

Prevalence and factors associated with substance use disorders among patients with bipolar disorder at Butabika National Referral Mental Hospital: a cross-sectional study

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Abstract

Background

Substance use disorders (SUDs) frequently co-occur with bipolar disorder (BD) in clinical settings and are associated with poorer outcomes, yet hospital-based data from sub-Saharan Africa are scarce. We determined the prevalence of SUDs and identified associated factors among adults with BD in Uganda.

Methods

This cross-sectional study consecutively enrolled 404 adults (≥ 18 years) with BD confirmed using the Mini-International Neuropsychiatric Interview (MINI) from the inpatient and outpatient units of Butabika National Referral Mental Hospital. SUDs were defined as moderate- or high-risk scores on the Alcohol, Smoking and Substance Involvement Screening Test (ASSIST). Sociodemographic, clinical, psychosocial, and environmental data were collected by structured questionnaire. Factors independently associated with any SUD were identified using multivariable binary logistic regression.

Results

The prevalence of any SUD was 22.5% (95% confidence interval [CI] 18.7–26.8), with alcohol use disorder most common (17.3%), followed by cannabis (9.7%), tobacco (9.4%), and khat (2.7%). Easy access to substances (adjusted odds ratio [aOR] 25.55, 95% CI 12.84–50.84), family history of SUD (aOR 11.41, 95% CI 4.94–26.31), and high suicidality risk (aOR 3.15, 95% CI 1.40–7.10) were independently associated with higher odds of any SUD, whereas female sex (aOR 0.31, 95% CI 0.18–0.52) and a social support system (aOR 0.20, 95% CI 0.08–0.52) were protective. Illness-course indicators were not independently associated with SUD.

Conclusions

Nearly one-quarter of adults with BD had a co-occurring SUD, predominantly alcohol. Because illness severity did not predict SUD, routine ASSIST screening is warranted for all patients, with concurrent suicidality assessment and particular attention to those reporting easy access or a family history of SUD. The findings support integrating brief, low-resource interventions and substance-availability measures into BD care in Uganda.

Background

Bipolar disorder (BD) is a chronic mood disorder characterised by recurrent episodes of mania or hypomania and depression that substantially impair functioning and quality of life [1]. It affects approximately 40 million people worldwide and ranks among the leading causes of disability, with a

considerable burden in Africa [2]. In Uganda, BD represents a substantial proportion of psychiatric diagnoses, underscoring its clinical and public-health importance [3, 4].

Substance use disorders (SUDs) are among the most frequent and clinically consequential comorbidities in BD. They are associated with earlier illness onset, more frequent relapse, poorer treatment adherence, greater suicidality, and higher rates of hospital readmission [5]. International studies report high lifetime prevalence of SUDs among people with BD, ranging from approximately 23% to 70%, with alcohol and cannabis the most commonly implicated substances [6–10]. Nicotine dependence is also highly prevalent and clinically significant [11]. The co-occurrence of BD and SUD is multifactorial; proposed mechanisms include shared genetic vulnerability, neurobiological overlap in reward and impulse-regulation pathways, self-medication of mood symptoms, and environmental exposures such as substance availability and social context [12–15].

Most of this evidence, however, derives from high-income settings and reflects lifetime, diagnosis-based estimates that are not directly comparable with cross-sectional, screening-based studies in low- and middle-income contexts, where substance availability and sociocultural norms differ [16]. In Uganda, alcohol, cannabis, khat, and tobacco are among the most commonly used psychoactive substances [17], and although people with BD are recognised to be at elevated risk of substance misuse [18], hospital-based data quantifying the prevalence and correlates of SUD among adults with confirmed BD remain limited. This dual burden compounds patient suffering, prolongs admissions, and strains an already under-resourced mental-health system.

In the absence of context-specific data, screening, risk stratification, and integrated dual-diagnosis interventions cannot be optimally targeted. This study therefore sought to determine the prevalence of SUDs and identify the sociodemographic, clinical, psychosocial, and environmental factors associated with them among adults with BD receiving care at Butabika National Referral Mental Hospital.

Methods

Study aim

The study's aim was to determine the prevalence and factors associated with substance use disorders among patients with bipolar disorder at Butabika national referral mental hospital.

Study design and setting

This was a cross-sectional study conducted at Butabika National Referral Mental Hospital, Uganda's largest specialised psychiatric facility, located in Kampala. The hospital has a bed capacity of 550, provides inpatient and outpatient services to patients from across Uganda and neighbouring countries, and manages a high volume of mood and substance use disorders.

Study population and eligibility

Eligible participants were adults aged 18 years and above with a diagnosis of BD confirmed using the MINI, who were able to provide informed consent. Patients in an acute, severe manic or depressive episode, or with a severe medical condition or significant cognitive impairment that precluded meaningful participation or reliable self-report, were excluded.

Sample size and sampling

The sample size was estimated using the Leslie Kish formula for a single proportion, assuming a conservative expected prevalence of 50% (to maximise the sample size given limited regional data), 95% confidence, and 5% precision, with a 10% allowance for non-response, yielding a target of 422 participants. Participants were recruited by consecutive sampling: all eligible patients attending the outpatient clinic or admitted to the inpatient wards during the study period were approached, and the next eligible patient was approached whenever one declined [19]. Of 422 patients approached, 404 completed the full interview and were included in the analysis (response rate 95.7%); 18 were excluded for incomplete data. In the final sample, 91 participants met the criteria for any SUD, permitting the inclusion of multiple predictors per model while maintaining an adequate events-per-variable ratio [20].

Data collection and measures

Data were collected by trained research assistants using a structured questionnaire. BD was confirmed using the MINI, a brief structured diagnostic interview based on standard diagnostic criteria [21]. Substance involvement was assessed using the WHO Alcohol, Smoking and Substance Involvement Screening Test (ASSIST), which yields substance-specific risk categories; a moderate- or high-risk score was operationalised as an SUD for each substance [22, 23]. Suicidality risk (none, low–moderate, or high) was assessed using the suicidality module of the MINI. Independent variables comprised sociodemographic factors (age, sex, marital status, religion, education, employment, income), clinical factors (BD subtype, age at onset, psychiatric hospitalisations, relapses, readmissions, and suicidality risk), and psychosocial and environmental factors (family history of SUD, history of trauma, presence of a social support system, and easy access to substances). Religion was recorded at the denomination level for description; for modelling, Christian denominations were combined into a single reference category to preserve a stable reference and adequate cell sizes.

Statistical analysis

Data were analysed using Stata version 18.0 [24]. Categorical variables were summarised as frequencies and percentages and continuous variables as medians with interquartile range (IQR). The prevalence of each SUD was reported with 95% CIs. Associations between each independent variable and each SUD outcome (alcohol, tobacco, cannabis, khat, and any SUD) were first examined using univariable binary

logistic regression. Variables significant at $p < 0.05$, or considered clinically important a priori, were entered into multivariable binary logistic regression models, structured thematically to maintain the events-per-variable threshold. Results are reported as crude and adjusted odds ratios (aORs) with 95% CIs; $p < 0.05$ was considered statistically significant.

Results

Participant characteristics

A total of 404 adults with BD were analysed (Table 1). The median age was 35 years (IQR 17), and 52.2% were male. Almost all participants had bipolar I disorder (98.5%), with a median age at onset of 23 years (IQR 11). Prior psychiatric hospitalisation was near-universal (93.5%), and 62.6% reported three or more previous relapses. High suicidality risk was present in 7.2%. A family history of SUD was reported by 42.6%, easy access to substances by 35.4%, and a history of trauma by 36.4%, while most participants (94.5%) reported having a social support system.

Table 1 Characteristics of 404 adults with bipolar disorder at Butabika National Referral Mental Hospital

Characteristic	Value
Age, years (median [IQR])	35 (17)
Male – sex	211 (52.2)
Marital status – single	184 (45.5)
Religion:	
Catholic	104 (25.7)
Pentecostal	97 (24.0)
Anglican	96 (23.8)
Muslim	96 (23.8)
other	11 (2.7)
Education:	
None	8 (2.0)
Primary	146 (36.1)
Secondary	170 (42.1)
Tertiary	80 (19.8)
Unemployed	175 (43.3)
Bipolar I disorder	398 (98.5)
Age at BD onset, years – median (IQR)	23 (11)
No prior psychiatric hospitalisation	26 (6.5)
High suicidality risk	29 (7.2)
≥3 previous relapses	253 (62.6)
Family history of SUD	172 (42.6)
Easy access to substances	143 (35.4)
History of trauma	147 (36.4)
Has a social support system	382 (94.5)

Values are n (%) unless otherwise stated. BD bipolar disorder, IQR interquartile range, SUD substance use disorder.

Prevalence of substance use disorders

The prevalence of any SUD was 22.5% (95% CI 18.7–26.8; Table 2). Alcohol use disorder was most prevalent (17.3%), followed by cannabis (9.7%), tobacco (9.4%), and khat (2.7%) use disorders. Amphetamine and opioid use disorders were each identified in a single participant, and no cases of cocaine, inhalant, sedative, or hallucinogen use disorder were found.

The characteristics of participants with each substance use disorder are presented in Table 3. Relative to the full sample (Table 1), participants with any substance use disorder were more often male (73.6% vs 52.2%) and far more likely to report easy access to substances (86.8% vs 35.4%) and a family history of substance use disorder (82.4% vs 42.6%). The patterns held across the individual substances and were most pronounced for tobacco, cannabis, and khat, where male predominance exceeded 87% and high suicidality risk was more common (20.5–27.3% vs 7.2% overall). Participants with cannabis or khat use disorder were younger (median age 27–28 vs 35 years), and Muslim affiliation was least common among those with alcohol use disorder (11.4%).

Table 2 Prevalence of substance use disorders among adults with bipolar disorder (n = 404)

Substance use disorder	n	Prevalence, % (95% CI)
Any SUD	91	22.5 (18.7–26.8)
Alcohol	70	17.3 (13.9–21.3)
Cannabis	39	9.7 (7.1–12.9)
Tobacco	38	9.4 (6.9–12.6)
Khat	11	2.7 (1.5–4.8)
Amphetamine	1	0.2 (0.03–1.7)
Opioid	1	0.2 (0.03–1.7)

CI confidence interval, SUD substance use disorder. Any SUD denotes at least one moderate- or high-risk ASSIST score.

Table 3 Participant characteristics by substance use disorder

Characteristic	Any SUD (n=91)	Alcohol (n=70)	Tobacco (n=38)	Cannabis (n=39)	Khat (n=11)
Age, years, median (IQR)	34 (14)	35 (12)	32 (12)	28 (13)	27 (12)
Male sex	67 (73.6)	47 (67.1)	34 (89.5)	34 (87.2)	10 (90.9)
Marital status: single	44 (48.4)	32 (45.7)	24 (63.2)	23 (59.0)	7 (63.6)
Religion:					
Catholic	31 (34.1)	24 (34.3)	11 (28.9)	15 (38.5)	2 (18.2)
Pentecostal	15 (16.5)	14 (20.0)	3 (7.9)	7 (17.9)	3 (27.3)
Anglican	28 (30.8)	22 (31.4)	12 (31.6)	8 (20.5)	3 (27.3)
Muslim	15 (16.5)	8 (11.4)	12 (31.6)	9 (23.1)	3 (27.3)
other	2 (2.2)	2 (2.9)	0 (0.0)	0 (0.0)	0 (0.0)
Education level:					
Primary	40 (44.0)	31 (44.3)	20 (52.6)	21 (53.8)	8 (72.7)
Secondary	40 (44.0)	28 (40.0)	16 (42.1)	15 (38.5)	2 (18.2)
Tertiary	11 (12.1)	11 (15.7)	2 (5.3)	3 (7.7)	1 (9.1)
Employment status: Unemployed	36 (39.6)	28 (40.0)	14 (36.8)	19 (48.7)	4 (36.4)
Bipolar I disorder	90 (98.9)	69 (98.6)	38 (100.0)	39 (100.0)	11 (100.0)
Age at BD onset, years, median (IQR)	22 (12)	22 (12)	20 (7)	21 (8)	20 (6)
No prior psychiatric hospitalisation	3 (3.3)	2 (2.9)	1 (2.6)	1 (2.6)	0 (0.0)
High suicidality risk	13 (14.3)	7 (10.0)	9 (23.7)	8 (20.5)	3 (27.3)
≥3 previous relapses	56 (61.5)	45 (64.3)	25 (65.8)	25 (64.1)	9 (81.8)
Family history of SUD	75 (82.4)	57 (81.4)	35 (92.1)	30 (76.9)	8 (72.7)
Easy access to substances	79 (86.8)	61 (87.1)	33 (86.8)	35 (89.7)	10 (90.9)
History of trauma	32 (35.2)	26 (37.1)	11 (28.9)	17 (43.6)	5 (45.5)
Has a social support system	79 (86.8)	61 (87.1)	34 (89.5)	31 (79.5)	9 (81.8)

Values are n (%) unless otherwise stated; percentages are column-wise (within each group). Groups are not mutually exclusive, as a participant may have more than one substance use disorder; the substance

columns are subsets of the Any SUD column. BD, bipolar disorder; IQR, interquartile range; SUD, substance use disorder.

Factors associated with any substance use disorder

In the multivariable models, easy access to substances (aOR 25.55, 95% CI 12.84–50.84), family history of SUD (aOR 11.41, 95% CI 4.94–26.31), and high suicidality risk (aOR 3.15, 95% CI 1.40–7.10) were each independently associated with higher odds of any SUD (Table 4). Female sex (aOR 0.31, 95% CI 0.18–0.52) and the presence of a social support system (aOR 0.20, 95% CI 0.08–0.52) were independently protective, and primary education (versus none) was associated with higher odds (aOR 2.64, 95% CI 1.24–5.61). Illness-course indicators, namely BD subtype, psychiatric hospitalisations, relapses, and readmissions, were not independently associated with any SUD.

Table 4 Factors independently associated with any substance use disorder (multivariable logistic regression, n = 404)

Factor	aOR (95% CI)	p-value
Female sex (vs male)	0.31 (0.18–0.52)	<0.001
Age (per year)	0.97 (0.95–1.00)	0.072
Primary education (vs none)	2.64 (1.24–5.61)	0.038
High suicidality risk (vs none)	3.15 (1.40–7.10)	0.021
Easy access to substances (vs no)	25.55 (12.84–50.84)	<0.001
Family history of SUD (vs no)	11.41 (4.94–26.31)	<0.001
Social support system (vs no)	0.20 (0.08–0.52)	0.001

aOR adjusted odds ratio, CI confidence interval, SUD substance use disorder. Estimates are adjusted within thematic sociodemographic, clinical, and psychosocial/environmental models.

Substance-specific associations

Patterns across individual substances were broadly consistent with the any-SUD model (Table 5). Female sex was protective across all four substance-specific outcomes, and easy access to substances was associated with markedly higher odds of every outcome. High suicidality risk was independently associated with tobacco, cannabis, and khat use disorders but not alcohol use disorder, while Muslim affiliation was associated with lower odds of alcohol use disorder specifically (aOR 0.35, 95% CI 0.16–0.77). Family history of SUD was associated with alcohol, tobacco, and cannabis use disorders, and a social support system was protective for alcohol and cannabis use disorders. Wide confidence intervals for some tobacco and khat estimates reflect the small numbers of cases for these outcomes and warrant cautious interpretation.

Table 5 Independent associations (aOR, 95% CI) across substance-specific use disorders

Factor	Alcohol	Tobacco	Cannabis	Khat
Female sex	0.47 (0.27–0.82)	0.11 (0.03–0.32)	0.15 (0.05–0.39)	0.12 (0.01–0.98)
Muslim (vs Christian)	0.35 (0.16–0.77)	–	–	–
Primary education	–	7.22 (1.61–32.45)	5.25 (1.46–18.93)	5.07 (0.60–42.75)
Age / onset (per year)	–	0.96 (0.94–0.99) [†]	0.94 (0.91–0.97)	0.91 (0.85–0.99)
High suicidality risk	–	5.95 (2.26–15.63)	4.56 (1.69–12.34)	4.73 (1.09–20.43)
Easy access	19.90 (9.40–42.10)	13.27 (4.95–35.56)	20.74 (6.96–61.81)	16.75 (2.08–134.96)
Family history of SUD	10.30 (3.96–26.76)	25.81 (3.44–193.75)	7.15 (2.06–24.74)	–
Social support system	0.27 (0.11–0.68)	–	0.14 (0.04–0.41)	–

Cells show adjusted odds ratios (95% CI) for statistically significant associations; – denotes not independently significant. [†] Age at BD onset (per year) for tobacco; current age (per year) for cannabis and khat. aOR adjusted odds ratio, CI confidence interval, SUD substance use disorder.

Discussion

In this cross-sectional study of 404 adults with BD at Uganda’s national referral mental hospital, nearly one-quarter had at least one co-occurring SUD, with alcohol use disorder predominating. Easy access to substances, a family history of SUD, and high suicidality risk were independently associated with higher odds of SUD, while female sex and a social support system were protective. Notably, indicators of illness severity and course were not independently associated with SUD.

The observed prevalence of 22.5% lies at the lower end of the wide international range and is consistent with the screening-based, point-prevalence nature of the ASSIST, which captures current moderate-to-high-risk involvement rather than lifetime diagnoses [9]. The predominance of alcohol mirrors both the international literature and Ugandan patterns of substance use, where alcohol is legal, culturally embedded, and widely available [17].

The strong association with easy access supports an availability-driven model of substance use in this population and identifies a modifiable, environment-level target. The association with family history is consistent with shared genetic and familial-environmental vulnerability [14]. The independent association between high suicidality and SUD, evident for tobacco, cannabis, and khat, aligns with

evidence that SUD and suicidality are closely linked in BD and likely share underlying vulnerabilities in emotion regulation and impulse control [25]. The protective association of female sex was consistent across substances and reflects both biological sex differences in substance vulnerability [26] and gendered sociocultural norms that constrain women's substance use in this setting; the same norms may also lead to differential under-reporting among women [27, 28]. The protective association of social support highlights a feasible, strengths-based avenue for intervention.

These findings have direct clinical implications. Because illness severity did not predict SUD, severity-based triage would miss many affected patients, supporting routine ASSIST screening for all adults with BD, coupled with concurrent suicidality assessment. Patients reporting easy access or a family history of SUD warrant particular vigilance. For those screening positive, the WHO ASSIST-linked brief intervention offers a low-resource, first-line response that can be delivered within existing clinical contact time and through task-shifting, making it feasible within Uganda's mental-health system, while the prominence of easy access argues for complementary population-level availability measures.

Strengths and limitations

Strengths include a relatively large sample, diagnostic confirmation of BD with the MINI, and use of the validated ASSIST. Several limitations should be considered. The cross-sectional design precludes causal or temporal inference. The single-site, referral-hospital setting and the near-exclusive representation of bipolar I disorder limit generalisability to primary care and to bipolar II disorder. Trauma, social support, and substance access were each measured as single binary items, which may have limited sensitivity, most plausibly explaining the null finding for trauma. Self-report may have led to under-reporting of substance use, particularly for illicit substances and among women. Finally, the cross-sectional MINI assessment could not establish whether mood symptoms persisted during abstinence, so a small number of participants with substance-induced mood disturbance may have been misclassified, while the exclusion of severely unwell patients, who may carry a higher substance-use burden, may have led the prevalence to be underestimated.

Conclusions

Nearly one-quarter of adults with BD at a Ugandan national referral hospital had a co-occurring SUD, predominantly alcohol, and SUD clustered with easy access, family history, and suicidality rather than with illness severity. These findings support universal, routine SUD screening within BD care, paired with suicidality assessment and brief intervention, and complemented by measures that reduce substance availability and strengthen social support. Longitudinal, multi-site studies using diagnostic interviews and multidimensional exposure measures are needed to clarify directionality and extend these findings beyond the referral setting.

Abbreviations

aOR
adjusted odds ratio
ASSIST
Alcohol, Smoking and Substance Involvement Screening Test
BD
bipolar disorder
CI
confidence interval
IQR
interquartile range
MINI
Mini-International Neuropsychiatric Interview
SUD
substance use disorder
WHO
World Health Organization

Declarations

Ethics approval and consent to participate.

The study was approved by the Makerere University School of Medicine Research and Ethics Committee (approval reference Mak-SOMREC-2024-1166), with institutional permission from Butabika National Referral Mental Hospital and clearance from the Uganda National Council for Science and Technology. Written informed consent was obtained from all participants; for participants unable to read or write, the consent form was explained orally and consent was indicated by thumbprint, witnessed by an impartial third party. All methods were performed in accordance with the Declaration of Helsinki.

Consent for publication.

Not applicable.

Competing interests.

The authors declare that they have no competing interests.

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Author Contribution

I.I.A. conceived and designed the study, collected and analysed the data, interpreted the results, and drafted the manuscript. J.S.N., R.O., and E.K.M. contributed to the study design, provided supervision, and critically revised the manuscript for important intellectual content. All authors reviewed and approved the final manuscript.

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Data Availability

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

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