

# Is There Any Relationship between Social Anxiety Disorder (SAD) and Attention Deficit Hyperactivity Disorder (ADHD)?

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## Abstract

Social anxiety disorder (SAD), formerly known as social phobia, is a pervasive disorder. When placed in social situations, individuals with social phobia experience intense and pervasive fear. People with SAD are afraid that they may be embarrassed or humiliated in front of others, itself leading to experiences of severe fear and anxiety. The instruments employed in this study were three questionnaires, namely demographic questionnaire, Connor Social Panic Inventory (SPIN), and The Conners' Adult ADHD Rating Scales–Self Report: Short Version (CAARS–S:S). For the purposes of this study, full-scale convenience sampling was performed on the statistical population of all medical students studying at the Islamic Azad University, Tabriz Branch in the academic year 2018.

209 people were included in this study, of whom 103 (49.3%) were male and 106 (50.7%) were female. Also, the mean age of the subjects was 25±2 years. Correlation coefficients between the items of inventories indicated a significant correlation between all subscales of ADHD and the presence or absence of social anxiety. There was no significant difference between the scores of male and female students. Based on the findings of this study, it seems that people with a social anxiety disorder are more likely to experience ADHD, while on the other hand, people with ADHD are more likely to have social anxiety.

**Keywords:** Social Anxiety Disorder, Attention Deficit Hyperactivity Disorder

## INTRODUCTION

Social anxiety disorder, formerly known as social phobia, is a pervasive disorder. When a person with SAD is placed in social situations or has to do something in front of them (for example, give a speech), he/she experiences intense and pervasive fear [1]. People with social anxiety disorder fear the slightest possibility that they may exhibit embarrassing or humiliating behaviors in front of others [2]. This disorder is common among students and is associated with a functional disorder in the educational period. [3] The nature of the disorder has been determined based on the studies on personality traits and development of social anxiety disorder, and these personality traits are associated with emotional processes such as irritability (an intense sensitivity to a painful or negative stimulus or experiencing a negative, persistent, and intense effect), and extroversion (extreme sensitivity to pleasurable stimuli or rewards or experiencing a positive, arrogant, and self-assured positive, yet persistent and intense effect more persistently and intensely) [4]. Irritability in people with social anxiety is a sign of vulnerability and coping extroversion [5, 6], and it seems that the cause for the inheritance of social anxiety disorder can be the inheritance of these personality traits [5]. Therefore, people who are more easily irritated and exhibit lower levels of extroversion are more likely to suffer from this disorder.

Attention Deficit Hyperactivity Disorder (ADHD) is one of the most common childhood disorders whose symptoms were first described by Heinrich Hoffmann in 1863. It is also known as minimal brain dysfunction (MBD).

The *Diagnostic and Statistical Manual of Mental Disorders* (DSM) describes it as a stable pattern of inattention and impulsivity and is classified as a neurodevelopmental disorder. For diagnosis, six or more symptoms of inattention and/or six or more symptoms of hyperactivity/impulsivity must have persisted for ≥6 months to a degree that is inconsistent with the developmental level and negatively affects social and academic/occupational activities, while

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symptoms (inattentive or hyperactive/impulsive) must be present in more than 2 settings (e.g., at home, school, or work; with friends or relatives; in other activities). Moreover, symptoms (inattentive or hyperactive/impulsive) must be present before the age of 12 years [7].

In fact, Attention Deficit-Hyperactivity Disorder (ADHD) is a behavioral pattern that occurs in childhood and develops evolutionarily with disproportionate levels of inattention, impulsivity, and/or hyperactivity.

The onset of this disorder occurs in childhood and adolescence [8]. In particular, this disorder is highly prevalent in adolescence in the age range of 18-29 years. [9] In about 80% of cases, this disorder develops from early adolescence to the late 20s. [10] The lifetime prevalence of this disorder ranges from 4.2 to 16% [11]. Epidemiological studies have indicated that this disorder is more prevalent in women than men [12]. Mohammadi et al. (2006) examined the prevalence of social anxiety disorder and its association with other psychiatric disorders in 2518 people over 18 years of age and reported that the lifetime prevalence of social anxiety disorder in the general population is 0.82% (0.4% in men and 1.3% in women) [13].

Numerous epidemiological studies have indicated a prevalence of 4 to 12% in the school-age population, which is 3 times higher in males than females. This disorder, which is characterized by general characteristics of inattention, lack of concentration, impulsivity, and restlessness, disrupts the child's functioning in school, home, and community, and if left untreated, the risk of academic failure, substance abuse, and psychiatric disorders is increased. In addition to hyperactivity, attention deficit, poor concentration, distraction, and problems with restlessness and mood swing are comorbid. Children with ADHD often exhibit learning disabilities and emotional difficulties. The severe effects of this disorder on society, such as high costs, family-related tensions, turmoil in school, vulnerability to crime and substance abuse, and persistence of psychiatric disorders into adulthood have been discussed in several cross-sectional and retrospective studies. Follow-up studies indicate the persistence of this disorder until adolescence and adulthood and the occurrence of psychological damages in later stages of life [14].

In another study performed on the students in Nigeria, the authors reported that the lifetime and 12-month prevalence of social phobia among Nigerian college students are 9.4% and 8.5%, respectively [15]. ADHD is a behavioral disorder that affects the individual's function in the workplace, school, social life, and home, both in childhood and adulthood, and includes three components: inattention, hyperactivity, and impulsive behavior [16]. People with ADHD are weak in the organization (i.e., they are weak in planning ahead, get tired quickly, make impulsive decisions), interpersonal communication (i.e., they behave inappropriately in social

situations, and are unable to keep talking to others), education, and work [17]. 66% of people with ADHD exhibit at least one symptom of neurodevelopmental disorder (such as restlessness, poor concentration, impulsivity, and mood swings). 64% directly complain of restlessness, while 44% exhibit signs of restlessness during their clinical interview [18]. A plethora of researchers argue that the most significant complication in ADHD is the inability to resist and refrain, which reduces the person's abilities in social issues, self-control, discipline, and punctuality [19]. Studies reveal that young ADHD patients can have a reduction of 85% in their risk of developing drugs if they receive proper medications [20]. Social anxiety disorder in adults is comorbid with ADHD in childhood. Patients with ADHD exhibit maladaptive behaviors in the community, based on which they are criticized, humiliated and insulted by the community and parents, and after each incident the person feels ashamed and guilty, hence leading to a vicious cycle. These patients often suffer from social fear and cognitive inhibition in social situations. The aforementioned inhibition remains a fear in the individual and is reiterated, and patients begin to focus and monitor their behavior based on the feedback they receive from others. Eventually, social situations that require performance and role-plays become a strong trigger for anxiety and panic attacks within patients [21]

Cuneyt Evren et al. (2016) performed a study between November 2015 and January 2016 on 520 students who were randomly selected from 5 different colleges to examine the severity of ADHD symptoms. According to the information obtained, the severity of ADHD symptoms was correlated to the severity of SAD symptoms (both in anxiety and fear and in withdrawal). Moreover, a low level of extroversion (introversion) is a synchronous variable for both "anxiety and fear" and "withdrawal", while high irritability is a synchronous variable only for "anxiety and fear" [22]. Furthermore, Ahmet Koyuncu et al. (2016) conducted a study on 130 patients with a social anxiety disorder and reported that 72.3% of patients had a history of exhibiting ADHD symptoms in childhood [23].

Based on the aforementioned concepts, the purpose of this study was to evaluate social anxiety disorder and ADHD among medical students of Azad University, as well as the correlation between the two in promoting mental health and paving the way for cognition and alleviating the damage inflicted on this educational group as a member of the healthcare team in prospective plans.

## MATERIALS AND METHODS

The present study was a cross-sectional descriptive study. The statistical population included medical interns and students of physiopathology course studying at the Islamic Azad University of Tabriz in the academic year of 2018. Sampling was performed using the conventional method, and the sample size was over 200 students of the Azad University of Tabriz. The instruments employed in this study were three

questionnaires, namely demographic questionnaire, Connor Social Panic Inventory (SPIN), and The Conners' Adult ADHD Rating Scales–Self Report: Short Version (CAARS–S:SV).

The Conners' Adult ADHD Rating Scales–Self Report: Short Version (CAARS–S:SV) contains 30 items which are scored on the Likert scale.

The questionnaire consists of the following scales:

1. DSM-IV: Inattentive Symptoms
2. DSM-IV: Hyperactive-Impulsive Symptoms
3. DSM-IV: ADHD Symptoms Total
4. ADHD Index

An overall score equal to or higher than 55 can indicate ADHD

Another tool employed in this study was the Social Panic Inventory (SPIN). It is a 17-item questionnaire scored on the Likert scale. It consists of 3 scales, namely, fear (6 items), avoidance (7 items), and physiological distress (4 items). These 17 items are scored from 0 to 4, and hence the total score ranges from 0 to 68. The higher the score of the respondent, the more severe the disorder (a score of 19 or higher indicates a problem [24-26]. Cronbach's alpha is 0.907 for SPIN and 0.937 for CAARS–S:SV.

After explaining the purpose of the study and obtaining their interest, informed consent was obtained from the candidates. Then, respondents completed three questionnaires of demographic questionnaire, Connor Social Panic Inventory (SPIN), and The Conners' Adult ADHD Rating Scales–Self Report: Short Version (CAARS–S:SV) in the presence of the researcher. In case any ambiguity arose, the researcher answered their questions. Finally, the results were used for statistical analysis.

Finally, following the completion of the relevant questionnaires and performing coding using SPSS v. 20, the information was analyzed using both descriptive statistics (mean, standard deviation, cross-tabulation, and frequency distribution) and inferential statistics (analysis of variance, regression analysis, t-test, or Fisher's exact test and factor analysis). The significance level was considered  $P < 0.05$  for this study.

## RESULTS AND DISCUSSION

### Sample size

Social phobia inventory (SPIN) and Conners' Adult ADHD Rating Scales–Self Report: Short Version (CAARS–S:S) were administered to 212 students. Also, owing to the limitations and non-completion of the questionnaires despite the follow-ups, 3 questionnaires were removed from the work process and thus the final sample volume was reduced to 209. 103 (49.3%) students were male and 106 (50.7%) were female. The mean age of the subjects was  $25 \pm 2$  years.

To examine the relationship between the two questionnaires, the criteria for measuring both questionnaires should be the same. For this purpose, both were converted to a scale of 100.

**Table 1.** Scales of Social phobia inventory and Connors Adult Questionnaire

	Mean $\pm$ SD	Median (range)
SPIN		
Fear 100	22.02 $\pm$ 16.5	20.83 (0,91.67)
Avoidance 100	22.34 $\pm$ 17	17.86 (0,89.29)
Physiological distress 100	23.35 $\pm$ 17.56	18.75 (0,87.5)
Connors' Adult ADHD Rating Scales		
DSM-IV inattentive symptoms100	28.01 $\pm$ 18.77	25.93 (0,96.3)
DSM-IV hyperactivity/impulsive symptoms100	29.81 $\pm$ 20.37	25.93 (0,90.48)
DSM-IV ADHD symptoms total100	28.9 $\pm$ 17.76	25.93 (0,92.59)
ADHD index100	29.97 $\pm$ 17.22	27.78 (0,77.78)

According to **Table 1**, the mean of all scales of fear, avoidance, and physiological distress, had increased. The higher the score, the more risk of social phobia on that scale

Likewise, in the scales of the Connors *Adult ADHD Rating Scales*, the higher the score, the higher the incidence of ADHD in that scale.

**Table 2.** Correlation matrix between the scales of the two questionnaires

		Fear 100	Avoidance 100	Physiological distress 100
DSM-IV inattentive symptoms100	Correlation co eff.	0.335	0.261	0.199
	p-value	0.000	0.000	0.004
	Frequency	208	208	208
DSM-IV hyperactivity/impulsive symptoms100	Correlation co eff.	0.215	0.131	0.156
	p-value	0.002	0.059	0.025
	Frequency	208	208	208
DSM-IV ADHD symptoms total100	Correlation co eff.	0.299	0.213	0.194
	p-value	0.000	0.002	0.005
	Frequency	208	208	208
ADHD index100	Correlation co eff.	0.371	0.277	0.256
	p-value	0.000	0.000	0.000
	Frequency	208	208	208

**Table 3.** Relationship between SAD and subscales of Adult ADHD Rating Scales

	Social phobia				p-value
	Without		With		
	Mean	SD	Mean	SD	
DSM-IV inattentive symptoms 100	24.54	16.94	36.82	20.58	<0.001
DSM-IV hyperactivity/impulsive symptoms 100	27.30	18.92	36.10	22.80	0.005
DSM-IV ADHD symptoms total 100	25.91	16.12	36.45	19.70	<0.001
ADHD index 100	26.97	16.29	37.67	17.44	<0.001

**Table 2** presents the correlation coefficients between the questionnaire scales, indicating that the more fear, avoidance, and physiological discomfort a person has, the more likely he/she is to suffer from ADHD.

Moreover, the findings from **Table 3** indicate that the prevalence of each of the subscales of the Connors Adult Questionnaire is higher among people who have social phobia by definition.

Among people suffering from the social phobia by definition, the means are 20.58 for the first subscale, 22.8 for the second subscale, 19.7 for the third subscale, and 17.44 for the last subscale (that is, the ADHD index).

As can be seen, the p-value of the difference in each subscale is statistically significant.

**Table 4.** Relationship between the genders in the questionnaire

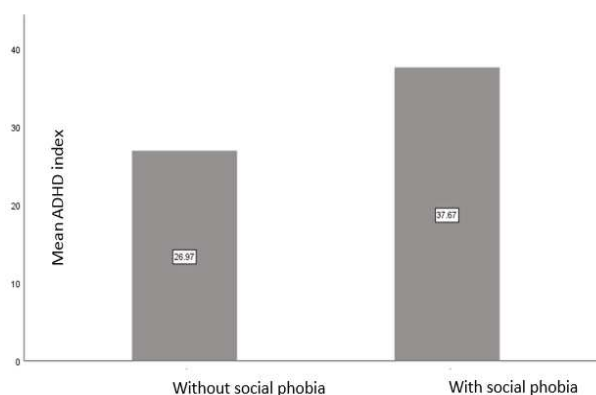
	Gender				p-value
	Male		Female		
	Mean ± SD	Median (range)	Mean ± SD	Median (range)	
DSM-IV inattentive symptoms 100	26.96 ± 19.51	25.93 (0,96.3)	29.03 ± 18.05	25.93 (0,81.48)	0.426
DSM-IV hyperactivity/impulsive symptoms 100	31.12 ± 22.06	25.93 (0,90.48)	28.53 ± 18.6	22.22 (0,88.89)	0.359
DSM-IV ADHD symptoms total 100	29.01 ± 19.1	25.93 (0,92.59)	28.79 ± 16.44	26.69 (0,79.63)	0.93
ADHD index100	30.41 ± 18.05	27.78 (0,77.78)	29.54 ± 16.44	27.78 (0,75)	0.716
Fear 100	22.31 ± 17.04	20.83 (0,79.17)	21.74 ± 16.05	20.83 (0,91.67)	0.802
Avoidance 100	23.51 ± 17.95	21.43 (0,75)	21.22 ± 16.04	17.86 (0,89.29)	0.331
Physiological distress 100	24 ± 17.85	18.75 (0,87.5)	22.72 ± 17.35	25 (0,81.25)	0.601

As can be seen in **Table 4**, there was no significant difference between the scores of male and female students.

**Table 5.** Relationship between ADHD index and social phobia subscales

	Non-standard regression coefficient	Standardized regression coefficient	t-statistic	p-value	95% CI	
					Lower bound	Upper bound
Fear 100	0.430	0.411	3.443	0.001	0.184	0.676
Avoidance 100	-0.023	-0.022	-0.217	0.829	-0.230	0.185
Physiological distress 100	-0.030	-0.031	-0.322	0.748	-0.217	0.156

As can be seen from **Table 5**, among the three subscales of social phobia, fear has the most effect on the ADHD index. In other words, the higher the score of fear, the higher the ADHD index and the more likely the person suffers from this disorder (p-value = 0.04).



**Figure 1.** The relationship between social phobia and ADHD

According to **Figure 1**, the mean ADHD index is higher in students with social phobia by definition.

Social anxiety disorder (SAD), formerly known as social phobia, is a pervasive disorder. When placed in social situations, individuals with social phobia experience intense and pervasive fear, leading to significant social dysfunction.

The purpose of this study was to examine the relationship between social phobia and attention deficit hyperactivity disorder in medical students of Tabriz Azad University.

Sadock et al. (2007) reported that women are more affected by this disorder than men, while in the present study, there was no significant difference between men and women in the occurrence of this disorder. Furthermore, Bella et al. (2009) reported that the prevalence of social phobia in Nigerian

students was 9.4% in females and 8.5% in males, respectively.

A cross-sectional descriptive study that examined the prevalence of ADHD in a group of 244 students in 2004 revealed that the age range of 18-32 years has the highest rate of prevalence. There was no significant difference between the group with and without ADHD in terms of the mean age. Furthermore, there was no significant difference between the two groups in terms of educational level.

The current study revealed a relatively high rate of ADHD in the study population, which is consistent with the prevalence rate of 2 to 4% for ADHD mentioned in previous studies. It should be noted however that the symptoms of inattention or impulsivity may be evident in those who did not complete the questionnaire, in which case the actual prevalence would be higher than the reported value.

Barkley et al. (1990) argue that the disease may be more prevalent in the general public who do not have a university-level education, and students with this disorder may be less successful in completing their course, which further highlighted the significance of its timely diagnosis and treatment.

Substance abuse has been cited as a consequence and disorder comorbid with ADHD [26], but due to the limited sample and the manner of questioning, this study is inconclusive in this regard.

Due to the limited sample size, the limitations of convenience samplings, non-randomness and exclusion criteria, questionnaires being self-reporting, and the impossibility of monitoring the completion of questionnaires, the results of this study cannot be generalized to all students, and hence more extensive studies are needed.

In our country, ADHD in adults has been studied and the aforementioned questionnaire has been adjusted based on the conditions of Iranian samples [26, 27]. The content validity was verified through a pilot study using Cronbach's alpha method. Owing to the high prevalence of this disorder in adults and the importance of its timely diagnosis and treatment, more extensive studies are needed to determine its prevalence in the general population.

On the other hand, practical solutions such as psychological assessment of students during initial enrollment, more attention to this disorder in university counseling centers, educating counselors, and timely referral to a psychiatrist, reduce the adverse effects of adult ADHD on their educational, occupational, and social life.

## CONCLUSION

Based on the findings of this study, it seems that people with a social anxiety disorder are more likely to experience

ADHD, while on the other hand, people with ADHD are more likely to have social anxiety.

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