

# Dual diagnosis and psychosocial correlates in substance abuse in Menoufia, Egypt

Nabil R. Mohamed<sup>a</sup>, Samy A. Hammad<sup>b</sup>, Lamia G. El Hamrawy<sup>a</sup>, Afaf Z. Rajab<sup>a</sup>, Mohamed S. El Bahy<sup>a</sup>, Mohamed R. Soltan<sup>a</sup>

Departments of <sup>a</sup>Neuro-Psychiatry <sup>b</sup>Toxicology and Clinical Forensic, Faculty of Medicine, Menoufia University, Shebin El Kom, Menoufia Governorate, Menoufia, Egypt

Correspondence to Mohamed R. Soltan, MSc, Department of Neuro-Psychiatry, Faculty of Medicine, Menoufia University, El Gory Village, Bercket El Saba City, Menoufia Governorate, Egypt  
Tel: +20 482 915 058, +20 482 999 084, +20 122 156 2006;  
e-mail: mohamed\_soltan200@yahoo.com

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## Objectives

To study the comorbid psychiatric disorders among substance abusers in Menoufia and to identify whether there is a correlation between the type of substance and the comorbid disorder that occurred, and also to determine whether there are specific risk factors that can cause this comorbidity.

## Background

A dual diagnosis presents a challenging problem to clinicians as substance use disorders occurring together with mental health disorders represent a major health problem.

## Participants and methods

Study participants comprised 120 Egyptian substance abusers. They were subjected to the following: semistructured interview sheet, Fahmy and El Sherbini Social Classification scale, semistructured clinical interview for DSM-IV (SCID) both SCID-I for Axis-I diagnosis and SCID-II for Axis-II diagnosis, Addiction Severity Index scale, and a urine screening for substance abuse.

## Results

The findings of the study suggested that 20% of the studied participants were tramadol abusers, 10% were both alcohol and cannabis abusers, 23% were other substances abusers, and 37% were polysubstance abusers. With respect to psychiatric comorbidity, 63.3% of the participants had comorbid psychiatric disorders and comorbid personality disorders (PDs). On studying risk factors for substance abuse, major depressive disorder was found to be the strongest predictor of alcohol abuse. Dependent PD and schizophrenia were the strongest predictors of cannabis abuse. Major depressive disorder and borderline PD were the strongest predictors of opioid abuse. Anxiety disorders and borderline PD were the strongest predictors of sedative abuse. On studying risk factors for comorbid psychiatric disorders in the participants studied, young age (<25 years) and being single were found to be the strongest predictors of comorbid Axis-I disorders.

## Conclusion

Individuals with psychiatric disorders are at an increased risk of having a comorbid substance abuse disorder and vice versa.

## Keywords:

dual diagnosis, psychosocial, substance abuse

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## Introduction

A dual diagnosis presents a challenging problem to clinicians and service planners as substance use disorders (SUDs) occurring together with mental health disorders represent a major health problem [1,2]. To develop effective interventions that include important changes to the treatment system, it is crucial that we better understand the underlying mental health conditions as well as the patterns of substance use and their interactions on different levels [3,4].

Individuals with psychiatric disorders are at an increased risk of having a comorbid substance abuse disorder and vice versa [3,5]. The Epidemiologic Catchment Area study found that 29% of all individuals with mental disorders have fulfilled the criteria for a substance abuse disorder at some time in their past and that having a

mental disorder increased the odds of having a SUD by 2.7 times [5,6].

Individuals abusing or dependent on drugs can develop symptoms similar to those seen in many psychiatric disorders including psychotic symptoms, depression, anxiety, mood swings, and criminal behavior [3,4]. Alcoholic individuals, for example, show a high prevalence of both transient, temporarily persistent anxiety and panic symptoms in early recovery, but only 6% (still twice the rate of the general population), however, have chronic anxiety disorders [4].

In this study, we will try to evaluate the various correlates of Egyptian substance abusers, compare our results with other researches in different countries, and study these correlates from different profiles.

## Participants and methods

The studied group comprised 120 Egyptian participants. Their age ranged between 18 and 50 years and both men and women were included. They fulfilled the criteria for substance abuse according to the DSM-IV-TR criteria. They were selected from both inpatients of the addiction center and from the psychiatric outpatient clinic of Neuro-Psychiatry Department in Menoufia University Hospitals. This was a cross-sectional study carried out for a period of 18 months (from 1 July 2011 to 31 December 2012).

After obtaining oral consent from each participant, the study was developed according to the standard in Quality Improvement System in Ministry Of Health and Population in Egypt. The participants were evaluated using a semistructured interview sheet that gathered general data as well as the drug habits of the patients (type of drug, route of administration, dose, etc.), Fahmy and El Sherbini Social Classification scale, which was used to evaluate the social class, Structured Clinical Interview for DSM-IV Axis-I disorders (SCID-I), which was used to diagnose psychiatric disorders, Structured Clinical Interview for DSM-IV Axis-II disorders (SCID-II), which was used to assess the DSM-IV personality disorders (PDs), the Addiction Severity Index (ASI) scale, which provides a multidimensional assessment for the problems presented by patients with substance abuse disorder, and a urine screening for substance abuse.

## Statistical design and analysis

The results from the questionnaires were collected, revised, coded, and tabulated, and statistically analyzed using Microsoft Excel and SPSS programs. There were descriptive and comparative types, where quantitative data were summarized as mean and SDs and qualitative data were summarized as numbers and percentages. A comparison was made using paired Student's test (*t*-test) in case of quantitative data of two groups and one-way analysis of variance (*f* test) followed by the Bonferroni pos-hoc for multiple comparison. The  $\chi^2$ -test was used for qualitative data. Variables that significantly affected the prevalence of dual diagnosis in substance abuse on this initial analysis by the  $\chi^2$ -test were introduced into the regression analysis model. Different sets of regression analysis were carried out for each group of variables, and then all the significant variables were grouped into two final regression analyses to evaluate the role of different independent variables in the dependent variable. Differences were considered significant if the *P* value was 0.05 or less.

## Results

### Descriptive data

Table 1 shows sociodemographic characteristics of the studied group. With respect to the pattern of substance abuse, it was found that the mean age of onset of substance abuse was  $25.02 \pm 6.88$  years and the mean age of onset of psychiatric disorders was  $23.97 \pm 6.43$  years. Figure 1 shows that opioids were the substance of major problem in 30%, especially tramadol tablets, which account for 20%. Cannabis was the substance of major problem in 10%, sedative tablets (clonazepam 2 mg, e.g. Apetryl) in 10%, alcohol in 10%, and inhalant (Gola) in 1.6%. Polysubstance abuse was present in 38.3% of the participants.

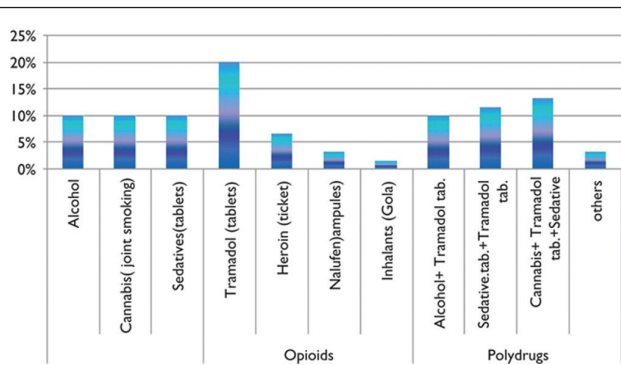
Table 2 shows that 63.3% of the patients had a comorbid psychiatric disorder, and the prevalence of mood disorders was as follows: 20% had substance-induced mood disorders, 10% had major depressive disorder (MDD), and 3–5% had bipolar disorders (Fig. 2). The prevalence of anxiety disorders was as

**Table 1 Descriptive statistics of sociodemographic criteria of the studied group**

Sociodemographic data	Studied group (n = 120) [n (%)]
Sex	
Male	110 (91.7)
Female	10 (8.3)
Age in years	
Mean $\pm$ SD	28.52 $\pm$ 6.73
Range	18–55
Age of onset psychiatric disorders	
Mean $\pm$ SD	23.97 $\pm$ 6.43
Range	13–37
Age of onset of substance abuse	
Mean $\pm$ SD	25.02 $\pm$ 6.88
Range	14–54
Education level	
Illiterate	30 (15)
Read and write	6 (5)
Secondary	14 (11.7)
Technical	40 (33.3)
University	42 (35)
Employment	
Employed	54 (45)
Unemployed	66 (55)
Social class <sup>a</sup>	
I (high)	48 (40)
II (medium)	46 (38.3)
III (low)	18 (15)
IV (very low)	8 (6.7)
Site of interview	
Inpatient	68 (54.7)
Outpatient	52 (43.3)
Marital status	
Single	64 (53.3)
Engaged	16 (13.3)
Married	38 (31.7)
Widow	2 (1.7)
Family history of	
Substance abuse	26 (21.7)
Alcohol abuse	8 (6.7)
Tobacco abuse	78 (65)
Legal problems	18 (15)
Psychiatric disorders	12 (10)
Other medical disorders	16 (13.4)

<sup>a</sup>Social class assessed by Fahmy and El Sherbini Social Classification scale (1990).

Figure 1



Severity of substance abuse according to the Addiction Severity Index scale.

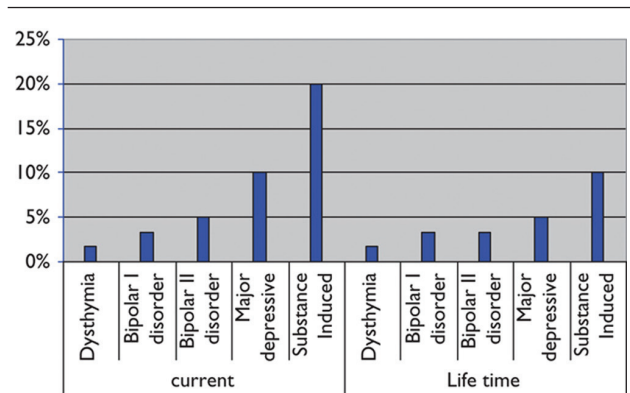
Table 2 Prevalence of psychiatric disorders among the studied group according to the structured

Parameters	Studied group (n=120) [n (%)]
Prevalence of comorbid Axis-I disorders	
Present	76 (63.3)
Absent	44 (36.7)
Prevalence of mood disorders	
Present	
Current	48 (40)
Life time	28 (23.3)
Absent	44 (36.7)
Prevalence of anxiety disorders	
Present	
Current	26 (21.7)
Life time	40 (33.4)
Absent	54 (44.9)
Prevalence of psychotic disorders	
Present	
Current	12 (10)
Life time	18 (15)
Absent	70 (75)
Prevalence of others disorders	
Present	
Current	4 (3.3)
Life time	8 (6.7)
Absent	78 (90)
Prevalence of comorbid personality disorders	
Present	76 (63.3)
Absent	44 (36.7)
Order of onset of Axis-I comorbidity	
Primary	20 (26.3)
Secondary	56 (37.7)

follows: 17% had substance-induced anxiety disorder, 7% had generalized anxiety disorder (GAD), and 7% had lifetime obsessive compulsive disorder (Fig. 3). The prevalence of psychotic disorders was as follows: 7–12% had substance-induced psychotic disorder and 3% had schizophrenia (Fig. 4); the prevalence of PDs was as follows: 63.3% had comorbid PDs (35% had antisocial PD, 17% had borderline PD, 3% had passive aggressive PD, 2% had dependent PD, and 3% had depressive PD) (Fig. 5).

With respect to the relation between type of abused substance and comorbid psychiatric disorders, the study showed a highly significant relationship between alcohol abuse and substance-induced anxiety disorders,

Figure 2



The prevalence of mood disorders among the studied group according to the structured clinical Interview for DSM-IV Axis-I disorders (SCID-I).

GAD, obsessive compulsive disorder, and antisocial PD. There was a significant relationship between cannabis abuse and MDD, dysthymia, substance-induced psychotic disorders, schizophrenia, substance-induced anxiety disorders, somatization disorder, and dependent PD. Also, significant relationships were found between opioid abuse and MDD, bipolar II disorders, and both borderline PD and antisocial PD. There were significant relationships between sedatives abuse and substance-induced anxiety disorder, obsessive compulsive disorder, GAD, panic disorders, and borderline PD. Also, a significant relationship was found between polysubstance abuse and substance-induced anxiety disorder.

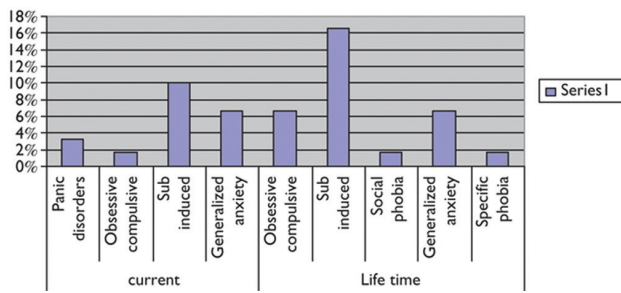
On comparing participants with comorbid Axis-I disorders and participants without comorbid Axis-I disorders, it was found that substance abuse participants with comorbid Axis-I disorders were significantly younger (<25 years), had a family history of alcohol abuse, had higher affection of family and social dimensions of ASI scale, and most of them were single.

On comparing participants with comorbid Axis-II disorders and participants without comorbid Axis-II disorders, it was found that illiteracy and higher affection in the legal dimension in the ASI scale were significantly higher among participants with comorbid borderline PD than those without comorbid PDs.

Substance abuse participants with comorbid antisocial PD were significantly younger (<25 years), of low social class, had a higher prevalence of outpatient treatment programs, had higher affection in family and social dimensions of the ASI scale, and most of them were single and illiterate compared with participants without comorbid PDs.

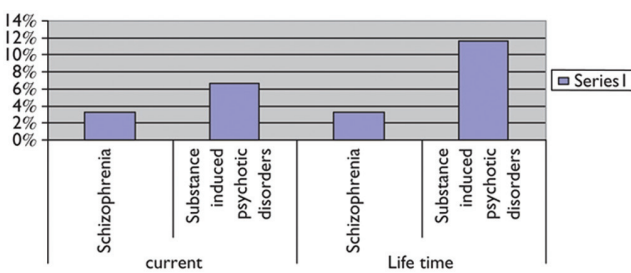


**Figure 3**



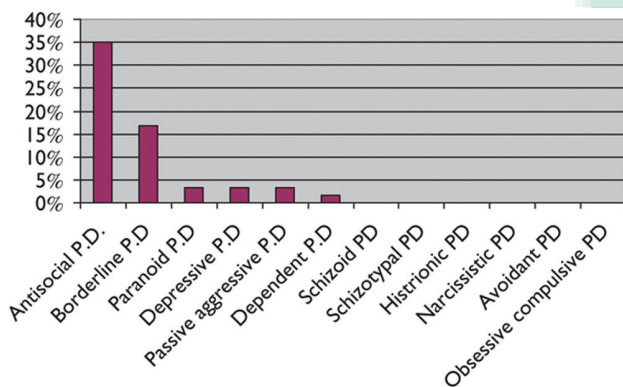
The prevalence of anxiety disorders among the studied group according to the structured clinical interview for DSM-IV Axis-I disorders (SCID-I).

**Figure 4**



The prevalence of psychotic disorders among the studied group according to the structured clinical interview for DSM-IV Axis-I disorders (SCID-I).

**Figure 5**



Distribution of different types of personality disorders among the studied group according to the structured clinical interview for DSM-IV Axis-II disorders (SCID-II). PD, personality disorder.

Table 3 shows the risk factors for different substance abuse in the studied participants. It shows that mood disorders, especially MDD, are the strongest predictor of alcohol abuse, followed by anxiety disorders; dependent PD was the strongest predictor of cannabis abuse, followed by schizophrenia; and mood disorders, especially MDD, are the strongest predictor of opioid abuse, followed by borderline PDs. Also, substance-induced anxiety disorder was

the strongest predictor of sedative abuse, followed by borderline PD.

Table 4 shows the risk factors for comorbid psychiatric disorders in the studied participants. It shows that younger age (<25 years) was the strongest predictor of comorbid Axis-I disorders, followed by higher severity of family and social dimensions in the ASI scale, and then single participants (marital status); male sex and younger age (<25 years) were independent risk factors for comorbid antisocial PDs, followed by low social class; and higher severity in the legal and psychiatric dimension in the ASI scale was an independent risk factor for comorbid borderline PDs, followed by illiteracy.

### Discussion

Sociodemographic data of the present study are consistent with those of Okasha [7], Fahmy MT (personal communication, 2002), Hatata *et al.* [8], Smith *et al.* [9] that showed that despite wide variations in basal rates of dual diagnoses, patterns of sociodemographic characteristics reported in this study are fundamentally similar across cultures and ethnic groups.

Despite the fact that the rate of substance abuse and dependence is higher among men than among women, the diagnosis of substance abuse is not sex specific [10].

Positive family history is one of the predictors of substance abuse and its relapse in the present study. Okasha [7] and Fahmy MT (personal communication, 2002) reported that more than one-third of users' fathers and almost half of their relatives were substance abusers and this indicates the effect of exposure to drug-related stimuli and the distorted models of fathers and relatives and detected also the significant role of identification and learning in entering the dilemma of substance abuse.

In the present study, opioids were the substance of major problem in 30% of substance abusers (tramadol tablets were the substance of major problem in 20% of participants), followed by cannabis, sedative tablets, alcohol in 10% of participants each, inhalant in 1.6% of participants, and polydrugs in 38.3% of participants. These results are consistent with those of Okasha [11], Abd El-Azim *et al.* [12], Hatata *et al.* [8], and Olson *et al.* [13]. They found that the substance of major problem was opioids, followed by cannabis, and most participants in their studies had polydrugs abuse during the entire course of illness.

**Table 3 Multivariate logistic regression model for risk factors for different substance use disorders**

	$\beta$	P-value	Odds ratio (exp. $\beta$ )	95% CI	
				Lower	Upper
Risk factors of alcohol use disorder					
Constant	6.51	0.30	0.003		
Mood disorders (MDD disorders)	0.96	0.4	1.08	1.53	2.89
Dysthymia	0.07	0.93	1.01	0.28	3.66
Anxiety disorders (substance-induced anxiety disorders)	1.92	0.05*	1.79	1.05	3.10
Obsessive compulsive disorder	0.09	0.79	1.0	0.60	1.22
Antisocial PD	0.54	0.05*	1.33	0.98	3.16
Risk factors of cannabis use disorder					
Constant	8.01	0.09	0.66		
Substance-induced psychotic disorder	1.17	0.03*	1.51	0.66	1.89
Schizophrenia	0.33	0.04*	1.55	0.48	3.66
Substance-induced anxiety disorder	1.18	0.049*	1.3	0.60	1.43
Somatization disorder	0.79	0.05*	1.41	0.98	2.68
Dependent PD	1.99	0.05*	1.59	1.01	3.13
Risk factors of opioid use disorder					
Constant	5.95	0.04	1.63		
Bipolar II disorder	0.68	0.45	0.99	0.66	1.89
MDD recurrent	2.01	0.01*	2.22	1.48	5.65
Substance-induced anxiety disorder	1.07	0.41	1.06	0.28	2.33
Borderline PD	1.10	0.04*	1.33	0.88	3.13
Antisocial PD	1.43	0.06	1.09	0.18	4.04
Risk factors of sedative use disorder					
Constant	10.90	0.01	2.30		
Obsessive compulsive disorder	0.88	0.43	1.01	0.29	2.33
Substance-induced anxiety disorder	1.44	0.013*	1.40	0.46	4.61
Generalized anxiety disorder	1.13	0.018*	1.10	0.46	2.31
Specific phobia	1.55	0.10	1.31	0.66	3.13
Borderline PD	1.12	0.05*	1.44	0.57	3.54

CI, confidence interval; MDD, major depressive disorder; PD, personality disorder.

\*Statistically significant ( $P < 0.05$ ).

**Table 4 Multivariate logistic regression model for risk factors for comorbid psychiatric disorders (Axis-I and Axis-II)**

	$\beta$	P-value	Odds ratio (exp. $\beta$ )	95% CI	
				Lower	Upper
Risk factors for comorbid Axis-I					
Constant	3.77	0.59	0.98		
Younger age (<25 years)	0.67	0.04*	1.4	0.22	1.98
Age of onset of substance abuse (<25 years)	0.99	0.77	1.01	0.23	1.88
Family history of alcohol abuse	1.55	0.11	1.09	0.36	2.77
Single marital state	1.36	0.05*	1.5	0.56	2.31
Severity of family and social dimensions in ASI scale	1.99	0.03*	2.01	0.78	3.89
Risk factors of comorbid borderline personality					
Constant	7.42	0.06	1.48		
Illiterate education level	0.56	0.81	1.06	0.41	2.03
Severity of legal dimension in ASI scale	1.13	0.044*	1.30	0.44	3.87
Severity of psychiatric dimension in ASI scale	1.54	0.05*	1.11	0.33	3.12
Risk factors of comorbid antisocial PD					
Constant	4.86	0.59	0.98		
Male sex	1.32	0.04*	1.32	0.22	1.98
Younger age (<25 years)	2.55	0.05*	1.4	0.56	2.31
Low social class	1.73	0.03*	1.3	0.36	2.77
High frequency of outpatient treatment programs	1.12	0.57	1.01	0.23	1.88
Severity of family and social dimensions in ASI scale	0.76	0.90	0.97	0.18	2.77

ASI, Addiction Severity Index; CI, confidence interval; PD, personality disorder.

\*Statistically significant ( $P < 0.05$ ).

The mean age of onset of substance abuse was 25 years, whereas the mean age of psychiatric disorders was 23 years. Thus, in the present study, the mean age of psychiatric disorders was earlier than age of onset of substance abuse. This is in agreement with a number of community epidemiologic surveys that have collected retrospective information about age of onset of mental and substance disorders, which consistently suggest

that mental disorders typically start at an earlier age than SUDs [1,14].

With respect to the prevalence of psychiatric disorders in the substance abuse participants studied, 63.3% of participants had comorbid psychiatric and PDs. The most frequently diagnosed PDs were antisocial PD in 35% of participants, followed by borderline PD in

16.7%. This is in agreement with the study by Skinstad and Swain [15] and Abd El-Azim *et al.* [12], who reported that the most frequently observed Axis-II disorders were in cluster B, especially borderline PD, and antisocial PD. The hypothesis was that these three traits (dependency, impulsivity, and self-harm) are related both to cluster B PDs and to SUDs. The association between these two types of disorders indicates that impulsivity and self-harm play a significant role in cluster B PDs and SUDs [16].

On studying risk factors for alcohol use disorders, anxiety disorders were found to be predictors of alcohol use disorders. This significant relationship was in agreement with the study by Goldstein and Levitt [17], who reported that 63% of those with anxiety disorder had a comorbid alcohol use disorder. There are several theories to explain the relationship between anxiety disorders and SUDs. The self-medication hypothesis of addiction led to the elaboration of the well-known tension-reducing theory of alcohol abuse [18]. In addition, it has been proposed that comorbid anxiety disorders and SUDs may derive from a common, shared factor because both anxiety and SUDs cluster within families and it has been suggested that the disorders had a common genetic predisposition [19]. Also, antisocial PD was a predictor of alcohol use disorders. This significant relationship was in agreement with the study by Ball *et al.* [18], who reported that 45.7% of their participants had cluster B comorbidity, especially antisocial PD (27.0%) and borderline PD (18.4%). However, this is in contrast to the study by Ross *et al.* [20], who reported that alcohol abusers had significant elevations on avoidant, schizoid, dependent, and passive-aggressive traits.

On studying risk factors for cannabis use disorders, schizophrenia was a predictor of cannabis use disorders, followed by substance-induced psychotic disorder, followed by substance-induced anxiety disorder, and then somatization disorder.

The significant relationship between cannabis use disorder and substance-induced psychotic disorders was in agreement with the study by Zammit *et al.* [21], who reported that using cannabis in adolescence increases the likelihood of experiencing symptoms of schizophrenia in adulthood and their findings were in agreement with those of the Swedish study by Zammit *et al.* [21], which add three new pieces of evidence. First, cannabis use is associated with an increased risk of experiencing schizophrenia symptoms, even after psychotic symptoms preceding the onset of cannabis use are controlled for, indicating that cannabis use is not secondary to a pre-existing psychosis. Second, early cannabis use (by the age of 15 years) confers

greater risk for schizophrenia outcomes than later cannabis use (by the age of 18 years). The youngest cannabis users may have the greatest risk because their cannabis use becomes longstanding. Third, risk was specific to cannabis use, as opposed to the use of other drugs, and early cannabis use did not predict later depression. Their findings now require to be replicated in large population studies with detailed measures of cannabis use and schizophrenia.

The significant relationship between cannabis use disorder and substance-induced anxiety disorders was in agreement with the study by Thomas *et al.* [22], who found that 22% of cannabis users experienced panic attacks following cannabis use. On studying the relationship between substances-induced anxiety disorders and cannabis, Toneatto *et al.* [23] found that there was no significant association between the level of anxiety and cannabis use in daily life. However, they found that the diagnosis of agoraphobia was significantly associated with increased likelihood of cannabis use, independent of state anxiety and other confounding factors. No evidence was found for an anxiolytic or an anxiogenic effect of cannabis in daily life. This finding does not support the hypothesis that participants with high levels of anxiety use cannabis as a means of self-medication.

The significant relationship between cannabis and MDD was in agreement with the study by Bovasso *et al.* [24], who found that cannabis abuse can be considered a risk factor for depression. Depression may be related to the postulated amotivational syndrome that is associated with chronic marijuana use [25]. The mechanism of action of cannabis is not well understood and may differ between states of chronic use and withdrawal. Data suggest that the major active chemical in marijuana,  $\delta$ -9-tetrahydrocannabinol, binds to specific endogenous receptors, disrupts cellular metabolism, impedes cellular protein synthesis, affects cell membranes, alters the dopamine system, and affects benzodiazepine receptors. Also, dependent PD was the strongest predictor of cannabis use disorders. This was in contrast to the study by Thomas *et al.* [22], who found higher scores on the Schizotypal Personality questionnaire.

On studying risk factors for opioid use disorders, mood disorders, especially MDD, were the strongest predictor of opioid use disorders. This significant relationship was in agreement with the study by Osilla *et al.* [26], who reported MDD in their opiate-dependent participants. Also, borderline PD was a predictor of opioid use disorders, followed by antisocial PD. This significant relationship was in agreement with the study by Okasha [7], who found



that individuals high on neuroticism/emotionality (e.g. with borderline, dependent, avoidant, and obsessive compulsive PDs) are more prone to affective instability and motivated to use substances for symptom relief (e.g. benzodiazepines, alcohol, opiates).

On studying risk factors for sedative use disorders, substance-induced anxiety disorder was found to be the strongest predictor of sedative use disorders, followed by GADs followed by specific phobia, and then obsessive compulsive disorder. These significant relationships were in agreement with the study by Schuckit and Hesselbrock [27], who reported that those with sedative-hypnotics dependence or abuse are more likely to have histories of independent MDD and panic disorders as well as substance-induced anxiety disorders. There are several theories to explain this relationship. The self-medication hypothesis of addiction holds that individuals with psychiatric disorders preferentially use psychoactive substances to treat their dysphoric states [16]. Also, borderline PD was a predictor of sedative use disorders. This significant relationship was in agreement with the study by Osilla *et al.* [26]. The explanation for comorbid sedatives abuse with borderline personality is that participants with borderline PD have a sense of boredom, impulsivity, and associated clinical syndromes such as anxiety, and dysthymic disorder can precipitate sedatives abuse [28].

On studying the risk factors for comorbid Axis-I disorders (dual diagnosis), it was found that younger age (<25 years) was the strongest predictor of comorbid Axis-I disorders, followed by severity in family and social dimensions in the ASI scale and being single. These results are consistent with the results of Hser *et al.* [29], Green [30], Goldstein and Levitt [17], and Hickie and Walter [31].

The significant relationship between dual diagnosis and young participants was in agreement with the study by Hickie and Walter [31], who found that mental disorders and related substance abuse are major health issues in the younger population, and among the main causes of death and disability in this population. These disorders have a peak onset age in later adolescence and early adulthood, corresponding to neurobiological and social changes in young individuals.

The significant relationship between dual diagnosis and severity in family and social dimensions in the ASI scale was in agreement with the study by Goldstein and Levitt [17], and this can be explained by the fact that participants with a dual diagnosis, receiving treatment for social problems, are likely to abuse high doses to treat social problems.

The significant relationship between dual diagnosis and single participants was in agreement with the study by Green [30] as their main analysis suggests that those with comorbid mental health and substance misuse, significantly within adult mental health services, are more likely to be socially excluded (defined by this study as being homeless, unemployed, having a lower educational level, and isolated, i.e. living alone). This could be because of a lack of stable housing, reflecting a chaotic lifestyle because of substance misuse in addition to mental health problems.

#### **Multivariate logistic regression model for risk factors for comorbid Axis-II**

On studying the risk factors for comorbid PDs (dual diagnosis), it was found that the severity of legal and psychiatric dimensions in the ASI scale was an independent risk factor for comorbid borderline PDs, followed by illiteracy as educational status. These significant relationships were in agreement with the study by Landhiem *et al.* [32], and these results can be explained by the fact that borderline participants have mood disorders, anxiety disorders, suicidal ideations and attempts, and also impulsivity, which makes them likely to abuse more drugs to relieve their symptoms.

Male sex and younger age (<25 years) were independent risk factors for comorbid antisocial PDs, followed by low social class (class III). These statistically significant relationships were in agreement with the study by Samuel *et al.* [18], who found a difference between male and female substance abusers with respect to antisocial PD. Also, it was in agreement with the study by Ross *et al.* [20], who reported that substance abusers with PDs were significantly younger than those without PDs.

#### **Limitations**

One limitation of the present study is that most of the participants abused polydrugs during the course of illness, which may affect the results of this study. This study would have yielded better results if participants had been categorized into those abusing one type of substance currently and those abusing substances over a lifetime, which would aid better assessment of the risk factors. Finally, the lack of follow-up does not allow us to gain a more comprehensive picture of the impact of comorbidity on the outcome of SUD.

#### **Conclusion**

SUD is clearly associated with increased rates of psychiatric disorders; all clinicians assessing individuals with alcohol and drug dependence should screen for other psychiatric disorders. Substance use and mental

health should be core topics in the training of all staff at undergraduate and postgraduate levels.

## Acknowledgements

### Conflicts of interest

None declared.

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