

The effect of stuttering on symptoms of depression and social anxiety in adolescents

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Abstract. – OBJECTIVE: This study aims at examining the relationship between the severity of stuttering, which makes it difficult to speak and communicate, and the symptoms of depressive and social anxiety disorders during adolescence.

PATIENTS AND METHODS: A total of 65 children between 14 and 18 years old, diagnosed with stuttering, were included in the study, regardless of gender. Stuttering Severity Instrument, Beck Depression Scale, and Social Anxiety Scale for Adolescents were administered to all participants.

RESULTS: The mean age of the 65 patients was 15.41±0.93. Out of them, 36 (55.4%) were female and 29 (44.6%) were male. In terms of stuttering levels, 25 participants (35.8%) had mild stuttering, 20 (30.8%) showed moderate stuttering, and 20 (30.8%) had severe stuttering. Depression levels of individuals diagnosed with stuttering increased significantly in parallel with the severity of stuttering ($p<0.001$). The social anxiety scale total score and subscale scores of individuals diagnosed with stuttering also increased significantly in parallel with stuttering severity ($p<0.01$).

CONCLUSIONS: The symptoms of depression and social anxiety disorders increase with the severity of stuttering in adolescent patients who applied to the child psychiatry clinic presenting stuttering.

Key Words:

Stuttering, Severity, Depressive disorder, Adolescence, Anxiety.

Introduction

Stuttering is a common speech disorder that can be seen in people of all ages and can cause disruptions in the normal fluency and timing of speech¹. Developmental stuttering (stuttering lagging behind healthy language development level) is the most common form². The typical age of onset of stuttering is 33 months. About 5-8% of pre-school children have stuttering problems at this

age, and boys stutter 1.5 times more often than girls³. The prevalence of stuttering in the youth and adult population is approximately 1% worldwide³. Factors for possible causes of stuttering can be listed as deficiencies in the linguistic processing, childhood traumas, parenting attitudes, and motor skills³. Stuttering causes communication problems in individuals' daily lives and becomes both a functional problem and a source of severe anxiety for the individuals, their family and relatives¹. In this respect, the child who tries to develop coping skills may encounter adverse situations in social environments, such as negative peer reactions, or be bullied⁴. It has been shown⁵ that fears of verbal communication in children who stutter are significantly increased compared to children who do not stutter, and these fears continue to rise until adolescence. The number of studies^{6,7} examining the relationship between stuttering and mental disorders has been increasing in recent years. Childhood depression is a mental disorder characterized by depressed mood, inability to enjoy life, decreased self-esteem and attention, changes in sleep and appetite, and deterioration in social and academic functioning¹. Childhood depression is considered to be a risk factor for the development of other mental disorders and can be simultaneously detected together with other conditions such as anxiety disorder⁸. Apart from biological factors, the etiology of depression includes negative cognitions about life events, other people, and future. Lack of social support and lack of social skills are considered risk factors for depressive disorder⁸. Stutterers think negatively about speech, they believe that their speech will be evaluated negatively by others; therefore, the anxiety they feel causes them to avoid most social environments⁹. This study examined the effect of the severity of stuttering, which makes it difficult to speak and communicate, on the symptoms of depressive and social anxiety disorders during adolescence.

Patients and Methods

Patients who applied to the Child and Adolescent Psychiatry Clinic for stuttering between June 15, 2022, and July 20, 2022, and patients who had previously applied to the clinic for stuttering but had not yet received any psychotherapy, medical treatment or speech-language therapy were invited to participate in the study. A total of 65 children aged 14-18 years, diagnosed with childhood-onset stuttering, according to the diagnostic criteria of the Diagnostic and Statistical Manual of Mental Disorders (DSM-5), were included in the study regardless of gender. Exclusion criteria were: a) having a co-speech disorder; b) having initiated a speech-language therapy prior to the study date; c) having a concomitant neurological disease; d) having received any known psychiatric diagnosis; e) and receiving treatment. A semi-structured clinical interview was conducted with the patient group and their parents by a child and adolescent psychiatrist using the "Schedule for Affective Disorders and Schizophrenia for School-Age Children-Present and Lifetime Version (K-SADS-PL)", which questions the psychiatric disorders that can be observed in children^{10,11}. Participants were asked to fill out the Beck Depression Scale, and the Social Anxiety Scale for Adolescents. The patients were evaluated by an otolaryngologist. Then, the Stuttering Severity Instrument was applied by the speech therapist.

Stuttering Severity Instrument

Total syllables in speech samples and syllables where stuttering occurs are counted manually. The total number of syllables and the number of syllables at which stuttering occurs are calculated to obtain the stuttering syllable percentage (SS%). Typical syllable rates range between two syllables per second in very slow speeches and six or more syllables in fast speeches. It is often impossible to count aloud or "whisper under the breath" fast enough to keep up with the rate of syllable production. Therefore, numbers are written on the Researcher Registration Form or on a blank paper so that syllables can be counted manually. A dot is written for each fluent syllable, and a slash mark is written for each stuttering syllable. The percentage and equivalent of stuttering severity are graded as 1-11% very mild, 12-40% mild, 41-77% moderate, 78-95% severe, 96-99% very severe¹².

Beck Depression Scale

It is a self-report scale developed by Beck in 1961 to measure emotional, cognitive, somatic, and motivational components. Although its main

purpose is to comprehensively evaluate the symptoms of depression, it also allows the evaluation of cognitive content. The scale consists of 21 items: 2 for emotions, 11 for cognitions, 2 for behaviors, 5 for somatic symptoms, and 1 for interpersonal symptoms. Outcomes are evaluated as 0-9: none/minimal depression, 10-18: mild depression, 19-29: moderate depression, 30-63: severe depression¹³.

Social Anxiety Scale for Adolescents

The scale includes 18 questions consisting of three sub-dimensions: "fear of negative evaluation", "social avoidance-anxiety in general situations", and "social avoidance-anxiety in new situations"¹⁴. In the reliability study of the Adolescent Social Anxiety Scale, the Cronbach alpha internal consistency coefficient was .88, and the split-half reliability coefficient was .85¹⁵.

Statistical Analysis

SPSS 21.0 for Windows (IBM Corp., Armonk, NY, USA) was used for statistical analysis. The data were subjected to Kolmogorov-Smirnov test, and Nonparametric tests were used in statistical analysis since the data did not comply with normal distribution. Kruskal-Wallis' test was used to compare multiple groups with independent variables. $p < 0.05$ was considered statistically significant. A Bonferroni correction was performed, and a Mann-Whitney U test was used for pairwise comparison of groups.

Results

The mean age of 65 participating patients with the diagnosis of stuttering was 15.41 ± 0.93 . Out of them, 36 (55.4%) were female and 29 (44.6%) were male. In terms of stuttering levels, 25 participants (35.8%) had mild stuttering, 20 (30.8%) showed moderate stuttering, and 20 (30.8%) had severe stuttering. There was no significant relationship between gender and stuttering severity ($p = 0.865$).

The Beck Depression Scale mean score of the participants was 21.40 ± 16.73 . In terms of depression levels, 32.3% (21 people) were in the minimal depression group, 20% (13 people) showed mild depression, 20% (13 people) moderate depression and 27.7% (18 people) severe depression. The participants' Beck Depression Scale score was significantly higher in the female patients' group than in the male patients' group ($p < 0.036$). There was a significant positive correlation between the severity of stuttering and the severity of depression ($p < 0.001$, $r = 0.845$).

The Kruskal-Wallis H test, which was used to determine whether the Beck Depression Scale scores differed significantly according to the level of stuttering, revealed that the depression levels of individuals diagnosed with stuttering increased significantly in parallel with the severity of stuttering ($p < 0.001$) (Table I). Then, the Bonferroni correction and the Mann-Whitney U test were used to determine which groups caused this significant difference. As a result, it was detected that the Depression Scale scores were significantly higher in moderate stuttering than in mild stuttering ($p = 0.005$), and the Depression Scale scores in severe stuttering were significantly higher than in mild stuttering ($p < 0.001$) and moderate stuttering ($p = 0.001$) (Table I).

The mean total score of the Social Anxiety Scale for Adolescents was 44.15 ± 22.09 . The mean score of social avoidance and feeling anxiety in new situations was 14.10 ± 6.44 , the mean score of fear of negative evaluation was 16.21 ± 7.98 , and the mean score of social avoidance and feeling anxiety in general situations was 14.6 ± 7.69 . The total score of the social anxiety scale for adolescents did not differ significantly by gender ($p = 0.916$). The Kruskal-Wallis' H test, performed to determine whether the Social Anxiety Scale for Adolescents total score and subscale scores differed significantly according to the level of stuttering, showed that the total score of the Social Anxiety Scale and subscale scores of individuals diagnosed with stuttering increased significantly in parallel with the severity of stuttering ($p < 0.001$, Table II). Then, Bonferroni correction and Mann-Whitney U test were used to determine which groups caused this significant difference. These analyses showed that the total and subscale scores of the Social Anxiety Scale for Adolescents were significantly higher in moderate stuttering compared to mild stuttering ($p < 0.001$) and severe stuttering compared to mild ($p < 0.001$) and moderate stuttering ($p < 0.001$) (Table II).

Discussion

Despite the reports on the comorbidity of stuttering and mental diseases, how this interaction occurs remains to be elucidated. In our study, we examined how the level of stuttering, which makes it difficult to speak and communicate in adolescence, affects depressive symptoms and social anxiety symptoms of individuals. Studies^{16,17} on the relationship between depression and stuttering in children and adolescents are scarce. Gunn et al¹⁷ reported high levels of anxiety, depression, and emotional/behavioral problems in their study of adolescents seeking speech therapy for stuttering. In a follow-up study by Briley et al¹⁸, examining the effect of stuttering on depressive symptoms and suicidal ideation in adolescents, it was found that depression symptoms in young adult men who stutter remained the same over time, but depressive symptoms increased with age in young adult women who stuttered. It has also been shown that men stuttering report more suicidal thoughts than women. Our study found that depressive symptoms in adolescent patients with stuttering were above normal values and symptoms were significantly higher in women than in men.

Stutterers think negatively about speech, they believe that their speech will be negatively evaluated by others; therefore, the anxiety they feel causes them to avoid most social environments⁹. As these cognitive negative evaluations are similar to social anxiety, the latter has been studied in individuals with stuttering, and many studies^{19,20} have so far supported the result that stutters have a relatively high rate of social anxiety. There is a consensus on the fact that children, adolescents, and adults who stutter are at a greater risk of experiencing and displaying symptoms of social anxiety compared to the general population^{19,21}. Iverach et al²², in their study with

Table I. The level of depressive symptoms according to the severity of stuttering.

Stuttering severity	Beck Depression Scale score		H	p^*
	Mean \pm SD	Median		
Mild ¹ (n=25)	7.56 \pm 5.845	7.00	47.373	$p^* < 0.001$
Moderate ² (n=20)	18.20 \pm 8.062	15.5		¹⁻² $p^{**} = 0.005$
Severe ³ (n=20)	41.9 \pm 11.410	41.5		¹⁻³ $p^{**} < 0.001$ ²⁻³ $p^{**} = 0.001$

p^* : Kruskal-Wallis' test statistical significance value; p^{**} : Mann-Whitney U test statistical significance value; the test was performed for pairwise comparison (¹⁻²: mild-moderate stuttering comparison, ¹⁻³: mild-severe stuttering comparison, ²⁻³: moderate-mild stuttering comparison); H: Kruskal-Wallis H test value, SD: standard deviation.

Table II. The level of anxiety symptoms according to the severity of stuttering.

		Mild ¹ (n=25)	Moderate ² (n=20)	Severe ³ (n=20)
SASA total score	Mean±SD	25.92±5.851	42.35±15.705	68.75±16.638
	Median	25.00	39.00	62.50
	H		43.942	
	p*	p* < 0.001 (1-3 p** < 0.001, 1-2 p** < 0.001, 2-3 p** < 0.001)		
SASA-SAANS	Mean±SD	8.64±2.514	14.05±5.13	21.00±4.039
	Median	9.00	13.00	20.00
	H		42.703	
	p*	p* < 0.001 (1-3 p** < 0.001, 1-2 p** < 0.001, 2-3 p** < 0.001)		
SASA-FNE	Mean±SD	9.52±3.097	16.40±5.706	24.40±6.361
	Median	10.00	15.00	20.50
	H		46.012	
	p*	p* < 0.001 (1-3 p** < 0.001, 1-2 p** < 0.001, 2-3 p** < 0.001)		
SASA-SAAGS	Mean±SD	8.56±2.042	13.15±4.602	23.60±6.142
	Median	8.00	12.00	22.00
	H		41.908	
	p*	p* < 0.001 (1-3 p** < 0.001, 1-2 p** < 0.001, 2-3 p** < 0.001)		

SASA: Social Anxiety Scale for Adolescents; SAANS: social avoidance and feeling anxiety in new situations; FNE: fear of negative evaluation; SAAGS: social avoidance and feeling anxiety in general situations; p*: Kruskal-Wallis' test statistical significance value; p**: Mann-Whitney U test statistical significance value; the test was performed for pairwise comparison (1-2: mild-moderate stuttering comparison, 1-3: mild-severe stuttering comparison, 2-3: moderate-mild stuttering comparison); H: Kruskal-Wallis H test value; SD: standard deviation.

102 adolescents aged 11-17 years, reported a positive correlation between the severity of stuttering and speech dissatisfaction and anxiety level. In accordance with literature, our study also found that social anxiety symptoms were higher in individuals with stuttering. Our study revealed that an increase in the severity of stuttering caused a significant increase in depressive symptoms, as well as in social anxiety symptoms. Investigation on the interaction between depression and social anxiety in children has brought forward many different causes²³. Some studies²⁴ have reported that the individual's experience of stuttering and its effect on daily functioning and self-awareness may be more effective on mental disorder than the severity of stuttering itself. In addition, in their psychological evaluation study with adolescents diagnosed with stuttering, Iverach et al²² reported that high depression symptoms were significantly associated with high anxiety symptoms. Adolescence is a period in which identity development is shaped, autonomy is gained, interaction with the peer group increases, and socialization becomes important²⁵. Therefore, adolescents with social anxiety are more likely to be depressed, due to negative cognitive processes such as poor social skills, low self-esteem, social isolation, peer victimization, loneliness and hopelessness^{23,26,27}. It

has been shown²³ that the comorbidity of depression and anxiety affects the quality of life more negatively and increases the risk of substance use and suicide; therefore, it is emphasized that more attention should be paid to these individuals.

Limitations

The limited number of patients and the single-center nature of the study are the main limitations of our study. Long-term follow-up of the effectiveness of speech-language therapy and its effect on psychological recovery on children with stuttering may be guiding for future studies. In addition, it will be valuable to follow these children until adulthood, also following their spiritual development due to stuttering.

Conclusions

It was determined that the symptoms of depression and social anxiety disorders increased in parallel with the increase in the severity of stuttering in adolescent patients who applied to the Child Psychiatry Clinic with the complaint of stuttering. Therefore, it is crucial to carefully screen for possible accompanying mental diseases in patients who apply to the clinic with the

complaint of stuttering and to develop a treatment plan for accompanying mental disorders besides speech and language therapy.

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Ethics Approval

The study group consisted of volunteer participants and included a total of 65 patients. Ethics Committee approval (Date: 08/06/2022, No.: 2022-9) was obtained from the local University Non-Interventional Clinical Research Ethics Committee.

Informed Consent

Informed consent was obtained from all subjects and their families involved in the study.

Availability of Data and Materials

The data underlying this article will be shared upon reasonable request to the corresponding author.

Conflict of Interest

The authors declare no conflict of interest.

Authors' Contributions

ES, BS: study concept, data collection, editing; ES, BS: analysis, writing; ES, BS: literature review, editing; ES, BS: study concept, analysis, data checking, editing.

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