

Effect of Stuttering Modification Technique on Social Emotional Functioning and Communication Skills in Stutterers

Rooma Imtiaz¹, Anum Ashraf^{2*}, Amna Rashid², Fazaila Ehsan¹, Talala Usman¹

ABSTRACT

OBJECTIVE: To look into how the stuttering modification technique affects a person's ability to communicate and their social-emotional functioning.

METHODOLOGY: This quasi-experimental study was conducted at Sehat Medical Complex Hospital from January to July 2023. Data were gathered from patients who had been experiencing stuttering. A non-probability convenient sampling strategy was selected for this study; data was collected from 30 individuals with moderate to severe stutters at Sehat Medical Complex Hospital. Individuals without comorbid speech impairments or psychological/neurodevelopmental disorders between the ages of 6 and 18 were included, regardless of gender. The CALMS rating scale was used to assess the cognitive, affective, linguistic, motor, and social components of stuttering, while the Stuttering severity instrument SSI 4 was utilized to determine the severity level.

RESULTS: According to the results of this study, the paired t-test was used for the pre and post-reading analysis. The results indicate significant t-values ranging from 11.584 to 22.954 and a p-value of 0.000, which suggests a substantial impact of stuttering modification techniques on cognitive, affective, linguistic, motor, social, and overall severity.

CONCLUSION: The result stated that significant improvements in cognitive, affective, linguistic, motor, social, and overall severity were observed in 30 individuals with moderate to severe stuttering to mild to moderate severity who used stuttering modification approaches. The results bolster the effectiveness of this therapy, which prioritizes desensitization and modification techniques in improving stutterers' social-emotional health and communicative abilities.

KEYWORDS: Stuttering severity instrument, CALM, Social-emotional, communication skills, stutterers.

INTRODUCTION

The definition of stuttering, a well-known condition, has been altered over time¹. A speech disorder called stuttering is characterized by uncontrollably prolonging or repeating sounds, syllables, or words and uncontrollably pausing or hesitating, which interferes with speech's natural, rhythmic flow². The most common type of stuttering, "Childhood speech fluency problem", affects at least 5% of all children and usually manifests between the ages of 3 and 6³. One percent of the population stutters, with boys affected roughly twice as frequently as girls⁴. The precise reasons for stuttering are unclear; Stuttering is, therefore, a pathological condition that impairs communication and lowers one's quality of life⁵. Throughout life, stuttering is linked to stigma, which has been called a "fundamental cause of health inequalities"⁶. Stuttering can significantly impact one's overall quality of life, potentially restricting social

engagement, causing isolation, and fostering frustration. This may hinder educational and employment opportunities, contributing to a higher risk of mental health issues. Effective treatment for stuttering is crucial for children and adults to alleviate these challenges⁷. Stuttering treatment is often categorized into two traditions with seemingly different theoretical foundations, further differentiated by behavioral or affective treatment goals, procedures, and structure. Integrated approaches emphasize the customization of stuttering treatment according to individual needs despite the consensus on prioritizing the client's perspectives. Despite acknowledging tailored approaches, the literature persists in characterizing clinicians as belonging to either fluency shaping or stuttering modification camps, creating a perceived division⁸.

The connection between stuttering and mental health is unsurprising, given that stuttering disrupts fundamental communication processes, impacting socialization. Negative communication encounters and the social phobia associated with adult stuttering can significantly limit social engagement and life prospects. Substantial evidence supports the association between stuttering and anxiety, suggesting lifelong implications that may heighten susceptibility to social and psychological challenges⁹. People who stammer (PWS) are perceived and believed to be biased, negative, uninformed,

¹Sehat Medical Complex, Samsani Road, Hanjarwal Orange Line, Multan Rd, Station Mustafa Town, Lahore, Pakistan

²Department of Rehabilitation Sciences, University of Lahore, Lahore, Pakistan

Correspondence: anumslp@gmail.com

doi: 10.22442/jlumhs.2024.01115

Received: 14-03-2024

Revised: 06-09-2024

Accepted: 16-09-2024

Published Online: 23-10-2024



stigmatized, or discriminatory by the general public¹⁰. Individuals who stutter often employ various strategies to anticipate and prevent stuttering. The most common approaches include avoidance, characterized by efforts to conceal or evade impending stuttering; self-management strategies learned in speech treatment, involving adjustments in speech rate, breathing, and pausing; and approach strategies, where individuals proceed with their planned speech without resorting to avoidance. Moreover, the anticipation of stuttering often triggers feelings of anxiety and physical tension among participants¹¹.

Tichenor SE 2022¹² found that children who stutter exhibited heightened emotional reactivity and poorer regulation of emotions and attention, even after accounting for gender, age, and language abilities. Another study indicated that children who stutter displayed elevated levels of anger/frustration and lower scores in inhibitory control, attentional shifting, approach, and motor activation assessments. Obiweluzo PE et al.¹³ examine stuttering through a social lens, emphasizing its occurrence within social interactions where stigma is prevalent. He proposes practical strategies to assist clients in understanding the social context's impact on speech and suggests bridging theory with practice for effective intervention. Integrated therapy can bring together stuttering modification and speech fluency approaches, emphasizing the importance of incorporating key elements from these main approaches. The diverse array of treatment methods mirrors the complex nature of stuttering¹⁴. These encompass speech restructuring, aimed at minimizing overt stuttering through fluency techniques like prolonged speech, and stuttering modification, which targets reduced physical tension and struggle through desensitization and modification techniques¹⁵. This integration should occur within a flexible and individually-focused framework to address the unique needs of each individual¹⁶.

Stuttering modification treatment (SMT) is a comprehensive strategy that first focuses on the psychological repercussions of stuttering. Through desensitization techniques, individuals are encouraged to lessen their concerns. After that, clients are instructed to use modification approaches to lessen struggle behaviors¹⁷. SMT aims to unlearn or change these reactions to achieve a more manageable forward-moving stuttering form¹⁸. This study aims to identify the effect of the stuttering modification technique on social-emotional functioning and communication skills in people who stutter. This study helps reduce the frequency and severity of dysfluencies and physical concomitant behaviors and learn to escape/avoid behaviors, thus relieving tension. Additionally, it aids in diminishing negative emotional responses to stuttering or communication, which extends to sky-rocketed patient confidence and ultimately enhances communication skills.

METHODOLOGY

This quasi-experimental study was conducted at Sehat Medical Complex Hospital from January to July 2023. Data were gathered from patients who had been experiencing stuttering. The sample size was 30, and based on a review of the existing literature available for participant selection, a non-probability convenient sampling technique was employed. Specific inclusion and exclusion criteria were applied. Individuals with moderate to severe stuttering, aged between 6 and 18 years, and of both genders, including males and females, were considered for inclusion.

On the other hand, specific exclusion criteria were implemented. Participants with other psychological or neurodevelopmental disorders, such as Attention deficit hyperactivity disorder (ADHD), Autism Spectrum Disorder (ASD), or intellectual disabilities, were excluded from the study. Additionally, individuals with comorbidities of other speech disorders, such as articulation or speech sound disorders, were not considered for participation.

This study analyzed the CALMS Rating Scale pre- and post-treatment for school-age children who stutter. This rating scale evaluates cognitive, affective, linguistic, motor, and social (CALMS) components related to stuttering. The severity of the participants was assessed using the Stuttering Severity Index (SSI -4)¹⁹. The stuttering modification strategy was used in this study.

Stuttering modification therapy involves various techniques designed to target different facets of stuttering. Desensitization was the first stage, which helped participants feel more at ease and less anxious by exposing them to various speaking scenarios and cues associated with their stuttering over time. The second element was acceptance-focused, urging people to accept their stuttering as a normal aspect of their speech and identity; this helped people feel less critical of themselves and encouraged them to approach communication positively.

Furthermore, participants were taught motor strategies, such as longer speaking and soft onsets, to help them relax physically and increase their stuttering fluency. It took place three times a week, with each session lasting for 30 min. The identification, desensitization, and partial alteration phases were covered for three months, with each participant attending 36 sessions. The SPSS 28.0 was used for the analysis.

RESULTS

Table I shows the Kolmogorov-Smirnov test of the Reader and Non-Reader groups of Cognitive, Affective, Linguistics, Motor, and Social (pre and post). As the p-values of all variables are more significant than 0.05, which means that the p-value is insignificant, it is concluded that data follows a normal distribution so we will move further towards parametric tests for analysis.

This descriptive summary in **Table I** provides information about the participant's demographics in the study. It shows the distribution of participants' ages, gender, educational levels, and severity of the condition. Notably, most participants were readers; there were 16 males and 14 females, and there was an even split between moderate and severe conditions.

Table I: Demographics of Participants

Variable	Frequency	Percentage
Participant Ages (Years)		
4 – 9	13	43.3
10-13	4	13.3
14-18	13	43.3
Participants Gender		
Male	16	53.3
Female	14	46.7
Participant's educational level		
Reader	20	66.7
Non-Reader	10	33.3
Severity		
Moderate	12	40.0
Severe	12	40.0
Very Severe	6	20.0

Table II shows the mean the most significant difference between pre and post for variables Cognitive, Affective, Linguistic, Motor, and Social, which are (11.93 to 6.40), (12.71 to 5.60), (7.84 to 4.04), (21.96 to 10.11) and (9.35 to 3.80) respectively.

Table III shows a statistically insignificant negative correlation in the Reader, Cognitive, Affective, Linguistic and Motor (pre and post) treatment groups. Social and severity score (pre and post) treatments are positively correlated and statistically insignificant.

Table IV presents the t-values of the Cognitive, Affective, Linguistic, Motor, Social and Severity scores (pre and post) are 11.584, 15.024, 11.152, 21.887 and 22.954, 15.057, respectively, which gives us a *p*-value

Table IV: Paired Sample Test Results

		Paired Differences					t	df	Sig.
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the difference				
					Lower	Upper			
Pair 1	Cognitive Pre – Cognitive Post	5.52500	2.61243	.47696	4.54950	6.50050	11.584	29	0.000
Pair 2	Affective Pre – Affective Post	7.11667	2.59453	.47370	6.14785	8.08548	15.024	29	0.000
Pair 3	Linguistic Pre – Linguistic Post	3.80000	1.86642	.34076	3.10307	4.49693	11.152	29	0.000
Pair 4	Motor Pre – Motor Post	11.85556	2.96685	.54167	10.74772	12.96339	21.887	29	0.000
Pair 5	Social Pre – Social Post	5.55556	1.32565	.24203	5.06055	6.05056	22.954	29	0.000
Pair 6	Severity Scorepre –Severity Score post	2.300	0.837	0.153	1.988	2.612	15.057	29	0.000

of 0.000. So, it concludes that we reject the null hypothesis.

Table II: Paired T-Test Results: Parametric Test, Descriptive Statistics

Paired Samples Statistics					
		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Cognitive Pre	11.9333	30	2.14248	.39116
	Cognitive Post	6.4083	30	1.39655	.25497
Pair 2	Affective Pre	12.7167	30	2.32187	.42391
	Affective Post	5.6000	30	.95953	.17518
Pair 3	Linguistic Pre	7.8444	30	1.71255	.31267
	Linguistic Post	4.0444	30	.55179	.10074
Pair 4	Motor Pre	21.9667	30	2.44847	.44703
	Motor Post	10.1111	30	1.20450	.21991
Pair 5	Social Pre	9.3556	30	1.28634	.23485
	Social Post	3.8000	30	.82861	.15128

Table III: Paired Sample Correlation Results

		N	Correlation	Sig.
Pair 1	Cognitive Pre and Cognitive Post	30	-.047	0.803
Pair 2	Affective Pre and Affective Post	30	-.094	0.620
Pair 3	Linguistic Pre and Linguistic Post	30	-.130	0.493
Pair 4	Motor Pre and Motor Post	30	-.230	0.222
Pair 5	Social Pre and Social Post	30	.274	0.143
Pair 6	Severity Score pre and Severity Score post	30	0.184	0.331

DISCUSSION

In this quasi-experimental study, the researchers examined the impact of the Stuttering Modification Technique on the social-emotional functioning and communication skills of stuttering individuals over three months. Significant improvements were observed in the study when the Cognitive, Affective,

Linguistic, Motor, and Social (CALMS)²⁰ used the Stuttering Severity Instrument 4 (SSI-4) to gauge the severity and a scoring scale to evaluate different skills. The results demonstrated significant changes in linguistic, cognitive, affective, physical, and social skills; the paired t-test revealed corresponded to p-values of 0.000 and t-values ranging from 11.152 to 22.954. The null hypothesis was rejected since the Stuttering Modification Technique positively and statistically significantly affected the individuals' cognitive, emotional, linguistic, motor, and social abilities. The study's findings are reinforced using objective measurements such as SSI-4 and CALMS, which comprehensively understand the treatment's effectiveness^{21,22}. Considering how these findings can impact clinicians and stutterers in practical situations is essential. The results across several domains demonstrate the benefits of the Stuttering Modification Technique, which may influence stutterers' treatment approaches and interventions²³. Further research could go further into the specific mechanisms by which these gains occur to build a more nuanced understanding of the intervention's effects on social-emotional functioning and communication abilities. When compared to one another^{24,25}. The Stuttering Modification Technique and the Successful Stuttering Management Program (SSMP) study demonstrated improvements in stuttering people. Another research suggests that Intensive Stuttering Modification Therapy is an integrated assessment of treatment outcomes; this implies that a decline may influence participants' enhanced self-concept in their self-perception of stuttering as a handicapping condition and a decreased worry. These modifications demonstrate how well the therapy promotes a more positive self-image and improves general communication abilities²⁶. Owing to the extensive psychological effects of stuttering, a cross-sectional survey was conducted with questions about anxiety, stigma, and adolescents' perceptions of their communication skills. Teens who struggled with stuttering had a lower sense of their communication skills²⁷. The Multicomponent Anxiety Inventory IV (MCAI-IV) Psychic and Somatic Anxiety subscale and the PSI Avoidance and Expectancy subscale showed some persistent improvements at the six-month post-treatment assessment. The Perceptions of Stuttering Inventory (PSI) subscales (Struggle, Avoidance, and Expectancy) and the stuttering severity (SSI-3) both showed significant improvements immediately after treatment. Conversely, the Stuttering Modification Technique study focused on social-emotional functioning and communication skills. After a three-month intervention, study participants showed statistically significant improvements in these categories based on the CALMS rating scale²⁸. The Stuttering Modification Technique may help with communication skills and social-emotional functioning. Both studies demonstrate the potential effectiveness

of specific stuttering therapeutic approaches, even though the focus and assessment methods vary. The SSMP primarily concentrates on stuttering intensity and related perceptions, whereas the Stuttering Modification Technique stresses improvements in social-emotional functioning and communication capacities. This demonstrates how helpful these methods could be for people who stammer.

CONCLUSION

This quasi-experimental research demonstrated how a 3-month stuttering modification method can effectively improve a variety of stuttering-related elements, such as motor, social, cognitive, affective, and linguistic skills. The results significantly affect stutterers since they may improve their communication and general well-being. These findings highlight the need for comprehensive stuttering therapies and have significant implications for researchers and therapists. It is necessary to conduct more research to determine the underlying mechanisms behind these advancements.

Ethical permission: The University of Lahore, IRB letter No. IRB-UOL-SMC/001-05/2024.

Conflict of Interest: No conflicts of interest, as stated by authors.

Financial Disclosure / Grant Approval: No funding agency was involved in this research.

Data Sharing Statement: The corresponding author can provide the data proving the findings of this study on request. Privacy or ethical restrictions bound us from sharing the data publicly.

AUTHOR CONTRIBUTION

Imtiaz R: Literature review, Data collection and responsible for the integrity of the research
 Ashraf A: Conception and critical revision of the article
 Rashid A: Review and final preparation of manuscript
 Ehsan F: Statistical Analysis
 Usman T: Discussion and Conclusion

REFERENCES

1. Freud D, Levy-Kardash O, Glick I, Ezrati-Vinacour R. Pilot program combining acceptance and commitment therapy with stuttering modification therapy for adults who stutter: A case report. *Folia Phoniatr Logop.* 2020; 72(4): 290-301. doi: 10.1159/000501078. Epub 2019 Jun 28.
2. Brignell A, Krahe M, Downes M, Kefalianos E, Reilly S, Morgan AT. A systematic review of interventions for adults who stutter. *J Fluency Disord.* 2020; 64: 105766. doi: 10.1016/j.jfludis.2020.105766. Epub 2020 Apr 30.
3. Sommer M, Waltersbacher A, Schlotmann A, Schröder H, Strzelczyk A. Prevalence and therapy rates for stuttering, cluttering, and developmental disorders of speech and language: evaluation of German health insurance data. *Front Hum*

- Neurosci. 2021; 15: 645292. doi: 10.3389/fnhum.2021.645292.
4. Etchell AC, Civier O, Ballard KJ, Sowman PF. A systematic literature review of neuroimaging research on developmental stuttering between 1995 and 2016. *J Fluency Disord.* 2018; 55: 6-45. doi: 10.1016/j.jfludis.2017.03.007. Epub 2017 Mar 12.
 5. Constantino C, Campbell P, Simpson S. Stuttering and the social model. *J Commun Disord.* 2022; 96: 106200. doi: 10.1016/j.jcomdis.2022.106200. Epub 2022 Feb 23.
 6. Briley PM, Gerlach H, Jacobs MM. Relationships between stuttering, depression, and suicidal ideation in young adults: Accounting for gender differences. *J Fluency Disord.* 2021; 67: 105820. doi: 10.1016/j.jfludis.2020.105820. Epub 2020 Nov 27.
 7. Laiho A, Elovaara H, Kaisamatti K, Luhtalampi K, Talaskivi L, Pohja S et al. Stuttering interventions for children, adolescents, and adults: a systematic review as a part of clinical guidelines. *J Commun Disord.* 2022; 99: 106242. doi: 10.1016/j.jcomdis.2022.106242. Epub 2022 Jun 16.
 8. Schneider P, Kohmaescher A, Sandrieser P. KIDS: A modification approach in stuttering therapy for school children. In: *Dialogue without barriers: Comprehensive intervention in stuttering.* 2023; p. 195-229.
 9. Lowe R, Menzies R, Onslow M, Packman A, O'Brian S. Speech and anxiety management with persistent stuttering: Current status and essential research. *J Speech Lang Hear Res.* 2021; 64(1): 59-74. doi: 10.1044/2020_JSLHR-20-00144. Epub 2021 Jan 5.
 10. Nippold MA. Stuttering in preschool children: Direct versus indirect treatment. *Lang Speech Hear Serv Sch.* 2018; 49(1): 4-12.
 11. Iimura D, Yada Y, Imaizumi K, Takeuchi T, Miyawaki M, Van Borsel J. Public awareness and knowledge of stuttering in Japan. *J Comm Disord.* 2018; 72: 136-45.
 12. Tichenor SE, Walsh BM, Gerwin KL, Yaruss JS. Emotional regulation and its influence on the experience of stuttering across the life span. *J Speech Lang Hear Res.* 2022; 65(7): 2412-30.
 13. Obiweluozo PE, Ede MO, Onwurah CN, Uzodinma UE, Dike IC, Ejiofor JN. Impact of cognitive behavioural play therapy on social anxiety among school children with stuttering deficit: a cluster randomized trial with three months follow-up. *Medicine(Baltimore).* 2021; 100(19): e24350.
 14. Karahan Tığrak T, Kulak Kayıkçı ME, Kirazlı MÇ, Tığrak A. Emotional and behavioural problems of children and adolescents who stutter: Comparison with typically developing peers. *Logopedics Phoniatrics Vocology.* 2021; 46(4): 186-92.
 15. Amster BJ, Klein ER. *More than fluency: The social, emotional, and cognitive dimensions of stuttering:* Plural Publishing; 2018.
 16. Lowe R, Helgadottir F, Menzies R, Heard R, O'Brian S, Packman A et al. Safety behaviors and stuttering. *J Speech Lang Hear Res.* 2017; 60(5): 1246-53.
 17. Connery A, Galvin R, McCurtin A. Effectiveness of nonpharmacological stuttering interventions on communication and psychosocial functioning in adults: A systematic review and meta-analysis of randomized controlled trials. *J Evidence-Based Med.* 2021; 14(1): 17-26.
 18. Sønsterud H, Halvorsen MS, Feragen KB, Kirmess M, Ward D. What works for whom? Multidimensional individualized stuttering therapy (MIST). *J Comm Disord.* 2020; 88: 106052.
 19. Tahmasebi N, Shafie B, Karimi H, Mazaheri M. A Persian-version of the stuttering severity instrument-version four (SSI-4): How the new additions to SSI-4 complement its stuttering severity score? *J Comm Disord.* 2018; 74: 1-9.
 20. Everard RA, Howell P. We have a voice: Exploring participants experiences of stuttering modification therapy. *Am J Speech Lang Pathol.* 2018; 27(3S): 1273-86.
 21. Tetnowski JA, Scott KS, Rutland BF. Fluency and fluency disorders. *The handbook of language and speech disorders.* 2021: 414-44.
 22. Westby C. A Multidimensional Approach to Stuttering. *Word of Mouth.* 2019; 30(4): 7-10.
 23. Tahmasebi N, Shafie B, Karimi H, Mazaheri M. A Persian-version of the stuttering severity instrument-version four (SSI-4): How the new additions to SSI-4 complement its stuttering severity score? *J Comm Disord.* 2018; 74: 1-9
 24. Tumanova V, Choi D, Wang Q. Effects of behavior inhibition on stuttering severity and adverse consequences of stuttering in 3–6 year old children who stutter. *J Comm Disord.* 2023; 104: 106332.
 25. Weekly T, Walker N, Beck J, Akers S, Weaver M. A review of apps for calming, relaxation, and mindfulness interventions for pediatric palliative care patients. *Children.* 2018; 5(2): 16.
 26. Kohmäscher A, Primaßin A, Heiler S, Avelar PDC, Franken M-C, Heim S. Effectiveness of Stuttering Modification Treatment in School-Age Children Who Stutter: A Randomized Clinical Trial. *J Speech Lang Hear Res.* 2023; 66(11): 4191-205.
 27. Onslow M, Kelly EM. Temperament and early stuttering intervention: Two perspectives. *J Fluency Disord.* 2020; 64: 105765.
 28. Erickson S, Block S. The social and communication impact of stuttering on adolescents and their families. *J Fluency Disord.* 2013; 38(4): 311-24.

