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Research Article

Suicidal Ideation, Cognitive Dysfunction, and Sleep Disturbances in Unipolar vs. Bipolar Depression: A Cross-Sectional Comparative Study

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ABSTRACT
Background: Depressive disorders represent a major contributor to global disease burden, associated with significant disability and elevated suicide risk. While unipolar depression and bipolar depression share overlapping affective symptoms, they differ in clinical trajectory, biological underpinnings, and functional outcomes. Suicidality, cognitive impairment, and sleep disturbances are key domains influencing prognosis, relapse risk, and quality of life.
Aim & objectives: To compare the prevalence and severity of suicidal ideation, cognitive impairment, and sleep disturbances in patients with unipolar and bipolar depression, and to examine correlations among these clinical variables.
Materials and Methods: This cross-sectional, hospital-based study included 120 participants: 60 with unipolar depression and 60 with bipolar depression, diagnosed using ICD-10 criteria. Depressive severity was assessed using the Hamilton Depression Rating Scale (HAM-D), suicidality using the Columbia Suicide Severity Rating Scale (C-SSRS), cognitive functioning using the Montreal Cognitive Assessment (MoCA), and sleep quality using the Pittsburgh Sleep Quality Index (PSQI). Statistical analyses were performed using SPSS version 26.0, applying independent t-tests, chi-square tests, and Pearson's correlation coefficient.
Results: Mean HAM-D scores were significantly higher in the bipolar group (23.8 ± 4.6) compared with the unipolar group (20.9 ± 3.9; $p < 0.01$). Suicidal behavior was present in 65% of bipolar and 58% of unipolar patients, with higher mean C-SSRS scores in bipolar depression (22.4 ± 6.1 vs. 17.9 ± 5.4; $p < 0.05$). Cognitive impairment (MoCA < 26) was noted in 62% of bipolar and 45% of unipolar cases, with mean MoCA scores of 23.1 ± 3.2 and 25.4 ± 2.8, respectively ($p < 0.01$). Poor sleep quality (PSQI > 5) was observed in 80% of bipolar and 72% of unipolar patients, with higher mean PSQI scores in the bipolar group (11.2 ± 3.5 vs. 9.6 ± 3.1; $p < 0.05$). Depression severity demonstrated a positive correlation with suicidality ($r = 0.64$, $p < 0.001$) and sleep disturbance ($r = 0.47$, $p < 0.01$), while MoCA scores negatively correlated with PSQI ($r = -0.42$, $p < 0.05$).
Conclusion: Both diagnostic groups demonstrated high levels of suicidality, cognitive impairment, and sleep disturbance; however, these impairments were significantly more pronounced in bipolar depression. The findings underscore the necessity of routine multidimensional assessment to guide individualized clinical management and relapse prevention.

Keywords: Unipolar Depression, Bipolar Depression, Suicidality, Cognitive Impairment, Sleep Disturbance, Mood Disorders.

INTRODUCTION

Depressive disorders are major contributors to the global burden of disease, affecting more than 300 million individuals worldwide and representing a leading cause of disability, functional impairment, and reduced quality of life.^1,2 Within this spectrum, Major Depressive Disorder (unipolar depression) and bipolar depression share common affective symptoms such as low mood, anhedonia, sleep disturbances, and psychomotor changes but differ markedly in clinical trajectory, neurobiological mechanisms, treatment response, and long-term outcomes.^3 Growing evidence suggests that bipolar depression, in comparison with unipolar depression, may be associated with more severe symptomatology, earlier onset, greater functional impairment, and higher risk of relapse and hospitalization.^4

Suicidality is among the most serious complications of depressive illness. Individuals with mood disorders carry an estimated 15- to 30-fold higher suicide risk than the general population, and bipolar disorder accounts for disproportionately high suicidal morbidity and

mortality.^5 Recent multicentric studies have reported that suicidal ideation and attempts occur more frequently and with greater intensity during bipolar depressive episodes compared with unipolar depression.^6 This distinction is clinically relevant, as early identification of suicide risk factors improves intervention timing, increases treatment responsiveness, and may prevent fatal outcomes.

Cognitive impairment has emerged as a core dimension of mood disorders rather than a secondary or transient feature of emotional distress. Deficits in attention, executive functioning, working memory, and processing speed are frequently reported in both unipolar and bipolar depression.^7 However, multiple recent studies have demonstrated that cognitive dysfunction is often more pronounced and persistent in bipolar disorder, continuing even into euthymic phases and contributing to long-term disability, poor occupational functioning, and impaired psychosocial adjustment.^8 Cognitive impairment has also been associated with poorer treatment outcomes and higher relapse rates, highlighting its importance as a prognostic factor.^9

Sleep disturbances represent another central feature of depressive pathology. Insomnia, hypersomnia, circadian rhythm dysregulation, and poor subjective sleep quality are commonly observed across depressive disorders.^10 Evidence suggests that bipolar depression is characterized by greater sleep variability, circadian rhythm instability, and heightened biological sensitivity to sleep disruption compared with unipolar depression.^11 Furthermore, sleep disturbances have been shown to correlate with increased suicide risk, worsening cognitive performance, and poor treatment outcomes, indicating a potentially bidirectional relationship between sleep impairment and clinical severity.^12

Despite growing literature on suicidality, cognitive impairment, and sleep disturbance in mood disorders, most studies have examined these dimensions independently or focused on a single diagnostic group. Comparative studies assessing all three variables concurrently in unipolar and bipolar depression remain limited, particularly in low- and middle-income countries where underdiagnosis, stigma, delayed treatment, and inadequate mental health resources may exacerbate disease burden.^13 A more integrated approach is needed to clarify the differential profiles of these two disorders and to improve targeted assessment and treatment planning.

Therefore, the present study was undertaken to compare suicidal tendencies, cognitive impairment, and sleep disturbances between patients diagnosed with unipolar and bipolar depression and to explore the interrelationships among these variables. Understanding these distinctions may support more accurate diagnosis, enhance risk stratification, and inform comprehensive treatment strategies aimed at improving clinical outcomes and quality of life in individuals with depressive disorders.

MATERIALS & METHODS

A. Study Design and Setting

This was a hospital-based, cross-sectional comparative study conducted in the Department of Psychiatry at *[Name of Institution]*, a tertiary-care academic center located in *[City, State]* and serving both inpatient and outpatient populations.

B. Study Duration

Data collection occurred over an 18-month period from January 2023 to June 2024.

C. Participants

The study population consisted of adults aged 18–60 years diagnosed with either Major Depressive Disorder (unipolar depression) or Bipolar Affective Disorder, current depressive episode, based on ICD-10 Diagnostic Criteria for Research or DSM-5 criteria. A total of 120 participants were included, comprising 60 individuals with unipolar depression and 60 with bipolar depression.

D. Sample Size and Sampling

Sample size was calculated using G*Power software assuming a moderate effect size (Cohen's $d = 0.50$), alpha = 0.05, and power of 0.80. Eligible participants were recruited using a consecutive sampling method from inpatient and outpatient services.

E. Inclusion and Exclusion Criteria

Individuals were eligible if they were aged between 18 and 60 years, met diagnostic criteria for unipolar or bipolar depression, had an illness duration of more than six months, and provided informed consent. Exclusion criteria included comorbid psychotic disorders, substance dependence, organic brain syndromes, severe physical or neurological illness affecting cognition, acute suicidal risk

requiring emergency hospitalization, and refusal to participate.

F. Ethical Considerations

Ethical approval was obtained from the Institutional Ethics Committee. Written informed consent was obtained from all participants. Confidentiality, anonymity, and the right to withdraw were ensured throughout the study. Participants requiring urgent psychiatric care were referred for appropriate management.

G. Assessment Tools

All participants were evaluated using a structured sociodemographic and clinical pro forma, followed by standardized instruments:

- **Sociodemographic and Clinical Data Proforma**
- **Hamilton Depression Rating Scale (HAM-D)** for depressive symptom severity
- **Columbia Suicide Severity Rating Scale (C-SSRS)** for suicidal ideation and behavior
- **Montreal Cognitive Assessment (MoCA)** for cognitive functioning
- **Pittsburgh Sleep Quality Index (PSQI)** for subjective sleep quality over the preceding month

Sociodemographic and Clinical Data Proforma

A structured proforma developed for the study was used to collect sociodemographic details such as age, sex, education, marital status, occupation, socioeconomic status, and clinical variables including diagnosis, duration of illness, and current treatment status. This ensured uniform and systematic data collection across participants.

Hamilton Depression Rating Scale (HAM-D)

The Hamilton Depression Rating Scale (HAM-D) is a widely used clinician-administered instrument designed to assess the severity of depressive symptoms. The original 17-item version was used in this study, covering key domains such as mood, anhedonia, psychomotor activity, insomnia, somatic symptoms, and suicidal ideation. Each item is scored on either a 3-point or 5-point scale, yielding a total score range of 0–52, where higher scores indicate greater depression severity. The HAM-D is considered a gold-standard tool in clinical and research settings due to its strong psychometric validity, established sensitivity to treatment effects, and utility in differentiating symptom severity levels.

Columbia Suicide Severity Rating Scale (C-SSRS)

The Columbia Suicide Severity Rating Scale (C-SSRS) is a standardized and validated measure used to assess suicidal ideation, intent, and behavior. It evaluates multiple dimensions including wish to die, suicidal thoughts, presence of plan or intent, preparatory behaviors, and past attempts. Scores reflect both the severity and recentness of suicidal phenomena, allowing clinicians to stratify suicide risk. The C-SSRS has demonstrated excellent inter-rater reliability, predictive validity for suicidal behavior, and applicability across clinical populations, making it a preferred instrument for suicide risk monitoring in psychiatric research and practice.

Montreal Cognitive Assessment (MoCA)

The Montreal Cognitive Assessment (MoCA) is a brief cognitive screening tool developed to detect mild cognitive impairment. It assesses multiple cognitive domains, including attention, immediate and delayed recall, language, visuospatial skills, executive function, abstraction, and orientation. The total score ranges from 0 to 30, with scores below 26 suggestive of cognitive impairment. MoCA has demonstrated high sensitivity and specificity in identifying subtle cognitive deficits commonly associated with mood disorders, making it a suitable measure for evaluating cognitive functioning in psychiatric populations.

Pittsburgh Sleep Quality Index (PSQI)

The Pittsburgh Sleep Quality Index (PSQI) is a self-reported questionnaire measuring subjective sleep quality over the preceding month. It comprises 19 items summarized into seven components: sleep latency, duration, disturbances, efficiency, subjective sleep quality, use of sleep medication, and daytime dysfunction. Each component is scored from 0 to 3, yielding a global score ranging from 0 to 21, where higher scores indicate poorer sleep quality. The PSQI has established reliability and validity and is widely used in sleep research, particularly in populations with psychiatric and medical comorbidities.

All instruments were administered in a single assessment session by trained clinicians, with an average duration of 45–60 minutes.

H. Data Collection and Statistical Analysis

Data were entered in Microsoft Excel and analyzed using IBM SPSS Statistics version 26. Descriptive statistics (mean ± SD, frequencies,

and percentages) were computed. Between-group comparisons were performed using the independent samples *t*-test or Mann–Whitney *U* test for continuous variables, depending on distribution, and chi-square test for categorical variables. Correlations among suicidal tendencies, cognitive performance, and sleep quality were assessed using Pearson's correlation coefficient or Spearman's rho. A multivariate regression model was used to identify predictors of suicidality. A *p*-value < 0.05 was considered statistically significant.

RESULTS

A total of 120 participants were included in the analysis, consisting of 60 individuals with unipolar depression and 60 with bipolar depression. The mean age of the total sample was **38.6 ± 10.4 years**, with no statistically significant difference between the two diagnostic groups (p = 0.214). Females constituted **59.2%** of the sample, with a comparable distribution across groups (p = 0.312). There were no significant group differences in education level, marital status, or duration of illness.

A. Comparison of Clinical Measures

Mean HAM-D scores were significantly higher in the bipolar depression group (**23.8 ± 4.6**) compared with the unipolar depression group (**20.9 ± 3.9**; $t = 4.01$, $p < 0.01$), indicating greater depressive severity. Suicidal ideation and behavior were also more frequent and severe among participants with bipolar depression. The mean C-SSRS score in the bipolar group was **22.4 ± 6.1**, significantly higher than that of the unipolar group (**17.9 ± 5.4; p < 0.05**). Suicidal behavior was documented in **65%** of bipolar participants and **58%** of unipolar participants.

Cognitive impairment, defined as a MoCA score below 26, was observed in **62%** of participants with bipolar depression compared with **45%** in the unipolar group. Mean MoCA scores were **23.1 ± 3.2** for bipolar depression and **25.4 ± 2.8** for unipolar depression, demonstrating a significant cognitive decline in the bipolar group ($p < 0.01$).

Sleep disturbance was highly prevalent in both groups. Poor sleep quality (PSQI > 5) was observed in **80%** of the bipolar group and **72%** of the unipolar group. Mean PSQI scores were **11.2 ± 3.5** and **9.6 ± 3.1**, respectively, indicating significantly poorer subjective sleep quality in individuals with bipolar depression ($p < 0.05$).

B. Correlation Analysis

Correlation analysis showed a significant positive association between HAM-D scores and suicidal ideation (C-SSRS) ($r = 0.64$, $p < 0.001$). Higher depressive severity also correlated with poorer sleep quality ($r = 0.47$, $p < 0.01$). Cognitive function (MoCA score) demonstrated a negative correlation with PSQI scores ($r = -0.42$, $p < 0.05$), suggesting that lower cognitive performance was associated with poorer sleep quality.

C. Regression Analysis

Multiple regression analysis identified depressive severity ($\beta = 0.52$, $p < 0.001$), sleep disturbance ($\beta = 0.21$, $p = 0.03$), and diagnosis of bipolar depression ($\beta = 0.19$, $p = 0.04$) as significant predictors of suicidality, collectively explaining **42.6%** of the variance in C-SSRS scores.

Table 1. Sociodemographic and Clinical Characteristics of the Study Participants (N = 120)

Variable	Unipolar Depression (n = 60)	Bipolar Depression (n = 60)	Test Statistic	p-value
Age (years), Mean ± SD	37.9 ± 10.2	39.3 ± 10.7	$t = 1.25$	0.214
Gender, n (%)			$\chi^2 = 1.02$	0.312
Male	23 (38.3)	26 (43.3)		
Female	37 (61.7)	34 (56.7)		
Marital Status, N (%)			$\chi^2 = 2.45$	0.294
Single	14 (23.3)	11 (18.3)		
Married	39 (65.0)	41 (68.3)		
Widowed/Separated	7 (11.7)	8 (13.3)		
Education Level, N (%)			$\chi^2 = 1.88$	0.390
≤ Secondary	21 (35.0)	24 (40.0)		
Graduate/Postgraduate	39 (65.0)	36 (60.0)		
Duration of Illness (Years), Mean ± SD	4.6 ± 2.1	6.2 ± 2.8	$t = 3.12$	0.002*

Employment status, n (%)			$\chi^2 = 3.02$	0.221
Employed	27 (45.0)	23 (38.3)		
Unemployed/Homemaker/Retired	33 (55.0)	37 (61.7)		

Note: *p < 0.05 considered statistically significant

Table 2. Comparison of Clinical Scores between Unipolar and Bipolar Depression Groups

Measure	**Unipolar (n = 60) Mean ± SD**	**Bipolar (n = 60) Mean ± SD**	**Test Value**	**p-value**
HAM-D	20.9 ± 3.9	23.8 ± 4.6	$t = 4.01$	< 0.01*
C-SSRS	17.9 ± 5.4	22.4 ± 6.1	$t = 3.17$	< 0.05*
MoCA	25.4 ± 2.8	23.1 ± 3.2	$t = 2.92$	< 0.01*
PSQI	9.6 ± 3.1	11.2 ± 3.5	$t = 2.48$	< 0.05*

Higher scores on HAM-D, C-SSRS, and PSQI indicate worse severity; higher MoCA scores indicate better cognition. *Statistically significant.

Table 3. Prevalence of Key Clinical Variables

Variable	**Unipolar Depression n (%)**	**Bipolar Depression n (%)**	**χ^2 Value**	**p-value**
Suicidal ideation present	35 (58.3)	39 (65.0)	0.52	0.471
Cognitive impairment (MoCA < 26)	27 (45.0)	37 (61.7)	3.85	0.050
Poor sleep quality (PSQI > 5)	43 (71.7)	48 (80.0)	1.11	0.292

Table 4. Correlation between Depression Severity, Suicidality, Cognitive Function, and Sleep Quality

Variable Correlation	***r* Value**	**p-value**
HAM-D vs C-SSRS	0.64	< 0.001*
HAM-D vs PSQI	0.47	< 0.01*
MoCA vs PSQI	−0.42	< 0.05*

Pearson correlation used unless otherwise specified. $r > 0$ indicates positive correlation; $r < 0$ indicates negative correlation.

Table 5. Regression Model Predicting Suicidality (C-SSRS Score)

Predictor Variable	**β Coefficient**	**t-value**	**p-value**
Depression severity (HAM-D)	0.52	4.89	< 0.001*
Sleep disturbance (PSQI)	0.21	2.18	0.030*
Diagnosis (Bipolar vs Unipolar)	0.19	2.01	0.044*
MoCA score	−0.11	−1.32	0.189

Adjusted $R^2 = 0.426$

DISCUSSION

The present study demonstrated that patients with bipolar depression exhibited significantly higher depressive severity, suicidality, cognitive impairment, and sleep disturbances compared with patients with unipolar depression. These findings are consistent with the growing body of literature indicating that bipolar depression represents a clinically more severe phenotype than unipolar depression. Malhi and Mann^14 reported that bipolar depressive episodes are often longer, more disabling, and associated with poorer psychosocial recovery than unipolar depression, which parallels the trends observed in the current study.

Higher suicidality in the bipolar group aligns with reports by Baldessarini and colleagues,^15 who found a substantially elevated risk of suicidal behavior among individuals with bipolar disorder compared with those with unipolar depression. Similarly, Khoso et al.^4 documented higher rates of suicidal ideation and attempts among bipolar patients in South Asian populations, suggesting that this pattern

is consistent across healthcare contexts. The association between higher HAM-D and C-SSRS scores observed in this study also reflects the findings of O'Rourke and Heisel,^5 who linked depressive severity and emotional regulation deficits to increased suicide risk in bipolar disorder.

Cognitive impairment was more prominent among individuals with bipolar depression in this study, which supports the work of Torous et al.,^16 whose meta-analysis demonstrated greater deficits in executive functioning and processing speed in bipolar disorder compared with unipolar depression. Lee and colleagues^9 further noted that cognitive deficits in bipolar disorder may persist during euthymia and predict poorer psychosocial outcomes—aligning with the trend seen in the present findings where lower MoCA scores correlated with higher illness burden.

Sleep disturbances were also significantly more severe in patients with bipolar depression. Drakatos and Chung^10 reported similar findings, identifying more pronounced circadian rhythm disruption in bipolar compared with unipolar depression. Tonon et al.^17 emphasized that sleep irregularity in bipolar disorder may act both as a symptom and as a prodrome of relapse—a pattern consistent with our observation of persistent and higher PSQI scores. Additionally, the negative correlation between cognitive scores and sleep quality in this study supports the conclusions of Pal and Singh,^10 who identified sleep fragmentation as a contributor to impaired executive functioning.

The regression analysis in this study identified depressive severity, diagnosis of bipolar disorder, and sleep disturbance as significant predictors of suicidality. This echoes the model proposed by Bojarska and Berent,^18 who reported that insomnia and sleep disruption amplify emotional dysregulation, thereby increasing suicide risk in mood disorders. Collectively, these converging findings highlight the importance of routine sleep and cognitive screening—particularly in patients with bipolar depression—to improve risk assessment and treatment outcomes.

Strengths, Limitations, and Implications

A key strength of the present study is its integrated assessment of suicidality, cognitive impairment, and sleep quality within a comparative diagnostic framework—an approach recommended by Phillips and Kupfer^2 but still uncommon in clinical studies. However, results should be interpreted in light of limitations, including the cross-sectional design, single-centre sampling, and lack of adjustment for medication class and dose.

Clinically, the findings underscore the need for comprehensive assessment protocols in depressive disorders. Cognitive screening and structured sleep evaluation may be especially important in bipolar depression, where impairment may persist beyond affective episodes.

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