

Socio-demographic profile and clinical co-morbidities of cannabis users attending a tertiary care hospital in India: A retrospective case record study

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ABSTRACT

Context: Cannabis use has been the most commonly used illicit psychoactive substance in India. Increasing use of cannabis has been associated with an increased risk of co-morbid psychotic spectrum disorders with worse outcomes. This risk increases with increased use in a dose-dependent manner. A very complex association exists between cannabis use and mental illness hence it is essential to understand the relationship between the two to facilitate better care and management.

Aim: The present study was conducted to assess the socio-demographic profile and psychiatric co-morbidities of cannabis users attending a tertiary mental health establishment in Goa.

Materials and Methods: A retrospective case record study was carried out among self-reported cannabis users attending services at a tertiary mental health establishment from June 2021 to June 2022. Data regarding cannabis use, clinical profile, and socio-demographic profile of the individuals was obtained and analyzed using appropriate statistical tests.

Results: One hundred and sixty-four cannabis users were evaluated which consisted of 140 males and 24 females, the mean age being 28 years with a standard deviation of 7.68. Ganja was the most commonly used form smoked as joints. The median age of initiation was 18 with females starting at a later age than males. Later initiation was associated with using lower quantities. Concurrent alcohol and nicotine use was present in 90% of the cases. The most commonly associated diagnosis was substance-induced psychosis.

Conclusions: Cannabis use in individuals with mental illness is more common in males and an early age of initiation was linked to earlier age of onset of psychiatric illness.

Key words: Cannabis, co-morbidities, induced psychosis, substance use

INTRODUCTION

Cannabis has been used in India for over 2,000 years. Indian use of cannabis dates back to Vedic times, mainly

for ritualistic and religious purposes, as documented in ancient literature. In the Sushruta Samhita, an ancient medical treatise, cannabis plant extract was recommended for the treatment of respiratory diseases and diarrhea. The pharmaco-active constituents of cannabis and their therapeutic value as well as the adverse effects they can produce, especially neurological effects, including

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withdrawal symptoms have already been described in Ayurvedic medicine. Medicinal use of cannabis in India did not spread due to religious and social stigma, but recreational use continued. In 1798, the British Parliament imposed a tax on cannabis by-products to curb consumption. The Indian Hemp Commission of 1894 concluded that the use of cannabis is very ancient and harmless in moderation. Despite this report, cannabis continued to remain illegal in India, with the restricted use of bhang being allowed in some parts of the country.^[1]

Cannabis is the most commonly used illicit psychoactive substance in India. According to the 2019 National Survey on Extent and Patterns of Substance Use in India, 3.1 crore users were reported to be using cannabis, of which one in 11 users had dependence. The prevalence of cannabis use in the state of Goa was found to be 0.7%, which was lower than the national average of 2.8%.^[1] In recent years, there has been a change in the societal and legal perspective toward the use of cannabis, with a push toward legalization. The increasing availability of cannabis in many countries has led to an increase in use and a decrease in the perception of risk among adults and adolescents.^[2] As cannabis has its roots in Indian culture and similar calls for legalization and cultivation of cannabis products have been made in India, it is important to examine the possible implications.

Several studies have linked cannabis use to a higher incidence of psychiatric disorders with worse outcomes in co-occurring cannabis use disorder.^[3] Cannabis use increases the risk of developing psychotic spectrum disorders in genetically susceptible individuals.^[4] This risk increases with increased use in a dose-dependent manner. It also has a positive correlation with major depressive disorder as well as bipolar disorder, with cannabis use found to lower the age of onset and worsen the symptoms of bipolar disorder. However, no clear association has been established between the incidence of anxiety disorders and cannabis use. Claims regarding the positive effects of cannabis use on anxiety also have not shown any clear results with findings being mixed. The results for post-traumatic stress disorder were similar to anxiety disorders with similarly mixed findings for studies investigating both positive therapeutic effects as well those studying potential harm.^[3-5]

Considering the complex association of cannabis and mental illness it is crucial to understand the relationship between the two to facilitate better care. The study was thus conducted to assess the socio-demographic profile and psychiatric co-morbidities of cannabis users attending a tertiary mental health establishment in Goa, India.

MATERIALS AND METHODS

This was a retrospective analytical study conducted at the Institute of Psychiatry and Human Behaviour, Goa, a

tertiary mental health establishment in India that caters to the state of Goa along with adjacent areas of neighboring states like Maharashtra and Karnataka. Goa being a tourist destination also receives its fair share of clients from across international borders. The study was carried out among self-reported users of cannabis attending the institute for the first time.

These users were identified by reviewing the case records and data regarding their socio-demographic details and cannabis use was collected using a semi-structured proforma. All data was collected by one author to maintain uniformity of the data collected. The sample size was calculated using a standard formula of $Z^2 \times (P) (1-P)/M^2$ after considering a prevalence (P) of 0.7% in Goa based on the 2019 National Survey on Extent and Patterns of Substance Use in India with Z value of 1.96 (corresponding to the confidence interval of 95%) and margin of error as 5% was found to be 164. Sampling was continuous. Data from May 2016 to July 2022 were included.

The case files of the included cases were reviewed to obtain the socio-demographic details of the participants.

Data regarding cannabis use pertaining to the type of cannabis used (Ganja, Charas, Bhang, Hashish), age of initiation, quantity, and presence of daily use was also retrieved. The clinical data collected included the diagnosis, duration of psychiatric illness, need for hospitalization, and use of any other substances.

The study was approved by the Institute Ethics Committee. The statistical analysis was carried out using Statistical Package for Social Sciences software version 20. Socio-demographic and clinical variables were summarized using frequency and percentage for categorical variables and mean and standard deviation for continuous variables. chi square test was used to evaluate the association between various socio-demographic parameters and the clinical factors. A two-tailed *P* value < .05 was considered to be statistically significant.

RESULTS

The sample of 164 cannabis users consisted of 140 males (85.4%) and 24 females (14.6%). The mean age of the participants was 28 years ranging from youngest at 17 years and oldest at 52 years (standard deviation = 7.68 years). Most individuals had secondary education or higher, belonged to middle socio-economic status, and were employed. Hinduism and Christianity were the most common religions followed by Islam. 52% (*N* = 86) of the cannabis users were unemployed at the time of presentation. Out of the ones who were employed most belonged to the highly skilled group [Table 1].

Cannabis use

Most common type of cannabis used was found to be ganja smoked in the form of joints. The mean age of initiation was 19.17 years with a standard deviation of 4.2 years, the median was found to be 18 years. The minimum age of initiation was 12 years whereas the maximum was 38 years.

Females were found to have a later age of initiation than men, with the mean age for men being 18.8 years whereas the mean age for women being 21.3, and this difference was found to be statistically significant (student *t*-test, $P = 0.009$). They were both found to be using similar quantities (in terms of joints/day) of cannabis.

The age of initiation and the quantity (joints/day) of cannabis showed a significant but weak negative correlation with a Pearson coefficient of -0.239 implying that users who started earlier in their life used marginally higher number of joints/day of cannabis (Pearson correlation, $P = 0.03$).

There was no statistically significant difference when the quantity of use (joints/day) and onset of cannabis use were compared across education status (one-way ANOVA test, P value = 0.777 and 0.606). The age of initiation appeared to be similar across the different educational groups [Tables 2 and 3].

When the quantity and age of initiation were compared among the different socio-economic strata, no difference was found in the age of initiation among the group but the middle and higher socio-economic strata were found to use a higher number of joints/day of cannabis [Table 4]. On one-way ANOVA test, no significant difference was found among the groups when assessing for quantity and the age of initiation of cannabis. The age of initiation and quantity (joints/day) was found to be similar among the urban and rural populations.

Duration of psychiatric illness

Initiation of cannabis use had a weak negative correlation to the duration of psychiatric illness (Pearson's correlation, Pearson coefficient -0.108), signifying that an earlier age of initiation of cannabis correlated to having a longer course of psychiatric illness.

Age of onset and initiation of cannabis use had a significant between positive correlation (Pearson's correlation, Pearson coefficient 0.149) inferring that the earlier the age of initiation of cannabis use the earlier the onset of illness. The initiation of cannabis use preceded the onset of mental illness by an average of 5 years.

Violence

Almost half of the participants were noted to display violent behavior during the course of their illness. The

Table 1: Socio-demographic details of the participants

Variables	<i>n</i>	Percentage
Sex		
Male	140	85.4
Female	24	14.6
Education		
Uneducated	2	1.2
Primary	3	1.8
Lower Secondary	61	37.2
Higher Secondary	42	25.6
UG	44	26.8
PG	12	7.3
Marriage		
Married	33	20
Unmarried	131	80
Address		
Rural	105	64
Urban	59	36
Socio-Economic Status		
Lower	66	40.2
Middle	75	45.7
Higher	23	14
Religion		
Hindu	106	64.6
Christian	40	24.4
Muslim	17	10.4
Buddhist	1	0.6
Occupation		
Unemployed	28	17.1
Student	14	22.6
Low skill	37	26.8
Moderate skill	44	25.0
High skill	41	8.5

Table 2: Quantity of cannabis (number of joints/day) compared across education background

Education	Mean	<i>n</i>	Std. Deviation
Data not available	-	4	-
Primary Education	1.00	3	1.732
Lower Secondary	2.15	61	1.579
Higher Secondary	2.14	42	1.894
Graduate	2.17	41	2.072
Post-Graduate	2.75	12	2.598
Total	2.16	160	1.880

One-way ANOVA test, $P=0.777$

Table 3: Age of initiation of cannabis use compared across educational backgrounds

Education	Mean	<i>n</i>	Std. Deviation
Uneducated	20.50	2	0.707
Primary Education	17.67	3	1.155
Lower Secondary	18.61	59	4.979
Higher Secondary	18.57	42	3.148
Graduate	20.14	44	4.359
Post-Graduate	20.73	11	3.003
Total	19.17	161	4.233

One-way ANOVA test, $P=0.606$

age of initiation of cannabis use had no significant correlation with the presence of violence (Student *t*-test, P value = 0.227), whereas the number of joints/day of

cannabis use was significantly linked to violent behavior in cannabis users (Student *t*-test, *P* value = 0.039). We used multiple regression analysis to assess the association of the quantity of cannabis used and the age of initiation and found they had no significant impact on violent behavior. (R-squared change = 0.033, *P* value = 0.077). The regular users (defined as daily use) were more likely to display violent behavior compared to occasional users with the difference being statistically significant (Chi-square test, *P* = 0.015) [Table 5].

Diagnosis

The most commonly associated diagnosis in cannabis users was found to be substance-induced psychosis and substance use disorder. The majority (90%) of individuals had co-morbid alcohol and nicotine use. The other substances that were commonly used were cocaine, MDMA, amphetamines, LSD, benzodiazepines, and opioids.

Other common diagnoses included schizophrenia, borderline personality disorder, antisocial personality disorder, anxiety disorders, depressive disorders, bipolar disorder, and attention deficit hyperactivity disorder [Figure 1].

In the psychotic and depressive group, the initiation of cannabis preceded the onset of illness. This was ascertained

by comparing the years of cannabis use with the years of illness.

Cannabis was reported as a form of self-medication in cases diagnosed with anxiety and ADHD and users reported an improvement in symptoms and a subjective “calming” effect after smoking cannabis. Although the number of these reports was limited.

Symptoms

Among the substance-induced psychosis group, the most common symptoms included delusions of persecution and reference, auditory hallucinations followed by symptoms of mania. Depressive and anxiety symptoms were the second most common type of symptoms noted.

DISCUSSION

In our study the male-to-female ratio was 5.25:1. This male predominance is similar to findings in other studies conducted by Chatterjee *et al.* in India and Rodrigo *et al.* in Sri Lanka^[5,6] who found that all the subjects meeting criteria for cannabis dependence were male.

Leah S. Richmond-Rakerd in a study assessing the age of initiation and progression of substance use found an early age of initiation to cannabis and also found that people with later age of initiation tended to use cannabis in lower frequencies.^[7] A similar negative correlation between the age of initiation and quantity of cannabis use was found in our study.

Table 4: Age of initiation and quantity (joints/day) of cannabis use compared across socio-economic strata

Socio-economic status	Age of initiation (years)	Quantity (number of joints/day)
Low		
Mean	18.46	1.91
<i>n</i>	65	65
Std. Deviation	4.276	1.656
Middle		
Mean	19.56	2.25
<i>n</i>	75	72
Std. Deviation	4.458	1.790
High		
Mean	19.95	2.61
<i>n</i>	21	23
Std. Deviation	2.906	2.607
Total		
Mean	19.17	2.16
<i>n</i>	161	160
Std. Deviation	4.233	1.880

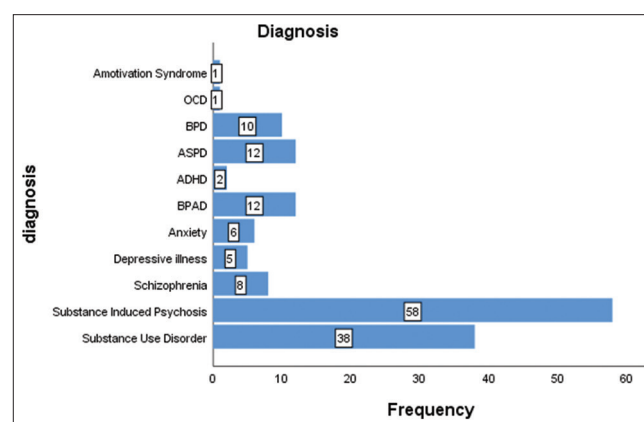


Figure 1: Various co-morbidities observed among participants

Table 5: Comparing age of initiation (AOI) of cannabis with gender and violence and quantity (joints/day)

Variable Compared	Groups	<i>n</i>	Mean	SD	SEOM	<i>t</i>	df	Sig. (2-tailed)	Mean diff.	Std. error diff.
AOI of cannabis	Male	138	18.81	4.828	1.007	2.664	159	0.09	2.493	0.936
	Female	23	21.30	4.036	0.344					
AOI of cannabis	Violent	91	18.8	4.371	0.458	-1.21	159	0.227	-0.815	0.672
	Non-Violent	70	19.63	4.029	0.482					
Quantity	Violent	91	2.43	1.89	0.199	2.078	158	0.39	0.617	0.297
	Non-Violent	69	1.81	1.80	0.218					

SD=Standard Deviation, SEOM=Standard Error of Mean, AOI=Age of initiation

In a study on the effects of socio-economic status and cannabis use, Legleye *et al.* found that adolescents from affluent families are more prone to experimentation with cannabis and to use it at low levels but present lower levels of frequent, heavy, or problematic use than those from other SES categories. Our study found a non-significant difference among the socio-economic strata with the higher socio-economic status group having a higher mean quantity (in terms of joints/day use) of cannabis use. This could reflect the high costs of procuring cannabis especially in its illegal form ganja, which was the most commonly used form.^[8]

Our study found a negative correlation between age of initiation and duration of psychiatric illness signifying that an earlier initiation of cannabis use was linked with earlier onset of the psychiatric illness. This finding substantiates previous findings that cannabis use in adolescence increases the susceptibility to develop mental illness at times reducing the age of onset of the illness in people previously susceptible.^[9]

A meta-analysis on cannabis-induced psychosis^[10] has shown a dose-dependent relation between cannabis use and psychotic symptoms. The most common psychiatric diagnosis found in our study was substance-induced psychosis; this group also had the highest mean quantity of use highlighting the dose relation. We also found that the cannabis use preceded the onset of psychotic symptoms, this finding was similar to that found by Rodrigo *et al.* in their study.^[6]

Although almost half the users displayed violent behavior which was linked to regular use of cannabis, there was no significant association found in our study with relation to age of initiation and quantity of cannabis use. In a meta-analysis on cannabis and violence, cannabis was linked to multiple forms of violent behavior and current cannabis use also predicted future violence. Perhaps in our study due to the sample size being lower the significance of the variable could not be ascertained.^[11]

CONCLUSION

We conclude that cannabis use among people with mental illness was more common in males, had an early age of initiation, was used in higher quantities (number of joints/day) among higher socio-economic groups, and was not different among religions, different educational backgrounds, and occupational backgrounds.

Early cannabis use was linked to an earlier age of onset of psychiatric illness and a longer duration of illness. The cannabis use preceded the onset of symptoms.

The most commonly associated psychiatric conditions were substance-induced psychosis, with the highest quantity of

use in this group followed by schizophrenia. BPAD, ASPD, BPD, depressive disorders, and anxiety disorders were some other conditions noted to be associated with cannabis use. Cannabis was also reported as a form of self-medication in the ADHD and Anxiety group.

Violence was found to be common in this group but the relationship with cannabis could not be ascertained.

Limitations

This study is not without its limitations. The study has been conducted at a tertiary care institute hence it is prone to have Berksonian bias. Since only self-reported cannabis users were taken in the study, some users who did not report use may have been missed. Hence the results of the study may not be extrapolated to a larger population.

Implications

The study highlights the need for early targeted intervention and education programs to tackle the rise of cannabis use in youth. It is important to understand why certain socio-demographic groups were more likely to use cannabis and develop strategies to address the underlying factors.

The fact that early cannabis use is associated with earlier onset of psychiatric illness and a longer duration of illness underscores the need for early intervention and prevention efforts. Healthcare providers should be aware of the potential risks associated with cannabis use, especially among young people, and should screen patients for substance use disorders.

The finding that some individuals with mental illness use cannabis as a form of self-medication for anxiety and ADHD suggests the need for better screening and treatment options for these conditions that are acceptable and accessible to the patients.

The study has important implications for policy related to cannabis use and mental health. It highlights the need for more research on the potential risks and benefits of cannabis use among individuals with mental illness, as well as the need for targeted prevention and intervention efforts to address the specific needs of this population.

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Conflicts of interest

There are no conflicts of interest.

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