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Assessment of anxiety and depression among substance use disorder patients: a case-control study

Ikram I. Mohamed¹, Hossam Eddin Khalifa Ahmad^{2*}, Shehab H. Hassaan² and Shymaa M. Hassan¹

Abstract

Background: Several evidences from epidemiologic and treatment studies indicate that anxiety disorders, depression, and substance use disorders commonly co-occur, and the interaction is multifaceted and variable. Epidemiological studies and investigations within clinical substance abuse populations have found an association between anxiety disorders, depression, and substance use disorders.

Results: The mean age was 28.1 ± 6.5 years. The majority belonged to the moderate socioeconomic status (52%). Substance use disorder (SUD) patients expressed higher levels of anxiety and depression in comparison to the control group. Most of the study group (97%) expressed different levels of anxiety. Eighty percent of them expressed high and moderate anxiety levels, and 20% of caregivers were having mild anxiety levels. Ninety-three percent of the substance users expressed different levels of depression, either mild 12%, moderate 9%, or severe 72%. The Drug Use Disorder Identification Test scores were positively correlated with anxiety ($r = 0.256$ and $p = 0.010$) and depression ($r = 0.330$ and $p = 0.001$). Moreover, it was found that anxiety and depression are positively correlated with each other's ($r = 0.630$ and $p = 0.001$).

Conclusion: Substance use disorders are associated with high levels of anxiety and depression. More specifically, it is associated with severe depression and anxiety. There is an obvious association between the presence of anxiety and depression on the one hand and the severity of drug-related problems on the other hand. Depression and anxiety are commonly present together in patients with SUDs.

Background

The lifetime prevalence of any substance use in Egypt varies between 7.25% and 14.5% [1]. Substance use disorders, mood, and anxiety disorders are widespread among the general population [2–4] and are associated with substantial social, economic, and health loss [5–8]. Reports published in the *Journal of the American Medical Association* indicate that roughly 50% of individuals with severe mental disorders are affected by substance abuse, 37% of alcohol abusers, and 53% of drug abusers who also have at least one serious mental illness, and of all people diagnosed as mentally ill, 29% abuse either alcohol or drugs [9].

Anxiety and depression are among the most common problems reported by persons seeking treatment for drug addiction. Primary psychiatric symptoms persist behind detoxification and remission of addictive behavior. From an addiction perspective, there may be significant risks associated with concurrent depression and anxiety symptoms, regardless of etiology [10].

Anxiety can be caused by drug addiction. Anxiety commonly occurs during the acute withdrawal phase of alcohol and can persist for up to 2 years as part of a post-acute withdrawal syndrome, in about a quarter of people recovering from alcoholism [11]. Depression and anxiety symptoms are among the most common problems reported by persons seeking treatment for drug addiction. Drug addiction, anxiety, and depression account for three-quarters of the disability attributed to mental disorders [12]. Depression and drug addiction are

* Correspondence: hossamkhalifa71@yahoo.com

²Psychiatry Unit, Department of Neurology and Psychiatry, Assiut University, Assiut, Egypt

Full list of author information is available at the end of the article

critical, not only because of their high prevalence but also because of their negative consequences. Individuals with co-morbid mental health and drug addiction often experience severe illness, disability, and poor treatment outcomes [13].

This study was done with the aim to assess levels of anxiety and depression among drug addict people.

Methods

Study design

This is a descriptive case-control study conducted at Assiut University Neuropsychiatry Hospital. This is an educational health facility, which provides both inpatient and outpatient mental health services to the entire population of Upper Egypt. The study was conducted from December 2015 until the end of May 2016.

Participants

The study included a selective sample of 100 patients with substance use disorder. Patients had to meet the following criteria to be included in the study: (i) to be 18 years or older, (ii) to be currently diagnosed with substance use disorder (SUD) according to Diagnostic and Statistical Manual of Mental Disorders (DSM-IV-TR), and (iii) to accept the participation in the study. Exclusion criteria included the following: (i) the patient had a known psychiatric diagnosis before being diagnosed with SUD, (ii) the patient was mentally retarded or has an organic brain disorder, and (iii) the patient has a chronic medical illness. The control group included 50 subjects without a history of the current or past history of SUD and free from chronic illnesses as well. They were recruited from the patients' relatives and the hospital staff.

Data were collected using face-to-face interviews conducted by a trained study team including a psychiatrist and psychologist. The researchers introduced themselves to participants before the interview and clearly expressed the purpose of the study, and consent was obtained from every participant.

Measures

Socioeconomic assessment scale for the family

We gathered information about socio-demographic information using this scale, which is prepared by Professor Abdel Tawab Abdullah, Faculty of Education, Assiut University, in 1998 and modified in 2010. It includes four main variables: [1] the educational level of the father and mother, [2] the occupation of the father and mother, [3] total family income, and [4] lifestyle of the family [14].

Drug Use Disorder Identification Test (DUDIT) Arabic version

This scale has been developed in the original English language version by Berman in 2007 [15]. It was

translated into Arabic and validated by Sfindla and colleagues in 2017 [16]. The purpose of the Drug Use Disorder Identification Test was to identify the use of patterns and various drug-related problems. It consists of 11 items, and the total score of this test was 44 points. A patient with 6 points or more probably has drug-related problems (for example, risky or harmful drug habits that might be diagnosed as substance abuse/harmful use or dependence), while a patient with 25 points or more is probably heavily dependent on drugs. The scale was reported to have good reliability using Cronbach's alpha (0.780) and possesses a high validity using Pearson correlation, ($r = 88\%$) for the total scale [15].

Hamilton Anxiety Rating Scale (HAM-A)

This scale has been developed by Max Hamilton in 1959 [17] and was translated into the Arabic language by Fatim in 1994 [18]. The purpose of this scale was to measure the severity of anxiety. The Hamilton Anxiety Rating Scale consists of 14 items; each item was scored based on a five-point Likert scale ranging from (0) = Not Present to [4] = Very Severe. The total score of this scale ranged from 0 to 56 and was divided into four levels: 17 or less indicated mild anxiety, from 18 to 24 indicated mild to moderate anxiety, 25 to 29 indicated a moderate to severe anxiety, and more than 30 indicated severe anxiety.

Hamilton Depression Rating Scale (HAM-D)

The Hamilton Rating Scale for Depression (HRSD), sometimes called the Hamilton Depression Rating Scale (HDRS) and abbreviated HAM-D, is based on a multiple item questionnaire and addresses depression indicators with special attention to the evaluation of recovery from depression [19]. Initially developed by Max Hamilton in 1960 [20], it has gone through numerous revisions since then. The Arabic version has high reliability and validity [21, 22]. The Hamilton Depression Rating Scale consists of 21 items to rate the severity of depression. Mild depression is ranging from 13 to 16, moderate depression is ranging from 17 to 19, and severe depression is ranging from 20 to above.

Statistical analysis

Data were analyzed using the Statistical Package for Social Studies (SPSS) software version 20. A descriptive analysis using means with standard deviation, frequency counts, and percentages was carried out. Pearson correlation coefficients (r) were employed to address the relationship between caregiver burden and study variables [23].

Results

Sociodemographic characteristics

The study included 100 SUD patients and 50 healthy control; 73% live in rural areas and 27% in urban ones. Their mean age was 28.1 years (SD = 6.5). Most of the patients were married (62%) while 38% were singles. Most of the patients were graduates of either secondary school or its equivalent (67%) or held a university degree (23%). Fourteen percent of them have no job apart from the domestic affairs, and the rest are either employed (20%), manual workers (52%), or students (10%) (Table 1). The majority of the participants in this study belonged to the moderate socioeconomic status group (52%), while 22% belong to the low socioeconomic class

and 26% were in the high socioeconomic class. A comparison between sociodemographic data shows no statistically significant difference between the SUD patients and healthy controls ($p = 0.643$) (Table 1).

Clinical characteristics of the study sample

The results showed that the majority of drug addict people (83%) are polydrug addict; they used several types of substances (e.g., tramadol-cannabis-opiates-alprazolam-heroin-nalbuphine), while 17% of them used only tramadol. The majority of the drug users prefer the oral route (68%), while 32% of them used drugs through several routes (oral-inhalation-injection).

Table 1 Comparison between the SUD patients ($n = 100$) and the control group ($n = 50$) regarding socio-demographic data

Variables	Drug addict people ($n = 100$)		Drug non-addict people ($n = 50$)		χ^2	p value
	No.	%	No.	%		
Age groups						
16–20 years	10	10.0	7	14.0	6.478	0.056
21–30 years	56	56.0	22	44.0		
31–40 years	30	30.0	13	26.0		
41–50 years	4	4.0	8	16.0		
Age, mean \pm SD	28.1 \pm 6.5		30.9 \pm 8.7		7.60	0.061
Marital status						
Single	38	38.0	13	26.0	2.125	0.144
Married	62	62.0	37	74.0		
Residence place						
Rural	73	73.0	39	78.0	0.438	0.507
Urban	27	27.0	11	22.0		
Level of education						
Illiterate	2	2.0	0	0.0	17.909	0.002**
Read and write	2	2.0	0	0.0		
Primary	3	3.0	1	2.0		
Preparatory	3	3.0	1	2.0		
Secondary	67	67.0	19	38.0		
University	23	23.0	29	58.0		
Occupation						
Not work	14	14.0	3	6.0	1.325	0.158
Employee	20	20.0	17	34.0		
Farmer	4	4.0	1	2.0		
Student	10	10.0	8	16.0		
Manual workers	52	52.0	21	42.0		
Socioeconomic status						
Low	22	22	11	22	0.267	0.643
Middle	52	52	24	48		
High	26	26	15	30		

*Statistically significant correlation ($p < 0.05$)

**Statistically significant correlation ($p < 0.01$)

As regards the duration of substance use, 93% of the patients used a drug for more than 1 year. Sixty-seven percent of them reported that they started drug use because of many reasons such as the effect of bad friends, as an experiment, to give them strength and activity, to forget problems and feel relaxed, to improve sexual ability, to spend excessive money, and to relieve chronic pain. However, 12% of them reported that they used drugs because of the effect of bad friends only, 13% to give the patient strength and activity only, and 8% of them reported that they used drugs to forget problems and feel relaxed (Table 2).

The drug-related problems

The DUDIT results of the study group revealed that 95% of drug addict people are probably heavily dependent on a drug, with the mean score is 31.45 ± 2.47 . While 5% of them have probable drug-related problems, with the mean score is 22.20 ± 2.49 (Table 3).

Levels of anxiety and depression

According to HAM-D scale results, 72% of the study sample was found to have severe depression in comparison to 6% of the control group ($p < 0.001$). It is worth noting that only 7% of the SUD group did not have depressive symptoms in comparison to 64% of the control group ($p \leq 0.001$). The results were similar as regards to anxiety. The prevalence of severe anxiety was 67% in the study group in comparison to 14% in the control group

($p < 0.001$). Five percent only of the SUD group have mild anxiety symptoms in comparison to 52% of the control group ($p \leq 0.001$) (Table 4, Figs. 1 and 2).

Correlation between socio-economic status, DUDIT, anxiety, and depression

The socio-economic status is positively but non-significantly correlated with Drug Use Disorder Identification Test scores ($r = 0.070$ and $p = 0.487$), anxiety ($r = 0.008$ and $p = 0.935$), and depression ($r = 0.048$ and $p = 0.638$). Drug Use Disorder Identification Test score is positively and significantly correlated with anxiety ($r = 0.256$ and $p = 0.010$) and depression ($r = 0.330$ and $p = 0.001$). Moreover, it was found that anxiety and depression are positively and significantly correlated with each other ($r = 0.630$ and $p = 0.001$) (Table 5).

Discussion

The purpose of this study was to assess the levels of anxiety and depression among SUD patients. Another objective of this study was to determine the correlation between the level of anxiety and depression on the one hand and the socio-demographic variables and drug use-related problems on the other side.

The current study revealed that the majority of drug addict people were polydrug addict. This might be due to the fact that one drug is used as a base or primary drug, with additional drugs to lighten or compensate for the side effects of the primary drug and make the

Table 2 Clinical characteristics of the SUD patients ($n = 100$)

Clinical data	No.	%
Diagnosis		
Polydrug addict	83	83.0
Single-drug addict	17	17.0
Types of abused drug		
Tramadol	17	17.0
Mixed (tramadol-cannabis-opiates-alprazolam-heroin-nalbuphine)	83	83.0
Methods of drug intake		
Oral	68	68.0
Mixed (oral-inhalation-injection)	32	32.0
History of abused drug		
Less than 6 months	3	3.0
More than 6 months and less than 1 year	4	4.0
More than 1 year	93	93.0
Reasons for drug abuse		
Bad friends	13	12.0
To give the patient strength and activity	12	12.0
To forget problems and feel flatten	8	9.0
Mixed (bad friends, trial, to give the patient strength and activity, to forget problems and feel flatten, weakness of sexual ability, excessive money, chronic pain)	67	67.0

Table 3 Distribution of using patterns and various drug-related problems among SUD patients (n = 100) according to Drug Use Disorder Identification Test

Using patterns and various drug-related problems	No.	%	Range		Mean ± SD
			Lowest score	Highest score	
Probable drug-related problems	5	5.0	18	24	22.20 ± 2.49
Probably heavily dependent on a drug	95	95.0	26	38	31.45 ± 2.47
Total	100	100.0	18	38	30.99 ± 3.18

experience more enjoyable with drug synergy effects or to supplement for the primary drug when supply is low [24]. These results are consistent with the findings of Panebianca et al. who revealed that the majority of drug addict people were polydrug addicts [25]. On the opposite side, Jabeen et al. found that more than half of drug addict people were single drug users [26].

The present study showed that about most of the drug users' sample had severe levels of depression in comparison to the non-users' and about more than two thirds of the drug users' group had a severe level of anxiety as well while the majority of drug non-addict people had a mild level of anxiety. Many theories have tried to explain the relationship between SUDs and mental illness such as causality theory [27], multiple risk factor/environmental triggers theory [28], and genetics/supersensitivity theory [29].

Some studies indicated that substance use has been linked to some kind of emotional distress prior to consumption [30, 31]. Others indicated that substance use is often used as a method to relieve emotional problems [32], although its effects are not very durable or effective in the long term, as consumption tends to enhance depressive symptoms [33].

Many studies are in concordance with our results. For example, Hodgson et al. showed that more than two

thirds of drug addict people had a severe level of anxiety [34], while the majority of drug non-addict people had a mild level of anxiety. Additionally, Pakhtunkhwa et al. demonstrated that most of the drug addict people tend to have severe levels of depression [35].

The results of this study showed a positive correlation between the presence of anxiety, depression, and substance-related problems elicited by DUDIT. Considering the mutual maintenance pattern of this comorbidity, it is not surprising that both anxiety, depression, and substance use disorders impact the course and treatment outcome for the counterpart condition. For example, studies have shown that anxiety and depressive disorders are related to increased severity of lifetime alcohol use disorders, increased lifetime service utilization among individuals with a substance use disorder, increased the severity of alcohol withdrawal, and higher relapse rates following substance abuse treatment [36–40].

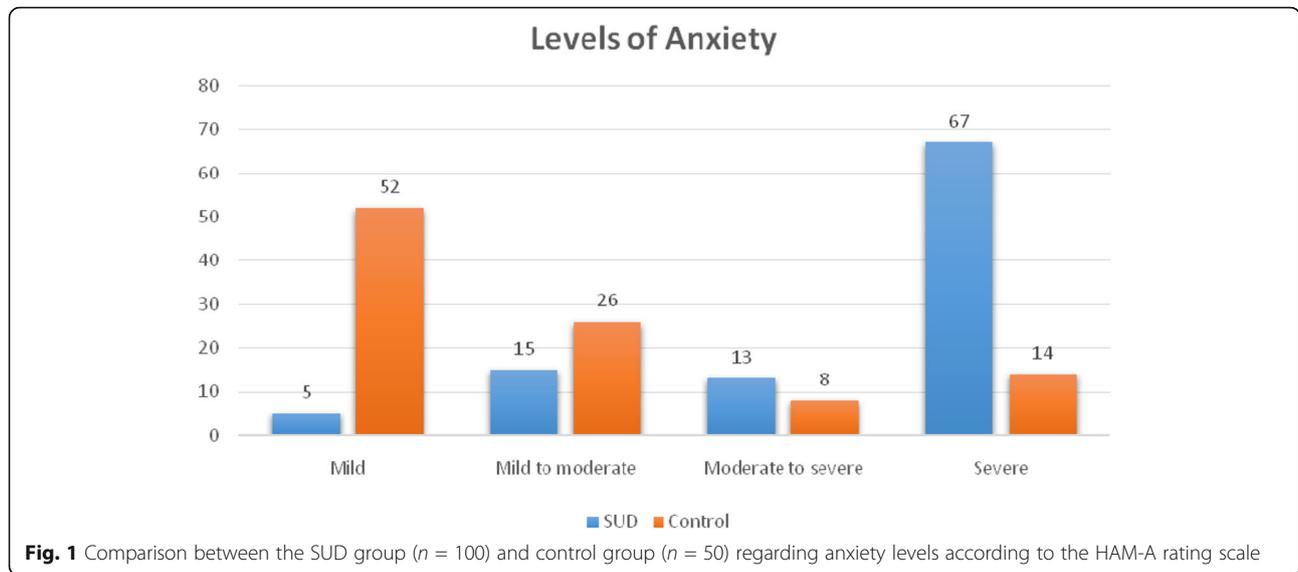
The correlation between anxiety and depression in this study can be explained by the direct causation model which states that one disorder causes or lowers the threshold for the expression of the other disorder [41]. The shared etiology model also referred to as the correlated liabilities model [42] indicated that a common set of risk factors leads to the development of both depression and anxiety.

Table 4 Comparison between levels of anxiety and depression among SUD patients (n = 100) and control group (n = 50) according to HAM-A and HAM-D rating scales

Variables	Drug addict people (n = 100)		Drug non-addict people (n = 50)		p value
	No.	%	No.	%	
Levels of anxiety					
Mild	5	5.0	26	52.0	< 0.001**
Mild to moderate	15	15.0	13	26.0	0.104
Moderate to severe	13	13.0	4	8.0	0.364
Severe	67	67.0	7	14.0	< 0.001**
Levels of depression					
Normal	7	7.0	32	64.0	< 0.001**
Mild	12	12.0	9	18.0	0.319
Moderate	9	9.0	6	12.0	0.565
Severe	72	72.0	3	6.0	< 0.001**

*Statistically significant correlation (p < 0.05)

**Statistically significant correlation (p < 0.01)



These findings are similar with the previous study reported by Grant et al. who found that anxiety is positively and significantly correlated with depression [43], whereas these findings are contradicted with Bellos et al. who found that anxiety is positively but non-significantly correlated with depression [44].

of anxiety and depression on the one hand and the severity of drug-related problems on the other hand. Depression and anxiety are commonly present together in the patients with SUDs. These findings throw the light on the problem of dual diagnosis and its impact on the prognosis and treatment process.

Conclusion

The prevalence of anxiety and depression among patients with substance use disorders is considerably high, and to be more specific, the level of severe depression and severe anxiety is the one we mean. There is an obvious association between the presence

Limitations

The findings of this study should be cautiously interpreted because a small sample was used. The restriction of the sample prevents the findings from being generalized to the larger population. This study relies completely on self-reports.

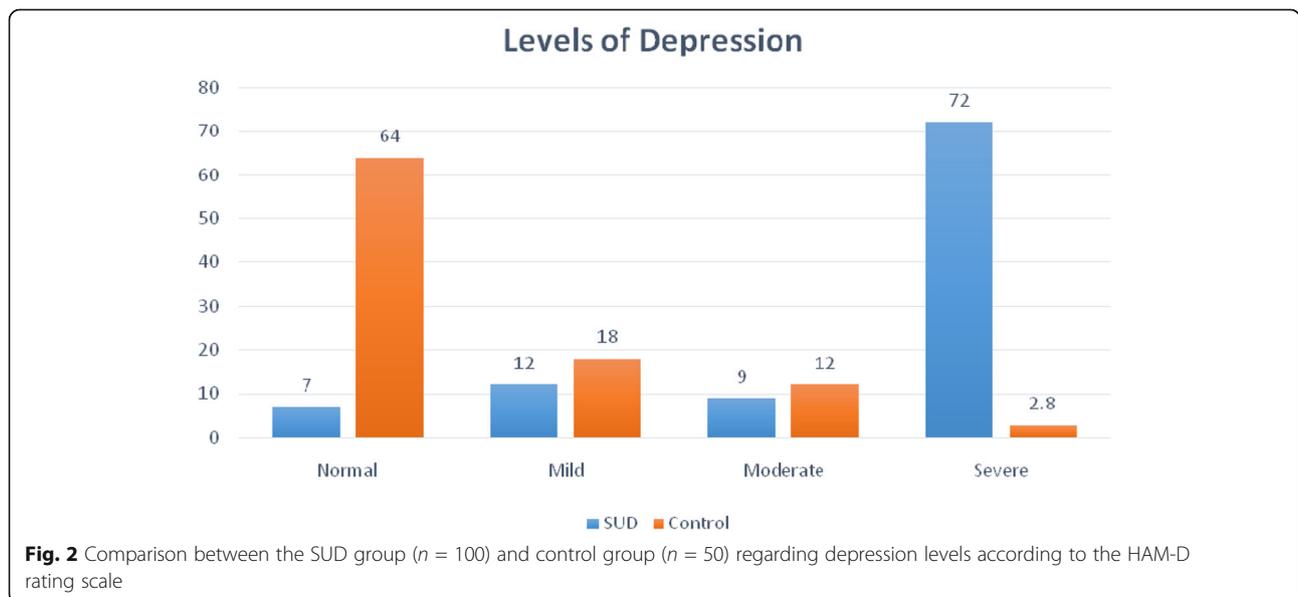


Table 5 Correlation between socio-economic status, Drug Use Disorder Identification Test, anxiety, and depression among SUD patients group ($n = 100$)

Variables		Socio-economic status	Drug Use Disorder Identification Test	Anxiety	Depression
Socio-economic status	<i>r</i>	1			
	<i>p</i> value				
Drug Use Disorder Identification Test	<i>r</i>	0.070	1		
	<i>p</i> value	0.487			
Anxiety	<i>r</i>	0.008	0.256	1	
	<i>p</i> value	0.935	0.010*		
Depression	<i>r</i>	0.048	0.330	0.630	1
	<i>p</i> value	0.638	0.001**	0.001**	

*Statistically significant correlation ($p < 0.05$)**Statistically significant correlation ($p < 0.01$)**Abbreviations**

DSM-IV-TR: Diagnostic and Statistical Manual of Mental Disorders; DUDIT: Drug Use Disorder Identification Test; HAM-A: Hamilton Anxiety Rating Scale; HAM-D: Hamilton Depression Rating Scale; SUD: Substance use disorder

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Authors' contributions

Ikram Mohamed contributed to the study design, interpretation of the data, and preparation and revision of the manuscript. HK contributed to the study design, collection and analysis, interpretation of the data, and preparation of the main manuscript. S. Hassaan and H. Khalifa contributed to the study design, interpretation of the data, and writing of the manuscript. Shymaa M. Hassan contributed to the analysis and interpretation of the data and revision of the manuscript. All authors approved the final manuscript.

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Availability of data and materials

The datasets that were generated during and/or analyzed during the current study are available from the corresponding author on reasonable request.

Ethics approval and consent to participate

Before starting data collection, the College of Nursing Ethical Committee approved the research in meeting no. 18 held on the 18th of December 2015 according to article 114 of its implementing regulations. Prior to the interview, written informed consent was obtained from the literate participants and was signed in the presence of a witness for illiterate ones. Privacy and secrecy of all data were assured by ensuring the anonymity of the questionnaire, interviewing the participants separately in a closed room, and keeping data files in a safe place.

Consent for publication

Not applicable

Competing interests

All authors declare no actual or potential conflict of interest whether financial, personal, or otherwise related to this manuscript.

Author details

¹Faculty of Nursing, Assiut University, Assiut, Egypt. ²Psychiatry Unit, Department of Neurology and Psychiatry, Assiut University, Assiut, Egypt.

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