

Prevalence, Clinical Correlates and Explanatory Models of Substance Use among Patients with Schizophrenia: A Cross-sectional Study from a Tertiary Care Hospital, Southern India

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ABSTRACT

Introduction: Prevalence rates of Substance Use Disorders (SUDs) in patients with schizophrenia are reported to be about twice of that of the general population. Co-morbid SUDs in these patients can affect the natural course of the illness, quality of life and treatment compliance. Increased rates of hospital admissions, longer duration of inpatient stay, more severe psychopathology, increased rates of criminal activity and violent behaviour have also been reported in this group of patients. Data from the region on substance use in patients with schizophrenia is sparse.

Aim: To study the prevalence of SUD's in patients with schizophrenia and the risk factors associated with SUD's and patient Explanatory Models (EM) regarding the same.

Materials and Methods: The present cross-sectional study was conducted in the Psychiatry Outpatient Clinic at Christian Medical College, Vellore, Tamil Nadu, India, from November 2016 to May 2017 in 103 consecutive patients with schizophrenia. Symptom severity was assessed using the Positive and Negative Symptom Scale (PANSS), substance use patterns with the Drug Abuse Screening Test (DAST), Alcohol Use Disorders Identification Test (AUDIT) and Fagerstrom's Test for Nicotine Dependence (FTND) and patient EMs for substance use with a semi-structured questionnaire. Socio-demographic and clinical details were also recorded. Data was analysed using Statistical Package for Social Sciences (SPSS) software version 16.0.1.

Chi-square test and the student's t-test were used to assess the significance of association for categorical and continuous variables, respectively. The Pearson's correlation coefficient was employed to assess the statistical significance of the association between two continuous variables. A p-value <0.05 was considered as statistically significant.

Results: The mean age of the participants was 37.54 years. The majority of the participants were males (n=60, 58.3%), 62 (60.2%) were married, 97 (94.2%) were literates and 54 (52.4%) participants were employed. The prevalence of substance use was seen in 30 (29.1%) participants. Nicotine was the most common substance of abuse (n=21, 20.4%) followed by alcohol (n=19, 18.4%). Male gender, being employed and a family history of substance use were factors significantly associated with any substance use with p-values 0.001, 0.001 and 0.01, respectively. Patient's explanations for the use of the nicotine included the feeling of relaxation it produced (n=13, 61.9%), and feeling more energetic and active (n=12, 57.1%). Making one more relaxed and social (n=14, 73.7%) was the most common patient explanation for alcohol use.

Conclusion: Alcohol and nicotine were common substances of abuse among the participants in this study. It is useful to understand patient's explanations for substance use in order to develop effective intervention programmes tailored to the individual patient's beliefs.

Keywords: Co-morbidity, Patient explanatory models, Psychotic illness, Substance use disorder

INTRODUCTION

The Substance Use Disorder (SUD) is the most frequently reported co-morbidity among patients with schizophrenia. The lifetime prevalence of substance use in patients with schizophrenia lies between 40-70% and is almost twice that reported in the general population [1]. The common substances of abuse among this group include alcohol, cannabis, nicotine, minor tranquilisers, barbiturates and opium [2,3]. Co-morbid SUDs in schizophrenia can affect the natural course of the illness, disease recurrence, quality of life, and treatment compliance. Increased rates of hospital admissions, longer duration of inpatient stay, more severe psychopathology, increased rates of criminal activity and violent behaviour have also been reported to be associated with SUDs [4,5].

Several hypotheses have been postulated to explain the high prevalence of SUDs in patients with psychotic disorders. These include use of substances as self-medication to ameliorate depression, anxiety, negative symptoms or cognitive deficits, to reduce side-effects of antipsychotic medication, as a coping strategy to deal with distressing psychotic symptoms or due to a biological

vulnerability that makes these individuals sensitive to small amounts of substances leading to SUDs [6,7].

Indian data regarding substance use in patients with schizophrenia is sparse. Available studies have reported a prevalence ranging from 48-63.6% with the most common substance of abuse being nicotine, followed by cannabis and alcohol and also SUDs were more common among men and those employed; they were associated with a longer duration of untreated psychosis and more depressive symptoms [8,9].

Kleinman defines Explanatory Models (EM) as notions about an episode of sickness and its treatment [10]. EMs influence many aspects of a patient's life. Many contradictory beliefs are held by some patients which may not be fixed and are influenced by various factors like cultural. Personality based and response to treatment intervention elicitation of EMs allows the doctor to have a clear understanding of the patient's perspective regarding the illness, fears, and expectations from treatment. These explanations also determine the patient's help-seeking behaviour; and allows the individual make sense of their experiences and serve as a coping strategy [11,12]. There are not

many studies from India that have explored patient explanations for substance use in psychosis. The aim of the present study was to assess the prevalence and socio-demographic and clinical correlates of SUD in patients with schizophrenia. The EMs that patients with schizophrenia hold regarding substance use were also elicited, as a better understanding of this will help clinicians adapt the management of substance misuse to the individual patient's beliefs.

MATERIALS AND METHODS

This cross-sectional study was carried out in the Psychiatry Outpatient Clinic of Christian Medical College, Vellore, Tamil Nadu, India, between November 2016 and May 2017. Consecutive patients with schizophrenia were recruited. Following this the recruitment participants were interviewed by the principal investigator at a single point in time and each interview was completed in about 30-45 minutes. All patients received treatment as usual. All patients were given medications by their treating doctor. The research team was not a part of the treating team. The medication details were obtained from the medical records of the participants. Two hundred and forty-five patients were screened for eligibility to participate in the research interview. One hundred and three patients fulfilled inclusion criteria and provided consent to participate in the study were recruited in the study. The Institutional Review Board and Ethics Committee approved the study protocol (IRB Min. No. 10177 dated 06.07.2016).

Sample size calculation: The sample size was estimated using the formula $4pq/d^2$ [13,14], where 'p' denotes the prevalence of substance use in patients with schizophrenia, estimated to be 70% [15], $q=(100-p)$ and d, the precision, taken as 9. The required sample size was calculated to be 103.

Inclusion criteria: All patients who registered for the Outpatient Clinic were screened for eligibility to participate in the study, those who satisfied International Classification of Diseases 10th Revision (ICD-10) diagnostic criteria for schizophrenia [16], ≥ 18 years of age and who spoke Tamil were included in the study.

Exclusion criteria: Subjects with significant language, hearing or cognitive impairment and patients with a primary SUD, mood disorder, or organic disorder were excluded from the study.

Assessment

Socio-demographic details like age, gender, religion, education, occupation, household income, marital status etc., and clinical information like age of onset and duration of illness, treatment details etc., were recorded in a specially designed proforma (Annexure-1).

The PANSS, freely available in the public domain, was used to rate symptom severity [17]. Three subscale scores (positive symptoms, negative symptoms, and general psychopathology) and a total score can be generated from the 30-item questionnaire. Each item is rated on a Likert scale of 1-7 where one represents absent and 7 represents extreme level of symptoms. The total score ranges from 30-210. PANSS has been used extensively in India and around the world and its psychometric properties like interrater reliability (0.6-0.8), concurrent and predictive validity has been well established [18].

The Tamil version of AUDIT, a 10-item questionnaire, developed by the World Health Organisation (WHO) was used to screen for alcohol use [19]. Each item is scored from 0-4. A total score of 0-7 indicates low risk, 8-15 an increased risk, 16-19 as high risk, and 20-40 as dependence. It is freely available in the public domain and has been extensively used in the region. The questionnaire has high sensitivity (>0.9) and specificity (>0.8) and good test-retest reliability (0.88) [20-22].

The Tamil version of Fagerstrom's Test for Nicotine Dependence (FTND), a standard instrument to assess the intensity of physical addiction to nicotine was also administered [23]. The scale consists of six items which evaluates the quantity of nicotine consumption,

compulsion to use and dependence. The total score ranges from 0-10 with high/severe dependence being a score of 6-10 and mild to moderate dependence being a score of 1-5. It is short and easy to administer; its validity and reliability (Cronbach's alpha coefficient: 0.74) have been established in different cultural settings [24,25]. A version for smokeless tobacco was used for patients with smokeless tobacco use.

Tamil version of Drug Abuse Screening Test (DAST) was used to assess other substance use. The psychometric properties of this scale have been well established for use of drugs other than alcohol and nicotine with a sensitivity of 0.98 and specificity of 0.91 [26]. It is a 10-item brief screening tool that is clinician or self-administered, with each question requiring a yes or no response. The total score ranges from 0-10 with 0 suggesting no problem, 1-2 low-level problem, 3-5 moderate level of problem, 6-8 substantial level of problem, and 9-10 severe level of problem. It is also available freely in the public domain.

Explanatory models regarding substance use was assessed using a semi-structured questionnaire with 14 questions that explored reasons for use, and benefits attributed to substance use [Annexure-1]. This questionnaire evolved out of group discussions involving patients, caregivers, and mental health professionals (psychiatrists, psychologists, psychiatric social workers, occupational therapists, and psychiatric nurses) from the center. Content validation was done independently by three psychiatrists (content validity index=1) [27].

STATISTICAL ANALYSIS

Mean and standard deviations were calculated to describe continuous variables, while frequency distributions were used to describe obtained for categorical data. As the data was normatively distributed; parametric statistical tests were used. The Chi-square test and the student's t-test were used to assess the significance of association between substance use and categorical socio-demographic or clinical variables (gender, marital status, type of schizophrenia etc.) and continuous (age, duration of illness, number of years of education etc.) variables, respectively. The Pearson's correlation coefficient was employed to assess the statistical significance of the association between two continuous variables. Statistical Package for the Social Sciences (SPSS) software version 16.0.1 was employed for the analysis of data. The p-value <0.05 was considered to be statistically significant.

RESULTS

Total 245 patients with schizophrenia were screened for eligibility to participate in the research interview. Of which, 103 patients fulfilled inclusion criteria and provided consent to participate in the study.

Socio-demographic and clinical characteristics: The mean age of the participants was 37.54 ± 10.89 years. The majority of the participants were males, married, literate, employed and from a rural background. A large number of the participants reported side-effects to medication, most commonly extrapyramidal symptoms [Table/Fig-1].

Prevalence and patterns of substance use: The prevalence of substance use in this study was 30 (29.1%) The most commonly used substance was nicotine, reported by 21 (20.4%) participants, among which 8 (38.1%) reported chewing tobacco while 13 (61.9%) smoked cigarettes/beedis; 16 (76.2%) were current users, while 5 (23.8%) reported past use. The mean age of nicotine users was 38.71 ± 11.13 years. The majority of participants who reported nicotine use were literates ($n=18$, 85.7%), gainfully employed ($n=17$, 81%) and married ($n=14$, 66.7%). The mean age of onset of nicotine use was 19.14 ± 3.5 years. The average number of cigarette/beedis smoked per day was reported as 10.45. The mean FTND score was 3.46 (range: 0-8) for smoking tobacco and 4.88 (range: 0-7) for smokeless tobacco [Table/Fig-1].

Characteristics	Mean±SD; Median (Range)
Age (years)	37.54±10.9; 36 (20-65)
Gender	
Males, n (%)	60 (58.3%)
Females, n (%)	43 (41.7%)
Religion	
Hindu, n (%)	81 (78.6%)
Muslim, n (%)	11 (10.7%)
Christian, n (%)	11 (10.7%)
Literacy	
Illiterate, n (%)	97 (94.2%)
Literate, n (%)	6 (5.8%)
Education (years of schooling)	10.5±4.8; 11 (0-19)
Marital status	
Single, n (%)	39 (37.9%)
Married, n (%)	62 (60.2%)
Separated/Divorced/Widowed, n (%)	2 (1.9%)
Residence	
Rural, n (%)	68 (66%)
Urban, n (%)	35 (34%)
Monthly family income (rupees)	12104±13380.9; 8000 (700-80000)
Debt	
No, n (%)	50 (48.5%)
Yes, n (%)	53 (51.5%)
Occupation	
Unemployed, n (%)	21 (20.4%)
Employed, n (%)	54 (52.4%)
Housewife, n (%)	28 (27.2%)
Duration of illness (months)	86.13±88.8; 54 (1-404)
Age of onset of illness (years)	30.36±10.43; 28 (14-64)
Subtypes	
Paranoid, n (%)	86 (83.5%)
Undifferentiated, n (%)	17 (16.5%)
Course of illness	
Continuous, n (%)	99 (96.1%)
Episodic, n (%)	4 (3.9%)
PANSS score	
PANSS positive	15.78±6.15; 15 (7-30)
PANSS negative	21.10±6.60; 21 (7-38)
PANSS general psychopathology	31.46±6.59; 31 (7-38)
PANSS Depressive anxiety factor	6.93±2.39; 7 (4-13)
PANSS total score	68.32±16.04; 67 (7-30)
Mean antipsychotic dose in chlorpromazine equivalents	328.17±206.49; 67-1067
Olanzapine, (n=17)	19.12±5.93; 10-30
Risperidone, (n=51)	4.78±1.73; 2-8
Aripiprazole, (n=18)	16.25±7.49; 5-30
Medication compliance	
Good, n (%)	33 (32%)
Fair, n (%)	36 (35%)
Poor, n (%)	34 (33%)
Antipsychotic induced side-effects present n (%)	56 (54.4%)
Type of side-effects	
Acute, n (%)	40 (38.8%)
Tardive, n (%)	7 (6.8%)
Metabolic, n (%)	7 (6.8%)

Metabolic co-morbidities present, n (%)	16 (15.5%)
Diabetes, n (%)	16 (15.5%)
Hypertension, n (%)	1 (1%)
Dyslipidemia, n (%)	1 (1%)
Family history of psychotic illness, n (%)	18 (17.5%)
Family history of Substance use, n (%)	43 (41.7%)
Any substance use present in life time, n (%)	30 (29.1%)
Nicotine use-Life time, n (%)	21 (20.4%)
Age of onset in years	19.14±3.5; 20 (12-25)
Number of cigarettes/beedis per day	10.45±13.98; 17 (1-60)
Alcohol use-Life time, n (%)	19 (18.4%)
Age of onset in years	21.33±4.54; 20 (15-30)
Lifetime other substance use-present, n (%)	2 (1.9%)
FTND score	
Smokers	3.46±4.88; 4 (0-8)
Smokeless	4.88±2.3; 5.5 (0-7)
AUDIT scores	8.63±8.64; 4 (1-32)
DAST scores	5±1.4; 5 (4-6)

[Table/Fig-1]: Socio-demographic and clinical characteristics of patients.

PANSS: Positive and negative symptom scale; DAST: Drug abuse screening test; AUDIT: Alcohol use disorders identification test; FTND: Fagerstrom's test for nicotine dependence

Alcohol use was reported by 19 (18.4%) participants, with current use in 10 (52.6%) and past use in 9 (47.4%). The mean age of those who reported alcohol use was 36.84±10.24 years. The mean age of onset of alcohol use was 21.33±4.54 years. All participants who reported alcohol use were literates. The majority of participants who reported alcohol use were gainfully employed (n=18, 94.7%), currently married (n=12, 63.2%) and from a rural background (n=11, 57.9%). Two patients reported having used other illicit substances in the past. These results are also tabulated in [Table/Fig-1].

Factors associated with substance use: Substance use was significantly associated with male gender ($\chi^2=21.42$, df=1, p-value <0.001), being in employment ($\chi^2=19.9$, df=1, p-value <0.001) and a positive family history of substance use ($\chi^2=8.11$, df=1, p-value <0.01). In addition, nicotine use was associated with fewer years of education (t=2.04, df=101, p-value <0.01) and alcohol use with higher antipsychotic dose (t=-2.64, df=101, p-value <0.05). These results are detailed in [Table/Fig-2-4].

Fagerstrom's test for nicotine dependence scores correlated with PANSS positive symptom score (r-value=0.75, p-value=0.003), negative symptom score (r-value=0.73, p-value=0.005), general psychopathology score (r-value=0.75, p-value=0.003) and total score r-value=0.81, p-value=0.001) among tobacco smokers, and with PANSS negative symptom score (r-value=0.75, p-value=0.03) for smokeless tobacco users. Among alcohol users, no correlation was found between AUDIT scores and socio-demographic or clinical variables.

Explanatory Models (EM) for substance use: The most common reasons cited by the participants for nicotine use were that it made them feel more relaxed and sociable (n=13, 61.9%), more active and energetic (n=12, 57.1%), more alert (n=5, 23.8%) and less stressed, anxious, or depressed (n=6, 28.6%). Similarly, the most cited reasons for the use of alcohol were that it made them more relaxed and sociable (n=14, 73.7%), reduced stress, anxiety, or depression (n=4, 21.1%), increased energy (n=4, 21.1%), alertness and clear thinking (n=3, 15.8%). None of the participants reported substance use as a measure to specifically counter auditory hallucinations or medication side-effects. The majority attributed substance use as a habit or a sign of weakness and did not consider it a disease or an inherited disorder. These results are summarised in [Table/Fig-5].

Socio-demographic and clinical variables	Substance use		t/ χ^2 /r-value	df	p-value
	Absent (n=73)	Present (n=30)			
Age in years (Mean±SD)	36.86±10.97	39.20±10.68	-0.99	101	0.34
Gender, n (%)					
Male	32 (31.0%)	28 (27.1%)	21.42	1	<0.001**
Female	41 (39.8%)	2 (1.9%)	-	-	-
Residence, n (%)					
Rural	48 (46.6%)	20 (19.4%)	0.01	1	0.93
Urban	25 (24.2%)	10 (9.7%)	-	-	-
Number of years of education (Mean±SD)	10.9±4.5	9.5±5.38	1.36	101	0.18
Employment status, n (%)					
No	45 (43.7%)	4 (3.9%)	19.9	1	<0.001**
Yes	28 (27.1%)	26 (25.2%)	-	-	-
Marital status, n (%)					
Currently single	31 (30%)	10 (9.7%)	0.74	1	0.39
Currently married	42 (40.8%)	20 (19.4%)	-	-	-
Duration of illness in months (Mean±SD)	89.48±93.45	77.97±77.19	0.6	101	0.55
Family history of schizophrenia, n (%)					
No	59 (57.2%)	26 (25.2%)	0.5	1	0.48
Yes	14 (13.6%)	4 (3.9%)	-	-	-
Family history of substance use disorder, n (%)					
No	49 (47.6%)	11 (10.7%)	8.11	1	0.004*
Yes	24 (23.3%)	19 (18.4%)	-	-	-
Age of onset of illness in years (Mean±SD)	29.44±10.55	32.03±11.12	-1.12	101	0.27
PANSS score (Mean±SD)					
PANSS Positive	15.79±6.0	15.73±6.62	0.05	101	0.96
PANSS Negative	21.73±6.59	19.57±6.5	1.52	101	0.13
General psychopathology	31.88±6.97	30.43±5.53	1.01	101	0.32
PANSS Depression anxiety factor	6.95±2.42	6.9±2.34	0.09	101	0.93
PANSS Total score	69.42±16.29	65.63±15.38	1.09	101	0.28
Antipsychotic dose equivalent to chlorpromazine (Mean±SD)	303.88±173.36	384.8±268.18	-1.82	101	0.07
Any medication related side-effects, n (%)					
No	30 (29.1%)	17 (16.5%)	-	-	-
Yes	43 (41.7%)	13 (12.6%)	2.08	1	0.15

[Table/Fig-2]: Association between socio-demographic and clinical variables with substance use.

PANSS: Positive and negative symptom scale; t=Student's t-test value, χ^2 - Pearson's chi-squared test value, r=Pearson's correlation coefficient, df: Degrees of freedom.

*p-value <0.05 was considered statistically significant

Socio-demographic and clinical variables	Nicotine use		t/ χ^2 /r-value	df	p-value
	Absent (n=82)	Present (n=21)			
Age in years (Mean±SD)	37.24±10.88	38.71±11.13	-0.55	101	0.58
Gender, n (%)					
Male	41 (39.8%)	19 (18.4%)	11.26	1	0.001*
Female	41 (39.8%)	2 (1.9%)	-	-	-
Residence, n (%)					
Rural	53 (51.5%)	15 (14.6%)	0.34	1	0.56
Urban	29 (28.2%)	6 (5.8%)	-	-	-
Number of years of education (Mean±SD)	10.98±4.44	8.62±5.72	2.04	101	0.04*
Employment status, n (%)					
No	45 (43.7%)	4 (3.98%)	8.61	1	0.003*
Yes	37 (35.9%)	17 (16.5%)	-	-	-
Marital status, n (%)					
Currently single	34 (33%)	7 (6.8%)	0.46	1	0.48
Currently married	48 (46.6%)	14 (13.6%)	-	-	-
Duration of illness in months (Mean±SD)	87.8±90.4	79.57±84.04	0.38	101	0.71
Family history of schizophrenia, n (%)					
No	67 (65%)	18 (17.5%)	0.19	1	>0.99
Yes	15 (14.6%)	3 (2.9%)	-	-	-

Family history of substance use disorder, n (%)					
No	53 (51.5%)	7 (6.8%)	6.74	1	0.009*
Yes	29 (28.2%)	14 (13.6%)	-	-	-
Age of onset of illness in years (Mean±SD)	29.8±10.83	31.71±10.43	-0.73	10	0.47
PANSS score (Mean±SD)					
PANSS Positive	15.56±6.08	16.62±6.49	-0.7	101	0.48
PANSS Negative	21.52±6.34	19.43±7.47	1.30	101	0.2
General psychopathology	31.57±6.73	31±6.16	0.35	101	0.72
PANSS Depression anxiety factor	6.93±2.4	6.95±2.38	-0.04	101	0.97
PANSS total score	68.65±15.86	67.05±17.12	0.41	101	0.69
Antipsychotic dose chlorpromazine equivalent	307.73±187.8	404.43±262.25	-1.93	101	0.06
Any medication related side-effects, n (%)					
No	35 (34%)	12 (11.7%)	1.41	1	0.24
Yes	47 (45.6%)	9 (8.7%)	-	-	-

[Table/Fig-3]: Association between socio-demographic and clinical variables with nicotine use.

PANSS: Positive and negative symptom scale; t=Student's t test value, χ^2 : Pearson's chi-squared test value, r=Pearson's correlation coefficient, df=Degrees of freedom.

*p-value <0.05 was considered statistically significant

Socio-demographic and clinical variables	Alcohol use		t/ χ^2 /r-value	df	p-value
	Absent (n=84)	Present (n=19)			
Age in years (Mean±SD)	37.7±11.08	36.84±10.24	0.31	101	0.76
Gender, n (%)					
Male	41 (39.8%)	19 (18.4%)	16.7	1	<0.001**
Female	43 (41.7%)	0	-	-	-
Residence, n (%)					
Rural	57 (55.3%)	11 (10.7%)	0.69	1	0.41
Urban	27 (26.2%)	8 (7.8%)	-	-	-
Number of years of education (Mean±SD)	10.27±4.89	11.47±4.34	-0.99	101	0.33
Employment status, n (%)					
No	48 (46.6%)	1 (1%)	16.72	1	<0.001**
Yes	36 (34.9%)	18 (17.5%)	-	-	-
Marital status, n (%)					
Currently single	34 (33%)	7 (6.8%)	0.09	1	0.77
Currently married	50 (48.5%)	12 (11.7%)	-	-	-
Duration of illness in months (Mean±SD)	90.26±92.79	67.84±67.48	0.99	101	0.32
Family history of schizophrenia, n (%)					
No	69 (66.9%)	16 (15.5%)	0.05	1	>0.99
Yes	15 (14.6%)	3 (2.9%)	-	-	-
Family history of substance use disorder, n (%)					
No	52 (50.4%)	8 (7.8%)	2.5	1	0.11
Yes	32 (31%)	11 (10.7%)	-	-	-
Age of onset of illness in years (Mean±SD)	30.21±10.99	30.11±9.76	0.04	101	0.97
PANSS score (Mean±SD)					
PANSS Positive	15.86±5.95	15.42±7.14	0.28	101	0.78
PANSS Negative	21.57±6.8	19±5.28	1.54	101	0.13
General psychopathology	31.79±6.67	30±6.19	1.07	101	0.29
PANSS Depression anxiety factor	6.95±2.35	6.84±2.61	0.18	101	0.86
PANSS Total score	69.24±15.99	64.26±16.1	1.22	101	0.22
Antipsychotic dose chlorpromazine equivalent	302.48±168.09	437.84±312.68	-2.64	101	0.01*
Any medication related side-effects, n (%)					
No	36 (34.9%)	11 (10.7%)	1.41	1	0.24
Yes	48 (46.6%)	8 (7.8%)	-	-	-

[Table/Fig-4]: Association between socio-demographic and clinical variables with alcohol use.

PANSS: Positive and negative symptom scale; t=Student's t-test value, χ^2 : Pearson's chi-squared test value, r=Pearson's correlation coefficient, df=Degrees of freedom.

*p-value <0.05 was considered statistically significant

There were no responses for the first question which was open-ended and therefore we followed it up with the subsequent thirteen close-ended questions. None of the

respondents believed that substance use reduces 'voices' or that substance use helped them in another way not mentioned above.

Participant beliefs and reasons	Nicotine (n=21) n (%)	Alcohol (n=19) n (%)
Reduce stress, anxiety or depression-yes	6 (28.6%)	4 (21.1%)
Reduce fear and suspiciousness-yes	1 (4.8%)	2 (10.5%)
Reduces side-effects of medications	0	1 (5.3%)
Makes one more active and energetic-yes	12 (57.1%)	4 (21.1%)
Makes one more alert and with clear thinking-yes	5 (23.8%)	3 (15.8%)
Makes one feel more normal-yes	4 (19%)	1 (5.3%)
Makes one more relaxed and social-yes	13 (61.9%)	14 (73.7%)
Believes it is a disease	0	1 (5.3%)
Believes it is a habit	15 (71.4%)	10 (52.6%)
Believes it is as a sign of weakness	5 (23.8%)	7 (36.8%)
Believes it is due to family history or genetic cause-yes	1 (4.8%)	0

[Table/Fig-5]: Reasons for use and beliefs related to substance use.

DISCUSSION

The SUDs are one of the most common co-morbidities seen in patients with schizophrenia, with prevalence rates higher than that in the general population, suggesting that the risk factors for the two groups may be somewhat different [28]. Co-morbid SUD in patients with schizophrenia is often associated with increased morbidity and mortality, non adherence to medications, poor treatment response and poor functional outcomes [29]. In those who continue to use substances further deterioration, infections and early mortality are risks.

Clinicians need to be alert to the possibility of SUD in their patients with schizophrenia. Creating a non judgemental therapeutic alliance will encourage patients to honestly report details of substance use. Clinicians dealing with patients with schizophrenia tend to focus on dealing with psychotic symptoms and may not adequately address the SUD which may complicate the management of the primary disorder.

The prevalence of SUDs in this study was 29.1%, suggesting that it is a common problem among patients with schizophrenia. Previous reports of prevalence rates of SUD in patients with schizophrenia range from 10-70% [1]. This wide variation in rates reflect differences in methodology of the studies such as the treatment setting and criteria used for diagnosis. This high prevalence makes it necessary to improve awareness among patients, caregivers and clinicians regarding this co-morbidity and its ill-effects to enable prevention and early intervention.

A variety of substances are abused by patients with schizophrenia; most studies, including the present one, have found nicotine and alcohol to be the commonest drugs of abuse in this patient group [1]. These are also the two most abused drugs among the general population in India [30]. The easy availability, accessibility, and affordability of these substances, especially in rural areas where most of the study population resided, may explain their frequency of use. It is possible that the variety of substances used may have been greater if the catchment area was urban.

Factors associated with substance abuse in schizophrenia: In the present study, male gender was found to be significantly associated with substance use, similar to past findings among patients with schizophrenia, as well as among the general population [31]. Rates of SUD among women with schizophrenia may be underestimated as clinicians may not ask female patients about addictions given the prevailing gender stereotypes regarding substance use [32].

Unlike that reported in some earlier studies, the present study found that those who were in employment were more likely to be using substances [33]. Possible explanations for this may be that the unemployed do not have the financial resources to procure substances, given the poor coverage of social security and pension

schemes in the country, or that substance use may be a strategy to cope with the stress of employment. A family history of substance use was found to be significantly associated with substance use in this study and this has been described earlier; several researchers have suggested that family members who use substances can have a modelling effect on others in the family [34,35]. Nicotine use was associated with lower education, similar to earlier research findings in schizophrenia, and in the general population [31]. Explanations for this association include lack of awareness of the ill-effects of the substance and cessation methods among those with lower education, and use of substance to cope with the stress related to associated lower occupational status and financial difficulties [36]. A positive correlation was found between symptom scores and FTND scores; this may support the self-medication hypothesis that suggests that patients use nicotine as they perceive it to have a beneficial effect on their symptoms [37,38].

Alcohol use was associated with higher doses of antipsychotic medication; some previous studies have also reported hazardous drinking to be associated with more, and higher doses of antipsychotic agents [31,39]. Given the cross-sectional nature of the study, the direction of the relationships described above cannot be ascertained.

Explanatory Models (EM) of Substance Use Disorders (SUD) in schizophrenia: Several hypotheses have been proposed for the high rate of co-morbid substance use and schizophrenia. A shared biological or genetic susceptibility to both substance abuse and schizophrenia has been proposed [40,41]. A greater vulnerability to SUDs due to impairments in thinking, judgement and impulse control in people with schizophrenia has also been postulated. Environmental and psychosocial factors have been implicated, as substances may be used to alleviate the dysphoria related to the limited vocational, recreational, and social opportunities that people with schizophrenia experience [42]. The downward social drift associated with the disorder may expose individuals to social settings where there is a greater prevalence of substance use [42].

Another explanation is the self-medication theory which suggests that individuals use substances to alleviate various symptoms of the disorder, to combat antipsychotic induced side-effects, or to improve attention and memory [40,41]. Most of the patients in this study mentioned the use of substances as an effort to remove negative affective states, reduce anxiety and feel more relaxed and energised. These findings support the self medication hypothesis, however, criticisms against this theory include the fact that each substance works in a different manner, on different receptors and the choice of substance is based on availability rather than on their specific effects. It has also been found that substance use generally predates the onset of psychosis and tend to exacerbate rather than relieve the symptoms of schizophrenia [43].

Treatment of such patients with a dual diagnosis requires that both disorders are addressed simultaneously. Given the nature of both disorders, active efforts are required to engage such patients in treatment. Management strategies that combine pharmacotherapy, psychosocial treatments, and substance abuse counselling provided by a multidisciplinary team have been found to have good treatment outcomes [44]. Medication management integrated with individual and group counselling, motivational interviewing, skill training, substance refusal skills, relapse prevention strategies, family and social support interventions and vocational rehabilitation are found to be beneficial [15]. The approach should be individualised keeping in mind the severity of illness, type of substance abused, and motivation to quit the substance [45]. The EMs elicited from the participants in this study also highlights the necessity to equip patients with healthy and practical coping, problem solving and relaxation techniques along with enlisting a supportive network.

Limitation(s)

All participants were interviewed by the first author ensuring adequate privacy however, given the sensitive nature of the topics explored, it is possible that participants might have felt unable to express their views freely. The cross-sectional design of the study does not allow one to make inferences on the direction of causality and the precise nature of association between the variables. Recruitment of participants from a tertiary hospital, where patients with severe illness are likely to be included could have resulted in selection bias. The diagnosis of substance use was based on patient and caregiver reports and not with investigations to confirm substance use, so bias may have been present. No comparison was made between patients with schizophrenia and healthy individuals to determine the relationship between clinical presentation and severity of substance use.

CONCLUSION(S)

People with schizophrenia seem to use substances for many of the same reasons as others in society, but several biological, psychological, and socio-environmental factors have been hypothesised to contribute to this population's high rates of SUDs. The easy and legal availability of nicotine and alcohol contribute to the widespread use among people with schizophrenia, as in the general population. The high rates of social, legal, and medical problems in this subgroup along with a more complicated course and outcome, despite adequate treatment of schizophrenia emphasises the need for early and appropriate intervention. Treatment of individuals with schizophrenia and co-morbid SUD use requires a multi-pronged approach, targeting both conditions simultaneously with a combination of pharmacological and psychosocial interventions. Understanding the relationship between the patients' perceptions and belief systems regarding the problem will help in designing interventions that will be acceptable to the population and improve engagement of patients with mental health services. Future research should focus on a better understanding of the reasons for substance use in patients with schizophrenia, in order to develop effective and appropriate interventions to prevent, detect and treat SUDs in this vulnerable population.

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Date of Submission: **May 20, 2022**Date of Peer Review: **Jul 18, 2022**Date of Acceptance: **Oct 17, 2022**Date of Publishing: **Jan 01, 2023****ANNEXURE-1****Proforma****Socio-demographic and Clinical Data Sheet**

Serial No.:

Hospital No.:

Gender: Male/Female

Age (in years):

Residence: Rural/Urban

Religion:

Years of education:

Literacy: Illiterate/Literate

Occupation: Unemployed/Employed/Housewife

Household income (Rupees per month):

Debt: Present/Absent

Marital Status: Single/Married/Widow/Widower/Separated/Divorced

Duration of illness (in months):

Age of onset of illness (years):

Subtype of schizophrenia: Paranoid/Hebephrenic/Catatonic/Undifferentiated

Course: Continuous/Episodic illness. If episodic number of episodes:

Current PANSS Score:

Positive:

Negative:

General Psychopathology:

Depression and anxiety factor:

TOTAL:

Compliance with medication (chart review): Good/Fair/Poor

Current medication:

Antipsychotic induced side-effects: No/Yes

Acute:

Tardive:

Metabolic:

Others:

Medical co-morbidities: No/Yes

If yes: DM/HT/Dyslipidemia/Others

Number of hospitalisations:

Age of first hospitalisation in years:

Family history of schizophrenia: No/Yes

Family history of substance use: No/Yes

Substance use: No/Yes If yes details:

Nicotine use: No/Yes If yes, Current/Past
 Duration of use(years)
 Age of onset
 Amount Per day
Per week
Per month

Alcohol use: No/Yes If yes, Current/Past
 Duration of use (years)
 Age of onset
 Amount Per day
Per week
Per month

Other substance use: No/Yes
 Name: Current/Past
 Duration of use (years)
 Age of onset
 Amount Per day
Per week
Per month

Explanatory models:

1. Why do you use -----(substance)?
 2. Do you believe it reduces your stress/anxiety/depression? No/Yes
 3. Do you believe it reduces the 'voices'? No/Yes
 4. Do you believe it reduces your fear/suspicious? No/Yes
 5. Do you believe it helps you be more active and energetic? No/Yes
 6. Do you believe it helps you be more alert and clear in thinking? No/Yes
 7. Does it make you feel more 'normal'? No/Yes
 8. Do you believe it helps reduce side-effects to medication? No/Yes
 9. Do you believe it helps you be more relaxed and sociable? No/Yes
 10. Has it helped you in any other way? No/Yes
- If yes- specify
11. Do you believe it is a disease? No/Yes
 12. Do you believe it is a habit? No/Yes
 13. Do you believe it is a sign of weakness? No/Yes
 14. Do you believe it is because of your family history/genetic causes? No/Yes