

Original Research Article

ASSOCIATION BETWEEN SOCIAL INTERACTION ANXIETY AND SEVERITY OF DEPENDENCE IN MALE PATIENTS WITH ALCOHOL USE DISORDER

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ABSTRACT

Background: The objective is to determine the point prevalence of clinically relevant social anxiety disorder (SAD) symptoms and evaluate the dimensional relationship and severity correlation between social interaction anxiety and alcohol dependence among male patients undergoing clinical rehabilitation.

Materials and Methods: Study Design: Hospital-based, cross-sectional observational study. Setting: Department of Psychiatry at a tertiary care medical centre. Participants: A sample of 120 male patients (aged 18–60 years) diagnosed with Alcohol Use Disorder (AUD) according to the Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-5) criteria. The minimum sample size was calculated using Cochran's single-proportion framework, based on an anticipated literature-derived prevalence of 27.6% and an 8.0% margin of error. All participants were selected via convenience sampling and were required to have documented, continuous clinical abstinence from alcohol for at least one month at evaluation. Patients with psychiatric comorbidities other than anxiety, or with severe, unstable medical/neurological conditions, were excluded. Main outcome measures: Point prevalence of social anxiety symptoms quantified using the Social Interaction Anxiety Scale (SIAS). Graded clinical severity profiles of alcohol dependence were measured using standardised diagnostic criteria. Independent associations between sociodemographic variables and severe alcohol dependence.

Results: Among the 120 participants (50.0% abstinent for 4–6 weeks, 50.0% for 6–8 weeks), a highly significant incremental association was found between the severity of social anxiety symptoms and mean alcohol dependence scores (mild: 1.68 ± 0.47 ; moderate: 3.48 ± 0.85 ; severe: 4.88 ± 1.68 ; $p=0.001$). Patients with formal social anxiety disorder exhibited a disproportionately high rate of severe alcohol dependence compared to those without the comorbidity (65.6% vs 18.2%, $p<0.001$). Spearman's rank correlation analysis confirmed a remarkably strong, positive linear correlation between underlying social interaction anxiety and alcohol dependence severity scores ($r = 0.813$, $p = 0.001$). No statistically significant associations were identified between severe alcohol dependence and primary sociodemographic measures, including socioeconomic status ($p=0.989$), education ($p=0.493$), or marital status ($p=0.271$).

Conclusion: Social interaction anxiety is significantly prevalent and strongly tied to the severity of alcohol dependence in treatment-seeking males, persisting even after a stabilised period of abstinence. The high, positive dimensional correlation supports a dose-response model consistent with the self-medication hypothesis. These findings highlight a critical clinical need for

routine, early screening for social anxiety symptoms within de-addiction settings and emphasise the development of integrated, dual-diagnosis clinical protocols (such as combined cognitive behavioural therapy and motivational enhancement) to reduce relapse rates and optimise long-term psychiatric recovery.

Keywords: Alcohol Use Disorder, Social Anxiety Disorder, Comorbidity, Social Interaction Anxiety Scale, Cross-Sectional Studies, Abstinence; Male.

INTRODUCTION

Alcohol Use Disorder (AUD) is a severe worldwide public health problem that is defined by problematic alcohol use and resulting significant clinical, social, and psychological impairment. AUD is often complicated by extensive psychiatric comorbidities, and these often significantly worsen the disease course and risk of relapse. Of these co-occurring disorders, the most common is Social Anxiety Disorder (SAD), which involves chronic, high levels of anxiety about social or performance settings. Epidemiological and clinical models indicate a complex, bidirectional relationship between these two pathologies. Although there are indications from genetic twin studies that there is a shared biometric vulnerability structure (innate social anxiety can predict and be responsible for subsequent AUD development), clinical experience often reveals a self-medication cycle.^[1] People frequently use alcohol as a maladaptive "social lubricant" to reduce the immediate social fear, which later escalates to "physiological dependence" and "alcohol abuse", becoming "severe and chronic".^[2,3]

Although it is increasingly acknowledged that these two clinical disorders coexist, there remains a substantial body of unexplored literature examining the relationship between specific behavioural types and objective measures of clinical severity, especially during critical periods of recovery. Fine-grained data on patients who are comorbid with SAD and are established in clinical abstinence programs are limited, although broad epidemiological studies have yielded data showing that comorbid SAD is associated with poorer overall health-related quality of life and poorer standard alcohol-focused therapeutic outcomes.^[4] Firstly, most primary literature focuses on actively drinking populations or samples that are predominantly seeking treatment for index anxiety disorders,^[5] with a considerable limitation in the availability of operational data about patients receiving a standardised psychiatric rehabilitation after a period of stabilisation and abstinence. Secondly, many cross-sectional observational models focus on global 'alcohol consumption levels' or one-dimensional diagnostics rather than examining specific cognitive mechanisms, such as unique interpretation and expectancy biases that directly connect specific social interaction fears to severe dependence severity.^[6] Moreover, current models often view alcohol dependence as a single rather than a

heterogeneous condition, and do not adequately stratify the correlations between specific aspects of social interaction and severity measures across locally recruited, demographically heterogeneous cohorts. This study aims to fill these important empirical gaps by examining the exact dimensional relationship between social interaction anxiety and the severity of social interaction profiles in a well-defined and specialised sample of individuals who are actively clinically treated for AUD. This is different from traditional observation cohorts, which include individuals who had not been abstinent from alcohol for at least one month, because this study includes only individuals who have maintained at least one month of continuous alcohol abstinence, which removes the immediate confounding neurotoxic and acute withdrawal responses associated with active drinking on measured anxiety scores. This study uses an intensive clinical recruitment methodology and a specific Social Interaction Anxiety Scale (SIAS), along with standardised measurement instruments, to separate the chronic, underlying characteristic of anxiety that is potentially more harmful to long-term recovery. In addition, this study examines these links in a population of men alone, within the context of a regional public health system, with particular clinical data on a population of severe dependence and high burden of suicidal ideation,^[7] that has not been well represented in regionalised, multi-centre systematic reviews.^[8]

Aim of the Study

The main objective of this study is to identify the point prevalence of clinically relevant symptoms of social anxiety in alcohol use disorder (AUD) patients who are abstinent for at least one month during clinical rehabilitation. Further, the current study is designed to examine the precise statistical relationship and dimensional correlation between SIA symptom severity and AD severity within this clinical population, thereby providing a definitive evidence-based basis for integrated, dual-diagnosis therapeutic interventions.

MATERIALS AND METHODS

Study Design and Setting: The study was a cross-sectional, hospital-based observational study conducted over 4 months. The study was conducted in the Department of Psychiatry at a tertiary care medical centre. Prior to starting, the institution's Ethics Committee approved the study and informed

written consent was required for all subjects involved.

Participants and Selection Criteria

Patients with a primary clinical diagnosis of Alcohol Use Disorder (AUD) were the study population. The total sample size was $N = 120$, which was obtained through convenience sampling.

Eligibility criteria for the study were:

Subjects aged between 18 and 60 with a formal diagnosis of Alcohol Use Disorder (AUD) made using the criteria outlined in the DSM-5. And sustained abstinence from alcohol for at least one month at evaluation, and who gave Consent to participate and informed consent.

If a subject had any of the following, they were excluded from the study: Comorbid psychiatric disorders other than anxiety-related disorders (e.g., major depressive disorder, bipolar affective disorder or psychotic disorders) to isolate the social anxiety phenotyping. Severe comorbid medical or unstable neurological conditions that could bias cognitive/behavioural assessments.

Cochran's single-proportion formula: $n = [Z^2 P(1 - P)] / d^2$ was used to set the minimum sample size for this study, which employed a cross-sectional observational design. A range of 23% to 35% of outpatients with alcohol dependence (AD) across all tertiary psychiatric clinics have been reported to suffer from significant comorbid social anxiety disorder (SAD) symptoms, based on published clinical data done by Oliveira LM et al.^[8] These historical parameters have been taken into consideration, and an anticipated prevalence (P) of 27.6% (0.276) was assumed for this cohort. The absolute margin of error (d) for the primary prevalence estimation was calculated to be 8.0% (0.08) at a 95% confidence level ($Z = 1.96$), and a minimum sample size of 120 participants was determined to achieve sufficient precision for prevalence estimation and subsequent nonparametric correlation testing. The demographic distribution of the treatment-seeking clinical volume during the study period resulted in an entirely male final study cohort ($n = 120$).

Operational measurements and variables.

A structured pro forma was used to systematically collect sociodemographic data, including age, socioeconomic status, educational level, occupational status, family structure, and marital status. Detailed clinical history of the exact amount of time that alcohol had been abstained was confirmed by clinical chart review and patient interviews.

There were two major operational dimensions that were measured:

Standardised diagnostic criteria were used to systematically study the graded severity and clinical phenotype of alcohol dependence.

1. **Alcohol Dependence Severity:** Graded severity levels and clinical phenotypes of alcohol dependence were systematically evaluated using

standardised diagnostic criteria, using DSM-5 symptom counts.

2. **Social Anxiety Phenotyping:** Social anxiety symptoms and social interaction impairments were formally quantified using the Social Interaction Anxiety Scale (SIAS).

Statistical Analysis

IBM SPSS Statistics version 26.0 was used for data processing and statistical computations. Means, standard deviations (SDs), and ranges are reported for continuous variables (e.g., age, scale scores) that were examined for normality. Categorical variables are summarised as absolute frequencies and percentages (n, %).

The data from the clinical measurement scales were ordinal and non-normally distributed; therefore, nonparametric inferential statistics were used. The Kruskal-Wallis test was employed to assess the differences in social anxiety scores in various stratified severity categories of alcohol use. Spearman's rank correlation coefficient (ρ) was used to assess the direction and strength of the linear correlation between social interaction anxiety and alcohol dependence. All statistical tests were two-tailed, and an a priori α of 0.05 was selected to establish the level of statistical significance.

RESULTS

There were 120 individuals who were using alcohol and were diagnosed with an alcohol use disorder. The sociodemographic characteristics of the study participants are summarised in [Table 1]. The lower and lower-middle categories of socioeconomic status accounted for 20.8% of the population each, while the upper-lower status accounted for 20.0%. 19.2% of participants were from the upper and upper-middle socioeconomic classes. Most participants (77.5%) were married, while 22.5% were unmarried. The distribution of abstinence length was also even (50% for 4–6 weeks and 50% for 6–8 weeks). As for educational level, 29.2% had a diploma and 28.3% had a high school education. A quarter (25.0%) of the study population was skilled workers, 36.7% were semi-skilled workers, and 26.7% were unskilled workers. The distribution of family type was almost evenly split, with 33.3% in each of the extended, joint, and nuclear family types. [Table 1]

A statistically significant association was observed between the severity of social anxiety symptoms and alcohol dependence scores. The alcohol dependence scores of the participants with mild, moderate, and severe social anxiety symptoms were 1.68 ± 0.47 , 3.48 ± 0.85 , and 4.88 ± 1.68 , respectively. The increase in alcohol dependence severity with different SIAS categories was found to be significant by the Kruskal-Wallis test ($p=0.001$). [Table 2]

There was also a strong correlation between social anxiety disorder and severe alcohol dependency.

However, of those with social anxiety disorder, 65.6% were severely alcohol dependent, while 34.4% were not. Among participants who did not have social anxiety disorder, 81.8% did not exhibit severe alcohol dependence, but 18.2% did exhibit severe alcohol dependence. On Chi-square analysis, this association was found to be highly statistically significant ($p < 0.001$). [Table 3]

A further assessment of the relationship between sociodemographic variables and severe alcohol dependence was carried out. There was no correlation between severe alcohol dependence and any of the following variables: socioeconomic status ($p = 0.989$), educational status ($p = 0.493$), occupation

($p = 0.440$), family type ($p = 0.874$) or marital status ($p = 0.271$) at a statistically significant level. The sample with diploma education and the married group seemed to be more likely to have a severe level of alcohol dependence, but these results did not reach statistical significance. [Table 4]

The strong correlation found between SIAS and alcohol dependence scores was confirmed by correlation analysis. [Figure 1] The correlation coefficient was statistically highly significant ($r = 0.813$; $p = 0.001$) when compared with Spearman's correlation analysis, suggesting that there was a positive correlation between the severity of social anxiety symptoms and alcohol dependence.

Table 1: Sociodemographic characteristics of study participants (N=120)

Variable	Category	Frequency (n)	Percentage (%)
Socioeconomic status	Lower	25	20.8
	Lower middle	25	20.8
	Upper lower	24	20.0
	Upper	23	19.2
	Upper middle	23	19.2
Marital status	Married	93	77.5
	Single	27	22.5
Duration of abstinence	4–6 weeks	60	50.0
	6–8 weeks	60	50.0
Educational status	Diploma degree	35	29.2
	High school	34	28.3
	Primary school	27	22.5
	Middle school	24	20.0
Occupation	Skilled	44	36.7
	Semi-skilled	44	36.7
	Unskilled	32	26.7
Family type	Extended	40	33.3
	Joint	40	33.3
	Nuclear	40	33.3

Table 2: Association between the severity of social anxiety symptoms and the alcohol dependence score

SIAS category	n	Mean alcohol dependence score $\pm$ SD	Kruskal wallis test
Mild	65	1.68 $\pm$ 0.47	0.001**
Moderate	23	3.48 $\pm$ 0.85	
Severe	32	4.88 $\pm$ 1.68	

Table 3: Association between Social Anxiety Disorder and Severe Alcohol Dependence

Social anxiety disorder	Severe AUD present n (%)	Severe AUD absent n (%)	p value
Present	21 (65.6)	11 (34.4)	<0.001
Absent	16 (18.2)	72 (81.8)	

*Chi-square test applied

Table 4: Association of sociodemographic variables with severe alcohol dependence

Variable	Category	Severe AUD present n (%)	Severe AUD absent n (%)	p value
Socioeconomic status	Lower	8 (32.0)	17 (68.0)	0.989
	Lower middle	7 (28.0)	18 (72.0)	
	Upper	8 (34.8)	15 (65.2)	
	Upper lower	7 (29.2)	17 (70.8)	
	Upper middle	7 (30.4)	16 (69.6)	
Educational status	Diploma degree	13 (37.1)	22 (62.9)	0.493
	High school	12 (35.3)	22 (64.7)	
	Middle school	5 (20.8)	19 (79.2)	
	Primary school	7 (25.9)	20 (74.1)	
Occupation	Semi-skilled	15 (34.1)	29 (65.9)	0.440
	Skilled	15 (34.1)	29 (65.9)	
	Unskilled	7 (21.9)	25 (78.1)	
Family type	Extended	12 (32.4)	25 (67.6)	0.874
	Joint	12 (27.9)	31 (72.1)	
	Nuclear	13 (32.5)	27 (67.5)	
Marital status	Married	31 (33.3)	62 (66.7)	0.271
	Single	6 (22.2)	21 (77.8)	

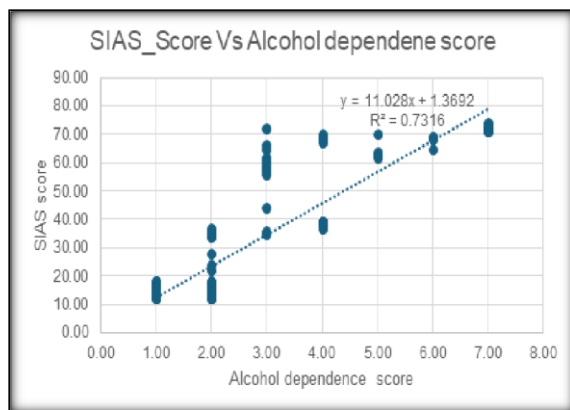


Figure 1: Correlation between the SIAS score and the alcohol dependence score

$r=0.813$ and p value $=0.001$.

DISCUSSION

The main aim of the present cross-sectional study was to assess the prevalence of social anxiety symptoms and to evaluate the relationships among the severity of alcohol dependence and social anxiety disorder (SAD). The Social Interaction Anxiety scale (SIAS) was used to measure social anxiety symptoms, and statistical analyses were used to examine the relationship between social anxiety symptoms and the severity of alcohol dependence. The results of the present study showed that the alcohol dependence severity was significantly related to social anxiety symptoms, which indicates that social anxiety has an important role in the clinical characteristics of alcohol use disorder.

The sociodemographic data of the participants are summarised in [Table 1]. The study population was relatively balanced, with lower- and middle-income SECs accounting for 20.8% each. The majority of participants were married (77.5%), and 36.7% were skilled or semi-skilled workers. The distribution of family types was the same across all three. These results indicate that alcohol dependency and dependency with social anxiety symptoms do not occur exclusively in one segment of the population; on the contrary, they occur in all segments of the population.

It was found that there was a statistically significant relationship between the severity of social anxiety symptoms and alcohol dependence scores in the present study [Table 2]. Participants who reported high scores on the social anxiety symptoms had significantly higher alcohol dependency scores than those who reported mild and moderate scores on the social anxiety symptoms. The mean ADS scores for participants with mild SIAS scores were significantly lower than those with severe SIAS scores, which increased from 1.68 ± 0.47 to 4.88 ± 1.68 ($p=0.001$). The discovery is consistent with the presence of a dose–response relationship between

the severity of social anxiety and alcohol dependence severity.

These results are in line with previous studies that have shown that social anxiety disorder and alcohol use disorder are highly comorbid disorders. Earlier studies suggested the idea that these anxiety disorders and alcohol use disorders share common genetic and psychological vulnerability factors, leading to high rates of psychiatric comorbidities, which could explain the progressive increase in alcohol dependence severity as a function of increasing SIAS severity in the present study.^[1,2] The self-medication hypothesis suggested by earlier studies might also account for the progressive increase in alcohol dependence severity as a function of increasing SIAS severity in the present study.

These findings highlight the need to detect and treat social anxiety symptoms early in people with alcohol dependence, and a study done by Stapinski et al. suggests that a multi-modal treatment approach with cognitive behavioural therapy and motivational enhancement may be warranted.^[4]

These results are in line with the previous studies done by Subotic-Kerry et al., showing high comorbidity rates between S.A.D. and A.U.D.^[3] The self-medication hypothesis from previous research may help to account for the increasingly greater severity of alcohol dependence as the severity of SIAS increases in the current study. These findings suggest that properly identifying and treating social anxiety symptoms early on in the course of alcohol dependence is important, and that integrated treatment strategies combining cognitive behavioural therapy and motivational enhancement should be considered. The current study also found a very significant relationship between social anxiety disorder and severe alcohol dependence [Table 3]. For those who suffer from social anxiety disorder, 65.6% were severely dependent on alcohol, while 18.2% were not ($p<0.001$). In line with the present study, an epidemiological study by Schneier et al reported that alcohol use disorders were more likely to be present in people with SAD in a national survey population.^[5]

This mechanism might account for greater use of alcohol in socially threatening situations and escalation to severe alcohol dependence in socially anxious individuals, which is in consensus with other studies done by Chow et al.^[6] A higher prevalence and severity of social anxiety symptoms were also reported among alcohol-dependent outpatients by Yoshimi et al., and social anxiety symptoms were found to be important predictors of clinical severity in their study.^[7] Similarly, Oliveira et al, in a systematic review, suggested that social anxiety disorder is highly prevalent and associated with increased illness burden among people with alcohol use disorder and found that it is associated with poor clinical outcomes.^[8]

The results of the present study are further corroborated by other studies. Cooper et al also

found that higher rates of coping-related drinking motives were associated with social anxiety disorder, and that individuals with both social anxiety disorder and alcohol dependence had higher psychiatric impairment and functional disability than those without social anxiety disorder.^[10] The present study also found that the level of alcohol dependence increased with increasing severity of social anxiety disorder, supporting the theory that drinking is used to reduce interpersonal anxiety and social discomfort.

The present study also showed a significant positive correlation between the SIAS scores and alcohol dependence scores with the Spearman correlation coefficient $r=0.813$ ($p=0.001$) [Figure 1]. This finding indicates that increasing severity of social anxiety symptoms is associated with increasing severity of alcohol dependence. In accordance with this notion, Miloyan and Doorn found a longitudinal relationship between social anxiety disorder and alcohol use disorder, indicating that individuals who continued to experience social anxiety symptoms over time were more likely to develop alcohol use disorder.^[11]

This high correlation in the present study could also be accounted for by common neurobiological and behavioural pathways between anxiety disorders and substance use disorders. These factors have been proposed in previous literature as mediators of this comorbidity: increased sensitivity to negative social appraisal, emotional dysregulation, stress-related neurobiological changes, and avoidance coping strategies, all of which could lead to increased alcohol use via negative reinforcement processes, resulting in more severe alcohol dependence.^[1,8]

In the present study, there were no statistically significant links between severe alcohol dependence and socioeconomic status, educational status, occupation, family type, or marital status [Table 4]. There were no statistically significant differences in the proportions of severe alcohol dependence in any of the categories, though there were relatively higher proportions of severe alcohol dependence in some categories. This finding indicates that other factors than just demographic measures may have a greater impact on the severity of alcohol dependence – psychological ones, like social anxiety symptoms. The findings of the present study have important clinical implications. Identification of social anxiety symptoms among individuals with alcohol use disorder may facilitate early psychiatric intervention and improve overall treatment outcomes. Gimeno et al. emphasised that integrated management strategies addressing both anxiety symptoms and alcohol dependence are associated with better clinical outcomes and reduced relapse risk among patients with dual pathology.^[12] Similarly, Moussaoui et al recently highlighted the importance of recognising coexisting social anxiety and alcohol dependence as a clinically significant dual pathology requiring multidisciplinary management approaches.^[13] The present findings therefore

support routine screening for social anxiety symptoms in de-addiction settings to enable comprehensive psychiatric care.

There are some limitations to the present study. The cross-sectional design does not allow causal inferences to be drawn from the data regarding the relationship between social anxiety symptoms and the severity of alcohol dependence. All participants were male, and the results may not be transferable to females. In addition, the small sample size and single-centre design could be a limitation in terms of external validity. There is a need for future longitudinal studies with larger and more diverse samples to better assess causal relationships, neurobiological mechanisms, and longer-term treatment outcomes of comorbid SAD and AUD.

CONCLUSION

Emotional neglect was the strongest independent predictor of depression severity in this sample, outweighing both emotional and physical abuse; sexual abuse and physical neglect showed no independent effect. Domain-specific trauma screening — particularly for emotional neglect — should be considered part of routine psychiatric assessment in young adults with depressive symptoms. As this was a cross-sectional study, causality cannot be established; longitudinal research in larger, more diverse samples is needed to confirm these findings and identify the mechanisms involved.

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