

Assessment of Stuttering Severity in Arabic-Speaking Adolescents and Adults in Conversational and Narrative Contexts

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ABSTRACT

Background: Stuttering is a speech fluency disorder characterized by variability. The frequency of the speaker's stuttering moments and duration varies significantly each day. Doctors are affected by this variability as the patient's stuttering moments in the clinic don't represent the whole stuttering experience. The highest variability is seen when the context changes from conversation to narration.

Objective: To assess stuttering severity in both narration and conversation in adolescents and adults to determine which situation is more stressful.

Methods: The study was conducted on 50 adolescent and adult stutterers with age range (10-35). They were divided into two groups according to their age: adolescents (below 18y) and adults (equal and above 18). All patients were subjected to a protocol of speech assessment used in the Phoniatic Unit-Assiut University Hospital and measured the stuttering severity using the Stuttering Severity Instrument-3 Arabic version (A-SSI). Two speaking tasks were used: conversational and narrative tasks.

Results: There was a significant difference between stuttering severity during conversation and narration. The narration shows a higher total severity score than the conversation. There was no statistical significance in (A-SSI) data between adults and adolescents except in involuntary movements. It showed a higher score of involuntary movement in adults than in adolescents.

Conclusion: The Stuttering severity score was higher during narration than during conversation. Narrative context offers more stuttering than conversational context so that it can be used during diagnosis and measuring the treatment outcome.

Key Words: Adolescence, adult, conversation, narration, stuttering.

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INTRODUCTION

Stuttering is defined as involuntary impairments in verbal expression. It is characterized by disruption in the forward flow of speech in form of (repetitions, prolongations, blocks, interjections, revisions) and may be accompanied by secondary behaviors, physical tension, negative reactions, increased avoidance, or decreased overall communication^[1,2]. Its prevalence is about 1% of the total population^[3].

Stuttering is well known for its variability as it varies from day to day and in different contexts and between different speakers. This variability often puts the stutterer into frustration, as when the stutterer experiences fluent moments, he becomes encouraged and expects more fluency, but unfortunately, the stuttering moment occurs, leading to more disappointment^[4]. In addition, this variability can cause difficulty and confusion in stuttering diagnosis and influences the degree of its severity. Many stutterers also avoid group discussions due to fears of being seen as humorous or unlikable, leading to feelings of rejection, introversion, anxiety, and self-criticism^[5,6].

Johnson *et al.*, investigated the effect of this variability on the precise diagnosis of stuttering, so they collected several speech samples from a group of stutterers, including the borderline ones. They concluded that the variability didn't significantly change the diagnosis from stutterers to non-stutterers except in a minority of the borderline stutterers^[7].

However, other studies found that stuttering variability affects the treatment outcome measures, as it can be difficult to differentiate between normal variability and post-therapy improvement. For example, ineffective treatment may be effective as the patient stuttered more during the pre-treatment evaluation and less during the post-treatment evaluation as a part of normal variability^[5,6]. In addition, understanding the causes of that variability will benefit the treatment of stuttering, as it will reveal the factors that lead to less stuttered speech, which can be utilized in treatment^[8].

Variability is usually affected by different speaking situations. For example, fewer stuttering moments occur during reading aloud than during spontaneous speech. It is also affected by emotions and stress^[9,10]. Variability was higher when changing from conversational to narrative context^[11,12]. Unfortunately, few studies have compared stuttering severity in conversational and narrative contexts. Moreover, these studies are limited to preschoolers and schoolers^[7,13,14]. Previous studies assumed that during narrative discourse, larger language units are utilized, while conversational context can be maintained with minimal answers; as a result, conversational context is less demanding. Conversely, conversational context is affected by its interaction and social factor^[15].

In addition, other studies suggested that during narrative discourse, not only the language processing areas are activated, but the whole brain is in activation, as the narrator tries to keep past events in mind while simultaneously gathering the details of the story, whether the actions, places, persons or reasons while mixing them with a sense of imagination and unexpectedness^[16]. This study aimed to assess stuttering severity in both narration and conversation in adolescents and adults to determine which situation is more stressful.

METHODS

After We conduct a prospective comparative study of fifty monolingual Arabic speaking patients with stuttering aged (10-35) years were recruited from the Outpatient Clinic of the Phoniatic Unit at Assiut University Hospital from September 2019 to January 2021.

Sample size calculation was carried out according to the following equation:

$$N = (z_{1-\alpha/2})^2 P(1-P) / D^2$$

Confidence level	= 95%
$Z_{1-\alpha}$	= 1.96
P	= 2% **
D	= 0.05

They were free from language, physical, or neuropsychiatric disorders, with no previous speech therapy and an IQ of 85 or above. They were divided into two groups: the adolescent group (24 patients below 18), and the adult group (26 patients aged 18 years and above). All patients were evaluated by the following protocol of speech assessment:

1. Elementary diagnostic procedures including:

(a) Patient's interview with Personal history taking, complaint, factors that increase stuttering, and presence of avoidance; (b) Vocal tract and routine ENT examination; (c) Auditory perceptual assessment (APA) of spontaneous and automatic speech. The speech of the stutterers was

analyzed with the observation of intaphonemic disruptions, repetitions, prolongations, and blocks; and (d) Visual perceptual analysis (VPA), including eye contact and involuntary movements in both face and extremities.

2. Clinical diagnostic Aids:

1- Stuttering Severity Instrument-3 Arabic Version (A-SSI)^[17]: Augmentation and documentation of auditory perceptual assessment by video recording was done in a room with good sound isolation. Two speaking tasks were used during recording: I- Conversational task: (about 150 words) in which the patient gave answers to open-ended questions asked by the physician about Pictures in SSI-3 Arabic Version; 9 questions were asked, such as "Tell me seven items you can see in the picture" and "Mention the animals you can see in the picture." Questions about the patient's personal life were also asked, such as "Tell me the name of your siblings in order," "Which places do you prefer to hang out and with whom?" and "What is your favorite food?" II-Narrative task: An uninterrupted speech sample (around 150 words) was given by the patient, which is elicited by describing what he has done from the morning, such as how he spends his day (75 words), storytelling by using a series of pictures present in the SSI-3 test. (75 words). The patient's speech was video recorded for at least 30 min with an assessment of the frequency of stuttering, the average duration of the three longest stuttering moments, and associated physical movements. Then, stuttering severity was assessed with a score from (0-40). Stuttering severity with a score from (0-19) was very mild, (20 - 22) mild, (23 - 30) moderate, (31 - 33) severe and (34- 45) very severe. The severity of stuttering during conversation and narration was assessed.

2- Psychometric Evaluation: By Stanford-Binet test fourth Edition^[18].

Statistical analysis of the data:

Data were fed to the computer and analysed using IBM SPSS software package version 20.0. (Armonk, NY: IBM Corp). Qualitative data were described using number and percent. The Kolmogorov-Smirnov test was used to verify the normality of distribution Quantitative data were described using range (minimum and maximum), mean and standard deviation. Significance of the obtained results was judged at the 5% level. The used tests were:

1 - Chi-square test: For categorical variables, to compare between different groups.

2 - Student t-test: For normally quantitative variables, to compare between two studied groups.

3 - Mann Whitney test: For abnormally quantitative variables, to compare between two studied groups.

RESULTS

1-Demographic data of the study group:

The mean age of the study group was (17.54±5.422) years, with age ranging between 10 and 35 years. 46 (92%)

patients were males and 4(8%) patients were females. 24 (48%) of patients were <18 and 26(52%) of patients were ≥ 18 (Table 1).

2- Comparison between SSI-3 data in conversation and narration:

There was a high statistically significant difference between conversation and narration regarding frequency, duration, involuntary movements, and total severity score (P value ≤ 0.001), with higher scores during narration. However, there was no statistically significant difference between conversation and narration as regards the mean of severity score in each severity grade (Table 2).

3- Agreement between raters in the evaluation of stuttering severity:

As shown in Table 3, there was significant-excellent agreement (weighted kappa=0.915, p < 0.001) between the two raters in the evaluation of the level of stuttering. In

other words, both raters agreed in 22 (91.7%) patients and disagreed in 2 (8.3%) patients i.e., 1st rater diagnosed them as mild and moderate while 2nd rater diagnosed them as slight and mild, respectively.

Table 1: Demographic data of the study group:

Age (years)	Number	%
<18	24	48.0
≥18	26	52.0
Range	10-35 years	
Mean±S.D.	17.54±5.422	
Sex		
Male	46	92.0
Female	4	8.0

Data expressed as frequency (percentage). Test of significance: Chi square test.

Table 2: Comparison between SSI-3 data of the studied groups in conversation and narration:

	Conversation		Narration		<i>P</i> value
Frequency					
Range	0-18		4-18		0.001*
Mean±S.D.	12.92±5.454		15.08±3.596		
Duration					
Range	0-5		1-6		<0.001*
Mean±S.D	2.98±1.237		3.32±1.133		
Involuntary Movement					
Range	0-13		0-14		<0.001*
Mean±SD	3.96±3.619		4.54±3.945		
Severity Score					
Range	0-35		6-36		<0.001*
Mean ± S.D	19.92±9.278		22.90±7.633		
Severity Grade	Range	Mean±SD	Range	Mean±SD	<i>P</i> value
Very Mild	0-18	11.05±6.103	6-19	14.19±4.46	0.092
Mild	20-22	21.14±0.9	20-22	21.14±0.90	1
Moderate	23-30	26.06±3.021	23-28	25.44±2.032	0.498
Severe	31-33	32.0±1.0	31-33	32.0±1.0	1
Very Severe	34-35	34.44±0.577	34-36	34.75±0.957	0.538

Tests of significance: 1-Mann Whitney test; 2-T-student Test; S.D: Standard deviation; *: Significant.

Table 3: Agreement between raters in the evaluation of stuttering severity:

		1 st Rater			Total
		Slight	Mild	Moderate	
2 nd Rater	Slight	7(29.2%)	1(4.2%)	0(0%)	8(33.3%)
	Mild	0(0%)	5(20.8%)	1(4.2%)	6(25%)
	Moderate	0(0%)	0(0%)	10(41.7%)	10(41.7%)
Total		7(29.2%)	6(25%)	11(45.8%)	24(100%)
Weighted Kappa Agreement		0.915		P < 0.001	
Chi-square test		36.384		P < 0.001	

4-Reliability Statistics for the Inter-rater agreement for stuttering severity:

In Table 4, the reliability statistics revealed a strong correlation between two scores ($r = 0.957$, $p < 0.001$), and excellent reliability (Cronbach's Alpha= 0.977, $p < 0.001$ and ICC= 0.955, $p < 0.001$). **5- Correlation between SSI-3 data during conversation and narration:**

There was a high positive statistically significant correlation between SSI data during conversation and narration (P value < 0.001) (Table 5).

Table 4: Reliability Statistics for the Inter-rater agreement for stuttering severity:

2 nd Rater	1 st Rater	
	<i>r</i> *	<i>p</i> -value
• Correlation	0.957	<0.001
• Cronbach's Alpha	0.977	<0.001
• ICC (Inter-class Correlation)	0.955(0.899-1.000)	<0.001

Table 5: Correlation between SSI-3 data during conversation and narration:

Stuttering (conversation)	Stuttering (Narration)	
	<i>R</i>	<i>P</i>
Frequency	0.835	<0.001*
Duration	0.893	<0.001*
Involuntary Movements	0.952	<0.001*
Severity Score	0.931	<0.001*

Test of significance: Chi-square; *: Significant.

6) Comparison between SSI-3 data during conversation between the two age groups:

There were mild statistically significant differences between the two age groups during the conversation (The first group is below 18 years old, while the second group is 18 years or above) only in involuntary movements (*P* value <0.039). However, no statistically significant differences were found between the two age groups regarding stuttering frequency, duration, or total severity score (Table 6).

Table 6: Comparison of SSI-3 data during conversation between the two age groups:

	Age		<i>P</i> value
	<18(24)	≥18(26)	
Frequency			
Range	4-18	0-18	0.327
Mean±SD	13±4.253	12.85±6.454	
Duration			
Range	1-4	0-5	0.255
Mean±SD	2.88±0.992	3.08±1.440	
Involuntary Movements			
Range	0-9	0-13	0.039*
Mean±SD	2.42±1.886	5.38±4.243	
Severity Score			
Range	2-31	0-35	0.098
Mean±SD	18.42±6.178	21.31±11.376	

Tests of significance: 1-Mann Whitney test; 2-T-student Test S.D: Standard deviation ; *: Significant.

7) Comparison of SSI-3 data during narration among between the two age groups:

There were mild statistically significant differences between the two age groups during narration in involuntary movements (*P* value <0.044). On the other hand, no statistically significant differences were found between the

two age groups regarding stuttering frequency, duration, or the total severity score (Table 7).

Table 7: Correlation between SSI-3 data during conversation and narration:

	Age		<i>P</i> value
	<18 (24)	≥18(26)	
Frequency			
Range	4-18	4-18	0.537
Mean±SD	15±3.539	15.15±3.717	
Duration			
Range	1-4	1-6	0.898
Mean±SD	3.37±0.875	3.27±1.343	
Involuntary Movements			
Range	0-9	0-14	0.044*
Mean±SD	3±2.207	5.96±4.652	
Severity Score			
Range	6-31	8-36	0.123
Mean±SD	21.33±5.585	24.35±8.998	

Tests of significance: 1-Mann Whitney test, 2-T-student Test S.D: Standard deviation; *: Significant.

DISCUSSION

Stuttering is variable; the frequency of a speaker's disfluencies and their duration vary markedly from situation to situation and from day to day^[6,7].

The situation in which a person is communicating can also affect his/her fluency. Differences in the frequency of disfluencies across situations are seen in both stutterers and non-stutterers^[19]. Stutterers show significantly greater variability between different speaking situations than within a single one^[14]. Reading aloud has been shown to produce less stuttering than spontaneous speech^[9]. The frequency of stuttering also varies with emotion and stress^[10].

Our results indicate that the stuttering severity index was higher in narration than in conversation, which included frequency, duration, and associated involuntary movements. This agrees with a study by Byrd *et al.*,^[13] comparing stuttering severity in school-aged stutterers during conversation and narration tasks. They concluded that stuttering severity is liable to increase in the narrative context more than in the conversational context. Also, another study was conducted by Costantino *et al.*,^[8] in which stuttering severity was assessed in three speaking tasks: conversation, narration, and picture description. They concluded that more stuttered syllables were present during the narrative than the conversational task. This may be explained by the fact that narration is more complicated than conversation. Narration is characterized by the complexity of its language components, as more phrasal expansions, grammatical morphemes, and adverbial clauses are used to tangle the information together^[20, 21]. In

contrast to conversation, narration activates not only the language processing areas as conversation does but also the whole brain areas^[15]. Moreover, during narration, the speaker alone takes the whole responsibility for planning, processing, and delivering all aspects of a topic. On the contrary, during conversation, both participants take responsibility and share the topic. Besides, there is time for the speaker to think and plan during the partner's turn^[7]. Also, in the narrative context, the speaker is affected by the listener's evaluation and whether she/he is entertained by his/her story^[13]. It was argued whether the length and syntactic complexity positively correlate with the frequency of stuttering moments. Many studies suggested a positive correlation, as when the length of the utterance and syntactic complexity increase, the frequency of stuttering moments also increases^[22,23]. Also, it was found that there is more spatiotemporal variability in the motor movements of stutterers when they utter long sentences, which are more linguistically complex during narration than when they answer with short, simple sentences during conversation^[24]. That could result in stutterers speaking more rapidly in the narrative context than in the conversational context, being more vulnerable to stuttering during narration^[25].

Contrary to our study, Yaruss^[14] found that conversational tasks elicited more stuttering than narrative tasks. He concluded that the conversational sample might be the preferred diagnostic tool when analysing the speech of pre-schoolers who stutter^[14]. This difference in the scores between the two age groups could be explained by the fact that narration during the preschool period doesn't have a communicative goal as conversation does, because it is almost self-centered as the child doesn't let the other be a participant in his narrative construction^[26]. Moreover, a huge growth occurs over time in the narrative ability, especially between the ages of five and twelve years. Thus, this growth can affect the frequency of stuttering moments during narration as the child grows up^[27,28].

Our study revealed a highly positive statistically significant correlation between stuttering during conversation and stuttering during narration. This agrees with a study conducted by Yaruss on preschool children, which examines whether stuttering severity in specific situations was related to the overall severity of stuttering. Pearson product-moment correlations were calculated between standard deviations across different situations: conversation and narration. The results of this study revealed a significant positive correlation between the frequency of stuttering moments during different situations, including conversation and narration, indicating that when the severity of stuttering during conversation increases, the same happens during narration^[14].

In this study, we divided the participants into two age groups: a group aged less than 18, and a group aged 18 or above. No difference was found between the two

age groups in terms of the frequency, duration, and total severity score during conversation and narration, which agreed with a study conducted on children who stuttered and revealed no significant difference between age groups in conversational and narrative contexts^[29]. Additionally, further research concluded that no significant difference was present in the frequency of stuttered syllables between adolescents and adults^[30].

On the other hand, there was a mild statistically significant difference between the two age groups in terms of the involuntary movements, which were higher in the older age group during conversation and narration. This may be explained by a study that suggested that the stutterer uses some movements to help in initiating the utterance, such as "starter movements" as a leg strike or facial grimace, along with "unblocking movements" such as sudden arm, leg, or neck jerk, which unblock the beginning of the disfluent sentence. The chronic and repetitive use of these sequential movements is a source of associated movement genesis, which is the cause of increasing associated movements across age groups^[31,32].

CONCLUSION

The stuttering severity score was higher in the narrative context than in the conversational context. However, no statistical significant difference is present according to SSI-3 data between both adults and adolescents except in involuntary movements, where adults show a higher score of involuntary movement than adolescents. Additionally, there is a significant correlation between stuttering severity during conversation and narration, as when stuttering severity during conversation increases, stuttering severity during narration also increases. Thus, the narrative sample should be used besides the standard conversational sample in diagnosis and measuring treatment outcomes for adults who stutt.

CONFLICT OF INTERESTS

There are no conflict of interests.

REFERENCES

1. Coleman, C. (2013): SIGnatures: Widening the treatment circle: Special Interest Group 4, Fluency and Fluency Disorders. The American Speech-Language-Hearing Association Leader; 18(2): 54-56.
2. Prasse JE, Kikano GE. Stuttering: an overview. American family physician. 2008;77(9):1271-6.
3. Kasbi F, Mokhlesin M, Maddah M, Noruzi R, Monshizadeh L, Mir Mohammad Khani M. Effects of stuttering on quality of life in adults who stutter. Middle East Journal of Rehabilitation and Health. 2015;2(1).

4. Bobrick B. Knotted tongues: Stuttering in history and the quest for a cure: Simon and Schuster; 2011.
 5. Constantino CD, Leslie P, Quesal RW, Yaruss JS. A preliminary investigation of daily variability of stuttering in adults. *Journal of Communication Disorders*. 2016;60:39-50.
 6. Bernardini, S., Onnivello, S., & Lanfranchi, S. (2024). Italian normative data for the Unhelpful Thoughts and Beliefs about Stuttering (UTBAS) Scales for adults who stutter. *Journal of Fluency Disorders*, 81, 106074.
 7. Johnson KN, Karrass J, Conture EG, Walden T. Influence of stuttering variation on talker group classification in preschool children: Preliminary findings. *Journal of communication disorders*. 2009;42(3):195-210.
 8. Constantino CD, Yaruss JS, Leslie P, Quesal RW. Day-to-day variability of stuttering: University of Pittsburgh; 2012.
 9. Rezai H , Torabi H, Tahmasebi N , Haghighizadeh M , Zamani P, Abdi F, Karami M, Mehdipour Z: Comparing speech rate and stuttering and frequency during reading and monologue between subjects with and without stuttering, *Journal of Modern Rehabilitation*, July 2019; 13(3):153-160.
 10. Vanryckeghem M, Hylebos C, Bruten GJ, Peleman M. The relationship between communication attitude and emotion of children who stutter. *Journal of Fluency Disorders*. 2001;26(1):1-15.
 11. Bloodstein, O., & Bernstein, R. N. (2021). A handbook of stuttering: Thomson Delmar Learning. Clifton Park. Chapter 13. Assessment in Stuttering, 7th Edn. San Diego: Plural Publishing.
 12. Yairi E, Ambrose N. Early Childhood Stuttering: For Clinicians by Clinicians. 521. 2005.
 13. Byrd CT, Logan KJ, Gillam RB. Speech disfluency in school-age children's conversational and narrative discourse. 2012.
 14. Yaruss JS. Clinical implications of situational variability in preschool children who stutter. *Journal of Fluency Disorders*. 1997;22(3):187-203.
 15. Coelho C, Youse K, Le K, Feinn R. Narrative and conversational discourse of adults with closed head injuries and non-brain-injured adults: A discriminant analysis. *Aphasiology*. 2003;17(5):499-510.
 16. Paul AM. Your brain on fiction. *New York Times*. 2012;17.
 17. Rifaie N. Arabicizing and standardizing the stuttering severity instrument (SSI) on the Arabic environment. *Ain Shams Med J* 1999;50 907-914.
 18. Melika L. Stanford Binet intelligence scale (4th Arabic version). 2nd edition Cairo: Victor Kiorlos Publishing. 1998.
 19. Ingham JC, Riley G. Guidelines for documentation of treatment efficacy for young children who stutter. *Journal of Speech, Language, and Hearing Research*. 1998;41(4):753-70.
 20. Stadler MA, Ward GC. Supporting the narrative development of young children. *Early Childhood Education Journal*. 2005;33(2):73-80.
 21. Wagner CR, Nettelbladt U, Sahlén B, Nilholm C. Conversation versus narration in preschool children with language impairment. *International Journal of Language & Communication Disorders*. 2000;35(1):83-93.
 22. Zackheim CT, Conture EG. Childhood stuttering and speech disfluencies in relation to children's mean length of utterance: A preliminary study. *Journal of Fluency Disorders*. 2003;28(2):115-42.
 23. Kleinow J, Smith A. Influences of length and syntactic complexity on the speech motor stability of the fluent speech of adults who stutter. *Journal of speech, language, and hearing research*. 2000;43(2):548-59.
 24. Smith A, Sadagopan N, Walsh B, Weber-Fox C. Increasing phonological complexity reveals heightened instability in inter-articulatory coordination in adults who stutter. *Journal of fluency disorders*. 2010;35(1):1-18.
 25. Smith A, Kleinow J. Kinematic correlates of speaking rate changes in stuttering and normally fluent adults. *Journal of Speech, Language, and Hearing Research*. 2000;43(2):521-36.
 26. Bråten S. The intersubjective mirror in infant learning and evolution of speech: John Benjamins Pub.; 2009.
 27. Ukrainetz TA, Justice LM, Kaderavek JN, Eisenberg SL, Gillam RB, Harm HM. The development of expressive elaboration in fictional narratives. 2005.
 28. Tilstra J, McMaster K. Productivity, fluency, and grammaticality measures from narratives: Potential indicators of language proficiency? *Communication Disorders Quarterly*. 2007;29(1):43-53.
 29. Gillam RB, Logan KJ, Pearson NA. TOCS: Test of childhood stuttering: Pro-Ed Austin; 2009.
 30. Tomaiuolo D, Del Gado F, Spinetti MG, Capparelli E, Venuti B. Profiling people who stutter: A comparison between adolescents and adults. *Procedia-Social and Behavioral Sciences*. 2015;193:266-73.
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31. Riva Posse P, Busto-Marolt L, Schteinschnaider A, Martinez-Echenique L, Cammarota A, Merello M. Phenomenology of abnormal movements in stuttering. Parkinsonism and related dis.
32. Guitar, B. (2024). Stuttering: An Integrated Approach to Its Nature and Treatment, 6th Edn. Philadelphia, PA: Wolters Kluwer.