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A Study of Emotion Regulation Difficulties, Repetitive Negative Thinking, and Experiential Avoidance in Adults with Stuttering: A Comparative Study

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Abstract

Objective: Stuttering is a type of communication and fluency disorder that hurts mental and emotional health. It is also associated with a significant increase in both trait and social anxiety. Studies on stuttering in adults have indicated the nature and impact of this phenomenon. In addition, some psychological aspects of this phenomenon remain vague and need further investigation. Therefore, the present study aimed to compare emotion regulation difficulties, repetitive negative thinking, and experiential avoidance between people who stutter and healthy individuals.

Method: In this study, 101 people who stutter (43 females and 58 males, with a mean age of 29.55 ± 187 years), as well as 110 healthy individuals (74 females and 36 males, with a mean age of 25.57 ± 489 years) as participants were chosen using the convenience sampling method among those who referred to the speech therapy clinics of Tehran, Iran. Research instruments including the repetitive negative thinking inventory, Difficulties in Emotion Regulation Scale, and Acceptance and Action Questionnaire (AAQ-I) were used for data collection. Data were analyzed using multivariate ANOVA test and Multiple Regression Analysis.

Results: The mean age of the participants was 29.55 years in the people who stutter and 25.57 years in the healthy individuals ($P < 0.01$). The present results indicated that the mean score of experiential avoidance was higher in the people who stutter (M ± SD: 35.74 ± 9.24) compared to the healthy individuals (M ± SD: 8.89 ± 31.11). Additionally, the mean score of emotion regulation difficulties was higher in the people who stutter (M ± SD: 88.75 ± 20.59) compared to the healthy individuals (M ± SD: 64.14 ± 94.94) ($P < 0.001$). However, there was no significant difference in the mean score of repetitive negative thinking between the people who stutter (M ± SD: 98.45 ± 25.85) and healthy individuals (M ± SD: 93.71 ± 25.24) groups ($P > 0.05$). There was a significant correlation between experiential avoidance and emotion regulation difficulties in people who stutter ($P < 0.01$). Experiential avoidance and repetitive negative thinking can significantly predict emotion regulation difficulties in people who stutter ($R = 0.65$, $P < 0.01$).

Conclusion: People who stutter obtained higher emotion regulation difficulties and experiential avoidance scores than those without stuttering and A significant correlation between experiential avoidance and emotion regulation difficulties was found. Future studies should consider the role of emotion regulation difficulties and experiential avoidance in people who stutter.

Key words: *Adults; Emotion Regulation; Negative Thinking; Speech Disorders; Stuttering*

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Stuttering is described as a childhood-onset communication and fluency disorder. The interpretation of this term can vary, contingent upon the specific context in which it is employed (1-4). Frequently, it denotes a cluster of verbal patterns that are assessed as non-conventional. Individuals diagnosed with a speech disorder known as stuttering, or people who stutter, experience unintended interruptions in the smoothness of their verbal communication. These interruptions predominantly manifest as the repetition of syllables or parts of words, prolonged sounds, inability to produce certain sounds, deliberate avoidance of specific terms, and instances of hesitations or pauses during speech (5-7). Due to these problems and their socially problematic nature, stuttering has a potentially negative impact on mental and emotional health. It is significantly associated with increased levels of trait and social anxiety (7-10). The severity of this problem is even higher when a person feels pressure or excitement (11).

Stuttering is a universal phenomenon, affecting 1% of adults and 5% of children (12). The prevalence of this disorder is three to four times higher among boys than girls, with this difference being more pronounced in adulthood (13). According to Webster's two-factor model (14), stuttering is due to two factors. The first factor is the impaired discrete function of the supplementary motor area (SMA), speech control, and speech coordination when there is a problem at the beginning of syllables. The second factor is the right hemisphere intermediacy, accompanied by fear, anxiety, and negative emotions (14). People who stutter have reported their adverse reactions to situations, communication difficulties in social situations, lower life satisfaction, and lower ability to achieve goals in life when stuttering (15), leading to a lower quality of life, mental health problems (16), fewer opportunities, lower job performance and financial status (17). Further, people who stutter may experience destructive feelings and emotions, such as shyness, confusion, guilt, low self-esteem, failure, and fear (18), and greater risk of loneliness and social isolation (4, 10, 19).

Considering the importance of stuttering and its associated problems, it is necessary to study stuttering from different perspectives, especially its psychological aspect. In addition to stuttering management methods and speech techniques, recognizing emotional, anxiety-related, and affective aspects of this disorder can also be a proper treatment approach. Emotion Regulation Difficulties are fundamental characteristics of many types of pathologies (20, 21). Emotion regulation is generally a process through which people can control their emotions and manage the timing and the way of expressing them (22).

Previous studies have suggested a relationship between emotions and stuttering (12, 23, 24). For example, a previous study indicated that people with stuttering showed significantly more severe reactions to unpleasant images than those without stuttering (25). The use of EEG sensors for reading brain activity indicated that individuals with stuttering had more affective complications compared to those without stuttering (26). Moreover, Guitar found that emotions were the cause of stuttering and its exacerbation (27). People who stutter experience more difficulties in regulating their emotions and their stress reactivity is associated with increased stuttering. Faced with emotions, people who stutter may have repetitive negative thinking to protect themselves (12, 28, 29).

Repetitive negative thinking, which is associated with emotional difficulties, encompasses a cognitive approach in which individuals ruminate on their past, present, and future problems or negative encounters (whether past or anticipated) that persistently recur, are partially intrusive, and pose challenges in disengaging from these problems (30). Individuals perceive repetitive negative thinking to be unproductive and consume their mental capacity (31, 32). Generally, repetitive negative thinking has an unpleasant content and negatively impacts daily activities, thereby provoking grief and feelings of insecurity (33). Several research studies propose that individuals with stuttering tend to demonstrate heightened awareness of negative thoughts and beliefs (28, 29), leading to a significant lack of speech fluency in the face of certain situations (34). Negative stuttering experiences cause some people to have negative thoughts about speaking, subsequently yielding negative consequences for them (29, 35). In addition, repetitive negative thinking results in self-focused rumination, disturbing beliefs, lack of self-regulatory strategies, and low self-esteem (36). Moreover, inappropriate beliefs and thoughts about stuttering increase social anxiety (37, 38).

Experiential avoidance refers to a person’s attempts to avoid distressing private experiences, feelings, memories, and thoughts, which can be harmful in the long run (39, 40). Experiential avoidance may be a common factor, underlying a wide range of psychopathologies (40, 41), leading individuals to inflexible efforts to prevent emotional and psychological experiences and suppress/control them (42). Previous studies indicate that many people who stutter do not attend social situations to avoid the negative emotional experiences associated with stuttering (43, 44). A previous study indicated that people who stutter have complex schemas for organizing certain fears and avoiding phonemes, words, and situations; consequently, they avoid stressful words and prevent negative emotional experiences (45). Moreover, under stressful situations, experiential avoidance leads to maladaptive responses, such as aggression, frustration, and physical pain (46). People who stutter often experience negative emotions and thoughts related to their speech disorder, affecting their quality of life. However, little is known about how these emotional difficulties relate to other common features of stuttering, such as experiential

avoidance (3). It is possible to resolve the problems of people who stutter and increase their performance by identifying the involvement of cognitive and emotional factors in stuttering. In the present study, we investigated the relationship between emotion regulation difficulties, repetitive negative thinking, and experiential avoidance in people who stutter; we also aimed to compare emotion regulation difficulties, repetitive negative thinking, and experiential avoidance between people who stutter and healthy individuals.

Materials and Methods

Participants

The population in this study included all people who stutter in Tehran, Iran. Using the convenience sampling method, the experimental cohort comprised 101 people who stutter falling within the age bracket of 18 to 50 years, who were referred to the speech therapy clinics of Tehran, Iran, and diagnosed with stuttering according to the clinicalist. The healthy individuals included 110 healthy individuals aged between 18 and 60 years, living in Tehran. Sampling was performed based on the following inclusion criteria: individuals' willingness to engage in the study, literacy, and minimum age of 18 years. The criteria for exclusion encompassed the presence of any existing disorders (except for stuttering in the people who stutter group) and incomplete questionnaires. After selecting the participants, questionnaires were distributed among them to be completed. The Repetitive Negative Thinking Inventory, Difficulties in Emotion Regulation Scale, and Acceptance and Action Questionnaire were employed for data collection.

Procedure

This observational case-control study was conducted utilizing the convenience sampling method. The Structured Clinical Interview for DSM-5-Personality Disorder (SCID-5-PD) and Structured Clinical Interview for DSM-5 (SCID-5) were administered by a clinical psychologist for the two groups, ensuring the exclusion of those with any other comorbid and related disorders from the study (47). Following the participant selection process, questionnaires were distributed among them for completion. The repetitive negative thinking inventory, emotion regulation difficulties, and Acceptance and Action Questionnaire were used for data collection.

Instruments

Difficulties in Emotion Regulation Scale (DERS):

This questionnaire was designed by Gratz and Roemer (2004) with 36 items and six subscales; the items are rated on a five-point Likert scale ranging from 1 (not entirely correct) to 5 (entirely correct) to clinically assess difficulties in regulating emotions (48). In Alavi's study, the internal reliability was investigated and the total internal consistency was reported to be 86%. The internal reliability of this questionnaire is 93%. In this questionnaire, higher scores indicate lower levels of emotion regulation (49). Factor analysis has shown the existence of six factors of non-acceptance of emotional responses, difficulty in engaging in goal-directed behavior, impulse control difficulties, lack of emotional awareness, limited access to emotional regulation strategies, and lack of emotional clarity. All six scales have Cronbach's alpha above 80%. All six subscales have a significant correlation with one another, and their internal reliabilities were 0.93, 0.85, 0.089, 0.086, 0.80, 0.088, and 0.84, respectively (50). In this study, Cronbach's alpha was 90.9%.

Repetitive Negative Thinking (RNT) Inventory:

This inventory was designed by McEvoy *et al.* (2010) with 31 items with a scale of five-point Likert to measure repetitive negative thinking (51). Cronbach's alpha coefficient of this questionnaire has been reported as 72-93%. The correlation of this questionnaire with Beck's depression and anxiety questionnaire was investigated and the correlation coefficients were reported as 42% and 38%, respectively. In Iran, in a study conducted by Khaleghi *et al.*, a reliability of 0.89% was reported (52). In this study, Cronbach's alpha coefficient of this scale was 93.5%.

Acceptance and Action Questionnaire (AAQ-I):

This tool was developed by Hayes *et al.* (2004) with 32 items (53). In the current study, the latest version of this tool, with 10 questions with a scale of seven-point Likert (never = 1 to always = 7), was used. The results show that the structure, reliability, and validity of this tool are acceptable and the average alpha coefficient is 0.84 (54). In Iran, the psychometric properties of this questionnaire were investigated by Abasi *et al*., and an alpha coefficient of 0.82 was reported. The validity of this questionnaire was calculated through correlation with Beck's scale of depression, anxiety and emotional disorder, and the correlation coefficients were measured as 0.44, 0.59 and 0.59, respectively. Furthermore, the results of the factor analysis demonstrated the appropriate weighting of the factors (55). Ten items were created to assess experiential avoidance, including “I am afraid of my feelings” and “my thoughts and feelings have ruined my life” (48). The reliability of this questionnaire in the Iranian population was obtained (alpha level, 0.85) (48). In this study, Cronbach's alpha was 77.3%.

Statistics

The findings of 211 individuals were analyzed using multivariate ANOVA (MANOVA) and Multiple Regression Analysis (stepwise method) in SPSS Version 21. A sample size of 244 was calculated for the two groups; however, 33 individuals did not complete the questionnaires.

Ethical Consideration

The ethics committee of the Vice-Chancellor in Research Affairs - Shahid Beheshti University of Medical Sciences approved this study (ID: IR.SBMU.RETECH.REC.1401.606). The study's

purposes and confidentiality of information were explained to the participants, and written consent forms were obtained from them.

Results

211 people participated in this study. In the people who stutter, 57.4% of the participants were male, and 42.6% were female. In the healthy individuals, 32.7% of males and 67.3% of females completed the questionnaires ($P < 0.01$). The mean age of the people who stutter and healthy individuals were 29.55 and 25.57, respectively ($P < 0.01$). The results in Table 1 indicate that age, sex, and occupation had significant associations with most measured variables, with males having higher scores than females in many areas. Additionally, college graduates had higher scores in measures of emotion regulation difficulties ($P < 0.01$), while marital status and education level did not show any significant associations ($P > 0.05$).

Table 1. The Demographic Characteristics of the People who Stutter and Healthy Individuals

Variables		People Who Stutter		Healthy Individuals		Significance Level
		Frequency	Percentage	Frequency	Percentage	
Sex	Male	58	57.4	36	32.7	0.001
	Female	43	42.6	74	67.3	
Education	Under high school diploma	3	3	2	1.8	0.38
	Diploma	18	17.8	26	23.6	
	Master's degree	55	54.5	64	58.2	
	Graduate	25	24.8	18	16.4	
Marital status	Single	71	70.3	88	80.9	0.14
	Married	29	28.4	21	19.1	
	Divorced	1	1	0	0	
Occupation	College Graduate	38	37.6	74	67.3	0.001
	Governmental employee	21	28.8	6	5.5	
	Self-employed	35	24.7	14	12.7	
	Unemployed	5	5	7	6.4	
	Homemaker	2	2	9	8.2	
Age		Mean	Standard deviation			
	People who Stutter	29.55	7.18			0.001
	Healthy Individuals	25.57	7.48			

Based on Table 2, the mean scores of experiential avoidance and emotion regulation difficulties were significantly higher compared to the healthy individuals ($P < 0.01$). However, the mean scores of repetitive negative thinking in the people who stutter and healthy individuals were not significantly different ($P > 0.05$). The mean score of experiential avoidance in the people who stutter and healthy individuals were 35.74 ± 9.24 and 8.89 ± 31.11, respectively. In addition, the mean scores for repetitive negative thinking in the people who stutter and healthy individuals were 98.45 ± 25.85 and 93.71 ± 25.24, respectively. Moreover, the mean score of emotion regulation difficulties in people who stutter and healthy individuals were 88.75 ± 20.59 and 64.14 ± 94.94, respectively.

The value of Wilks' lambda was equal to 0.86, based on the MANOVA test ($F = 4.11$, $df = 202$, $P < 0.01$). The results presented in Table 3 indicate a significant difference between the two groups regarding the mean scores of experiential avoidance inventory and emotion regulation difficulties. However, there was no significant difference in the mean score of the repetitive negative thinking inventory between the two groups. Overall, experiential avoidance was higher in the people who stutter compared to healthy individuals. The results also demonstrated that the mean score of emotion regulation difficulties was significantly higher in the people who stutter compared to the healthy individuals ($P < 0.01$).

Table 4 indicates that there is a positive and significant correlation between the variables of emotion regulation difficulties with experiential avoidance in people who stutter ($P < 0.001$).

Multicollinearity index was examined before regression analysis. Given that the tolerance index for independent repetitive negative thinking and experiential avoidance variables was above 0.1 and VIF factor was between 1-2, indicating that there was no multicollinearity. Regression analysis was performed by the stepwise method. According to the results, the model of emotion regulation difficulties based on the variables of

experiential avoidance and repetitive negative thinking became significant (F (2,98) = 37.17, P < 0.001, R = 0.65, R^2 = 0.43, adjusted R^2 = 0.42).
The results also showed that the independent variables of repetitive negative thinking (B = -0.15, t = -2.01, P < 0.05) and experiential avoidance (B = 0.63, t = 8.26, P < 0.05) significantly predicted the emotion regulation difficulties in people who stutter. The results are illustrated in Table 5.

Table 2. The Mean and Standard Deviation of Variables in the People who Stutter and Healthy Individuals

Variables		People who Stutter		Healthy Individuals	
		Mean	Standard Deviation	Mean	Standard Deviation
	Experiential Avoidance (EA)	35.74	9.24	31.11	8.89
	Repetitive Negative Thoughts (RNT)	98.45	25.85	93.71	25.24
Emotion Regulation Difficulties	Rejection of Emotional Responses	13.65	5.14	11.38	4.11
	Impairment of Purposeful Behaviors	14.82	4.71	12.52	4.39
	Impairment of Impulse Control	14.10	5.31	11.97	3.86
	Lack of Emotional Awareness	16.35	3.55	15.57	3.70
	Poor Emotion Regulation Strategies	18.86	6.54	15.77	5.19
	Lack of Transparency and Emotional Separation	10.97	3.22	9.24	2.38
	Total Score	88.75	20.59	76.64	14.94

Table 3. The Results of Group Comparisons Based on Multivariate ANOVA for Different Variables

Variable	Total Squares	df	F	Significance Level	Squared Eta
Experiential Avoidance (EA)	1665.65	1	20.29	< 0.001	0.09
Repetitive Negative Thoughts (RNT)	1181.64	1	1.81	0.18	0.009
Rejection of Emotional Responses	271.71	1	12.66	< 0.001	0.06
Impairment of Purposeful Behaviors	277.21	1	13.42	< 0.001	0.06
Impairment of Impulse Control	238.05	1	11.17	< 0.001	0.05
Lack of Emotional Awareness	31.53	1	2.39	0.12	0.01
Poor Emotion Regulation Strategies	202.31	1	14.53	< 0.001	0.07
Lack of Transparency and Emotional Separation	158.31	1	19.90	< 0.001	0.09
Emotion Regulation Difficulties	7951.56	1	24.90	< 0.001	0.11

Table 4. The Pearson Correlations among Experiential Avoidance and Emotion Regulation Difficulties, Repetitive Negative Thoughts in People who Stutter

Variable	Age	Sex	ERDs	EA
Emotion Regulation Difficulties (ERDs)	-0.05	-0.09	-	
Experiential Avoidance (EA)	-0.10	-0.03	0.63	-
Repetitive Negative Thoughts (RNT)	0.03	0.11	-0.18	-0.05

Table 5. Regression Coefficient for Predicting Emotion Regulation Difficulties

Variable	B	95% CL	β	t	ρ
Experiential Avoidance (EA)	1.40	[1.06 - 1.74]	0.63	8.26	0.00
Repetitive Negative Thoughts (RNT)	-0.12	[-0.24 - 0.00]	-0.15	-2.01	0.04

Note. R^2 adj = 0.42 (N = 101, ρ = 0.000). CL = confidence interval for B

Discussion

The present study evaluated and compared emotion regulation difficulties, repetitive negative thinking, and experiential avoidance with stuttering intensity in people who stutter and healthy individuals. The results indicated significant associations between sex, age, and occupation with all measured variables, with males having higher scores in most measures compared to females. College graduates also had higher scores in most measures of emotion regulation difficulties. Age also showed significant differences, while education level and marital status did not demonstrate significant associations. This may suggest that these factors do not considerably affect the development of experiential avoidance, repetitive negative thinking, or emotion regulation difficulties. Furthermore, the results indicated that the people who stutter obtained higher scores in emotion regulation difficulties and experiential avoidance compared to those without stuttering. A significant correlation between experiential avoidance and emotion regulation difficulties was found. In addition, the results indicated that experiential avoidance and repetitive negative thinking can significantly predict emotion regulation difficulties in people who stutter.

In this study the people who stutter obtained lower scores in emotion regulation compared to people without stuttering. This finding is in line with the studies of Arnold *et al.* (23), Karrass *et al*. (56), Xavier *et al*. (57), and Alipour *et al*. (58).

Generally, emotions and emotional experiences are significant factors in stuttering, playing considerable roles in the mental health of individuals and affecting social interactions as well as physiological reactions (such as a higher heart rate, blood pressure, muscle contraction, and higher activity of the sympathetic system) (58 ,21 ,20). Additionally, people who stutter face difficulties in emotion regulation, which are major issues in the persistence of this disorder into adulthood (22).

The examination of emotion regulation in people who stutter and their parents and caregivers suggest that they are significantly different from normal people in terms of emotion management and regulation (24 ,23 ,12). People who stutter exhibit more negative emotions than normal people when exposed to negative stimuli and express fewer positive emotions in response to positive stimuli (23 ,12, 24). Emotion regulation in people who stutter is associated with more excitement and reactivity, leading to emotional dysregulation and increased stuttering (25).

People who stutter regulate their emotions in inappropriate ways, and their attention is focused on dangers, threats, and cognitive biases, leading to the persistence and intensification of stuttering (26). Emotions and emotional regulation also contribute to a person's response to emotional stimuli and lead to effective or ineffective coping (29 ,28 ,12). According to the emotional regulation model, people prone to emotional disorders experience a greater number of negative emotions due to their emotional disorder when faced with stress and turn to rumination, worry, and repetitive negative thinking to avoid these unpleasant feelings (58 ,12).

Additionally, the present study indicated that the people who stutter scored higher in experiential avoidance compared to those without stuttering. experiential avoidance refers to a person's attempts to avoid specific unwanted inner experiences and includes two components. The first component pertains to individuals' aversion to encountering distressing internal experiences, while the second component involves the various strategies employed by individuals to modify or alter these distressing experiences or the subsequent outcomes stemming from such experiences (39, 40).

Although avoidance of negative inner experiences can relieve anxiety in the short run, this strategy has conflicting long-term effects and increases anxiety (59). These findings indicate that people with emotion regulation difficulties show a reduced capacity to accept their emotions, lower emotional clarity, and diminished ability to reduce negative emotions through goal-based behaviors. They also use more unhealthy emotion regulation strategies and exhibit more impulsive behaviors in response to negative emotions, resulting in increased experiential avoidance (46 ,45). These results are consistent with the studies of Morse and Dunkley, Mohammadkhani *et al*., (60) and Cruz *et al*. (63). In this study, experiential avoidance was more significantly related to negative emotions and coping problems.

People who have emotion regulation difficulties or use ineffective emotion regulation strategies experience higher experiential avoidance and difficulties in regulating emotional styles. They are also unable to cope with daily life problems, challenges, and discomfort, leading to more psychological problems and discomfort, in addition to lower mental health (61-64). People who stutter ignore positive social information in various situations, which can intensify their negative beliefs, fears, and avoidant behaviors (65). The findings showed that people with and without stuttering did not differ in repetitive negative thinking. The results indicated that repetitive thinking was high in both groups with and without stuttering (66-68). Evidence demonstrates that a person paradoxically reinforces the cycle of negative experiences to prevent negative thinking and feelings that occur in stressful situations (69).

Considering the role of dysfunctional thought factors, underlying assumptions and cognitive processes in the pathology of stuttering, these factors are common among individuals with stuttering (3, 30, 32). The following reasons can be considered to explain this finding. It should be noted that the tests in this study were performed during the COVID-19 pandemic, and consequently, people without stuttering also had threatening thoughts and ruminations related to the epidemic and the virus. It can be concluded that an

independent secondary factor, namely COVID-19, increased the score of repetitive negative thinking in the non-stuttering group. COVID-19 not only affected people's fear and rumination, but also had adverse effects on their quality of life and attitudes toward themselves, others, and the future; it also affected the participants' responses in this study.

Overall, the results provide insights into the potential associations between various demographic factors and mental health outcomes. They highlight the importance of considering these factors when assessing and treating individuals with mental health concerns. Further research could explore additional variables and their impact on mental health outcomes to better understand the complex nature of mental health.

Limitation

There were a number of limitations in this study. Firstly, the participants were selected by convenience sampling; therefore, caution should be exercised when generalizing the results. Secondly, the study utilized a cross-sectional design, meaning that it captured data at a single point in time. This design does not allow for the assessment of changes over time or the establishment of causal relationships between variables. Thirdly, the current study was conducted in a specific geographic area (Tehran, Iran), and may not be representative of other people who stutter in different regions or cultures. Furthermore, the study did not account for potential confounding factors such as age, gender, comorbid conditions, or medication use, which may impact the participants' experiences with emotion regulation difficulties, repetitive negative thinking, and experiential avoidance. Lastly, the COVID-19 pandemic was the main limitation of this study, as it affected the participants' responses and also limited the possibility of referral to medical centers.

Conclusion

The study found that people who stutter experienced more severe difficulties with emotion regulation than those without stuttering. While they reported higher levels of emotional avoidance, they did not significantly differ in repetitive negative thinking compared to their non-stuttering counterparts. The study suggests that psychotherapists should prioritize addressing emotion regulation and emotional avoidance in people who stutter through appropriate treatment strategies, such as third wave cognitive-behavioral therapies. These findings provide valuable insights into the potential demographic factors that may impact mental health outcomes and highlight the need for considering such factors when assessing and treating individuals with mental health concerns. Further research could explore additional variables to better understand the complex nature of mental health.

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Conflict of Interest

None.

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