association of Otorhinolaryngology XVII. National Congress: Adana*.
19. Belgin E, Derinsu U. (1987). The role of environment and psychic factors in the formation of staples, the approach methods in our clinic. *Turkish Otolaryngology Archive*. 25: 155-160.
20. Zebrowski PM. (2003). Developmental stuttering. *Pediatr Ann*. 32: 453-458.
21. Van Riper C. (1971). *The nature of stuttering*. Englewood Cliffs, NJ: Prentice-Hall. P: 225.
22. Hearne A, Packman A, Onslow M, Quine S. (2008). Stuttering and its treatment in adolescence: The perceptions of people who stutter. *Journal of fluency disorders*. 33: 81-98.
23. Yaruss S, Logan K, Conture E. (1994). Speaking rate and diadochokinetic abilities of children who stutter. *Journal of Fluency Disorders*. 19: 221-222.

24. Howell P. (2007). Signs of developmental stuttering up to age eight and at 12 plus. *Clinical Psychology Review*. 27: 287–306.
25. Yairi E, Ambrose N. (2005). *Early childhood stuttering*. Austin, TX: Pro Ed.
26. Bothe AK. (2003). Evidence-based treatment of stuttering: V. The art of clinical practice and the future of clinical research. *Journal of Fluency Disorders*. 28: 247–257.
27. Topbas SA. (2006). Turkish perspective on communication disorders. *Logopedics Phoniatrics Vocology*. 31: 76-88.
28. Kalinowski J, Saltuklaroglu T, Dayalu VN, Guntupalli V. (2005). Is it possible for speech therapy to improve upon natural recovery rates in children who stutter? *International Journal of Language & Communication Disorders*. 40: 349-358.