

# Prevalence and Correlates of Co-occurring Substance Use Disorder among Patients with Severe Mental Disorder at Amanuel Mental Specialized Hospital, Addis Ababa, Ethiopia

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## Abstract

**Introduction:** Substance use disorder occurs significantly in patients with severe mental disorders. When substance use concurrently occurs with severe mental disorders, it is associated with poor treatment outcomes, more frequent use of hospitals, treatment noncompliance, more frequent suicidal attempt, frequent and longer episodes, and poor over all adjustments, violent behavior and greater risk of HIV infection. However; little is known about the prevalence of co-occurring substance use disorders in patients with severe mental disorders in Ethiopia. The objective of this study was to assess the prevalence and correlates of co-occurring substance use disorder among patients with severe mental disorders at Amanuel mental specialized hospital, Addis Ababa, Ethiopia.

**Method:** Institution based cross sectional study design was conducted in June, 2014. Study Participants were recruited by using systematic random sampling technique. Substance use disorder was assessed through face to face interviews by trained psychiatry nurses using Structured Clinical Interview of DSM-IV (SCID). Correlates for substance use disorder were assessed using a structured questionnaire.

**Results:** A total of 260 schizophrenic and 261 bipolar patients were included in the study. About 84.4% (bipolar) and 82.7% (schizophrenic) patients were life time substance users, while 77.4% (bipolar) and 75% (schizophrenic) patients were current substance users. Of all substance users, 49.8% (bipolar) and 48.1% (schizophrenic) were poly substance users. When we adjusted for the effect of potential confounding variables Age [AOR=2.32, CI= (1.18-4.56)], history of hospitalizations [AOR=3.12, CI= (1.20-8.27)] and history of relapse [AOR=3.35, CI= (1.13-8.83)] were more likely to have substance use disorder as compared to schizophrenic patients who were in age group of <27, no history of hospitalizations and no history of relapse respectively. Bipolar patients, who were in age group of >38 AOR=2.32, CI= (1.18-4.56), history of hospitalizations [AOR=1.75, CI= (1.07-4.37)] and history of relapse [AOR=5.18, CI=(1.72-15.64)] were more likely to have substance use disorder as compared to bipolar patients who were in age group of <27, no history of hospitalizations and no history of relapse respectively.

**Conclusion and recommendation:** In general, prevalence of co-occurring substance use disorder among patients with severe mental disorder is high. Patient's age, history of hospitalization and relapses were associated with substance use disorder. Early identification and integrated management of co- occurring substance use disorder in patients with severe mental disorders is vital.

**Keywords:** Severe mental disorder; Prevalence; Substance use; Addis Ababa; Ethiopia

## Background

Substance abuse, according to diagnostic and statistical manual text revised (DSM-IV-TR) criteria is defined as use of any drug, usually by self-administration, in a manner that deviates from approved social or medical patterns while; substance dependence is the repeated use of a drug or chemical substance, with or without an altered physiologic state caused by repeated administration of a drug, the cessation of which results in a specific syndrome [1].

One study reported that about 16.7% of patients with mental disorders have co morbid substance-use disorder of which 27% are for any substance use disorders, 9% for any alcohol-use disorder and 6% for any drug-use disorder. Results of the Epidemiologic Catchment Area study on co morbid disorders indicated that patient with mental disorder had a substance-use disorder (28.9%), alcohol-use disorder (36.6%) and a drug-use disorder (53.1%) [2]. More recent studies based on the National Longitudinal Alcohol Epidemiologic Survey (NLAES) showed, of 9.9% of the population who had a lifetime diagnosis of major depression, 19.9% had a co morbid drug-use disorder, 24.3% of this population had an alcohol-use disorder and/or major depressive

disorder and 16.2% of whom had both major depressive and alcohol-use disorders [3].

Patients with schizophrenia abuse an array of substances, depending upon access and availability [4-6]. The common substances for abuse are alcohol [7-9], cocaine and other psycho stimulants [10] and cannabis [11]. Types of substance use among individuals with severe mental illness might be associated with the availability and patterns of use of various drugs in different community environments [12].

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Some people who abuse drugs show symptoms similar to those of schizophrenia. Therefore, people with schizophrenia may be mistaken for people who are affected by drugs. Most researchers do not believe that substance abuse causes schizophrenia. However, people who have schizophrenia are much more likely to have a substance or alcohol abuse problem than the general population [13].

Substance abuse can make treatment for schizophrenia less effective. Some drugs, like marijuana, amphetamines or cocaine, may make symptoms worse. In fact, research has found increasing evidence of a link between marijuana and schizophrenia symptoms [14,15]. In addition to this, people who abuse drugs are less likely to follow their treatment plan; and addiction to nicotine is the most common form of substance abuse in people with schizophrenia [16]. According to DSM-IV-TR, 55% to 90% of patients with mental disorders and 22% of the general population smoke cigarette [17].

Patients with bipolar I disorder have high risks of co-morbid substance use disorders, with lifetime prevalence as high as 50%–60% [18]. Substance use disorder co-morbidity is eventually associated with worse bipolar I disorder outcome and higher suicidal risk [19,20].

Substance use disorder is the most frequently occurring in this population. Of all, alcohol is the most common substance of abuse, other than nicotine (nicotine is much more prevalent than any other substance of abuse in this population) [21]. Study found that 33.7% of people with a diagnosis of schizophrenia also met the criteria for an alcohol use problem at some time during their lives and 47% met the criteria for any substance use disorder (excluding nicotine dependence). Rates of substance use disorder tend to be higher among males, and among people of both genders and all ages in institutional settings, such as hospitals, emergency rooms, jails, and homeless shelters. This holds true for people with and without schizophrenia [22].

The high prevalence of substance use disorders (SUDs) in persons with bipolar disorder (BD) is well documented. Up to 60% of bipolar patients develop an SUD at some point in their lives. Alcohol use disorders are particularly common among BD patients, with a lifetime prevalence of roughly 50% [23].

Recent epidemiologic data indicate that 38% of persons with bipolar I disorder and 19% of those with bipolar II disorder meet criteria for alcohol dependence. Co-morbid SUDs in patients with BD are associated with: poor treatment compliance longer and more frequent mood episodes more mixed episodes more hospitalizations more frequent suicide attempts [23,24]. *Therefore, assessing prevalence and factors associated with substance use disorder among patients with severe mental disorders is important for early clinical identification, interventions and comprehensive management plan.*

## Methods

### Study setting and design

Institution based cross-sectional study was conducted in June, 2014 at Amanuel Mental Specialized Hospital, Addis Ababa, Ethiopia. 524 patients were recruited for the study. Study participants were included using systematic random sampling technique. One patient refused to participate in the study.

### Data collection

Data were collected by trained psychiatry nurses using pretested Structured Clinical Interview for DSM-IV (SCID). The structured clinical interview for DSM-IV-TR axis I disorders (SCID) was used

to assess co-occurring substance use disorders in patients with severe mental disorders.

### Data processing and analyses

Data were analyzed using SPSS version 20. Bivariate analysis was done to see the association of each independent variable with the outcome variable. Potential confounders (important) variables were entered into binary logistic regression model to identify the effect of each independent variable with the outcome variables. A p-value of less than 0.05 was considered statistically significant, and adjusted odds ratio with 95% CI was calculated to determine association.

### Ethical consideration

Ethical clearance was obtained from the Institutional Review Board of Amanuel Mental Specialized Hospital. Written informed consent was obtained (after capacity to consent test) from each study participant (care giver) after they were introduced to the purpose of the study and informed about their rights to interrupt the interview at any time. Confidentiality was maintained at all levels of the study.

## Results

### Socio demographic characteristics

A total of 260 schizophrenic and 261 bipolar patients were included in the study. The mean age of the respondents were 33.74 ( $\pm$  SD=9.36) and 34 ( $\pm$  SD=9.40) years for bipolar and schizophrenic patients respectively. Among the respondents (bipolar and schizophrenic patients respectively), 187 (71.6 %) and 120 (69.6%) were males, 491(59.10%) and 165 (63.5%) were orthodox religion followers, 151(58.1) and 157 (60.2%) were single (unmarried). Concerning educational status, 262 (31.6%) and 100 (38.5%) were completed secondary educational level for bipolar and schizophrenic participants respectively.

### Prevalence of substance use in patients with severe mental disorders

Majority of the respondents, 220 (84.4%) (Bipolar patients) and 215 (82.7%) (Schizophrenic patients) had used substance, of which 648 (78.10%) and 648 (78.10%) were current users and, 220 (84.4%) and 215 (82.7%) were life time users of any substance respectively for bipolar and schizophrenic patients. The most commonly used substance 161 (61.8%) and 155 (59.6%) khat, and 160 (61.3%) and 154 (59.2%) alcohol for bipolar and schizophrenic patients respectively (Table 1 and 2).

### Prevalence of poly substance use in patients with severe mental disorders

About half of the study participants (bipolar and schizophrenic patients), 130 (49.8%) and 125 (48.1%) were poly substance users, of which 110 (42.1%) and 104 (40 %) were used Alcohol and khat in their life time and, 90 (34.5%) and 84 (32.3%) were life time users of Alcohol and nicotine respectively (Table 3).

### Percentage distribution socio demographic characteristics of respondents by their substance use

The magnitude of substance use found to be higher among males than females, younger patients than geriatric populations, separate and divorce than married and among patients with lower educational status than higher educational status for both patients with schizophrenia and bipolar disorder.

Substance used	Severe Mental Disorders			
	Schizophrenia		Bipolar disorder	
	Current use	Life time use (ever had used)	Current use	Life time use (ever had used)
Alcohol	124 (47.7%)	154 (59.2%)	125 (47.5%)	160 (61.3%)
Khat/chat	134 (51.5%)	155 (59.6%)	141 (54%)	161 (61.8)
Nicotine	65 (25%)	85 (32.7%)	64 (24.5%)	82 (31.4%)
Cannabis	5 (1.9%)	5 (1.9%)	4 (1.5%)	4 (1.5%)
Any substance use	195 (75%)	215 (82.7%)	202 (77.4%)	220 (84.4%)

**Table 1:** Percentage distribution of respondents by their substance use (schizophrenia, n=260 and bipolar disorder, n=261) Amanual hospital, Addis Ababa, Ethiopia, June 2014.

Substance use disorders	Severe Mental Disorders			
	Schizophrenia		Bipolar disorder	
	Current use disorder	Life time use (ever had used) disorder	Current use disorder	Life time use (ever had used) disorder
Alcohol use disorder	71 (27.3%)	94 (36.2%)	74 (28.4%)	102 (39.1%)
Khat/chat use disorder	123 (47.3%)	125 (48.1%)	130 (49.8%)	132 (50.6%)
Nicotine use disorder	34 (13.1%)	34 (13.1%)	33 (12.6%)	34 (13%)
Cannabis use disorder	4 (1.5%)	4 (1.5%)	4 (1.5%)	4 (1.5%)
Any substance use disorder	160 (61.5%)	165 (63.5%)	167 (64%)	172 (65.9%)

**Table 2:** Percentage distribution of respondents by their substance use disorders (schizophrenia, n=260 and bipolar disorder, n=261) Amanual hospital, Addis Ababa, Ethiopia, June 2014.

Substance used	Severe Mental Disorders			
	Schizophrenia		Bipolar disorder	
	Current use	Life time use (ever had used)	Current use	Life time use (ever had used)
Alcohol and khat	72 (29.2%)	104 (40%)	74 (28.4%)	110 (42.1%)
Alcohol and nicotine	43 (16.2%)	84 (32.3%)	44 (16.9%)	90 (34.5%)
Alcohol and cannabis	5 (1.9%)	5 (1.9%)	4 (1.5%)	4 (1.5%)
Khat/chat and nicotine	25 (9.6%)	65 (25%)	34 (13%)	62 (23.8%)
Khat/chat and cannabis	5 (1.9%)	5 (1.9%)	4 (1.5%)	4 (1.5%)
Nicotine and cannabis	5 (1.9%)	5 (1.9%)	4 (1.5%)	4 (1.5%)
Alcohol, khat and nicotine	36 (14.2%)	64 (24.6%)	34 (13%)	62 (23.8%)
Alcohol, khat, nicotine and cannabis	5 (1.9%)	5 (1.9%)	4 (1.5%)	4 (1.5%)
Poly substance use	95 (36.5%)	125 (48.1%)	94 (36%)	130 (49.8%)

**Table 3:** Percentage distribution of respondents by their poly substance use (schizophrenia, n=260 and bipolar disorder, n=261) Amanual hospital, Addis Ababa, Ethiopia, June 2014.

### Percentage distribution respondents with substance use disorder by their rate of hospitalization, suicide and treatment

Majority of those who had hospitalization had co-occurring substance use disorders as compared to those who have no hospitalizations for schizophrenia (81.5% and 37.9%) and bipolar disorders (82.56% and 38.2%). From those who have history of relapse almost 90% of them have co-occurring substance use disorders and less than 25% of those who have co-occurring substance use disorders get treatment for substance use disorders (Table 4).

### Percentage distribution of respondents by their reason of substance use

For those patients who had co-occurring substance use disorder (more than 50%), the main reasons of substance use were to alleviate symptoms, because of peer pressure, relaxation and to increase concentrations and less than half of those who had co-occurring substance use disorders were use the substance for pain relief, because of availability and because of its low-cost (Table 5 and 6).

### Discussion

This study assessed the magnitude and correlates of co-occurring substance use disorders in patients with severe mental disorders, particularly schizophrenia and bipolar disorders, at Amanuel mental specialized hospital. The results of this study revealed that more than 60% of the respondents 65.9% (bipolar patients) and 64% (schizophrenic patients) have substance use disorder. This finding is in line with other studies [19-20,23,25] but higher than [22] and lower than [17,18]. The possible reasons for this difference might be due to the difference in data collection instrument, socio-demographics and culture. Unlike other studies [7-9,16-20] among substance use disorder, the most common disorder is khat use disorder where about 132 (50.6%) (Bipolar patients) and 125 (48.1%) (Schizophrenic patients) have used khat in their life time. The possible reasons for this difference might be due to differences in socio-demographics and culture.

Based on the current finding, 39.1% (bipolar) and 36.2% (schizophrenic) had alcohol use disorder in their life time. The current finding (for schizophrenic patients) is in line with other study [22] but lower for (bipolar patients) [23]. Regarding to nicotine use disorder,

Substance use disorder	Severe Mental Disorders			
	Schizophrenia		Bipolar disorder	
	Current use disorder	Life time use (ever had used) disorder	Current use disorder	Life time use (ever had used) disorder
Alcohol and khat use disorder	72 (29.2%)	104 (40%)	32 (12.3%)	62 (23.8%)
Alcohol and nicotine use disorder	43 (16.2%)	84 (32.3%)	24 (9.2%)	24 (9.2%)
Alcohol and cannabis use disorder	5 (1.9%)	5 (1.9%)	4 (1.5%)	4 (1.5%)
Khat/chat and nicotine disorder	25 (9.6%)	65 (25%)	34 (13%)	34 (13%)
Khat/chat and cannabis use disorder	5 (1.9%)	5 (1.9%)	4 (1.5%)	4 (1.5%)
Nicotine and cannabis use disorder	5 (1.9%)	5 (1.9%)	4 (1.5%)	4 (1.5%)
Alcohol, khat and nicotine use disorder	36 (14.2%)	64 (24.6%)	14 (5.4%)	24 (9.2%)
Alcohol, khat, nicotine and cannabis disorder	5 (1.9%)	5 (1.9%)	4 (1.5%)	4 (1.5%)
Poly substance use disorder	95 (36.5%)	125 (48.1%)	71 (27.2%)	81 (31%)

**Table 4:** Percentage distribution of respondents by their poly substance use disorders (schizophrenia, n=260 and bipolar disorder, n=261) Amanual hospital, Addis Ababa, Ethiopia, June 2014.

co-occurring any life time substance use disorders in schizophrenic participants				
Variables	YES	NO	Crude OR(95%CI)	Adjusted OR((95%CI)
<b>Age</b>				
≤27(RC)	64	36	1	1
28-38	70	20	0.58(0.27-0.97) *	<b>0.51(0.27-0.98)*</b>
>38	31	39	2.24(1.20-4.17) *	<b>2.32(1.18-4.56) *</b>
<b>PLACE OF RESIDENCE</b>				
Urban	115	66	1.01(0.58-1.75)	1.09(0.61-1.92)
Rural (RC)	50	29	1	1
<b>Peer pressure</b>				
Yes	94	50	1.19(0.72-1.98)	1.08(0.62-1.94)
No (RC)	71	45	1	1
<b>Hospitalization</b>				
Yes	134	36	7.08(4.01-12.52)*	<b>3.15(1.20-8.27)*</b>
No (RC)	31	59	1	1
<b>Relapse</b>				
Yes	145	45	8.06(4.35-4.93)*	<b>3.35(1.13-9.94)*</b>
No (RC)	20	50	1	1
<b>Suicidal attempt</b>				
Yes	94	30	2.87(1.69-4.88)	1.03(0.40-1.72)
No (RC)	71	65	1	1

Each socio demographic variables adjusted for each socio demographic variables and peer pressure, peer pressure adjusted for each socio demographic variables, and other variables such as hospitalization, relapse and suicidal attempt adjusted each other.

**Key:-\* significant association RC (1:00): reference category/group**

**Table 5:** Binary logistic analysis of respondents selected Socio-demographic characteristics and other factors associated with co-occurring any life time substance use disorders in schizophrenic participants in Amanual hospital, Addis Ababa, Ethiopia, June 2013.

Co-occurring any life time substance use disorders in bipolar participants				
Variables	YES	NO	Crude OR(95%CI)	Adjusted OR((95%CI)
<b>Age</b>				
≤27(RC)	61	35	1	1
28-38	78	28	0.45(0.23-0.89) *	<b>0.46(0.24-0.90)*</b>
>38	33	36	1.96(1.05-3.67) *	1.92(1.01-3.37) *
<b>PLACE OF RESIDENCE</b>				
Urban	114	62	1.17(0.67-2.03)	1.19(0.67-2.11)
Rural (RC)	58	27	1	1
<b>Peer pressure</b>				
Yes	94	50	1.25(0.74-2.09)	0.95(0.54-1.69)

No (RC)	71	45	1	1
<b>Hospitalization</b>				
Yes	134	34	5.70(3.26-9.94)*	1.75(1.07-4.37)
No (RC)	38	55	1	1
<b>Relapse</b>				
Yes	152	42	8.51(4.55-15.85)*	<b>5.18(1.72-15.64)*</b>
No (RC)	20	47	1	1
<b>Suicidal attempt</b>				
Yes	102	28	3.17(1.85-5.45) *	1.02(0.51-2.13)
No (RC)	70	61	1	1

Each socio demographic variables adjusted for each socio demographic variables and peer pressure, peer pressure adjusted for each socio demographic variables, and other variables such as hospitalization, relapse and suicidal attempt adjusted each other.

**Key:-\* significant association**      **RC (1:00): reference category/group**

**Table 6:** Binary logistic analyses of respondents selected Socio-demographic characteristics and other factors associated with Co-occurring any life time substance use disorders in bipolar participants in Amanuel hospital, Addis Ababa, Ethiopia, June 2013.

13.1% (bipolar) and 13% (schizophrenic) had used nicotine in their life time. These findings are lower than other studies [16-20]. This might be due to the difference in data collection instrument, socio demographics and culture.

Based on the finding, 1.5% (both bipolar and schizophrenic patients) had used cannabis in their life time. This finding is in agreement with other studies [25]. Poly substance co morbidity was higher among peoples with schizophrenia (48.1%) than peoples with bipolar disorder (31%). This is might be due to peoples with schizophrenia have high probability to contact with different peoples.

According to this study the prevalence of substance use disorder was found to be higher among males than females, younger patients than geriatric populations, separate and divorce than married, among patients with lower educational status than higher educational status for both peoples with schizophrenia and bipolar disorder. These findings were supported by other studies [22,25-29].

The results of this study showed that majority of those who have hospitalization (81.5% and 82.56%) had co-occurring substance use disorders as compared to those who have no hospitalizations (37.9% and 38.2%) for both schizophrenic and bipolar patients respectively. Similarly, for schizophrenic and bipolar patients who had history of suicidal ideation (69.1% and 70.93%) and attempt (57% and 59.3%) have co-occurring substance use disorders as compared to those who have no suicidal ideation (31.8% and 32.6%) and attempt (29.47% and 30.34%) respectively. Patients who had history of relapse, 90% of them have co-occurring substance use disorders and less than 25% of those who have co-occurring substance use disorders get treatment for substance use disorders. These findings were in line with other studies [16,23,30-33].

The most commonly used substance was khat 61.8% (bipolar) and 59.6% (schizophrenic) followed by alcohol 61.3% (bipolar) and 59.2% (schizophrenic). About half of the respondents 49.8% (bipolar) and 48.1% (schizophrenic) were poly substance users of which; about 42.1% and 40% are using alcohol and khat in their life time and about 90 (34.5%) and 84 (32.3%) are life time users of Alcohol and nicotine respectively. Unlike this study, as far as we reviewed, none study tried to assess non pathological substance use for schizophrenia and bipolar disorders yet.

The main reasons of use the substance for those who have (schizophrenia and bipolar) co-occurring substance use disorders were to alleviate symptoms, because of peer pressure, relaxation and

to increase concentrations and less than half of those who have co-occurring substance use disorders use the substance for pain relief, because of availability and low-cost. This finding is similar with other studies [4-6,12,16,30-33].

57% (schizophrenic) and 54% (bipolar) patients with age group of 28-38 were less likely to have co-occurring substance use disorders and age group >38 were found to have 2.32 times for schizophrenic and 1.92 times for bipolar more likely to have co-occurring substance use disorders than their younger age (age <28). This finding is in agreement with other studies [30-34].

Individuals with history of hospitalizations were 3.15 (schizophrenic) and 1.75 (bipolar) times more likely to have co-occurring substance use disorders than individuals without history of hospitalizations. Also individuals with history of relapse were found to have 3.35 (schizophrenic) and 5.18 (bipolar) times more likely to have co-occurring substance use disorders than individuals without history of relapse. This might be due to the neuro-chemical effect of substance which is already abnormal in each disorder. These findings were supported by other studies [26,30].

In this study Co-occurring substance use disorders in both schizophrenic and bipolar disorder patients was not found to be associated with educational level, place of residence and suicidal attempt. Limitations include the cross sectional nature of the study and associated factors are assessed for life time co-occurring substance use disorders which may not indicate prediction for active substance use disorders for interventions.

## Conclusion and Recommendation

The magnitude of co-occurring substance use disorders is high and almost similar in both schizophrenic and bipolar disorder patients. Majority of both bipolar and schizophrenic participants have used substance of which about half of them are poly users and the most commonly used substance were khat and alcohol. Being younger Age, peer pressure, history of hospitalization and relapses were significantly associated with co-occurring substance use. Routine screening for substance use disorders for patients with severe mental disorders is advisable. More emphasis will be given to assess co-occurring substance use disorders in schizophrenic and bipolar disorder patients who are younger age group, have history of hospitalizations and relapses. Further researches which include effects of factors for co-occurring substance use disorders should be conducted to strengthen and broaden the current findings.

## Competing Interests

The authors declare that they have no competing interests.

## Authors' Contributions

GA conceived the study and was involved in the study design, reviewed the article, analysis, report writing and drafted the manuscript. BD was involved in the study design, analysis, report writing, editing and drafted the manuscript. DA and LB were involved in the study design, analysis and drafted the manuscript. All authors contributed to writing the draft of the manuscript, and have approved the final draft.

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