JOURNAL OF PAKISTAN PSYCHIATRIC SOCIETY
(Reviewed Manuscript - Version of Record to Follow)

ORIGINAL ARTICLE:

Cannabis Use in First-Episode Psychosis: Associations with Symptom Dimensions and Sociodemographic Factors

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Submitted: 17 December 2025
Accepted: 30 March 2026

ABSTRACT

OBJECTIVE

To determine sociodemographic and clinical predictors of cannabis use among patients with first-episode psychosis (FEP) admitted to a tertiary care psychiatric unit in Pakistan.

STUDY DESIGN

Cross sectional study

PLACE & DURATION OF STUDY

The study was conducted at the Psychiatry Unit, Khyber Teaching Hospital, Peshawar from January 2021 to December 2024.

SUBJECTS AND METHODS

104 consecutive inpatients with First Episode Psychosis (FEP) and no prior antipsychotic exposure were assessed using a structured proforma for sociodemographic and clinical data. Symptom severity was measured with the Positive and Negative Syndrome Scale (PANSS). Binary logistic regression was applied to identify predictors of cannabis use.

RESULTS

Among 104 participants (77.9% male; mean age 23.4 ± 8.4 years), cannabis use was reported exclusively among males (28.4%). Unemployment and lower socioeconomic status significantly predicted cannabis use. Being employed, OR = 0.017, 95%, CI [0.001–0.367] or being a student, OR = 0.064, 95%, CI [0.006–0.693] was associated with markedly lower odds of cannabis use compared with unemployment. Satisfactory socioeconomic status was also protective, OR = 0.074, 95% CI [0.010–0.522]. Clinically, moderate manic symptoms and higher PANSS activation scores were linked with lower likelihood of cannabis use ($p < 0.05$).

CONCLUSION

Cannabis use in first-episode psychosis is strongly influenced by social determinants such as occupation and socioeconomic status rather than symptom severity. Culturally informed, gender-sensitive prevention strategies are needed to address substance use risk in psychosis within South Asian contexts.

KEYWORDS

First-episode psychosis, Cannabis use, Sociodemographic factors, Pakistan.

INTRODUCTION

Substance use among individuals experiencing first-episode psychosis (FEP) is a critical public health concern. Co-occurring drug use is associated with earlier onset, greater symptom severity, poorer adherence, and worse outcomes including relapse and rehospitalization.[1] Although evidence from Western settings is extensive, findings from South Asia remain limited despite high regional burden and differing sociocultural determinants of substance use.

The prevalence of drug use in psychosis varies across settings, influenced by socioeconomic background, cultural attitudes, and drug availability.[2] Cannabis is particularly implicated in the onset and course of psychotic disorders, with meta-analyses showing robust associations between cannabis exposure and increased risk of schizophrenia and psychosis. [3] Yet, this relationship is not uniform, suggesting that sociodemographic and clinical characteristics may modify its expression.

Socioeconomic disadvantage, unemployment, and low education are consistently linked to higher rates of substance use, reflecting social vulnerability and reduced protective structures.[4] Conversely, being a student or employed may provide protection through routine, structure, and social support. Clinical characteristics, such as manic or activation symptoms, have also been associated with substance use, although findings are inconsistent.[5]

Most existing research arises from Western populations, where economic and cultural conditions differ markedly from those in South Asia.[6] In such contexts, substance use may not only reflect individual vulnerability but also broader determinants including employment opportunities, family cohesion, and social norms surrounding drug use.[7] The influence of these contextual factors on cannabis use in psychosis has not been systematically studied in low- and middle-income countries, particularly in Pakistan, where psychiatric epidemiology and service infrastructure differ substantially from Western models.

Given these gaps, there is a need to identify the local social and clinical predictors of cannabis use among patients with FEP. Previous literature indicates that both socioeconomic status and specific symptom dimensions may shape substance involvement,[8,9] but region-specific data remain scarce. The present study therefore examines sociodemographic and clinical determinants of cannabis use in a South Asian FEP cohort, aiming to inform culturally appropriate prevention and early intervention strategies.

SUBJECTS AND METHODS

Participants

A precision-based calculation was used for sample size calculation, targeting a worst-case prevalence (p = 0.5) with 95% confidence and 10% absolute precision, yielding a minimum sample size of approximately 96 participants. Allowing for an expected 10% exclusion rate, a total of 106 participants were targeted. All consecutive eligible inpatients during the accrual period were enrolled, resulting in *n = 104.* Assessments were preferably conducted before medication initiation to minimize pharmacological confounding. All consecutive inpatients diagnosed with *first-episode psychosis (FEP)* were eligible. Inclusion criteria were clinical diagnosis of FEP requiring hospitalization, no prior exposure to antipsychotic medication, age ≥12 years, and ability to provide informed consent, or guardian consent where applicable. Exclusion criteria included:

- Psychosis secondary to mania, organic brain disease, or substance intoxication;
- Unstable medical illness, CNS pathology, or severe head trauma;
- Cognitive impairment or intellectual disability interfering with assessment reliability.

Written informed consent was obtained from all participants or their legal guardians.

Instruments

Symptom severity was rated using the 30-item Positive and Negative Syndrome Scale (PANSS), covering Positive, Negative, General Psychopathology, and derived symptom clusters.[10] Although the two bilingual psychiatrists involved in the study were not formally certified in the Structured Clinical Interview for the Positive and Negative Syndrome Scale (SCI-PANSS),[11] they mutually agreed upon a standardized approach to its administration. Prior to data collection, both clinicians reviewed the SCI-PANSS manual and reached consensus on interview sequencing, scoring anchors, and interpretation of symptom thresholds. Each assessment began with an introductory, non-confrontational phase to establish rapport and reduce anxiety, followed by a gradual transition to core psychopathological domains. Delusions and hallucinations were explored sensitively using culturally appropriate prompts and corroborated through collateral information from family members. This structured yet flexible approach ensured consistency across interviews and improved rating reliability, particularly valuable in first-episode psychosis, where insight and cooperation may be limited. Inter-rater reliability for PANSS total and subscale ratings was good ($\kappa = 0.67$, $p < 0.0005$), indicating satisfactory consistency between raters. Symptom clusters were derived according to established factor-analytic models. The *Activation cluster* included items such as excitement (P4), hostility (P7), tension (G4), uncooperativeness (G8), and poor impulse control (G14).

A structured proforma was used to record sociodemographic and clinical variables. Sociodemographic factors included age, gender, marital status, education, occupation, and socioeconomic status while clinical factors included PANSS subscales and symptom clusters, manic symptoms, duration of untreated psychosis, premorbid personality type, and reason for treatment delay.

Procedure

This cross-sectional study was conducted at the Department of Psychiatry, Khyber Teaching Hospital (KTH), Peshawar, a tertiary care teaching facility affiliated with Khyber Medical College. The study period extended from January, 2021, to December, 2024. Ethical approval was obtained from the Institutional Review Board of Khyber Medical College (Ref: 623/DME/KMC). The study complied with the ethical principles of the Declaration of Helsinki. Data were analyzed using IBM SPSS Statistics version 25.0. Descriptive statistics were calculated for all variables. Associations between categorical variables were examined using Chi-square (χ^2) tests, and effect sizes were expressed as Cramér's V where appropriate. Binary logistic regression was performed to determine predictors of cannabis use. Two regression models were tested:

1. A *sociodemographic model* including age, gender, education, occupation, and socioeconomic status;
2. A *clinical model* including PANSS subscale scores, symptom clusters, manic symptoms, duration of untreated psychosis, and premorbid personality.

Variables with $p < 0.10$ in bivariate analyses were included in multivariate models. Model adequacy was assessed using the *Hosmer–Lemeshow goodness-of-fit test,* and results were reported as odds ratios (ORs) with 95% confidence intervals (CIs). Statistical significance was set at $p < 0.05$.

RESULTS

Out of total 104 patients, the majority were male (77.9%), with a mean age of 23.4 years (SD = 8.4). Gender groups did not differ significantly in terms of age at onset of symptoms, educational attainment, socioeconomic status, or geographic background ($p > .05$; see Table 1). Cannabis use emerged as a strongly gender-skewed pattern, with all cases of use occurring among males (28.4%) and none among females, $\chi^2(1, N = 104) = 8.51$, $p = .004$. Beyond cannabis and other substances, additional gender disparities were notable. Males were predominantly single (72.8%), whereas most females were married (65.2%), $\chi^2(1, N = 104) = 9.72$, $p = .001$. Employment status also differed significantly: 43.2% of males were employed and 16.0% were students, while 87.0% of females were unemployed, $\chi^2(2, N = 104) = 15.94$, $p < .001$.No significant gender-related differences emerged for age categories, family history of psychosis, duration of untreated psychosis, or reasons for referral delay ($p > .05$).

Table 1

Sociodemographic Characteristics by Gender with Chi-Square Analysis

Variable	Category	Male (n = 81)	Female (n = 23)	χ^2 (df)	p-value*
Age group	≤18 years	27 (33.3%)	8 (34.8%)	0.02 (2)	.991
	19–29 years	38 (46.9%)	10 (43.5%)		
	≥30 years	16 (19.8%)	5 (21.7%)		
Marital status	Single	59 (72.8%)	8 (34.8%)	9.72 (1)	.001*
	Married	22 (27.2%)	15 (65.2%)		
Education	≤5 years	39 (48.1%)	15 (65.2%)	2.13 (1)	.144
	>5 years	42 (51.9%)	8 (34.8%)		
Occupation	None	31 (38.3%)	20 (87.0%)	15.94 (2)	<.001*
	Student	13 (16.0%)	2 (8.7%)		
	Employed	35 (43.2%)	0 (0%)		
Socioeconomic status	Poor	43 (53.1%)	11 (47.8%)	0.19 (1)	.665
	Satisfactory	38 (46.9%)	12 (52.2%)		
Geographical zones	Peshawar	40 (49.4%)	10 (43.5%)	1.54 (3)	.673
	North KP	17 (21.0%)	5 (21.7%)		
	South KP	11 (13.6%)	2 (8.7%)		
	Tribal/Remote	13 (16.0%)	6 (26.1%)		
Family history of psychosis	Absent	60 (74.1%)	17 (73.9%)	0.11 (2)	.946
	1st-degree relatives	12 (14.8%)	3 (13.0%)		
	2nd-degree relatives	8 (9.9%)	3 (13.0%)		
DUP	≤2 weeks	45 (55.6%)	17 (73.9%)	3.05 (2)	.218
	<1 month	16 (19.8%)	4 (17.4%)		
	>1 month	19 (23.5%)	2 (8.7%)		
Reason for delay	Cultural	54 (66.7%)	19 (82.6%)	1.91 (1)	.167

Variable	Category	Male (n = 81)	Female (n = 23)	χ^2 (df)	p-value*
	Other	25 (30.9%)	4 (17.4%)		
Comorbid drug use	Yes	23 (28.4%)	0 (0%)	8.51 (1)	.004*
	No	57 (70.4%)	23 (100%)		

Binary logistic regression analyses were conducted to identify demographic and clinical predictors of cannabis use among patients. Two models were examined: one including sociodemographic variables (Table 1) and another incorporating clinical and symptom cluster variables (Table 2).

In the sociodemographic model, occupation and socioeconomic status (SES) emerged as significant predictors. Being a student was associated with substantially lower odds of cannabis use compared with being unemployed, B = –2.74, SE = 1.21, Wald = 5.12, p = .024, OR = 0.064, 95% CI [0.006, 0.693] meaning that students had about 15 times lower odds of cannabis use. Similarly, being employed predicted lower odds of use, B = –4.10, SE = 1.58, Wald = 6.73, p = .009, OR = 0.017, 95% CI [0.001, 0.367] indicating that employed individuals had approximately 59 times lower odds of cannabis use compared with the unemployed. Patients with satisfactory socioeconomic status were also less likely to use cannabis relative to those with poor socioeconomic status, B = –2.61, SE = 1.00, Wald = 6.81, p = .009, OR = 0.074, 95% CI [0.010, 0.522] corresponding to about 14 times lower odds of use. Other demographic variables, including, age group, education level, and geographic zone, were not significant predictors of cannabis use.

Table 2

Binary logistic regression Model 1: Sociodemographic Variables

Predictor	B (Coef.)	SE	Wald χ^2	p-value	OR (Exp(B))	95% CI for OR
Gender (Female vs Male)	19.87	8086.1	0.00	.998	4.28×10^8	0.000 – ∞
Age (19–29 vs ≤18)	–0.561	0.971	0.33	.564	0.57	0.09 – 3.83
Age (≥30 vs ≤18)	0.277	0.935	0.09	.767	1.32	0.21 – 8.24
Education (>5 yrs vs ≤5 yrs)	0.092	0.661	0.02	.890	1.10	0.30 – 4.00
Occupation (Students vs None)	–2.741	1.211	5.12	.024*	0.064	0.006 – 0.693
Occupation (Employed vs None)	–4.095	1.578	6.73	.009*	0.017	0.001 – 0.367
SES (Satisfactory vs Poor)	–2.610	1.000	6.81	.009*	0.074	0.010 – 0.522
Zones (North KP vs Tribal)	2.160	1.328	2.65	.104	8.67	0.64 – 117.03
Zones (South KP vs Tribal)	0.956	1.504	0.40	.525	2.60	0.14 – 49.54
Zones (Peshawar vs Tribal)	1.620	1.266	1.64	.201	5.05	0.42 – 60.39

Within the clinical model, manic symptoms and PANSS activation were significant predictors. Patients with moderate manic symptoms showed reduced odds of cannabis use compared to those without manic symptoms, B = –2.16, SE = 1.10, Wald = 3.86, p = .049, OR = 0.116, 95% CI [0.013, 0.994] representing about 9 times lower odds. Higher PANSS activation scores (above average vs below average) were likewise associated with lower likelihood of cannabis use, B = –1.79, SE = 0.89, Wald = 4.02, p = .045, OR = 0.167, 95% CI [0.029, 0.962] equating to nearly 6 times lower odds. In this study, symptom clusters were derived from established factor-analytic models of the PANSS. The Activation cluster comprised items reflecting heightened arousal, irritability, and behavioral disinhibition, including P4 (Excitement), P7 (Hostility), G4 (Tension), G8 (Uncooperativeness), and G14 (Poor impulse control). Collectively, these items capture a clinical profile of psychomotor overactivity, interpersonal hostility, and impaired self-regulation. Other clinical predictors, including PANSS positive, negative, composite, depression, and general psychopathology subscales, duration of untreated psychosis, reason for referral delay, and premorbid personality traits, did not significantly predict cannabis use.

Table 3

Binary logistic regression Model 2: Clinical Variables

Predictor	B (Coef.)	SE	Wald χ^2	p-value*	OR (Exp(B))	95% CI for OR
Manic Symptoms (Mild vs Absent)	0.511	0.977	1.37	.241	1.67	0.25 – 11.23
Manic Symptoms (Moderate vs Absent)	–2.158	1.098	3.86	.049*	0.116	0.013 – 0.994
Manic Symptoms (Florid vs Absent)	–1.145	0.977	1.37	.241	0.32	0.05 – 2.16
PANSS Activation (Above Avg vs Below)	–1.788	0.892	4.02	.045*	0.167	0.029 – 0.962
PANSS Positive (Above Avg vs Below)	0.502	1.080	0.22	.642	1.65	0.20 – 13.73
PANSS Negative (Above Avg vs Below)	–0.698	1.608	0.19	.664	0.50	0.02 – 11.64
PANSS Composite (Above Avg vs Below)	1.271	1.134	1.26	.263	3.56	0.39 – 32.92
PANSS General Psychopathology (Above Avg vs Below)	–1.452	0.932	2.43	.119	0.23	0.04 – 1.45
PANSS Depression (Above Avg vs Below)	1.302	1.111	1.37	.241	3.68	0.42 – 32.42
DUP >1 month vs ≤2 weeks	–0.952	0.790	1.45	.228	0.39	0.08 – 1.82
Reason for Delay (Other vs Cultural)	0.814	0.744	1.19	.274	2.26	0.52 – 9.71
Premorbid Personality (Paranoid vs Sociable)	2.427	2.125	1.30	.253	11.33	0.18 – 729.6
Premorbid Personality (Schizoid vs Sociable)	–0.023	1.528	0.00	.988	0.98	0.05 – 19.52

*p value calculated through Binary Logistic Regression.

DISCUSSION

This study examined demographic and clinical predictors of cannabis use in patients with first-episode psychosis (FEP), with additional analyses comparing gender-based differences. Several significant findings emerged, highlighting the interplay of social, demographic, and clinical factors in shaping substance use patterns in early psychosis. By situating these results in the broader literature, both convergences and divergences with prior evidence become apparent, offering insights into how cultural context and symptom heterogeneity may influence cannabis use among individuals with psychosis particularly in low-income countries.

Clear gender differences were observed in marital status, occupational engagement, and comorbid drug use. Males were more frequently single, whereas females were predominantly married. This aligns with prior studies from South Asia showing earlier marriage among women due to cultural and socioeconomic factors. Occupational differences were also evident: nearly half of males were employed while the vast majority of females were unemployed, reflecting entrenched gender roles and limited economic opportunities for women in the region. Substance use patterns also diverged sharply by gender. Comorbid cannabis use was reported exclusively among males, consistent with epidemiological findings across Pakistan and other low- and middle-income countries (LMICs), where cultural norms and restrictive gender roles limit women's exposure to drugs while men face greater social acceptability and access.[12,18] Global data also indicate that men with psychosis are significantly more likely to use substances than women, with male gender and homelessness being one of the strongest demographic predictors of cannabis misuse in schizophrenia-spectrum disorders.[13] Taken together, these results underscore the need for gender-sensitive approaches in prevention and treatment planning.

The logistic regression analyses revealed that occupational status and socioeconomic background were significant predictors of cannabis use. Specifically, students and employed individuals were substantially less likely to use cannabis compared to unemployed patients. These findings are consistent with prior studies that have linked unemployment and socioeconomic disadvantage with higher rates of substance misuse and worse clinical outcomes in psychosis.[13] Employment and education appear to provide structured routines, protective social networks, and a sense of purpose that may buffer against substance involvement. Conversely, unemployment often reflects both social disadvantage and illness-related disability, increasing vulnerability to drug use.

Satisfactory socioeconomic status was also protective, further underscoring the role of structural inequalities in shaping drug use risk. Prior research has highlighted the strong association between socioeconomic deprivation and cannabis use among individuals with psychosis, with disadvantaged groups often experiencing higher rates of both initiation and persistence of use. These findings echo prior research where unemployment and socioeconomic disadvantage were strongly linked with substance misuse in psychosis. Being student and having satisfactory socioeconomic status also conferred protection, further underscoring the role of social determinants in shaping risk. Interestingly, age, education, and geographical zones did not significantly predict cannabis use, suggesting that within this clinical cohort, social roles and economic conditions outweighed other demographic characteristics.

The clinical model yielded unexpected findings: moderate manic symptoms and higher PANSS Activation scores were associated with reduced odds of cannabis use. This contrasts with several prior studies reporting that excitatory or affective symptoms, such as mania, agitation, or hostility, are often linked with increased vulnerability to substance misuse. One possible explanation is that patients exhibiting overt manic or hostile behaviors are identified earlier by families or communities and brought to clinical attention sooner, thereby curtailing the opportunity for sustained cannabis use. In collectivist cultural contexts like South Asia, visible disinhibition or aggression often triggers rapid help-seeking, whereas quieter or internalizing symptoms may go unnoticed for longer. Another interpretation is that families and caregivers may impose stricter supervision on patients displaying agitation or hostility, limiting their access to substances. In contrast, individuals with more subtle psychotic features (e.g., paranoia, thought disorder) may retain greater opportunity to engage in drug use before detection. Cultural and legal stigmatization of drug use in Pakistan may further reinforce underreporting, particularly among patients with disruptive behaviors who are already viewed as socially problematic. It is also possible that symptom heterogeneity underlies these associations. Cannabis-related psychosis may present more frequently with paranoia, perceptual disturbances, or thought disorder rather than mania or hostility. In such cases, the lower odds of cannabis use among patients with manic or activation symptoms could reflect distinct pathways into psychosis, where cannabis contributes to one phenotype but not another. This interpretation aligns with emerging evidence suggesting that cannabis use is not uniformly associated with all psychotic symptom clusters but may preferentially interact with specific neurobiological or psychosocial vulnerabilities.

Implications

These findings carry several implications for clinical practice and future research. First, interventions should target unemployed and socioeconomically disadvantaged individuals with FEP, who appear to be at heightened risk for cannabis use. Vocational rehabilitation, social support, and educational engagement could be critical protective factors. Second, the apparent protective association between cannabis use and manic or activation symptoms calls for cautious interpretation but underscores the need for symptom-specific analyses in substance use research. Rather than assuming a uniform effect of cannabis on all dimensions of psychosis, future studies should adopt multidimensional approaches that recognize heterogeneity in symptom presentation.

Finally, given the regional and cultural distinctiveness of these results, further replication in South Asian and other LMIC contexts is warranted. Longitudinal designs are particularly needed to disentangle causal directions, whether cannabis reduces the likelihood of certain symptoms, whether those symptoms reduce the likelihood of cannabis use, or whether both reflect underlying differences in illness trajectory and social environment.

Limitations

This study has limitations. The sample size, particularly for females, was modest, which may have limited power to detect smaller effects. Cross-sectional design precludes causal inference. Additionally, substance use was assessed through information from the family of the patients and is subject to recall bias.

CONCLUSION

This study highlights that cannabis use in first-episode psychosis is shaped more by social determinants, such as occupation and socioeconomic status, than by clinical symptom severity. Gendered patterns of use reflect cultural norms, with important implications for tailored prevention in South Asian contexts. Future research, ideally longitudinal, is needed to clarify whether lower cannabis use among patients with manic and activation symptoms reflects genuine protective effects, earlier detection, or reporting biases.

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