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Original Research

Comparing the Prevalence of Substance Use Disorders in Patients with Bipolar Disorder vs. Major Depressive Disorder

[1]Dr. Krishnendu Mondal, [2]Dr. Ambar Tiwari, [3]Dr. Ajeet Kumar

[1]Assistant Professor, Department of Psychiatry, Laxmi Chandravanshi Medical Collage Hospital, Bisrampur, Jharkhand, Bharat.
[2]Assistant Professor, Department of Psychiatry, Muzaffarnagar Medical College, Muzaffarnagar, Uttar Pradesh, Bharat.
[3]Assistant Professor, Department of Psychiatry, Baba Raghav Das Medical College Gorakhpur, Uttar Pradesh, Bharat.

Corresponding author
Dr. Ambar Tiwari
Assistant Professor, Department of Psychiatry, Muzaffarnagar Medical College, Muzaffarnagar, Uttar Pradesh, Bharat.

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ABSTRACT

Aim: This study aimed to compare the prevalence and patterns of Substance Use Disorders (SUD) among patients diagnosed with Bipolar Disorder (BD) and Major Depressive Disorder (MDD), and to identify clinical predictors of SUD across both groups.

Material and Methods:A cross-sectional, observational study was conducted on 100 adult psychiatric patients (50 with BD and 50 with MDD) at a tertiary care hospital. Diagnoses were established using DSM-5 criteria and structured clinical interviews (SCID-5). Sociodemographic and clinical data were collected, and the presence of SUD was assessed using DSM-5 standards. Substances examined included alcohol, cannabis, nicotine, opioids, stimulants, and sedatives. Comparative statistical analysis was conducted using chi-square and t-tests, and a multiple logistic regression model was used to determine predictors of SUD.

Results: The two groups were demographically comparable. Patients with BD had a significantly higher prevalence of SUD (58%) than those with MDD (28%) ($p < 0.01$). Alcohol and nicotine were the most commonly used substances in both groups. Among SUD-positive individuals, the majority used only one substance. Logistic regression revealed that having a diagnosis of BD significantly increased the odds of SUD (OR = 3.03; $p = 0.008$), with psychiatric hospitalization also showing a marginal association ($p = 0.050$). Gender, age, and illness duration were not statistically significant predictors.

Conclusion: Bipolar Disorder is strongly associated with a higher prevalence of Substance Use Disorders compared to Major Depressive Disorder. These findings emphasize the importance of routine screening and integrated management of SUD in patients with BD to improve clinical outcomes.

Keywords: Bipolar Disorder, Major Depressive Disorder, Substance Use Disorder, Prevalence, Comorbidity

Introduction

Mood disorders are among the most prevalent and debilitating psychiatric conditions, profoundly affecting individuals' thoughts, emotions, behaviors, and overall quality of life. Among these, Bipolar Disorder (BD) and Major Depressive Disorder (MDD) represent two major diagnostic entities, each characterized by distinct clinical courses, symptom profiles, and treatment challenges. Despite their diagnostic differences, both disorders are associated with a high degree of comorbidity with other psychiatric and medical conditions. One of the most common and concerning comorbidities in this population is Substance Use Disorder (SUD), which refers to the recurrent use of alcohol or other substances that lead to clinically significant impairment or distress.[1]

The relationship between mood disorders and SUD is complex, bidirectional, and influenced by multiple biopsychosocial factors. Individuals with mood disorders often engage in substance use as a form of self-medication, attempting to alleviate symptoms such as sadness, anxiety, insomnia, or agitation. Conversely, chronic substance use may exacerbate or even precipitate mood symptoms, leading to a vicious cycle of worsening psychiatric morbidity. The

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presence of comorbid SUD in mood disorder patients has been associated with poorer clinical outcomes, including increased symptom severity, higher relapse rates, greater functional impairment, higher risk of hospitalization, treatment nonadherence, and elevated suicide risk.[2]

Although SUD is prevalent across various mood disorders, emerging evidence suggests that its prevalence and impact may differ significantly between BD and MDD. Bipolar Disorder, characterized by alternating episodes of mania, hypomania, and depression, often presents with heightened impulsivity, emotional dysregulation, and sensation-seeking behaviors. These traits may predispose individuals with BD to experiment with or rely on substances more frequently than those with unipolar depression. Additionally, manic or hypomanic states can impair judgment and increase risk-taking behaviors, further elevating the risk of substance use. On the other hand, Major Depressive Disorder, primarily defined by persistent low mood, anhedonia, and cognitive dysfunction, may also lead to substance use as individuals seek relief from emotional distress. However, the mechanisms, motivations, and patterns of use may differ from those seen in BD.[3]

Despite growing recognition of the high comorbidity between mood disorders and SUD, direct comparative studies focusing on the differential prevalence of SUD in BD and MDD remain limited. Most clinical and epidemiological studies have focused on one disorder at a time or have not distinguished between different mood disorder subtypes. This gap in the literature limits our ability to develop tailored screening, prevention, and intervention strategies based on specific diagnostic categories. Understanding the differences in SUD prevalence and patterns of use between BD and MDD patients is essential for informing clinical practice, enhancing early identification of at-risk individuals, and implementing more effective, diagnosis-specific treatment approaches.[4]

Furthermore, substance use among individuals with mood disorders may vary depending on multiple demographic and clinical factors, including age, gender, duration of illness, number of psychiatric hospitalizations, and psychosocial stressors. For instance, younger patients and males have often been found to be at higher risk for substance misuse, while longer illness duration and frequent hospitalizations may reflect a more severe clinical course complicated by comorbid SUD. Recognizing these risk factors in routine psychiatric assessments could aid in early detection and targeted management.[5]

In clinical settings, comorbid SUDs frequently complicate the treatment of both BD and MDD. For patients with BD, substance use may worsen the course of illness by increasing the frequency and intensity of mood episodes, complicating mood stabilization, and limiting pharmacologic treatment options due to potential drug interactions or contraindications. Similarly, in MDD, substance use can blunt treatment responses, prolong depressive episodes, and increase the risk of suicide. Despite these serious implications, SUDs are often underdiagnosed or inadequately addressed in patients with mood disorders, partly due to overlapping symptoms, stigma, and fragmentation in mental health and addiction care services.[6]

Given these challenges, there is a critical need to better understand the scope and characteristics of SUD among patients with BD and MDD. By comparing the prevalence and substance use patterns in these two populations, clinicians and policymakers can gain valuable insights that may inform more personalized and integrated treatment strategies. A comprehensive understanding of these comorbidities is especially important in tertiary care settings, where complex and treatment-resistant cases are more commonly encountered.[7,8]

This study aims to address this gap by directly comparing the prevalence of SUD in patients diagnosed with Bipolar Disorder versus those with Major Depressive Disorder. In addition to examining overall prevalence, the study explores the types of substances used, the number of substances per individual, and the demographic and clinical variables associated with substance use in each group. Through this comparative approach, the study seeks to contribute to a more nuanced understanding of how SUD manifests across different mood disorders and to support the development of targeted screening and intervention programs. Ultimately, identifying and addressing comorbid SUDs more effectively may lead to better clinical outcomes, reduced healthcare costs, and improved quality of life for individuals suffering from mood disorders.

Materials and Methods

This was a cross-sectional, observational study conducted at tertiary care hospital over a time period of 6 months. A total of 100 adult patients (aged 18–65 years) were recruited for the study. Participants were divided into two diagnostic groups based on DSM-5 criteria: 50 patients diagnosed with Bipolar Disorder (BD) and 50 patients diagnosed with Major Depressive Disorder (MDD). Diagnoses were made by board-certified psychiatrists using structured clinical interviews (SCID-5).

Inclusion criteria included:

- A confirmed diagnosis of BD (Type I or II) or MDD
- Age between 18 and 65 years
- Ability to provide informed consent

Exclusion criteria included:

- Current psychotic symptoms or diagnosis of schizophrenia spectrum disorders
- Severe cognitive impairment

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- Ongoing withdrawal or intoxication states
- Severe physical illness.
- Incomplete clinical data

Methodology

Sociodemographic and clinical data were collected using a structured questionnaire, including age, gender, marital status, employment status, education level, duration of illness, and number of psychiatric hospitalizations. Diagnosis of Substance Use Disorders (SUD) was determined using DSM-5 criteria, assessed through clinical interview and corroborated by medical records when available. Substances assessed included alcohol, cannabis, opioids, stimulants, sedatives, and nicotine.The primary outcome was the prevalence of SUDs in each group (BD vs. MDD). Secondary outcomes included the type of substances used and the number of substances used per patient.

Statistical Analysis

Descriptive statistics were used to summarize sociodemographic and clinical characteristics. Prevalence rates of SUDs in BD and MDD groups were compared using the chi-square test or Fisher's exact test for categorical variables. Independent samples t-tests were used for continuous variables. A p-value < 0.05 was considered statistically significant. All analyses were performed using SPSS version 26.0 statistical software.

Results

Sociodemographic Characteristics (Table 1)

The sociodemographic profiles of patients with Bipolar Disorder (BD) and Major Depressive Disorder (MDD) were relatively similar, with no statistically significant differences observed across variables. The mean age of BD patients was 36.5 years (±10.2), while MDD patients had a slightly higher mean age of 38.1 years (±9.8), though this difference was not statistically significant (p = 0.41). In terms of gender distribution, males comprised 56% of the BD group and 44% of the MDD group (p = 0.22), indicating a slight male predominance in the BD group. Marital status, employment status, and level of education were comparable between groups, with no meaningful statistical differences (p-values all > 0.05). These findings suggest that the two diagnostic groups were demographically well-matched.

Clinical Characteristics (Table 2)

When comparing clinical variables, patients with BD had a longer mean duration of illness (8.3 ± 5.4 years) than those with MDD (6.7 ± 4.9 years), though this difference approached but did not reach statistical significance (p = 0.07). However, a significant difference was observed in the frequency of psychiatric hospitalizations: 70% of BD patients had at least one psychiatric hospitalization compared to only 36% in the MDD group (p< 0.01). This aligns with the generally more severe and episodic nature of bipolar illness, which often leads to recurrent inpatient care.

Prevalence of Substance Use Disorders (Table 3)

A marked difference was noted in the prevalence of Substance Use Disorders (SUDs) between the two groups. SUD was significantly more common among BD patients, with 58% reporting a history of SUD compared to only 28% of MDD patients (p< 0.01). Conversely, 72% of MDD patients had no history of SUD versus 42% in the BD group. This statistically significant disparity highlights the stronger association between bipolar disorder and substance misuse.

Types of Substances Used (Table 4)

Among patients with SUD, the types of substances used were broadly similar between the BD and MDD groups, with no statistically significant differences for any substance. Alcohol was the most frequently used substance in both groups (69% in BD, 64% in MDD). Nicotine use was also high and comparable (59% vs. 57%). Cannabis was more commonly used among BD patients (38%) compared to MDD (29%), though the difference was not significant (p = 0.53). Usage of opioids, stimulants, and sedatives was low in both groups and statistically nonsignificant. These results suggest that while the overall prevalence of SUD differs, the types of substances used are fairly consistent across diagnoses.

Number of Substances Used per Patient (Table 5)

Most patients with SUD in both groups used only one substance: 59% of BD and 71% of MDD patients. A smaller proportion used two substances (28% in BD vs. 21% in MDD), and very few used three or more substances (14% in BD, 7% in MDD). These differences were not statistically significant, indicating that the **severity** or **poly-substance use** among those with SUD does not differ substantially between the two diagnostic groups.

Multiple Logistic Regression Analysis (Table 6)

The logistic regression analysis identified diagnosis as a significant predictor of SUD. Patients with BD had three times higher odds (OR = 3.03; 95% CI: 1.33–6.91; p = 0.008) of having a substance use disorder compared to those with MDD, even after controlling for other variables. Number of psychiatric hospitalizations was also marginally significant (p = 0.050), suggesting that more frequent hospitalizations may be associated with increased likelihood of SUD. Gender (male), younger age, and longer duration of illness showed trends toward association but were not statistically significant. Overall, this model indicates that diagnosis of BD is an independent and strong predictor of SUD.

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Table 1: Sociodemographic Characteristics

Variable	Bipolar Disorder (n=50)	Major Depressive Disorder (n=50)	p-value
Mean Age (years)	36.5 ± 10.2	38.1 ± 9.8	0.41
Gender (Male)	28 (56%)	22 (44%)	0.22
Married	31 (62%)	34 (68%)	0.52
Employed	21 (42%)	24 (48%)	0.53
Higher Education	18 (36%)	20 (40%)	0.68

Table 2: Clinical Characteristics

Clinical Variable	Bipolar Disorder (n=50)	Major Depressive Disorder (n=50)	p-value
Mean Duration of Illness (years)	8.3 ± 5.4	6.7 ± 4.9	0.07
≥1 Psychiatric Hospitalization	35 (70%)	18 (36%)	**<0.01**

Table 3: Prevalence of Substance Use Disorders (SUD)

SUD Presence	Bipolar Disorder (n=50)	Major Depressive Disorder (n=50)	p-value
Any SUD	29 (58%)	14 (28%)	**<0.01**
No SUD	21 (42%)	36 (72%)	

Table 4: Types of Substances Used (Among SUD+ Patients)

Substance Used	BD (n=29)	MDD (n=14)	p-value
Alcohol	20 (69%)	9 (64%)	0.71
Cannabis	11 (38%)	4 (29%)	0.53
Nicotine	17 (59%)	8 (57%)	0.89
Opioids	6 (21%)	2 (14%)	0.54
Stimulants	5 (17%)	1 (7%)	0.38
Sedatives	4 (14%)	2 (14%)	1.00

Table 5: Number of Substances Used per Patient (Among SUD+ Patients)

Number of Substances Used	BD (n=29)	MDD (n=14)	p-value
1	17 (59%)	10 (71%)	0.42
2	8 (28%)	3 (21%)	0.57
≥3	4 (14%)	1 (7%)	0.48

Table 6: Multiple Logistic Regression Predicting Substance Use Disorder (SUD)

Predictor Variable	B (SE)	Wald	OR (95% CI)	p-value
Diagnosis (BD vs. MDD)	1.11 (0.42)	6.99	3.03 (1.33–6.91)	**0.008**
Gender (Male)	0.67 (0.40)	2.82	1.95 (0.89–4.26)	0.093
Age (years)	-0.03 (0.02)	2.19	0.97 (0.93–1.01)	0.139
Duration of Illness	0.05 (0.04)	1.39	1.05 (0.98–1.13)	0.238
Psychiatric Hospitalizations	0.49 (0.25)	3.84	1.63 (1.00–2.67)	**0.050**

Discussion

The findings from this study demonstrate a significantly higher prevalence of Substance Use Disorders (SUDs) among patients with Bipolar Disorder (BD) compared to those with Major Depressive Disorder (MDD). Specifically, 58% of individuals with BD met criteria for SUD, whereas only 28% of those with MDD did ($p< 0.01$). This disparity is in line with the findings of Goldstein and Levitt (2006), who reported that nearly 60% of individuals with BD, particularly BD-I, have comorbid SUDs, which are associated with greater symptom severity, more frequent relapses, and poorer functioning.[8] Similarly, Swann (2010) emphasized the strong and biologically grounded relationship between BD and SUDs, citing impulsivity and dysregulated reward processing as contributing factors, and reported that about half of BD patients have a lifetime SUD.[9]

In contrast, MDD patients in our study demonstrated a significantly lower prevalence of SUD, consistent with the findings of Hasin et al. (2005), who found that in a national survey, lifetime alcohol use disorder was present in 16.5% and drug use disorder in 6.2% of those with MDD.[10] This supports our observation that SUD is less prevalent in MDD than BD, although still clinically significant. Cerullo and Strakowski (2007) further reinforced the notion that while SUDs are common in both conditions, they are more disruptive in BD due to their exacerbating effects on manic and depressive episodes, which may explain

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the higher rate of hospitalizations in our BD group (70% vs. 36%; $p< 0.01$).[11]

The clinical impact of SUDs is particularly critical in the management of BD, as highlighted by Salloum and Thase (2000), who found that substance abuse leads to poorer medication response, more frequent relapses, and a more complicated treatment course in BD.[12] In our study, these effects may be reflected in the higher frequency of psychiatric hospitalizations among BD patients. Although gender and age were not significant predictors in our regression analysis, there was a trend suggesting that males and younger patients may be at higher risk, which aligns with Davis et al. (2008), who noted that male gender and early onset of illness are risk factors for SUDs in depressive disorders as well.[13]

The global relevance of our findings is supported by meta-analytic data. Hunt et al. (2016) conducted a systematic review and reported a pooled SUD prevalence of 42.6% in bipolar samples, closely matching the 58% rate seen in our cohort and reinforcing the high burden of comorbidity in clinical settings.[14]Nesvåg and Bramness (2015) also observed significantly higher rates of cannabis use disorders in BD compared to MDD, with lifetime prevalence rates of 21.2% and 7.9%, respectively.[15] While our sample showed a higher proportion of cannabis users in the BD group (38% vs. 29%), the difference was not statistically significant, likely due to the smaller sample size.

Our findings are consistent with the broader literature on dual diagnosis. Buckley and Brown (2006) emphasized that patients with co-occurring mood and substance use disorders present with greater diagnostic and treatment complexity and are at higher risk of poor outcomes.[16] Interestingly, while our data showed similar patterns of substance use types across both groups, the overall higher prevalence in BD underscores the need for more vigilant screening and integrated care. The functional consequences of excessive substance use in BD, highlighted by Lagerberg et al. (2010), are often more severe than clinical characteristics alone suggest, aligning with our results where poly-substance use, although not significantly different, was more common in BD.[17]

Gender differences, although not statistically significant in our study, showed a trend of higher SUD prevalence among males, which is consistent with findings by Frye et al. (2003), who reported that male patients with BD had nearly double the rate of alcohol dependence compared to females (39% vs. 21%) This gender-based vulnerability may have implications for tailoring interventions.[18]

The recent Indian study by Grover et al. (2022) found a 29.4% prevalence of comorbid substance dependence in BD, with a strong association with more severe clinical features and poorer outcomes.[19] These findings mirror our observation of a high SUD burden in BD and its correlation with frequent hospitalizations, which was also highlighted as a near-significant predictor in our logistic regression model ($p = 0.050$). Additionally, Preuss et al. (2021) reported elevated rates of illicit drug use in BD patients, particularly cannabis and stimulants, which were substances more frequently used by BD patients in our study as well, though not significantly so.[20]

Conclusion

In conclusion, our study demonstrates that patients with Bipolar Disorder exhibit a significantly higher prevalence of Substance Use Disorders compared to those with Major Depressive Disorder. The results underscore BD as an independent risk factor for SUD, with notable implications for treatment planning. These findings highlight the need for integrated screening and tailored intervention strategies in clinical practice. Future research should further explore the underlying mechanisms and outcomes of targeted interventions.

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