ORIGINAL ARTICLE

The Relationship Between Social Anxiety and Anxiety Sensitivity in Young Adults with Methamphetamine Use Disorder

Metamfetamin Kullanım Bozukluğu Olan Genç Yetişkinlerde Sosyal Anksiyete ve Anksiyete Duyarlılığı Arasındaki İlişki

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ABSTRACT

Objective: Recently, it has been observed that the prevalence of substance use in young adulthood has increased. Comorbidity of anxiety disorders is high in individuals with substance use disorder (SUD). In this study, it was aimed to investigate the relationship between anxiety sensitivity and social anxiety in young adults using methamphetamine.
Material and Methods: 101 patients diagnosed with methamphetamine use disorder were included in the study. Participants were evaluated with sociodemographic data form, Addiction Profile Index (BAPI), Symptom Check List (SCL-90-R), Liebowitz Social Anxiety Inventory (LSAI) and Anxiety Sensitivity Index-3 (ASI-3).
Results: It was determined that 70.3% of the subjects with SUD were diagnosed as social anxiety disorder (SAD). ASI-3, SCL-90-R and BAPI scores were statistically significantly higher in the SAD group than in the non-SAD group (p<0.05). A statistically significant positive correlation was found in the SAD group between the LSAI-fear/anxiety subscale scores and ADI-3 total (r=0.26, p<0.05), ADI-3 cognitive (r=0.34, p<0.05) and SCL-90-R total scores (r=0.28, p<0.05). No correlation was found between LSAI scores and ADI-3 total and subscale scores in the non-SAD group (p>0.05).
Conclusion: It can be suggested that anxiety sensitivity is a common risk factor for both methamphetamine use disorder and social anxiety. Social anxiety symptoms should be questioned in individuals with methamphetamine use disorder and substance addiction treatment should be carried out together with social anxiety disorder treatment.
Keywords: Methamphetamine use disorder, young adult, anxiety sensitivity, social Anxiety

ÖZ

Amaç: Son zamanlarda genç erişkinlik döneminde madde kullanım yaygınlığının arttığı gözlenmektedir. Madde kullanım bozukluğu(MKB) olan bireylerde anksiyete bozukluğu eştanısı yüksektir. Bu çalışmada metamfetamin kullanan genç erişkinlerde kaygı duyarlılığı ile sosyal anksiyete arasındaki ilişkinin araştırılması amaçlanmıştır.
Gereç ve Yöntemler: MKB tanısı alan 101 hasta çalışmaya dahil edildi. Katılımcılar sosyodemografik veri formu, Bağımlılık Profil İndeksi(BAPI), Belirti Kontrol Listesi(SCL-90-R), Liebowitz Sosyal Anksiyete Envanteri(LSAE) ve Anksiyete Duyarlılık İndeksi-3(ADİ-3) ile değerlendirildi.
Bulgular: MKB olgularının %70,3'ünün Sosyal Anksiyete Bozukluğu(SAB) tanısı aldığı belirlendi. ADİ-3, SCL-90-R ve BAPİ puanları SAB grubunda, SAB olmayan gruba göre istatistiksel olarak anlamlı derecede yüksekti (p<0.05). SAB grubunda LSAE-korku/anksiyete alt ölçek puanları ile ADİ-3 toplam(r=0.26, p<0.05), ADİ-3 bilişsel(r=0.34, p<0.05) ve SCL-90-R toplam puanları arasında istatistiksel olarak anlamlı pozitif bir korelasyon saptandı(r=0.28, p<0.05). SAB olmayan grupta LSAE puanları ile ADİ-3 toplam ve alt ölçek puanları arasında korelasyon bulunmadı (p>0,05).
Sonuç: Kaygı duyarlılığının hem metamfetamin kullanım bozukluğu hem de sosyal kaygı için ortak bir risk faktörü olduğu öne sürülebilir. Metamfetamin kullanım bozukluğu olan bireylerde sosyal anksiyete belirtileri sorgulanmalı ve madde bağımlılığı tedavisi sosyal anksiyete bozukluğu tedavisi ile birlikte yürütülmelidir.

Anahtar Kelimeler: Metamfetamin kullanım bozukluğu, genç erişkin, anksiyete duyarlılığı, sosyal anksiyete

Introduction

Young adulthood is a critical period for transitioning from recreational to problematic use of psychoactive substances, including nicotine. Studies show a prevalence of about 30% for tobacco use and 13% for alcohol abuse or substance abuse during this period. Substance use among young people is also common in our country. This prevalence may increase in the presence of anxiety disorders. Recent studies in psychiatry show that anxiety disorders and substance use disorders (SUD) occur together at higher rates than expected (1,2). A meta-analysis found that individuals with SUD were two to three times more likely to have any anxiety disorder compared to those without SUD

(3). Grant et al. (2004) found that approximately 17.7% of those with SUD in the last 12 months met the criteria for anxiety disorder, and 15% of those with any anxiety disorder in the last 12 months had at least one SUD. In this study, the relationship between anxiety disorders and SUD was found stronger than the relationship between anxiety and alcohol use disorders (4). In clinical studies, it has been reported that one of the most common comorbid conditions in methamphetamine users is anxiety (5,6). In various studies, it has been shown that amphetamine and methamphetamine users report a history of anxiety and develop anxiety disorder after they start using amphetamine (7-9). This high synchrony

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observed between anxiety and SUD arouses significant interest among researchers and clinicians because of its developmental and chronicity characteristics, clinical impact and treatment factors.

Social anxiety disorder (SAD), which has a high lifetime prevalence of 4.0-13.3% among anxiety disorders and follows a chronic process, is defined in DSM-5 as "a marked fear or concern about one or more social situations in which the individual is exposed to possible scrutiny by others (10,11). There are studies showing that individuals with social anxiety have higher rates of smoking, alcohol and drug use than individuals who are not socially anxious (12-15). Social phobia begins in early childhood or adolescence and is often accompanied by depression, other anxiety disorders, alcohol and substance abuse, or eating disorders (16). Zimmerman et al. (2004) reported the rate of SAD in substance addicts as 62.6% Although studies examining treatment-seeking alcohol addicts and drug-addicted individuals indicate a high proportion of individuals who meet the criteria for SAD, this disorder may be overlooked in SUD treatment (17). People with high social anxiety appeared to be more likely to use cannabis to reduce anxiety in social situations, consistent with their patterns of tension reduction (18). The lifetime prevalence of cannabis addiction among people with social anxiety disorder (SAD) is approximately seven times that of the general population (19).

Etiological models for the accompaniment of SAD and SUD generally suggest three types of mechanisms: (a) social anxiety causes or increases the risk of substance abuse; (b) substance abuse causes or increases the risk of social anxiety; and/or (c) a third variable causes or increases the risks of both disorders. According to the first model, substances are used to cope with negative emotions. Here, they are used as self-medication tools because the pharmacological or psychological effects of alcohol, cannabis and other substances act as negative reinforcers by reducing the deterrent effects of anxiety symptoms (20). Considering the strong influence of some structural and environmental factors on the development of adolescents and young adults, it can be thought that other variables mentioned in the third model are more likely to increase the risk of both social phobia and substance abuse. It is possible that one of these covariates may be anxiety sensitivity. Anxiety sensitivity (AS) is a cognitive style that reflects an individual's tendency to interpret anxiety-related sensations as harmful or dangerous (21). Many researchers suggest that anxiety sensitivity may be an important mediating factor for drug use behavior (22,23). In a sample of students, increased anxiety sensitivity was associated with increased reports of substance abuse (24). It has been suggested that anxiety sensitivity is associated with poorer coping skills, which may increase the tendency to use drugs or alcohol (25).

There is no study in the existing literature on the relationship between social anxiety and methamphetamine addiction, which has been widely used recently. In our study, it was aimed to evaluate the relationship between social phobia and anxiety sensitivity in young adults with methamphetamine use disorder. If anxiety sensitivity is determined as a common risk factor as a result of our findings, it can be thought that it will contribute to the development of new treatment approaches in this direction.

Materials and Methods

A total of 101 patients using methamphetamine who were admitted to the Alcohol and Substance Addiction Treatment Clinic of a Training and Research Hospital and were diagnosed with SUD by SCID-5-PD (structured clinical interview for DSM-5), were included in our study. Patients who used substances other than methamphetamine, had neurological and neurocognitive disorders, and were diagnosed with substance use-related psychotic disorder were not included in the study. Participants were evaluated with sociodemographic data form, Addiction Profile Index (BAPI), Symptom Check List (SCL-90-R), Liebowitz Social Anxiety Inventory (LSAI) and Anxiety Sensitivity Index-3 (ASI-3). Study sample were divided into two groups as SAD and non-SAD groups according to LSAI scores. Participants with a Liebowitz Social Anxiety Inventory score of 67 and below were defined as the group without social anxiety disorder (non-SAD group), and those with a score of 68 and above were defined as the group with social anxiety disorder (SAD group). According to LSAI scores, 70 of the 101 participants were classified as SAD and 31 as non-SAD group.

Sociodemographic data form: In the form created by the researchers, questions related to the variables of substance use such as age, marital status, educational status, employment status, as well as the type of drug used, age at onset of substance use, frequency of use were included.

Addiction Profile Index (BAPI): It is a self-report questionnaire consisting of 37 items and 5 subscales which was developed by McLellan et al. (1992) to determine the severity of addiction (26). The subscales measure the characteristics of substance use, dependency diagnosis, the effect of substance use on the person's life, craving and the motivation for quitting using substances. Below 12 points is considered as low addiction severity. Turkish validity and reliability study was conducted by Ögel et al. (2012) (27).

Symptom Check List (SCL-90-R): It is a psychiatric symptom screening tool based on self-assessment. It was developed by Derogatis et al. (28) and its Turkish validity and reliability study was carried out by Dağ (29). It was composed of 10 subscales: somatization, anxiety, depression, obsessive-compulsive features, sensitivity in interpersonal relationships, anger, paranoid thoughts, psychotic symptoms, phobia and additional scales. The increase in the General Symptom Index (GSI), which is the overall mean score of the scale, indicates the level of distress experienced by the individual's psychiatric symptoms. In the evaluation of each subscale score and general symptom score, scores between 0.00-1.5 are considered as "normal",

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scores between 1.51-2.5 "high symptom level" and scores between 2.51-4.00 as "very high symptom level".

Liebowitz Social Anxiety Inventory (LSAI): It was developed by Liebowitz to investigate the social anxiety symptoms (30,31). The scale consists of 24 items assessing fear/anxiety and avoidance in 11 social interaction situations (e.g., talking to authorized persons) and 13 performance-based situations (e.g., taking a test). Using a 4-point Likert-type scale (from 0 to 3), participants rate their fears/anxiety and avoidance for each item. For all items, social anxiety symptoms are indexed by summing fear and avoidance ratings. The Turkish validity and reliability study was carried out by Dilbaz and Güz (2001). Those who scored 68 and above were considered at risk for social anxiety (32).

Anxiety Sensitivity Index-3 (ASI–3): The scale was developed by Taylor et al. (2007) in order to evaluate physical, social and cognitive sub-categories and anxiety sensitivity multidimensionally (33). It consists of 18 items in three subdimensions as cognitive, physical and social concerns. The Turkish validity and reliability study was performed by Mantar et al. (2010) (34).

Statistical Analysis

Study data were analyzed with the IBM Statistical Package for the Social Sciences for Windows 26.0 package program (SPSS 26.0-IBM, NY, USA). Demographic and clinical characteristics of the participants were evaluated with descriptive statistical analyzes such as number, percentage, and mean. The distribution of the variables was evaluated with Shapiro Wilk test and it was determined that the variables showed normal distribution. Paired comparisons were investigated with Student-t test and relationships between categorical variables were investigated by using the Chi-Square test. The relationship between the BAPI, SCL-90-R, LSAI and ASI-3 scores was analyzed by Pearson Correlation Analysis. In all analysis, p<0.05 was accepted as the threshold value for statistical significance.

Results

It was determined that 70.3% of the participants were diagnosed as social anxiety disorder according to LSAI scores. There was no statistically significant difference between the two groups in terms of age, educational status, marital status, employment status and the age of onset of substance use(p>0.05). Sociodemographic data of the groups are presented in Table 1. While 56.4% of the sample group stated that the reason for substance use was to relieve anxiety and boredom, 11.9% stated that it was to increase self-confidence, to be assertive, and 4% to dream. There was no statistically significant difference between the two groups in terms of the reason for substance use (p>0.05).

When the ASI-3, SCL-90-R total and subscale scores of the SUD sample group were compared according to the presence of SAD, it was found that all scale scores were statistically significantly higher in the SAD group than in the non-SAD group (p<0.05) (Table 2).

The SAD and the non-SAD groups were compared in terms of BAPI total and BAPI subscale scores, and BAPI total(p=0.039), dependency diagnosis(p=0.037) and craving(p=0.044) subscale scores were statistically significantly higher in the SAD group than the non-SAD group (Table 3).

Table 1. Sociodemographic data of the methamphetamine use disorder subjects according to the presence of social anxiety disorder

	SAD (n=31)	Non-SAD (n=70)	p
Age (Mean±SD)	31,19±6,09	30,50±6,59	,609
Education status			
Primary	17(%54,8)	36(%51,4)	
High school	11(%35,5)	31(%44,3)	,473
University and higher	3(%9,7)	3(4,3)	
Marital status			
Married	8(25,8)	24(%34,3)	
Single/Divorced	23(%74,2)	46(%65,7	,398
Working status			
Having regular job	16(%51,6)	36 (%51,4)	
Not having regular job	15(%48,4)	34(%48,6)	,986
Age onset of substance use (Mean±SD)	21,12±9,78	23,41±7,85	,257

*p<0.05, SAD: Social anxiety disorder group, non-SAD: non-Social anxiety disorder group, SD: Standard deviation

Table 2. Comparison of groups according to SCL-90-R, ASI-3 Total and ASI-3 subscale scores

	Group	n	Mean	SD	t	*df*	p
ASI-3 Total	Non-SAD	31	12,09	15,82	-3,52	59,38	,001
	SAD	70	24,41	16,36			
ASI-3 physical	Non-SAD	31	3,09	4,82	-3,84	75,68	,000
	SAD	70	7,55	6,453			
ASI-3 cognitive	Non-SAD	31	5,09	6,15	-3,16	67,27	,002
	SAD	70	9,54	7,25			
ASI-3 social	Non-SAD	31	3,90	5,71	-2,86	51,50	,006
	SAD	70	7,31	5,03			
SCL-90-R Total	Non-SAD	31	,60	,54	-4,01	92,30	,000
	SAD	70	1,21	,96			

*p<0.05, ASI-3: Anxiety Sensitivity Index-3, SCL-90-R: Symptom Check List-90-R, SAD: Social anxiety disorder group, Non-SAD: Non-Social anxiety disorder group, SD: Standard deviation

Table 3. Comparison of groups according to BAPI Total and BAPI subscale scores

		n	Mean	SD	t	df	p
The characteristics of substance use	Non-SAD	31	,56	,70	-1,38	64,87	,170
	SAD	70	,78	,79			
Dependency diagnosis	Non-SAD	31	4,77	3,37	-2,11	60,90	,037
	SAD	70	6,37	3,58			
The effect of substance uses on the person's life	Non-SAD	31	10,80	6,88	-1,17	50,95	,241
	SAD	70	12,40	5,98			
Craving	Non-SAD	31	2,48	2,40	-2,03	56,61	,044
	SAD	70	3,52	2,36			
The motivation for quitting using substances	Non-SAD	31	3,87	2,45	-1,553	46,67	,124
	SAD	70	4,57	1,90			
BAPI Total	Non-SAD	31	4,06	2,32	-2,09	56,34	,039
	SAD	70	5,10	2,27			

*p<0.05, SAD: Social anxiety disorder group, Non-SAD: Non-Social anxiety disorder group, BAPI: Addiction Profile Index, SD: Standard deviation

As a result of the correlation analysis between the ASI-3, SCL-90-R, LSAI and BAPI scale scores of the groups, a statistically significant positive correlation was found in the SAD group between the LSAI- fear/anxiety subscale scores and ADI-3 total (r=0.26, p<0.05), ADI-3 cognitive (r=0.34, p<0.05) and SCL-90-R total scores (r=0.28, p<0.05). No correlation was found between LSAI-avoidance subscale scores and SCL-90-R, ADI-3 and BAPI scores in the SAD group (p>0.05). In the SAD group, there was a statistically significant positive correlation between BAPI and ADI-3 total, physical, cognitive and social subscales (respectively, r=0.56,r=0.37, r=0.51 and r=0.53, p<0.05) and SCL-90-R (r=0.64, p<0.05). In the non-SAD group, there was a statistically significant positive correlation between both LSAI-fear/anxiety and avoidance scores, and both SCL-90-R (respectively, r=0.49 and r=0.47, p<0.05) and BAPI (respectively, r=0.62 and r=0.53, p<0.05) scale scores. Also, a statistically significant positive correlation was found in the non-SAD group between BAPI and SCL-90-R scale scores (r=0.57, p<0.05). No correlation was found between LSAI scores and ADI-3 total and subscale scores in the non-SAD group (p>0.05) (Table 4).

Table 4. Pearson correlation analysis between LSAI, ASI-3, SCL-90-R and BAPI scale scores of the groups

			1	2	3	4	5	6	7
SAD	1. LSAI-Fear/Anxiety	r	-						
	2. LSAI-Avoidance	r	.35*						
	3. ASI Total	r	.26*	.08					
	4.ASI-physical	r	.13	.15	.85*				
	5.ASI-cognitive	r	.34*	.08	.89*	.60*			
	6.ASI-social	r	.20	-.02	.86*	.62*	.70*		
	7.SCL-90-R	r	.28*	.19	.54*	.29*	.63*	.46*	
	8.BAPI	r	.11	-.01	.53*	.37*	.51*	.53*	.64*
Non-SAD	1. LSAI-Fear/Anxiety	r	-						
	2. LSAI-Avoidance	r	.56*						
	3. ASI Total	r	.10	.15					
	4.ASI-physical	r	.11	.12	.95*				
	5.ASI-cognitive	r	.09	.09	.95*	.88*			
	6.ASI-social	r	.09	.22	.93*	.84*	.81*		
	7.SCL-90-R	r	.49*	.47*	.09	.10	.10	.06	
	8.BAPI	r	.62	**.53***	.20	.18	.18	.21	**.57***

r=Pearson correlation coefficient, *p<0.05

SAD: Social anxiety disorder group, Non-SAD: Non-Social anxiety disorder group, LSAI: Liebowitz Social Anxiety Inventory, ASI: Anxiety Sensitivity Index-3, SCL-90-R: Symptom Check List-90-R, BAPI: Addiction Profile Index, SD: Standard deviation

Discussion

In our study, in which we investigated the relationship between social anxiety and anxiety sensitivity in young adult men using methamphetamine, it was a remarkable finding that social anxiety scores were above the cut-off point in 70.3% of our sample group. This high SAD rate among methamphetamine addicts was similar to the rates reported by Zimmerman et al. (20). In the literature, there are also study results reporting that the presence of social anxiety disorder is associated with less substance use, especially in adolescents, and that social anxiety disorder may be a protective factor from substance use (35,36). Although the cross-sectional nature of our study did not allow us to establish a cause-effect relationship between the variables, we can explain the high prevalence of SAD among people who use methamphetamine by one of the following three mechanisms; (a) SAD symptoms leading to self-medication with methamphetamine, (b) methamphetamine use causing SAD, or (c) having common factors shared for both, such as anxiety sensitivity (AS). When the study sample was divided into two groups as those with and without social anxiety, it was determined that the severity of addiction, general psychiatric symptom severity, and anxiety sensitivity of the social anxiety group were higher than the group without social anxiety. Anxiety sensitivity was found to affect addiction-related variables as well as psychiatric symptoms. These results suggest that AS is a common risk factor for methamphetamine use and social anxiety.

Anxiety sensitivity is one of the important factors in the development and maintenance of substance-related disorders (37). Higher AS can increase the likelihood of substance use in individuals with anxiety (38). Individuals with higher anxiety sensitivity tend to misinterpret the results of their physiological response to anxiety, thereby exacerbating their symptoms. The expectation model of fear assumes that avoidance of feared stimuli results from both expectation and sensitivity (39). Rector, Szacun-Shimizu, and Leybman (2007) found that the physical, social, and cognitive dimensions of ASI were highly associated with panic disorder with or without agoraphobia, social anxiety disorder, and generalized anxiety disorder in middle-aged adults (40). Thus, individuals with high social anxiety may be more likely to fear negative evaluation of their experiences by others and take preventive measures to prevent or regulate these experiences to alleviate distress.

Reiss (39), who suggested the expectation model of fear, has suggested that anxiety sensitivity plays a role in the development and maintenance of anxiety disorders and substance-related disorders. According to Reiss (1991), high expectation anxiety increases avoidant behaviors such as substance use, and high anxiety sensitivity may exacerbate these behaviors. It has been reported that there is a positive relationship between anxiety sensitivity and drug and alcohol use in patients with post-traumatic stress disorder (41). It appears that high anxiety sensitivity leads to more severe anxiety reactions and increases the likelihood of using substances as a way of avoiding these unpleasant feelings (25).

Substance use is generally motivated by efforts to regulate emotions (42,43). Our study sample stated that they mostly used the substance to relieve anxiety and boredom. In emotion-regulation models of SUD, it is suggested that negative affect states may increase the risk of substance use by reducing negative emotions by negative reinforcement or self-medication

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(38,44). Studies examining the examples of psychiatric treatment show that there is a similarity between social anxiety and alcohol and other substance use disorders (38,44-46). These results suggest that people with social anxiety may turn to substance use in order to cope with their symptoms.

The results of McCaul et al. (2017) showed that high ASI scores were associated with a more frequent and stronger desire to consume alcohol (47). Wolitzky-Taylor et al. (2015) showed that anxiety sensitivity was a mediating factor in the relationship between social anxiety disorder, generalized anxiety disorder, and panic disorder in adolescents with alcohol consumption problems (48). DeMartini and Carey (2011) have stated that AS can affect alcohol consumption through a chain of mediators in the model, they proposed to explain the relationship between anxiety sensitivity and alcohol consumption (49). Buckner et al. (2011) have suggested that the social anxiety component of AS regulates the relationship between cannabis use and craving, and that people sometimes use coping strategies such as substance abuse to avoid negative evaluations or to avoid embarrassment in social situations (50). McDermott et al. (2009) have shown that social anxiety is more common among crack/cocaine users with post-traumatic stress disorder (51).

High AS is associated with SUD in many studies (22,52,53). In studies examining the relationships between SUD and ASI sub-dimensions, physical and cognitive symptoms of ASI were associated with relapse (54,55). In our study, physical, cognitive and social components of AS, general psychiatric symptom severity and severity of addiction were found higher in the SAD group compared to the non-SAD group. However, the correlation between the cognitive component of AS, and the anxiety component of social anxiety in the social anxiety group may indicate that cognitive processes should be studied more specifically in individuals using methamphetamine accompanied by social anxiety. Also, higher levels of social anxiety were associated with a faster orientation towards negative social cues and more generally threat-related social information (56,57).

In the methamphetamine use disorder with the SAD group, the correlation between the BAPI total scores and all the variables except for both the fear/anxiety and avoidance subscale of the LSAI suggests that anxiety and avoidance action may decrease with the use of methamphetamine. Individuals with social anxiety are likely to use stimulants and cocaine to reduce anxiety symptoms and self-medicate (58). For some individuals, symptoms of anxiety may precede methamphetamine use, and substance use may indeed constitute a strategy for managing distressing psychiatric symptoms (59). Since stimulants and cocaine have similar pharmacological effects with antidepressants (increased norepinephrine, dopamine and serotonin) used to treat social anxiety, it has been suggested that individuals with social anxiety may use these substances in social settings (60). The low dopamine 2 receptor binding potential in

social anxiety also supports this view (61).

In substance addicts without social anxiety disorder LSAI-anxiety subscale scores were correlated with LSAI-avoidance, SCL-90-R and BAPI scores, while the BAPI score was positively correlated with LSAI-avoidance and SCL-90-R scores. The fact that LSAI anxiety and avoidance subscale scores did not show a correlation with AS in the subjects without SAD and that LSAI-avoidance scores were associated with BAPI and SCL-90-R scores indicated that avoidance was more related to substance use behavior than anxiety. Some studies point out that individuals with social anxiety who do not reach the level of a clinical disorder may be at higher risk of alcohol dependence than individuals with high levels of social anxiety (13,14).

The cross-sectional nature of our study does not allow to establish a cause-effect relationship. Another limitation of ours is that social anxiety disorder diagnosis was based on LSAI scores and the study data consists of the self-reports of the participants.

Conclusions

Since substance use is generally motivated by efforts to regulate emotions, it is important to detect the presence of a condition that affects functionality such as social anxiety. Since the presence of social anxiety may pose a risk for resumption of substance use, the treatment of methamphetamine use disorder should be carried out together with the treatment of social anxiety.

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References

1.Kessler RC, Crum RM, Warner LA, Nelson CB, Schulenberg J, Anthony JC. Lifetime co-occurrence of DSM-III-R alcohol abuse and dependence with other psychiatric disorders in the National Comorbidity Survey. Arch Gen Psychiatry 1997 ;54:313-321.

2.Kushner MG, Abrams K, Borchardt C. The relationship between anxiety disorders and alcohol use disorders: a review of major perspectives and findings. Clin Psychol Rev 2000; 20:149-171.

3.Lai HMX, Cleary M, Sitharthan T, Hunt GE. Prevalence of comorbid substance use, anxiety and mood disorders in epidemiological surveys, 1990–2014: A systematic review and meta-analysis. Drug Alcohol Depend 2015; 154:1-13.

4.Grant BF, Dawson DA, Stinson FS, Chou SP, Dufour MC, Pickering RP. The 12-month prevalence and trends in DSM-IV alcohol abuse and dependence: United States, 1991–1992 and 2001–2002. Drug Alcohol Depend. 2004;74:223-234.

5.Darke S, Kaye S, McKetin R, Duflou J. Major physical and psychological harms of methamphetamine use. Drug Alcohol Rev 2008; 27:253-262.

6.Zweben JE, Cohen JB, Christian D, Galloway GP, Salinardi M, Parent D, et al. Psychiatric symptoms in methamphetamine users. Am J Addict. 2004; 13:181-190.

7.Hall W, Hando J, Darke S, Ross J. Psychological morbidity and route of administration among amphetamine users in Sydney, Australia.

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Addiction 1996; 91:81-87.

8.McKetin R, Ross J, Kelly E, Baker A, Lee N, Lubman DI, et al. Characteristics and harms associated with injecting versus smoking methamphetamine among methamphetamine treatment entrants. Drug Alcohol Rev 2008; 27:277-285.

9.Glasner-Edwards S, Mooney LJ, Marinelli-Casey P, Hillhouse M, Ang A, Rawson R, et al. Anxiety disorders among methamphetamine dependent adults: association with post-treatment functioning. Am J Addict. 2010; 19:385-390.

10.Stein DJ, Lim CCW, Roest AM, de Jonge P, Aguilar-Gaxiola S, Al-Hamzawi A, et al. The cross-national epidemiology of social anxiety disorder: Data from the World Mental Health Survey Initiative. BMC Med 2017; 15:143.

11.Judd LL. Social phobia: a clinical overview. J Clin Psychiatry 1994; 55 Suppl:5-9.

12.Kessler RC, Stein MB, Berglund P. Social phobia subtypes in the National Comorbidity Survey. Am J Psychiatry 1998; 155:613-619.

13.Merikangas KR, Avenevoli S, Acharyya S, Zhang H, Angst J. The spectrum of social phobia in the Zurich cohort study of young adults. Biol Psychiatry 2002; 51:81-91.

14.Crum RM, Pratt LA. Risk of heavy drinking and alcohol use disorders in social phobia: a prospective analysis. Am J Psychiatry 2001; 158:1693-1700.

15.Prinstein MJ, Boergers J, Spirito A. Adolescents' and their friends' health-risk behavior: factors that alter or add to peer influence. J Pediatr Psychol 2001; 26:287-298.

16.Myrick H, Brady K. Current review of the comorbidity of affective, anxiety, and substance use disorders. Curr Opin Psychiatry 2003; 16:261-70.

17.Zimmermann G, Pin MA, Krenz S, Bouchat A, Favrat B, Besson J, et al. Prevalence of social phobia in a clinical sample of drug dependent patients. J Affect Disord 2004; 83:83-87.

18.Buckner JD, Bonn-Miller MO, Zvolensky MJ, Schmidt NB. Marijuana use motives and social anxiety among marijuana-using young adults. Addict Behav 2007; 32:2238-2252.

19.Agosti V, Nunes E, Levin F. Rates of psychiatric comorbidity among U.S. residents with lifetime cannabis dependence. Am J Drug Alcohol Abuse 2002; 28: 643-652.

20.Khantzian EJ. The self-medication hypothesis of substance use disorders: a reconsideration and recent applications. Harv Rev Psychiatry 1997; 4:231-244.

21.Reiss S, Peterson RA, Gursky DM, McNally RJ. Anxiety sensitivity, anxiety frequency and the prediction of fearfulness. Behav Res Ther 1986; 24:1-8.

22.Norton GR. Substance use/abuse and anxiety sensitivity: What are the relationships? Addict Behav 2001; 26:935-946.

23.Stewart SH, Kushner MG. Introduction to the Special Issue on "Anxiety Sensitivity and Addictive Behaviors." Addict Behav 2001; 26:775-785.

24.Wagner MK. Behavioral characteristics related to substance abuse and risk-taking, sensation-seeking, anxiety sensitivity, and self-reinforcement. Addict Behav 2001; 26:115-120.

25.Kushner MG, Thuras P, Abrams K, Brekke M, Stritar L. Anxiety mediates the association between anxiety sensitivity and coping-related drinking motives in alcoholism treatment patients. Addict Behav 2001; 26:869-885.

26.McLellan AT, Kushner H, Metzger D, Peters R, Smith I, Grissom G, et al. The Fifth Edition of the Addiction Severity Index. J Subst Abuse Treat 1992; 9:199-213.

27.Ögel K, Evren C, Karadağ F, Gürol DT. The development, validity, and reliability of the Addiction Profile Index (API). Turk Psikiyatri Derg 2012; 23:263-275.

28.Derogatis LR, Lipman RS, Covi L. SCL-90: an outpatient psychiatric rating scale--preliminary report. Psychopharmacol Bull 1973; 9(1):13-28.

29.Dağ I. Belirti Tarama Listesi (Scl-90-R)'nin Üniversite Öğrencileri için güvenirliği ve geçerliği. Türk Psikiyatri Dergisi 1991; 2:5-12.

30.Heimberg RG, Horner KJ, Juster HR, Safren SA, Brown EJ, Schneier FR, et al. Psychometric properties of the Liebowitz Social Anxiety Scale. Psychol Med 1999; 29:199-212.

31.Fresco DM, Coles ME, Heimberg RG, Liebowitz MR, Hami S, Stein MB, et al. The Liebowitz Social Anxiety Scale: a comparison of the psychometric properties of self-report and clinician-administered formats. Psychol Med 2001; 31:1025-1035.

32.Dilbaz, N. Validity and reliability of the Liebowitz social anxiety scale. 37th National Psychiatry Congress Abstract Book, Istanbul, 232, 2001.

33.Taylor S, Zvolensky MJ, Cox BJ, Deacon B, Heimberg RG, Ledley DR, et al. Robust dimensions of anxiety sensitivity: development and initial validation of the Anxiety Sensitivity Index-3. Psychol Assess 2007; 19:176-188.

34.Mantar A. Validity and reliability study of the Turkish form of Anxiety Sensitivity Index-3 (Doctoral dissertation, Dokuz Eylül University Faculty of Medicine), 2008.

35.McCauley Ohannessian C. Anxiety and substance use during adolescence. Subst Abus 2014; 35(4):418-25.

36.Fröjd S, Ranta K, Kaltiala-Heino R, Marttunen M. Associations of social phobia and general anxiety with alcohol and drug use in a community sample of adolescents. Alcohol Alcohol 2011; 46(2):192-199.

37.Saed O, Khakpoor S. Anxiety sensitivity and substance-related disorders: a narrative review. Asia Pac J Clin Trials Nerv Syst Dis 2020; 5:37-41.

38.Stewart SH, Conrod P. Anxiety and Substance Use Disorders: The Vicious Cycle of Comorbidity. Springer Science & Business Media, 2007.

39.Reiss S. Expectancy model of fear, anxiety, and panic. Clin Psychol Rev 1991; 11:141-153.

40.Rector NA, Szacun-Shimizu K, Leybman M. Anxiety sensitivity within the anxiety disorders: disorder-specific sensitivities and depression comorbidity. Behav Res Ther 2007;45(8):1967-1975.

41.Naifeh JA, Tull MT, Gratz KL. Anxiety Sensitivity, Emotional Avoidance, and PTSD Symptom Severity Among Crack/Cocaine Dependent Patients in Residential Treatment. Cognit Ther Res 2012; 36:247-257.

42.Cooper ML, Frone MR, Russell M, Mudar P. Drinking to regulate positive and negative emotions: a motivational model of alcohol use. J Pers Soc Psychol 1995; 69:990-1005.

43.Ingram RE, Price JM. Vulnerability to Psychopathology: Risk Across the Lifespan. Guilford Press, 2010.

44.Burke RS, Stephens RS. Social anxiety and drinking in college students: a social cognitive theory analysis. Clin Psychol Rev 1999 ;19:513-530.

45.DeWit DJ, MacDonald K, Offord DR. Childhood stress and symptoms of drug dependence in adolescence and early adulthood: social phobia as a mediator. Am J Orthopsychiatry 1999; 69:61-72.

46.Evren C. Social anxiety disorder and alcohol use disorders. Current Approaches in Psychiatry 2010; 2: 473-515.

47.McCaul ME, Hutton HE, Stephens MAC, Xu X, Wand GS. Anxiety, Anxiety Sensitivity, and Perceived Stress as Predictors of Recent Drinking, Alcohol Craving, and Social Stress Response in Heavy Drinkers. Alcohol Clin Exp Res 2017; 41:836-845.

48.Wolitzky-Taylor K, Guillot CR, Pang RD, Kirkpatrick MG, Zvolensky MJ, Buckner JD, et al. Examination of anxiety sensitivity and distress tolerance as transdiagnostic mechanisms linking multiple anxiety pathologies to alcohol use problems in adolescents. Alcohol Clin Exp Res 2015; 39:532-539.

49.DeMartini KS, Carey KB. The role of anxiety sensitivity and drinking

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motives in predicting alcohol use: a critical review. Clin Psychol Rev 2011; 31:169-177.

50.Buckner JD, Zvolensky MJ, Smits JAJ, Norton PJ, Crosby RD, Wonderlich SA, et al. Anxiety sensitivity and marijuana use: an analysis from ecological momentary assessment. Depress Anxiety 2011; 28:420-426.

51.McDermott MJ, Tull MT, Gratz KL, Daughters SB, Lejuez CW. The role of anxiety sensitivity and difficulties in emotion regulation in posttraumatic stress disorder among crack/cocaine dependent patients in residential substance abuse treatment. J Anxiety Disord 2009; 23:591-599.

52.Bonn-Miller MO, Zvolensky MJ, Bernstein A. Marijuana use motives: concurrent relations to frequency of past 30-day use and anxiety sensitivity among young adult marijuana smokers. Addict Behav 2007; 32:49-62.

53.Schmidt NB, Buckner JD, Keough ME. Anxiety sensitivity as a prospective predictor of alcohol use disorders. Behav Modif 2007; 31:202-219.

54.Zvolensky M, Bonn-Miller M, Bernstein A, Marshall E. Anxiety sensitivity and abstinence duration to smoking. J Ment Health 2006; 15:659-670.

55.Zvolensky MJ, Bernstein A, Cardenas SJ, Colotla VA, Marshall EC, Feldner MT. Anxiety sensitivity and early relapse to smoking: a test among Mexican daily, low-level smokers. Nicotine Tob Res 2007; 9:483-491.

56.Buckner JD, Maner JK, Schmidt NB. Difficulty disengaging attention from social threat in social anxiety. CognitTherRes 2010; 34:99-105.

57.Schulze L, Renneberg B, Lobmaier JS. Gaze perception in social anxiety and social anxiety disorder. Front Hum Neurosci 2013; 7:872.

58.Sareen J, Chartier M, Paulus MP, Stein MB. Illicit drug use and anxiety disorders: findings from two community surveys. Psychiatry Res 2006; 142:11-17.

59.Robinson J, Sareen J, Cox B, Bolton J. Self-medication of anxiety disorders with alcohol and drugs: Results from a nationally representative sample. J Anxiety Disord 2009; 23:38-45.

60.Camacho A, Stein MB. Modafinil for social phobia and amphetamine dependence. Am J Psychiatry 2002; 159:1947–1948.

61.Schneier FR, Liebowitz MR, Abi-Dargham A, Zea-Ponce Y, Lin SH, Laruelle M. Low dopamine D(2) receptor binding potential in social phobia. Am J Psychiatry 2000; 157:457-459.