Anxiety, Social Phobia, Depression, and Suicide among People Who Stutter; A Review Study

Mohsen Rezaeian¹, Moslem Akbari², Amir Hossein Shirpoor², Zahra Moghadasi³, Niloufar Chitsaz Zadeh⁴, Zahra Nikdel², Maryam Hejri²

1- Professor of Epidemiology, Rafsanjan University of Medical Sciences, Rafsanjan, Iran.
2- M.A Clinical Psychology, Dept., of Psychology, Islamic Azad University, Roudehen Branch, Roudehen, Tehran, Iran.
3- M.A General psychology, Dept. of Psychology, Islamic Azad University, Science and Research Branch, Tehran, Iran.
4- M.A General Psychology, Payame Noor University of Kish International Center, Kish, Iran.
5- M.A General Psychology, Dept. of Psychology, Islamic Azad University, Khorasgan Branch, Isfahan, Iran.

Abstract

Background: Mental disorders in people who stutter are controversial among researchers. This review study aims to probe four common mental disorders, including anxiety, social phobia, depression, and suicide in people who stutter (PWS) as well as in people who do not stutter (PWNS).

Materials and Methods: For the purpose of this review study, we searched 5 combined keywords, including stutter and anxiety, stutter and social anxiety, stutter and depression, stutter and mental disorders, as well as stutter and suicide on Science Direct, Springer, Google Scholar, and Scopus from 1985 to 2020. From among 321 papers searched, a total of 34 research papers were related to this study.

Results: According to the results, anxiety and social anxiety were the most common mental disorders in the stuttering population. Unfortunately, most studies on stuttering and mental disorders have been conducted on adults, while mental disorders, especially anxiety, most likely occur during adolescence. Findings on depression were very heterogeneous, accordingly, sometimes no difference was observed, and sometimes the rate of depression was found to be higher in the PWS than in the control group. It seems depression in PWS increases with aging. There is no adequate research on the relationship between suicide and stuttering, but a positive association has been established between suicide and anxiety as well as between social anxiety and depression.

Conclusion: The rate of anxiety and social anxiety was higher in PWS than in PWNS. We need more research on mental disorders in PWS because various psychological aspects, especially depression, have not yet been fully studied in people who stutter.

Keywords: Mental Disorder, Anxiety, Social Phobia, Depression, Suicide, Stuttering

Introduction

Stuttering is a disorder in the normal fluency and time patterning of speech [1]. Craig A (2002) showed that the prevalence of stuttering was about 1%, and its rate of incidence was 4-5% across the entire life span in the state of New South Wales, Australia [2–4]. According to the results, the prevalence of stuttering was 0.72% across the whole population, with the highest and lowest prevalence rates having been in younger children (1.4–1.44) and in adolescents (0.53), respectively. In addition, the male-to-female ratio ranged from 2.3:1 in younger children to 4:1 in adolescents, with the ratio of 2.3:1 registered across all ages. Household members were also interviewed by
asking whether anyone in the household had ever stuttered. If the answer was ‘yes’, the same corroborative questions would be asked. These data along with the prevalence data provided an estimate of the incidence or risk of stuttering, which ranged from 2.1% in adults (21–50 years old) to 2.8% in younger children (2–5 years old), and to 3.4% in older children (6–10 years old). In addition, the prevalence of total speech disorders was 14.8% in the Iranian community, among whom 13.8% had a speech sound disorder, 1.2% had the stuttering disorder, and 0.47% had a voice disorder [5].

Negative consequences of stuttering start from age 4-5 and continues throughout the life [6, 7]. These problems become more complex in adolescence, which include anxiety, social communication, and educational problems [8, 9]. People with stuttering, due to the listeners’ negative reactions and negative attitude to their speeches, demonstrate avoidance behaviors, anxiety, aggression, with conflicts existing in most of them [10, 11]. These negative experiences lead to the feelings of embarrassment, shame, and lack of academic achievement. The probability of having psychological, behavioral, and emotional disorders, especially anxiety, is higher among people who stutter [12–14].

The psychosocial aspect of stuttering is one of the major components of this disorder that needs special attention in the course of treatment. Negative thoughts and reactions against stuttering start from childhood when a child begins to notice their speech differences [15, 16]. Negative attitudes towards communication and even the “self” develop when a child experiences stuttering and stigmatization in the society. Stuttering is accompanied by the destructive feelings of frustration, anger, guilt, and humiliation [17]. Because of social stigmas, PWS could have a lower chance for employment and higher education [18].

The degree of the impact of stuttering on a person’s life differs among individuals. Some people encounter serious problems with communication competence, self-confidence, romantic relationships, and personality attributes [19–21]. The effects of stuttering on personality development have been studied in three countries, including Germany, Australia, and Iran. Based on these studies, PWS has a higher agreeableness. Jafari et al (2015) argued that the higher level of agreeableness in PWS would probably be a self-defense mechanism against being bullied and teased [20]. This study showed the importance of social stigmatization in personality development, thereby exerting an effect on many aspects of an individual’s life.

Because of the aforementioned impacts of stuttering on PWS’s everyday life and psychological profiles, many studies have been carried out on mental disorders among PWS.

Per A. Alm (2014) reviewed several studies on comparing mental disorders between PWS and PWNS [22]. In this study, no significant differences were observed between PWS and PWNS in shame, sadness, social phobia, social functioning, as well as psychological and emotional activities; however, stronger impulsive behaviors and greater lack of control were observed among PWS than in PWNS. Their review of studies revealed that negative social assessments were among the major reasons for differences between PWNS and PWS. In addition, their review showed that the cognitive behavioral therapy (CBT) was one of the most effective treatments for mental disorders in PWS, which showed a clear effect on social anxiety and psychological wellbeing in this population. However, this study did not show any effects on speech fluency. Another result from their review was that improved fluency after the fluency shaping therapy was associated with anxiety reduction. Studies on psychological treatments focusing on anxiety have verified their positive effects on psychological wellbeing but have shown little or no effect on speech fluency [22].

Kefalianos, Onslowcm Blockd, Menziesc, and Reilly (2012) found out that stutterers’ temperament would not lead to anxiety [23]. Some stuttering preschool children experience negative peer responses and difficulties in social interactions with their peers as a consequence of their stuttering [10]. Although results of research on adaptability are not the same, new research using observations rather than parent assessment questionnaires suggests that CWS have lower adaptability and a lower capacity for regulating their attention than CWNS [23].

Iverach, O’Brien, Kefalianos, and Reilly (2013) reviewed several studies to determine the scope of research on the timing of anxiety onset in stuttering. Researchers claim that anxiety in stuttering people might increase over time until exceeding normal limits in adolescents and adults [24].

Iverach and Rapee (2013) reviewed some studies to determine the level of social anxiety in people who stutter and to suggest that research accomplished prior to the turn of the century produced evidence of raised anxiety in people who stutter [25]. Because of the proven impact of stuttering on a person’s life, psychosocial wellbeing, and the quality of life, studying mental
Mental Disorder among Stutters

JOHE, Spring 2020; 9 (2) 100

Disorders in PWS is of great importance in treating stuttering. Against this background, this study aims to review three common mental disorders, including anxiety, social phobia, and depression among PWS [25].

Materials and Methods

In this paper, to answer an old question, there was a need for a wide range of relevant papers. To this end, we searched keywords with stutter, including stutter and anxiety, stutter and social anxiety, stutter and depression, as well as stutter and mental disorders and suicide on ScienceDirect, Springer, Google Scholar, and Scopus from 1985 to 2020. A total of 34 relevant research papers were selected from among 321 papers for this study. For anxiety, social anxiety, and depression, 13, 12, and 9 papers were selected, respectively.

Results

Anxiety: Anxiety is probably the most common mental disorder among people who stutter [24, 26]. The majority of studies on mental disorders in PWS have been conducted on anxiety. Given the role of speaking in academic achievement and job success, it is evident that anxiety is common in stutterers [27, 28]. Despite numerous studies, the cause-effect relationship between stuttering and anxiety has not been clearly explored [8, 29]. The results obtained in research on anxiety among children with stuttering are equivocal [24]. Some research reports anxiety as a common disorder among children and adolescents who stutter [30–33], yet some other research does not establish this relationship [34–38]. Boys tend to hide their anxiety about their stuttering [36]. This could be one of the reasons for the dual results of research on stuttering anxiety, with the worse outcome being produced perhaps due to the fact that these people are less likely to undergo treatment [39–42]. Unfortunately, most research on stuttering and anxiety has been carried out on adults, while the most likely occurrence period of mental disorders, especially anxiety, is during adolescence [43]; however, in few studies on mental disorders in people with stuttering during adolescence, anxiety has been considered one of the most common psychiatric disorders [31–33, 44].

Table 1. A summary of reviewed research studies on anxiety and stuttering

| Study | Age range | n | Anxiety measure(s) | Findings |
|-------|-----------|---|--------------------|----------|
| Andrews, G., & Harris, M. (1964). The syndrome of stuttering | 9–11 years | 80 | General Anxiety scale for children | Null; there were no differences in anxiety compared with age-matched non-stuttering controls. |
| Blood, G., & Blood, I. (2007). Preliminary study of self-reported experience of physical aggression and bullying of boys who stutter: Relationship with increased anxiety | 11–12 years | 18 | RCMAS | Stuttering young people had significantly higher anxiety levels than age-matched non-stuttering controls. |
| Blood, G., Blood, I., Maloney, K., Meyer, C., & Qualis, C. (2007). Anxiety levels in adolescents who stutter | 12–18 years | 36 | RCMAS | Stuttering young people experienced anxiety within normal limits, but higher than those in age-matched non-stuttering controls. |
| Blood, G., Blood, I., Tellis, G., & Gabel, R. (2001). Communication apprehension and self-perceived communication competence in adolescents who stutter | 13–18 years | 39 | PRCA | Stuttering young people had significantly higher levels of communication apprehension (anxiety) than age-matched non-stuttering controls. |
| Craig, A., & Hancock, K. (1996). Anxiety in children and young adolescents who stutter | 9–14 years | 96 | STAIC | Null; no differences were observed in anxiety compared with age-matched non-stuttering controls, and anxiety levels were within the average range according to the normative data. |
| Craig, A., Hancock, K., Chang, E., McCready, C., Shepley, A., McCaul, A., Costello, D., Harding, S., Kehren, R., Masel, C., et al. (1996). A controlled clinical trial on stuttering in elderly people | 9–14 years | 97 | STAIC | Null; stuttering young people showed anxiety levels in an average range according to normative data. |
Stuttering young people had higher levels of state anxiety than age-matched recovered stutterers as well as age-matched non-stuttering controls.

The majority of stuttering adolescents experienced high levels of communication apprehension.

Stuttering adolescents were diagnosed at least once with a mental disorder, with the majority of these diagnoses having involved anxiety.

Null; the trend for recovered stutterers or those with very low levels of stuttering indicated reduced anxiety over time according to normative data.

Stuttering young people had significantly higher levels of anxiety than age-matched non-stuttering controls.

Null; no differences were observed in cortisol levels between stuttering children and normative data.

Null; no significant differences were observed in anxiety between stuttering preschoolers and age-matched non-stuttering controls.

Social phobia: Social anxiety is a chronic mental disorder characterized by severe fear from others in social situations or by fear from one’s performance being assessed by others [1]. The prevalence of social anxiety in the US adult community is 8-13%, which is one of the major psychiatric disorders in the world [10, 45–47]. It is a common disorder in PWS [28, 48–51], which also exists in teenage stutterers [24]. This disorder could also be observed among children aged 7 to 12 [19]. People seeking treatment for stuttering are more likely to show symptoms, such as social phobia [52]. In some studies, 22-60% of PWS suffered from social anxiety [25, 53–56]. Suffering from social anxiety could negatively affect treatment outcomes [28].

Results of a comparison made between stuttering and non-stuttering individuals indicate that the probability of being diagnosed with social phobia, anxiety, and the general anxiety disorder is several times higher in PWS than in PWNS. Future research should assess the impacts of these mental disorders on treatment outcomes [28]. Shame, guilt, poor social interactions, and fear of speaking, especially among strangers, are common problems facing stuttering people [57–62]. It seems that social anxiety exacerbates in stuttering people with childhood experiences, communication problems, and negative outcomes.
In addition, their entire life could be a source of social anxiety. Social anxiety intensifies behavioral weaknesses in social situations and reduces social interactions [63–65].

There are many reasons for the connection between stuttering and social anxiety. Stuttering is accompanied by negative social factors and psychological disorders in life [66, 67]. These negative consequences start in early childhood, for children are prone to being ridiculed, harassed, avoided, bullied, and teased by their peers [68–70]. Negative consequences are intensified during school hours due to more social interactions and the need for speaking to be included in the community. Against this background, stuttering people are more likely to be rejected by peers and to be excluded from the society and social connections [71–73].

Not surprisingly, most stutterers report that stuttering exerts lots of negative effects on their academic performance during the academic year as well as on their social and emotional performance [74–76]. There are many reasons why stuttering people experience a high level of social anxiety, and there are many ways for growing social anxiety [77–79] during childhood and adolescence [80, 81]. Clinical psychologists suggest many social, environmental, biological, genetic, and psychological reasons for the sources of social anxiety, which in combination show the complexity of the disorder [82–84].

Some of these factors, such as social factors, could be stronger in PWS. CWS could be more exposed to negative reactions from peer groups, such as ridicule, rejection, and harassment [77, 81, 84]. These reactions reduce social interactions, age-appropriate social interactions, and social skills, yet they increase the chance of experiencing social anxiety [81].

There is not enough research on examining factors leading to the emergence and growth of social anxiety in stuttering people. The main problem to be assessed is that PWS could become more anxious when they are taken into consideration, and the other major problem is that they react when they are evaluated. They might not react under normal conditions; therefore, this point must be taken into account when evaluating social situations in PWS [85].

Table 2. Details of studies included in the meta-analysis that compared trait anxiety in adults who stutter (PWS) with non-stuttering controls (NSC); Sex is shown (M = male; F = female); in addition, the mean age or the age range has been shown in years.

| NSC                  | PWS(N) | NS(N) | Anxiety measure                        | Mean(SD) |
|----------------------|--------|-------|----------------------------------------|----------|
| Bonifacio (1974)     | 35/M/26.2 | 35/M/25.0 | Spielberger State-Trait Anxiety Inventory | 44.6(11.8) | 36.3(8.5) |
| Molt and Guilford (1979) | 15/13M/16-55 | 15/13M/16-55 | Spielberger State-Trait Anxiety Inventory | 36.7(10.6) | 34.7(8.3) |
| Peters and Hulstijn (1984) | 24/20M/18-37 | 24/19M/18-37 | Amsterdamse Vragenlijst N Scale | 65.4(28.7) | 59.4(26.3) |
| Craig (1990)         | 102/82M/18-75 | 102/82M/18-75 | Spielberger State-Trait Anxiety Inventory | 43.1(11.0) | 35.8(7.0) |
| Miller and Watson (1992) | 38/M/16-68 | 38/M/16-68 | Spielberger State-Trait Anxiety Inventory | 35.7(11.4) | 33.2(9.0) |
| Blood et al. (1994)  | 11/M/19-36 | 11/M/19-33 | Spielberger State-Trait Anxiety Inventory | 34.8(6.7) | 35(4.5) |
| Mahr and Torosian (1999) | 22/18M/27-51 | 100/50M/ | Self-Rating Anxiety Scale | 44.5(8.9) | 33.8(5.9) |
| Craig et al. (2003)  | 63/M/38.4 | 102/82M/18-75 | Spielberger State-Trait Anxiety Inventory | 38.5(9.6) | 35.8(7.0) |
| Ezrati-Vinacour et al. (2004) | 47/M/18-43 | 47/M/18-43 | Spielberger State-Trait Anxiety Inventory | 42.9(8.8) | 34.6(7.8) |
| Ivarch et al. (2009) | 94/72M/18-73 | 102/82M/18-75 | Spielberger State-Trait Anxiety Inventory | 41.9(10.4) | 35.8(7.0) |
| Blumgart et al. (2010) | 200/151M/45.7 | 200/106M/47.1 | Spielberger State-Trait Anxiety Inventory | 39.7(12.0) | 33.9(9.0) |
| Ivarch et al. (2018) | 82/61M/18-80 | 193/158m/18-80 | DSM-5 | 64.1(35.8) | 45.4(25.1) |

**Depression:** The correlation between depression and stuttering has not yet been thoroughly investigated, and research on this subject is incomplete. However, the comparison of mean depression scores in PWS and PWNS shows that the mean depression scores for stutterers are higher [86–88]. In addition, depression could occur in PWS, based on DSM 4 (IV-TR) [89]. There is a
strong positive correlation between depression and anxiety [90]. Besides, the relationship between depression and stuttering has been shown in past research [88].

Depression itself has several types, with their common features being sadness, lack of pleasure, attenuated appetite, reduced or increased sleep, and impaired functions [1]. Research on depression in stutterers has received contradictory results as well. Although some studies have reported high levels of depression in stutterers [91–93], others have failed to prove PWS suffer from more serious depression than their peers [94, 95]. In Miller and Watson's study, the average depression scores for stutterers were higher than those for non-stutterers. Research reports that people who stutter are more likely to suffer from mood disorders and depression [92]. However, research reported a negative correlation between stuttering and depression [96, 97]. Some studies used other tests to measure depression. Research, using the Reynolds Adolescent Depression Scale, showed no significant differences among stuttering and non-stuttering adults in depression between the two groups [93, 98].

In contrast to research conducted in Spain, stuttering students showed more significant symptoms of depression than the non-stuttering ones. In this study, clinical diagnosis was not used, but a self-report questionnaire was utilized to measure depression [10, 99]. Some research also used the personality inventory to measure depression in stutterers. Research using the Minnesota Multiphasic Personality Inventory [100] and MMPI–2 [101] showed that people who stutter had significantly higher scores of depression than those not stuttering [102, 103]. In summary, the relationship between depression and stuttering is not still well defined, with one reason for which being the non-use of an appropriate unit for measuring depression; the other reason would be the small number of the research population used in clarifying the connection between depression and stuttering [104].

### Table 3.
Details of studies included in the review having compared trait depression in adults/adolescents who stutter (PWS) and non-stuttering controls (NSC): sex breakdown is shown (M = male; F = female); in addition, the mean age or the age range have been shown in years.

| - | N/Age | Measure | Result |
|---|---|---|---|
| PeterHays/L. Leigh Field (1989) | - | Beck Depression Inventory | No difference was observed between PWS and PWNS. |
| Susan Miller and Ben C. Watson (1992) | -/Adults | Beck Depression Inventory | PWS suffer from stronger depression than PWNS. |
| Melissa A. Bray et al. (2003) | -/Adolescents | DSM-4 | There is no difference between PWS and PWNS (adolescents). |
| Lisa Iverach et al. (2010) | 92 PWS, 920 PWNS/Adults | DSM-4 | PWS suffer from stronger depression than PWNS. |
| Yong Li Foo (2014) | 214 PWS, 4280 PWNS | CID-9 | PWS suffer from stronger depression than PWNS. |
| Anthony Gunn et al. (2014) | 20 PWS (12-14 years), 17 PWS (15-17 years) | DSM-4 | Older adolescents (15-17 years) were reported with stronger depression than younger adults (12-14 years). |
| Ashley Craig et al. (2015) | 200 PWS/Adults | SCL-90 | Adults have a higher rate of depression than the normal population. |
| Lisa Iverach et al. (2016) | 102 PWS/11-17/Adolescents | Children's Depression Inventory | Older adolescents got higher scores than younger adolescents. |
| Yvonne Tran et al. (2017) | 129 PWS/Adults | SCL-90 | No difference was observed between PWS and the normal population. |

### Suicide:
Research on the connection between suicide and stuttering is not adequate. However, studies on this subject are contradictory. Simon (2009) claims that stuttering is not considered as a suicide risk factor [105]. In contrast, Li, Chau, Yip, and Wong (2014) claim that stuttering could be effective in suicide attempts [106]. Anderson (2016) reports people who stutter have several social problems, such as isolation [107]; in addition, there is a relationship between stuttering...
and depression [108-110], between stuttering and anxiety [111, 112], and between stuttering and social anxiety [113-115]. Besides, the connection between suicide, depression, anxiety, social anxiety, and the quality of life has been established. Thus, people who stutter probably have suicide risk factors, such as depression, anxiety, and social anxiety. There is no study on the assessment of suicide plans and attempts among stuttering people.

Discussion

Stuttering could disturb healthy and pleasurable speech as well as verbal communication in a community. However, stuttering problems in many cases are not limited to speech problems, yet they exert negative effects on mental health among PWS. Stuttering could be accompanied by several disorders, which make treatment more difficult. Although much attention has been paid to mental disorders in stutterers for several decades, many psychological aspects have not yet been fully covered in stutterers. The majority of studies on psychological disorders in stutterers have been related to anxiety and social phobia. It seems the most common psychological disorders are the same perhaps because stuttering starts in childhood and is strengthened by the environment. According to Iverach L (2014), the high level of anxiety and social anxiety in stutterers indicates that the diagnosis and treatment of such disorders during childhood and adolescence have not been fully emphasized, with these disorders becoming more severe with aging [25]. Accordingly, it could be helpful to help diagnose and treat these psychological disorders in PWS during childhood to improve their mental health in adulthood. The likelihood of depression increases with aging. Although there is no clear evidence about the relationship between stuttering and depression, there are conflicting reports indicating it seems necessary to focus future research on depression. To produce clarity in this case, diagnostic interviews could be more helpful than questionnaires. Mental health problems in PWS could have negative effects on interpersonal relationships, vocational relationships, academic achievements, and romantic relationships; therefore, treatment should not be limited to speech fluency techniques. Although higher fluency could reduce the severity of mental disorders in part, it would be better to ask mental health professionals to diagnose and treat these disorders because in many cases these mental disorders could be left unaffected after treatment. Most studies on psychological disorders in stutterers have been done by speech-language pathologists. Therefore, the majority of them have focused on evaluating disorders using questionnaires, yet few studies have been conducted on treating mental disorders in PWS. Therefore, for the more proper diagnosis and timely treatment of disorders in stutterers, it would be better to ask for mental health professionals' services alongside stuttering treatments administered by speech-language pathologists. Stuttering adults are not willing to be informed on the diagnosis of other mental disorders in addition to stuttering; thus, their responses to the questionnaires could not be valid. Mental health professionals could raise the validity of responses to questions through using therapeutic communication; thus, their diagnosis could be more accurate. There are conflicting results about the level of mental disorders in people who stutter so that in some studies there are no significant differences between stutterers and non-stutterers. Two major reasons could be given for this issue, including the non-use of a unique evaluation tool and clinical interviews as well as the difference in the mental health level of the studied populations. Mental health and attitudes towards mental disorders are not similarly important in different societies. Therefore, studies on mental disorders in people who stutter could not yield the same results in different societies. An example is the well-designed study on personality in PWS living in Iran, which found no high level of neuroticism in PWS, which helped reduce stigmatization towards PWS [20, 21]. These studies show the high level of agreeableness in PWS; however, the high level of agreeableness is not always beneficial. The results of the study by Jafari et al could be used by therapists to address high levels of agreeableness in therapies and to help clients adjust and keep an optimal level of agreeableness in different situations to avoid exploitation by others and to improve their mental health. Unfortunately, there is not enough research on studying suicide among stutterers. However, the positive relationship between suicide and common mental disorders in stutterers has been established. For future studies, it is recommended that suicide be studied during adolescence among stutterers.

Conclusion

In this review study, high prevalence of three mental disorders (anxiety, social phobia, and depression) was shown in individuals with developmental stuttering. The results also indicate that anxiety and social phobia are common among people who stutter, and in many studies, the
average of depression was higher in PWS than in the normal population. It is recommended that more research be conducted on suicide among PWS in the future. In addition, therapists must be encouraged to address mental health issues in this group of people. Besides, it is recommended that PWS be referred to relevant experts for the diagnosis and treatment of mental health disorders.

Acknowledgement
The authors would like to thank Dr. Mona Ebrahimipour and Mrs. Reyhanefeh Jafari for their valuable assistance in preparing the manuscript.

Conflict of interest: None declared.

References
1. American Psychiatric Association. Diagnostic and Statistical Manual of Mental Disorders (DSM-5®). 5th ed. Washington DC, United States: American Psychiatric Association Publishing; 2013.
2. Sikandar MZ, Tahir FN, Shah SIA. Self-Esteem and anxiety among Young Adult Male Stutterers of Central Punjab. Biomedica 2019; 35(1):37-40.
3. Iverach L, O’Brian S, Jones M, Block S, Lincoln M, Harrison E, et al. Prevalence of anxiety disorders among adults seeking speech therapy for stuttering. J Anxiety Disord 2009; 23(7):928-34.
4. Craig A, Hancock K, Tran Y, Craig M, Peters K. Epidemiology of stuttering in the community across the entire life span. J Speech Lang Hear Res 2002; 45(6):1097-105.
5. Karbasi SA, Fallah R, Golestan M. The prevalence of speech disorder in primary school students in Yazd-Iran. Acta Med Iran 2011; 49(1):33-7.
6. Blood GW, Blood IM. Preliminary study of self-reported experience of physical aggression and bullying of boys who stutter: relation to increased anxiety. Percept Mot Skills 2007; 104(3 Pt 2):1060-6.
7. Langevin M, Packman A, Onslow M. Peer responses to stuttering in the preschool setting. Am J Speech Lang Pathol 2009; 18(3):264-76.
8. Scheurich JA, Beidel DC, Vanryckeghem M. Exposure therapy for social anxiety disorder in people who stutter: An exploratory multiple baseline design. J Fluency Disord 2019; 59:21-32.
9. Blood GW, Blood IM. Bullying in Adolescents Who Stutter: Communicative Competence and Self-Esteem. Communication Science and Disorders 2004; 31:69-79.
10. Gunn A, Menzies RG, Onslow M, O’Brian S, Packman A, Lowe R, et al. Phase I trial of a standalone internet social anxiety treatment for adolescents who stutter: iBroadway. Int J Lang Commun Disord 2019; 54(6):927-39.
11. Snyder GJ. Exploratory research in the measurement and modification of attitudes toward stuttering. J Fluency Disord 2001; 26(2):149-60.
12. Craig A, Hancock K, Tran Y, Craig M. Anxiety levels in people who stutter: a randomized population study. J Speech Lang Hear Res 2003; 46(5):1197-206.
13. Moutier CY, Stein MB. The history, epidemiology, and differential diagnosis of social anxiety disorder. J Clin Psychiatry 1999; 60(Suppl 9):4-8.
14. Yaruss JS, Quesal RW, Reeves L, Molt LF, Kluetz B, Caruso AJ, et al. Speech treatment and support group experiences of people who participate in the National Stuttering Association. J Fluency Disord 2002; 27(2):115-34.
15. Bricker-Katz G, Lincoln M, McCabe P. A lifetime of stuttering: how emotional reactions to stuttering impact activities and participation in older people. Disabil Rehabil 2009; 31(21):1742-52.
16. O’Brien S, Jones M, Packman A, Menzies R, Onslow M. Stuttering severity and educational attainment. J Fluency Disord 2011; 36(2):86-92.
17. Bloodstein O, Bernstein Ratner N. A Handbook on Stuttering, 6th ed. New York, NY, United States: Thomson-Delmar Learning; 2008;
18. Daniels DE, Gabel RM. The impact of stuttering on identity construction. Top Lang Disord 2004; 24(3):200-15.
19. Iverach L, Jones M, McLellan LF, Lyneham HJ, Menzies RG, Onslow M, et al. Prevalence of anxiety disorders among children who stutter. J Fluency Disord 2016; 49:13-28.
20. Jafari R, Baziar M, Bleek B, Reuter M, Montag C. Personality attributes of Iranian people who stutter. J Commun Disord 2015; 58:119-25.
21. Jafari R, Shahbodaghi R, Ashayeri H, Keyhani M, Baziyar M. The five factor model of personality and stuttering. Procedia Soc Behav Sci 2014; 127:307-10.
22. Alm PA. Stuttering in relation to anxiety, temperament, and personality: review and analysis with focus on causality. J Fluency Disord 2014; 40:5-21.
23. Kefalianos E, Onslow M, Block S, Menzies R, Reilly S. Early stuttering, temperament and anxiety: Two hypotheses. J Fluency Disord 2012; 37(3):151-63.
24. Smith KA, Iverach L, O’Brien S, Kefalianos E, Reilly S. Anxiety of children and adolescents who stutter: a review. J Fluency Disord 2014; 40:22-34.
25. Iverach L, Rapee RM. Social anxiety disorder and stuttering: current status and future directions. J Fluency Disord 2014; 40:69-82.
26. Nnamani A, Akabogu J, Otu MS, Ukoha E, Uloh-Bethels AC, Omile JC, et al. Cognitive behaviour language therapy for speech anxiety
among stuttering school adolescents. J Int Med Res 2019; 47(7):3109-14.

27. Rocha MS, Yaruss JS, Rato JR. Temperament, Executive Functioning, and Anxiety in School-Age Children Who Stutter. Front Psychol 2019; 10:2244.

28. Iverach L, Jones M, O’Brien S, Block S, Lincoln M, Harrison E, et al. The relationship between mental health disorders and treatment outcomes among adults who stutter. J Fluency Disord 2009; 34(1):29-43.

29. Iverach L, Menzies RG, O’Brien S, Packman A, Onslow M. Anxiety and stuttering: continuing to explore a complex relationship. Am J Speech Lang Pathol 2011; 20(3):221-32.

30. Miller R. Anxiety and self-related constructs in learners who stutter in the learning of English as a foreign language. [PhD thesis]. Valencia, Spain: University of Valencia; 2020;

31. Blood GW, Blood IM, Tellis G, Gabel R. Communication apprehension and self-perceived communication competence in adolescents who stutter. J Fluency Disord 2001; 26(3):161-78.

32. Davis S, Shisca D, Howell P. Anxiety in speakers who persist and recover from stuttering. J Commun Disord 2007; 40(5):398-417.

33. Mulcahy K, Hennessey N, Beilby J, Byrnes M. Social anxiety and the severity and typology of stuttering in adolescents. J Fluency Disord 2008; 33(4):306-19.

34. Andrews G, Harris M. The syndrome of stuttering. 1st ed. London: Heinemann Medical Books; 1964;

35. Craig A, Hancock K. Anxiety in children and young adolescents who stutter. Australian Journal of Human Communication Disorders 1996; 24(1):28-38.

36. Messenger M, Packman A, Onslow M, Menzies R, O’Brien S. Children and adolescents who stutter: Further investigation of anxiety. J Fluency Disord 2015; 46:15-23.

37. Ortega AY, Ambrose NG. Developing physiologic stress profiles for school-age children who stutter. J Fluency Disord 2011; 36(4):268-73.

38. van der Merwe B, Robb MP, Lewis JG, Ormond T. Anxiety measures and salivary cortisol responses in preschool children who stutter. Communication Science and Disorders 2011; 38:1-10.

39. Iverach L, Jones M, Lowe R, O’Brien S, Menzies RG, Packman A, et al. Characteristics of adults who stutter by treatments sought. Logoped Phoniatr Vocol 2019; 44(3):134-42.

40. Blood GW, Blood IM, Tellis GM, Gabel RM. A preliminary study of self-esteem, stigma, and disclosure in adolescents who stutter. J Fluency Disord 2003; 28(2):143-58.

41. Erickson S, Block S. The social and communication impact of stuttering on adolescents and their families. J Fluency Disord 2013; 38(4):311-24.

42. Huber A, Packman A, Quine S, Onslow M, Simpson J. Improving our clinical interventions for stuttering: Can evidence from qualitative research contribute? Int J Speech Lang Pathol 2004; 6(3):174-81.

43. Albano AM, DiBartolo PM, Heimberg RG, Barlow DH. Children and Adolescents: Assessment and Treatment. In: Heimberg G, Liebowitz MR, Hope DA, Schneier FR, Eds. Social Phobia Diagnosis, Assessment and Treatment. New York, NY, United States: Guilford Press; 1995. P.387–425.

44. McAllister J, Collier J, Shepstone L. The impact of adolescent stuttering and other speech problems on psychological well-being in adulthood: evidence from a birth cohort study. Int J Lang Commun Disord 2013; 48(4):458-68.

45. Kessler RC, Chiu WT, Demler O, Merikangas KR, Walters EE. Prevalence, severity, and comorbidity of 12-month DSM-IV disorders in the National Comorbidity Survey Replication. Arch Gen Psychiatry 2005; 62(6):617-27.

46. Ruscio AM, Brown TA, Chiu WT, Sareen J, Stein MB, Kessler RC. Social fears and social phobia in the USA: results from the National Comorbidity Survey Replication. Psychol Med 2008; 38(1):15-28.

47. Topham P. Feeling stupid: A survey of university students’ experience of social anxiety in learning situations. Bristol, United Kingdom: University of the West of England; 2020;

48. Ezrati-Vinacour R, Levin I. The relationship between anxiety and stuttering: a multidimensional approach. J Fluency Disord 2004; 29(2):135-48.

49. Kraaimaat FW, Vanryckeghem M, Van Dam-Baggen R. Stuttering and social anxiety. J Fluency Disord 2002; 27(4):319-30.

50. Mahr GC, Torosian T. Anxiety and social phobia in stuttering. J Fluency Disord 1999; 24(2):119-26.

51. McAllister J. Stuttering, Social Anxiety, and Cognitive Bias. Procedia-Social Behav Sci 2015; 193:286.

52. Lindsay A, Langevin M. Psychological counseling as an adjunct to stuttering treatment: Clients’ experiences and perceptions. J Fluency Disord 2017; 52:1-12.

53. Britton PM, O’Brien K, Ellis C. Behavioral, Emotional, and Social Well-Being in Children Who Stutter: Evidence from the National Health Interview Survey. J Dev Phys Disabil 2019; 31(1):39-53.

54. Blumgart E, Tran Y, Craig A. Social anxiety disorder in adults who stutter. Depress Anxiety 2010; 27(7):887-92.

55. Menzies RG, O’Brien S, Onslow M, Packman A, St Clare T, Block S. An experimental clinical trial of a cognitive-behavior therapy package for chronic stuttering. J Speech Lang Hear Res 2008; 51(6):1451-64.
56. Stein MB, Baird A, Walker JR. Social phobia in adults with stuttering. Am J Psychiatry 1996; 153(2):278-80.

57. Belby JM, Byrnes ML, Meagher EL, Yaruss JS. The impact of stuttering on adults who stutter and their partners. J Fluency Disord 2013; 38(1):14-29.

58. Bleek B, Reuter M, Yaruss JS, Cook S, Faber J, Montag C. Relationships between personality characteristics of people who stutter and the impact of stuttering on everyday life. J Fluency Disord 2012; 37(4):325-33.

59. Corcoran JA, Stewart M. Stories of stuttering: A qualitative analysis of interview narratives. J Fluency Disord 1998; 23(4):247-64.

60. Daniels DE, Gabel RM, Hughes S. Recounting the K-12 school experiences of adults who stutter: a qualitative analysis. J Fluency Disord 2012; 37(2):71-82.

61. Plexico L, Manning WH, Levitt H. Coping responses by adults who stutter: Part II. Approaching the problem and achieving agency. J Fluency Disord 2009; 34(2):108-26.

62. Plexico LW, Manning WH, Levitt H. Coping responses by adults who stutter: Part I. Protecting the self and others. J Fluency Disord 2009; 34(2):87-107.

63. Blood GW, Blood IM. Long-term Consequences of Childhood Bullying in Adults who Stutter: Social Anxiety, Fear of Negative Evaluation, Self-esteem, and Satisfaction with Life. J Fluency Disord 2016; 50:72-84.

64. Iverach L, Rapee RM, Wong QJJ, Lowe R. Maintenance of Social Anxiety in Stuttering: A Cognitive-Behavioral Model. Am J Speech Lang Pathol 2017; 26(2):540.

65. Freud D, Amir O. Resilience in people who stutter: Association with covert and overt characteristics of stuttering. J Fluency Disord 2020; 64:105761.

66. García-Pastor MD, Miller R. Unveiling the needs of students who stutter in the language skills-a study on anxiety and stuttering in EFL learning. Eur J Spec Needs Educ 2019; 34(2):172-88.

67. Boey RA, Van de Heyning PH, Wuyts FL, Heylen L, Stoop R, De Bodt MS. Awareness and reactions of young stuttering children aged 2–7 years old towards their speech disfluency. J Commun Disord 2009; 42(5):334-46.

68. Langevin M, Kleitman S, Packman A, Onslow M. The Peer Attitudes Toward Children who Stutter (PATCS) scale: an evaluation of validity, reliability and the negativity of attitudes. Int J Lang Commun Disord 2009; 44(3):352-68.

69. Teesson K, Packman A, Onslow M. The Lidcombe Behavioral Data Language of stuttering. J Speech Lang Hear Res 2003; 46(4):1009-15.

70. Nabiieh El-Adawy AA-S, St. Louis K, Emam AM, Elbarody ZM, Mostafa E. Attitudes towards stuttering of parents and other family members of children who stutter in Egypt. Speech Lang Hear 2020; doi: 10.1080/2050571X.2020.1724360

71. Davis S, Howell P, Cooke F. Sociodynamic relationships between children who stutter and their non-stuttering classmates. J Child Psychol Psychiatry 2002; 43(7):939-47.

72. Hearne A, Packman A, Onslow M, Quine S. Stuttering and its treatment in adolescence: the perceptions of people who stutter. J Fluency Disord 2008; 33(2):81-98.

73. Langevin M, Prasad NG. A stuttering education and bullying awareness and prevention resource: a feasibility study. Lang Speech Hear Serv Sch 2012; 43(3):344-58.

74. Hayhow R, Cray AM, Enderby P. Stammering and therapy views of people who stammer. J Fluency Disord 2002; 27(1):1–16.

75. Hugh-Jones S, Smith PK. Self-reports of short-and long-term effects of bullying on children who stammer. Br J Educ Psychol 1999; 69(Pt 2):141-58.

76. Klein JF, Hood SB. The impact of stuttering on employment opportunities and job performance. J Fluency Disord 2004; 29(4):255-73.

77. Kearney CA. Social Anxiety and Social Phobia in Youth: Characteristics, Assessment, and Psychological Treatment. Boston, MA, United States: Springer; 2005.

78. Kimbrel NA. A model of the development and maintenance of generalized social phobia. Clin Psychol Rev 2008; 28(4):592-612.

79. Ollendick TH, Hirsfeld-Becker DR. The developmental psychopathology of social anxiety disorder. Biol Psychiatry 2002; 51(1):44-58.

80. Alfano CA, Beidel DC, Turner SM. Cognitive correlates of social phobia among children and adolescents. J Abnorm Child Psychol 2006; 34(2):182-201.

81. Morris TL. Social Phobia. In: Vassey MW, Dadds MR, Eds, The Developmental Psychopathology of Anxiety. Oxford, England: Oxford University Press; 2001. P.435–58.

82. Higa-McMillan CK, Ebesutani C. The etiology of social anxiety disorder in adolescents and young adults. In: Alfano CA, Beidel DC, Eds, Social anxiety in adolescents and young adults: Translating developmental science into practice. 10th ed. Washington, DC, US: American Psychological Association 2011. P.29–51.

83. Hofmann SG, Barlow DH. Social Phobia (Social Anxiety Disorder). In: Barlow DH, Ed, Anxiety and Its Disorders: The Nature and Treatment of Anxiety and Panic. 2nd ed. New York, NY, United States: Guilford Press; 2002. P.454–76.

84. Rapee RM, Spence SH. The etiology of social phobia: empirical evidence and an initial model. Clin Psychol Rev 2004; 24(7):737-67.

85. Smith KA, Iverach L, O’Brien S, Mensah F, Kefalianos E, Hearne A, et al. Anxiety in 11-year-old children who stutter: Findings from a prospective longitudinal community sample. J Speech Lang Hear Res 2017; 60(5):1211-22.
86. Mahserejian SM, Scripture JP, Mauro AJ, Lawrence EJ, Jonasson EM, Murray KS, et al. Microtubule Stutter: a Transient Dynamic Instability Phase that is Strongly Associated with Catastrophe. bioRxiv 2019; doi:10.1101/2019.12.16.878603

87. Manning W, Beck JG. Personality dysfunction in adults who stutter: another look. J Fluency Disord 2013; 38(2):184-92.

88. Miller S, Watson BC. The relationship between communication attitude, anxiety, and depression in stutterers and nonstutterers. J Speech Hear Res 1992; 35(4):789-98.

89. Association Psychiatric Association. Diagnostic Criteria from DSM-IV-TR. Philadelphia, United States: The Association; 2000.

90. Nelg G, Hendrieckx C, Reddy P, Browne JL, Bot M, Dixon J, et al. Comorbid elevated symptoms of anxiety and depression in adults with type 1 or type 2 diabetes: Results from the International Diabetes MILES Study. J Diabetes Complications 2019; 33(8):523-9.

91. Liu Y, Shi W, Ding B, Li X, Xiao K, Wang X, et al. Analysis of Correlates in the SAS, the SDS, and the MMPI of Stutters. Chinese Journal of Clinical Psychology 2001; 9(2):133-4.

92. Tran Y, Blumgart E, Craig A. Subjective distress associated with chronic stuttering. J Fluency Disord 2011; 36(1):17-26.

93. Bray MA, Kehle TJ, Lawless KA, Theodore LA. The relationship of self-efficacy and depression to stuttering. Am J Speech Lang Pathol 2003; 12(4):425-31.

94. Lee YC, Chen VC, Yang YH, Kuo TY, Hung TH, Cheng YF, et al. Association Between Emotional Disorders and Speech and Language Impairments: A National Population-Based Study. Child Psychiatry Hum Dev 2020; 51(3):355-65.

95. Carter AK, Breen LJ, Beilby JM. Self-efficacy beliefs: Experiences of adults who stutter. J Fluency Disord 2019; 60:11-25.

96. Lucey J, Evans D, Maxfield ND. Temperament in Adults Who Stutter and Its Association With Stuttering Frequency and Quality-of-Life Impacts. J Speech Lang Hear Res 2019; 62(8):2691-702.

97. Iverach L, Jones M, O’Brian S, Block S, Lincoln M, Harrison E, et al. Mood and substance use disorders among adults seeking speech treatment for stuttering. J Speech Lang Hear Res 2010; 53(5):1178-90.

98. Perez HR, Stoeckle JH. Stuttering: Clinical and research update. Can Fam Physician 2016; 62(8):479-84.

99. Ardila A, Rosselli M, Puente AE. Neuropsychological Evaluation of the Spanish Speaker. New York City, United States: Springer Science+Business Media; 1994.

100. Butcher JN, Dahlstrom WG, Graham JR, Tellegen A, Kaemmer B. Manual for the restandardized Minnesota Multiphasic Personality Inventory: MMPI-2. An administrative and interpretive guide. Minneapolis, Minnesota, United States: University of Minnesota Press; 1989.

101. Dahlstrom WG. Comparability of two-point high-point code patterns from original MMPI norms to MMPI-2 norms for the restandardization sample. J Pers Assess 1992; 59(1):153-64.

102. Butcher JN, Dahlstrom WG, Graham JR, Tellegen A. Minnesota Multiphasic Personality Inventory-2 (MMPI-2): manual for administration and scoring. Minneapolis, Minnesota, United States: University of Minnesota Press; 1989.

103. Treon M, Dempster L, Blaesing K. MMPI-2/A assessed personality differences in people who do, and not do, stutter. Social Behavior and Personality: an International Journal 2006; 34(3):271-94.

104. Freud D, Zukerman G, Icht M. Personality Dimensions of Speech-Language Pathologists who Work With Clients who Stutter. Commun Disord Q 2019; doi: 10.1177/1525740119886538

105. Simon RI. Suicide risk assessment forms: form over substance? Am Acad Psychiatry Law 2009; 37(3):290-3.

106. Li TM, Chau M, Yip PS, Wong PW. Temporal and computerized psycholinguistic analysis of the blog of a Chinese adolescent suicide. Crisis 2014; 35(3):168-75.

107. Anderson K. The Board Game Club: They were lonely. They were isolated. They had social challenges. Then their SLP started a gaming club for them, and everything changed. ASHA Lead 2016; 21(9):40-1.

108. White J, Morris J. Re-Thinking Ethics and Politics in Suicide Prevention: Bringing Narrative Ideas into Dialogue with Critical Suicide Studies. Int J Environ Res Public Health 2019;16(18):3236.

109. Manning W, Gayle Beck J. The role of psychological processes in estimates of stuttering severity. J Fluency Disord 2013; 38(4):356-67.

110. Muschol M, Kosterin P, Ichikawa M, Salzberg BM. Activity-dependent depression of excitability and calcium transients in the neurohypophysis suggests a model of “stuttering conduction.” J Neurosci 2003; 23(36):11352-62.

111. Lutz J, Mashal N, Kramer A, Suresh M, Gould C, Jordan JT, et al. A Case Report of Problem Solving Therapy for Reducing Suicide Risk in Older Adults with Anxiety Disorders. Clin Gerontol 2020; 43(1):110-7.

112. Enătescu I, Craina M, Ghufovchi A, Giurgi- Oncu C, Hogea L, Nussbaum LA, et al. The role of personality dimensions and trait anxiety in increasing the likelihood of suicide ideation in women during the perinatal period. J Psychosom Obstet Gynecol 2020; 1-11.
113. Stokes N. Social Integration and Suicide Ideation [MSc thesis]. San Marcos, Texas, United States: Texas State University; 2019;
114. Lento RM, Boland H. Suicide in Anxiety Disorders. In: Bui E, Charney ME, Baker AW, editors. Clinical Handbook of Anxiety Disorders. Totowa, New Jersey, United States: Humana, Cham; 2020. doi:10.1007/978-3-030-30687-8_11
115. Duffy ME, Mueller NE, Cougle JR, Joiner TE. Perceived burdensomeness uniquely accounts for suicidal ideation severity in social anxiety disorder. J Affect Disord 2020; 266:43-8.
116. Akbari M, Ebrahimi-Moghadam H. The Effect of Cognitive Therapy on Depression among the Adults with Stuttering. Journal of Research in Rehabilitation Sciences 2017; 13(2):104-10.
117. Akbari M. How dreams help us to accept death: A case study. International Journal of Dream Research 2019; 12(2):72–6.