

Prevalence of Substance Abuse in Patients Suffering from Schizophrenia: A Cross-sectional Study

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ABSTRACT

Background: Compared with non-abusing individuals who have schizophrenia, those with co-occurring schizophrenia and substance use have been found to have higher rates of homelessness, more unemployment, and poorer overall functioning. Various factors like genetic and environmental vulnerability, including family and social influences, early life trauma, and poor frontal lobe functioning, contribute to the development of psychiatric distress and drug abuse.

Aims and objectives: This study aimed to assess the prevalence of substance dependence in cases of schizophrenia, and to check the correlation of severity of psychiatric symptoms in schizophrenia with severity of substance dependence.

Materials and methods: This study was a cross-sectional non-interventional hospital-based study. Diagnosis of schizophrenia was made according to the International Classification of Diseases 10 (ICD-10). The severity of symptoms of schizophrenia was assessed using Brief Psychiatric Rating Scale (BPRS) and the severity of substance dependence was assessed using Severity of Dependence Scale (SDS). The data obtained were analyzed using SPSS version 26.

Results: A total of 50 patients diagnosed with schizophrenia as per the ICD-10 criteria were recruited after their informed consent. Majority of the participants were young lower middle-class male; most of the participants were married (80%), homemakers or students by profession (22% each), belonging to a rural area (54%). Fifty-four percent of them ($n = 27$) reported having comorbid substance use disorder. The mean BPRS score was found to be 62.4 ± 22.36 , while the mean SDS score was 5.3 ± 5.17 . The BPRS score was found to be significantly correlated with the SDS score ($r = 0.949$, $p < 0.001$).

Conclusion: A significant correlation was found between severity of psychiatric symptoms and severity of substance dependence.

Keywords: Alcohol, Cannabis, Dual diagnosis, Opioids, Schizophrenia, Substance dependence.

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INTRODUCTION

There is a significant association between cannabis and schizophrenia. Persons who abused cannabis (more than 50 occasions) were at greater risk of schizophrenia compared with cannabis nonusers. The use of substances like amphetamines and cocaine has ability to increase psychotic symptoms.¹

People having schizophrenia along with substance use have been reported to have greater chances of being homeless,^{2,3} more unemployed,⁴ and lower overall functioning than nonabusing people with schizophrenia.⁵ The most significant predictors for frequent rehospitalization in schizophrenia patients, according to Haywood et al.,⁶ was substance abuse.

A younger age at schizophrenia onset is linked to substance usage, according to studies.^{7,8} It has been recently discovered that high risk of developing psychosis in young adults is linked to cannabis use by adolescents with the "high output" catechol O-methyltransferase polymorphism (Val/Val).⁹ People with schizophrenia experience adverse clinical effects, like relapse, after using small amounts of drugs of abuse.¹⁰ Thus, it seems that individuals with schizophrenia are more susceptible to the negative effects of psychoactive substances, with even very low levels of alcohol and drug usage having negative effects.

The self-medication hypothesis has dominated attempts to explain why substance use has become more prevalent among people with schizophrenia.¹¹ It was found that to deal with negative symptoms (apathy, avolition, and dysphoria), address sleeping disturbances, and get rid of the adverse effects

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of psychotropics patients with schizophrenia self-medicates. According to Levin et al.,¹² memory and complex response time deficiencies brought on by haloperidol may be reversed. Adler et al.¹³ in his study stated that nicotine enhances cognitive function in people with schizophrenia.

The emergence of psychiatric condition along with substance use is impacted by several factors like vulnerabilities in genetic or environmental factors, influence of society or family, some

personality traits, trauma in childhood, and frontal brain functioning impairment.¹⁴ It is hypothesized that though addiction and other psychiatric disorders share similar pre-existing abnormalities in their neurobiological make up, they exhibit differences in the expression of their symptom.¹⁵

The neural circuitry responsible for drug reward (mesolimbic dopamine pathway) is also affected in schizophrenia which might explain a greater propensity for addiction in patients with schizophrenia. Chambers et al.¹⁶ proposed that patients with schizophrenia has structural changes in the frontal cortex and hippocampal formation which may diminish the reward effect of substance use and the ultimately the behavior of seeking drugs increases.

Juckel et al.¹⁷ by using functional magnetic resonance imaging discovered a correlation between the decreased activation of the left ventral striatum (part of reward system) and negative symptom severity in schizophrenic patients who were medication free. Additionally, patients with alcohol craving also showed dysfunction in the ventral striatum.¹⁸ There is a specific neuronal correlation in particular specific regions of the brain of schizophrenic patients with comorbid substance abuse disorders. Matholon et al.¹⁹ in their study concluded that schizophrenic patients with comorbid substance use had the greatest grey matter deficits mainly in the superior temporal and prefrontal regions. Therefore, comorbidity may exacerbate the prefrontal cortical abnormalities that are already evident in both alcohol dependence and schizophrenia as a result of an interaction impact.²⁰

The prevalence of substance use in north-eastern India is quite significant; however, there have been very few studies on comorbid schizophrenia and substance use in this region.²¹ This study aims to shed more light on relation of substance use in the patient suffering from schizophrenia and thus hope to contribute to the understanding of clinical management of such comorbidities.

AIMS AND OBJECTIVES

- To assess the salient sociodemographic variables of schizophrenic patients with comorbid substance use.
- To assess the prevalence of comorbid substance use disorder in cases of schizophrenia.

MATERIALS AND METHODS

Case Definition

A case is defined as, “patient fulfilling the diagnostic criteria for schizophrenia according to ICD 10 attending the outpatient department (OPD) of Psychiatry, Silchar Medical College and Hospital.”

Place of Study

This hospital-based study was conducted in the Department of Psychiatry of Silchar Medical College and Hospital, Silchar, Assam, which is a tertiary level hospital, with an average of 1,000–1,200 patient visits per day.

Catchment Area

Whole of southern Assam, comprising the districts of Cachar, Hailakandi, and Karimganj, the adjoining areas of the neighboring states of Tripura, Manipur, and Mizoram.

Period of the Study

The study was conducted over a period of 3 months.

Inclusion Criteria

- All patients who have given informed consent regarding the participation in the study.
- Patients fulfilling the ICD-10 diagnostic criteria of “schizophrenia.”

Exclusion Criteria

- Patients suffering from severe physical illnesses
- Patients having mental retardation
- Patients suffering from severe cognitive impairment
- Patients having history of nicotine use.

Mode of Selection of Cases

Sampling Procedure

This is a hospital-based cross-sectional study approved by the Institutional Ethics Committee. The sample size was calculated as per universal sampling. Screening of total 73 schizophrenic patients who visited the outpatient department within the period of September 2020 to November 2020 was done and among them only those patients who were fulfilling the International Classification of Diseases 10 (ICD-10) criteria for schizophrenia, as diagnosed by the consultant psychiatrist, and who were willing to be a part of the study and had given informed consent for the same were included in the study. Patients with debilitating physical illnesses, intellectual disability, and severe cognitive impairment were excluded. Finally, 50 patients who were satisfying both the inclusion and exclusion criteria were chosen as the sample of our study.

Description of Tools

- Semi-structured pro forma for sociodemographic data.
- Diagnosis of schizophrenia according to ICD-10.²²
- Brief Psychiatric Rating Scale (BPRS):²³
 - In the late 1960s, BPRS came into being as a short measuring scale. It is used to address the severity of psychiatric symptomatology. It assesses change of symptoms like disturbance of thought, withdrawn emotional state and retardation, anxiety and depression, and hostility and suspiciousness in psychotic patients. When raters are experienced with substantial training, reliability of the BPRS is good to excellent. To increase reliability, a semistructured interview has been developed. Validity is also good, especially when evaluating the symptoms of schizophrenia, and it has been used as a measuring tool in the studies of schizophrenia since past few decades.
 - The BPRS consists of 18 items and takes 20–30 minutes for the interview and scoring. BPRS score for symptoms ranging from 1 to 7 where 1 signifies “not present” and 7 is for “extremely severe”. If the item is not assessed, then enter 0.
 - As per clinical global impression (CGI), a BPRS score for “mildly ill” schizophrenia is up to 31, for “moderately ill” up to 41, and for “markedly ill” up to a score of 53.²⁴
- The Severity of Dependence Scale (SDS):²⁵
 - It is designed as a measure of dependence for illicit drug classes, is a 5-item, 16-point scale for assessing the psychological aspects of dependence, particularly those related to impaired control over, preoccupation with, and anxiety toward drug use. It has been shown to be a valid and reliable indicator of alcohol, cannabis, and opioid dependence.²⁶ Its main advantage over other measures of alcohol dependence is that it is quick to administer—taking less than a minute—which is a crucial factor to take into

Table 1: Sociodemographic variables of the participants

Sociodemographic variables	Frequency (n = 50)	Percentage (%)
Gender		
Male	33	66.0
Female	17	34.0
Domicile		
Rural	27	54.0
Urban	23	46.0
Marital status		
Unmarried	10	20.0
Married	40	80.0
Occupation		
Student	11	22.0
Unemployed	7	14.0
Daily laborer	10	20.0
Business	07	14.0
Service	04	08.0
Homemaker	11	22.0
Socioeconomic status		
Lower	4	8
Upper lower	12	24
Lower middle	19	38
Upper middle	12	24
Upper	03	06

Table 2: Severity of schizophrenia in participants

Severity of schizophrenia (BPRS score)	Frequency (n = 50)	Male (n = 33)	Female (n = 17)	Percentage
Mild schizophrenia (31–40)	15	06	09	30
Moderate schizophrenia (41–52)	07	04	03	14
Severe schizophrenia (53–126)	28	23	05	56

BPRS, Brief Psychiatric Rating Scale

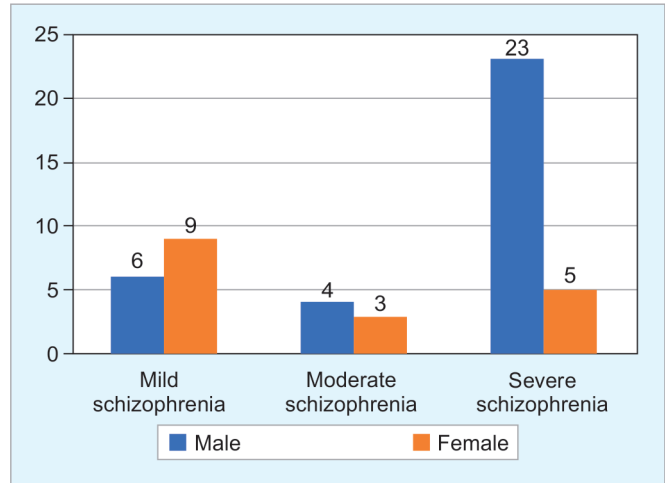
account when using several assessment tools in everyday clinical practise. Cut-off scores for dependency have been established for the SDS for cocaine,²⁷ amphetamines,²⁸ cannabis,²⁹ alcohol,³⁰ and benzodiazepines.³¹

ANALYSIS OF DATA

Data were analyzed using SPSS version 26.0 and *p*-value of 0.05 was considered significant. To find out the correlation between BPRS and SDS scores, Pearson's correlation analysis was used.

RESULTS

Sociodemographic variables of the patients with schizophrenia are described in Table 1. The mean age of the study population is 40.5 ± 16.35 years, majority of them belonging to the age-group of 16–30 years (36%). Male patients were 66%, majority residing in rural areas (54%), majority were married (80%), and mostly belonging from an upper middle socioeconomic status (38%). The severity of schizophrenia is reported in Table 2 and Figure 1, in which 30% of the patients had mild, 14% had moderate, and 56% had severe

**Fig. 1:** Severity of schizophrenia**Table 3:** Prevalence of substance use disorder in the participants

Substance use disorder	N (%) (n = 50)
Cannabis	13 (26.0)
Alcohol	11 (22.0)
Opioid	03 (6.0)
None	23 (46.0)

Table 4: Mean total scores of SDS and BPRS in the participants

	Total (n = 50)
SDS score (mean \pm SD)	5.3 \pm 5.17
BPRS score (mean \pm SD)	62.4 \pm 22.36

BPRS, Brief Psychiatric Rating Scale; SDS, Severity of Dependence Scale. The mean BPRS score was 62.4 ± 22.36 . The mean SDS score was 5.3 ± 5.17 .

schizophrenia. Fifty-four percent of the participants ($n = 27$) were diagnosed to have substance use disorders. Among them, 26% had cannabis use, 22% had alcohol use, and 6% had opioid use reported in Table 3. Around 69.7% of the male participants ($n = 23$) had substance use disorder, among them maximum used cannabis (36.4%), followed by alcohol (27.3%) and opioids (6.0%) presented in Table 4. Compared with this, only 23.5% of the female participants ($n = 4$) had substance use disorder, 11.7% had alcohol use disorder, followed by 5.9% each of cannabis and opioid use disorder (see Fig. 2). The mean BPRS score was 62.4 ± 22.36 . The mean SDS score was 5.3 ± 5.17 (Table 4). The correlation between BPRS and SDS scores was found to be significant ($p < 0.001$) with a Pearson's correlation value (*r*) of 0.949 (Table 5 and Fig. 3).

DISCUSSION

Among 50 participants in the study, most were male (66%), hailing from rural area (54%), married (80%), belonging to lower middle socioeconomic status (38%). The mean age was 40.5 ± 16.35 years. Most of them were homemakers (22%) and students (22%) followed by daily laborers (20%). This reflects the sociodemographic nature of the population that access healthcare from the Silchar Medical College.

We used cut-offs for the BPRS to measure the severity of illness as was suggested by Leucht et al.²⁴ according to which mild, moderate, and markedly ill correspond to a BPRS total score of 31, 41,

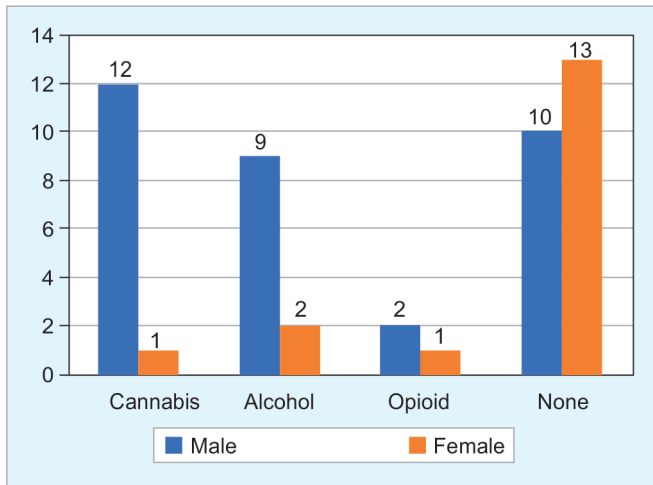


Fig. 2: Gender-wise distribution of prevalence of substance use disorder in the participants

Table 5: Relationship between the BPRS and SDS scores

BPRS total score	Pearson's correlation (<i>r</i>)	SDS total score
	0.949**	
	Significance (<i>p</i>)	<0.001

BPRS, Brief Psychiatric Rating Scale; SDS, Severity of Dependence Scale. The correlation between BPRS and SDS scores was found to be significant ($p < 0.001$) with a Pearson's correlation value (*r*) of 0.949.

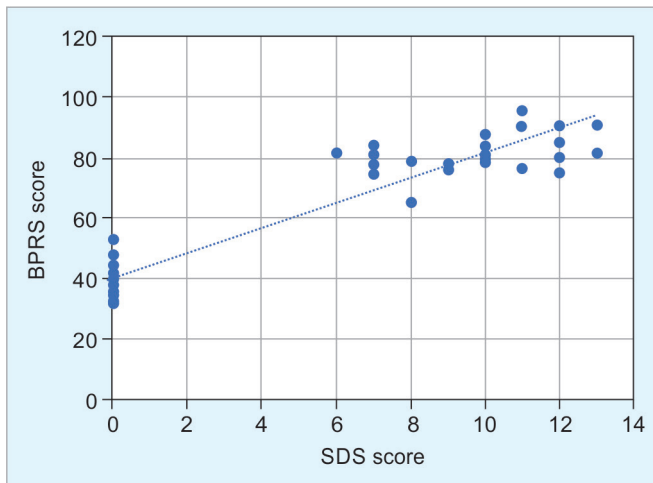


Fig. 3: Represents the relationship between mean BPRS and SDS scores BPRS, Brief Psychiatric Rating Scale; SDS, Severity of Dependence Scale

and 53 consecutively. Accordingly, we found mild schizophrenia in 30% of the participants, moderate schizophrenia in 14% of the participants, and severe schizophrenia in 56% of the participants.

In this study, we found that 54% of the participants had comorbid substance use disorder ($n = 27$). The lifetime prevalence of any drug-use disorder (other than tobacco) is 50%.³² This is similar to our finding. Of these participants, 26% had cannabis, 22% had alcohol, and 6% had opioid use disorders. It has also been observed that the frequency of substance use in patients with schizophrenia is much more than that in the general population, which is also reflected in our study.^{33–35} In India, the prevalence of alcohol-use disorder in the general population is 14.6%, that of cannabis use is 2.8% and that of opioid use is 2.1%.²¹

Another finding of our study was that 69.7% of the male participants ($n = 23$) and 23.5% of the female participants had substance-use disorder. Among the male participants, most had cannabis use (36.4%), followed by alcohol use (27.3%) and opioid use disorder (6.0%). Among the female participants with substance-use disorder, 11.7% had alcohol use and 5.9% each had cannabis and opioid use. This is similar to consistent findings that men are more likely to abuse drugs and/or alcohol than women. The higher prevalence of alcohol use in women in this study may be explained by the fact that alcohol consumption is more in women in Assam, as reported in a Health Ministry survey in 2019–2020.³⁶

A unique aspect of our study was an attempt to quantitatively correlate the intensity of schizophrenic symptoms with the severity of dependence. We used the BPRS and the SDS scales for this purpose. The mean BPRS score was found to be 62.4 ± 22.36 , while the mean SDS score was 5.3 ± 5.17 . On applying Pearson's correlation, we found a Pearson's correlation coefficient of 0.949 and p -value of < 0.001 . Thus, we found a significant correlation between the severity of psychiatric symptoms in schizophrenia and the severity of substance dependence in our study participants. This finding needs to be replicated with a larger sample size in other studies as it could have an effect in the planning of intervention in patients of schizophrenia with a comorbid substance-use disorder.

CONCLUSION

It has been found that comorbid substance-use patients with schizophrenia are more vulnerable to physical injury and illness. They also have higher rates of presenting to in-patient department and emergency services and have poorer outcomes in psychosis.

It has been observed that there is high risk of substance misuse among young male patients, as has also been replicated in this study. However, there is a great deficiency in identifying females having both schizophrenia and substance-use disorder. Thus those females who do not receive adequate deaddiction treatment for substance abuse, pose a great challenge that may be tackled by incorporating gender-specific approaches into treatment strategies.

In our study, we found a correlation between severity of both symptoms and substance dependence. The findings of our study suggest a correlation between the severity of symptoms and the severity of substance dependence. This needs to be further explored in controlled studies as they can help in developing plans for management of such dual diagnosis patients.

The result of being unable to provide adequate treatment to these patients ultimately ends in poorer outcomes and hence gives rise to higher overall costs. Since last few years, cohesive treatment focusing on both the disorders simultaneously are gaining much more attention. It will require further more years of research to organize an optimal psychological and pharmacological treatment regimen for schizophrenic patients with substance-use disorder. Policy makers need to modify their approach so that newer treatment strategies are developed that address the concerns of this particular patient group, as stated in these results and provide treatment to these individuals in a sufficient manner.

Strength

The strength of our study was that unlike previous studies that we could find, we made an attempt to quantitatively correlate the severity of psychiatric symptoms with the severity of dependence. We found a significant correlation between these two parameters. This finding needs to be further investigated.

Limitations

Our study has a few limitations:

- This study was done with fewer sample size.
- Selection bias of the patient group seen at a tertiary care hospital.
- There was no control group.
- Factors like duration of illness and previous treatment modalities have not been considered.
- The personality of patients has not been assessed and stressors have not been taken into consideration.

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