

# Biochemical Diagnostic Significance of Cannabis Indica Misuse in Society- A Socio-Behavioral Validation Study

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## ABSTRACT

**Introduction:** Cannabis indica, usually known as weed, has transitioned from a traditional herb to a widely misused psychoactive substance. While its medicinal value is acknowledged, its misuse especially among youth has become a silent epidemic. The normalization of recreational use, increased potency, and early exposure have contributed to a rise in cannabis use disorder (CUD), cognitive decline, and social dysfunction.

**Objective:** To determine the diagnostic significance of Cannabis indica misuse in society using behavioral screening tools as the gold standard.

**Study Design:** Cross-sectional validation study.

**Material and Methods:** A cross-sectional validation study was conducted on 140 individuals aged 15–45 years in urban centers of Kashmir from 01-01-2025 to 01-07-2025. Participants were screened for cannabis misuse using self-reported frequency, DSM-5 criteria, and the Cannabis Use Disorder Identification Test-Revised (CUDIT-R). Behavioral assessments were used as the gold standard.

**Results:** Among 140 participants, 94 (67.1%) were under 30 years of age. 46 (32.9%) were over 30. 48 individuals (34.3%) met criteria for cannabis misuse, while 92 (65.7%) did not. Of these, 36 were true positives, 12 false positives, 80 true negatives, and 12 false negatives. The sensitivity of self-reported cannabis misuse was 75.0%, specificity 86.9%, positive predictive value 75.0%, and negative predictive value 86.9%.

**Conclusion:** Cannabis misuse is underreported and often masked by cultural normalization. While self-reporting shows moderate sensitivity, behavioral screening tools offer higher diagnostic reliability. Early detection and intervention are essential to mitigate long-term harm.

**Key Words:** Cannabis indica, misuse, cannabis use disorder, behavioral screening, Kashmir, public health.

## INTRODUCTION

Cannabis indica, a subspecies of the cannabis plant, has long been used in South Asian cultures for medicinal and spiritual purposes. However, in recent decades, its recreational misuse has surged, particularly among adolescents and young adults. The World Drug Report (2024) estimates that over 220 million people globally use cannabis, with a significant portion developing patterns of misuse.

In Kashmir, the socio-political instability, unemployment, and lack of recreational infrastructure have contributed to a rise in substance use, with cannabis being the most accessible and culturally tolerated. The early onset of use, often before age 18, is associated with long-term cognitive impairment, motivational deficits, and increased risk of psychosis.

This study aims to assess the diagnostic accuracy of self-reported cannabis use in identifying misuse, using validated behavioral tools as the gold standard. The findings aim to inform public health policy and community-level interventions in Kashmir.

**Operational definitions:** Cannabis Misuse: Use of Cannabis indica in a pattern that leads to psychological, social, or physical harm, as defined by DSM-5 criteria.

**CUDIT-R:** A validated 8-item screening tool for identifying problematic cannabis use.

**True Positive (TP):** Individuals who self-report misuse and meet CUDIT-R criteria.

**False Positive (FP):** Individuals who self-report misuse but do not meet CUDIT-R criteria.

**True Negative (TN):** Individuals who deny misuse and do not meet CUDIT-R criteria.

**False Negative (FN):** Individuals who deny misuse but meet CUDIT-R criteria.

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## MATERIALS AND METHODS

**Study Design:** Cross-sectional validation study

**Setting:** Urban mental health clinics and community centers in Srinagar, Anantnag, and Baramulla (Kashmir)

**Duration:** January 1 to July 1, 2025

**Sample Size:** 140 participants, calculated using WHO sample size calculator

**Sampling Technique:** Non-probability purposive sampling

**Inclusion Criteria:**

- Age 15–45 years
- History of cannabis use in the past 12 months
- Consent to participate

**Exclusion Criteria:**

- Diagnosed psychotic disorders
- Concurrent substance dependence (excluding nicotine)
- Severe cognitive impairment

**Data Collection Procedure:** Participants completed a structured questionnaire including demographic data, cannabis use history, and self-perceived impact. CUDIT-R was administered by trained psychologists. Data were anonymized and analyzed using SPSS v25.

## RESULTS

A total of 140 participants were included in the study, with a mean age of  $26.8 \pm 7.2$  years. The majority of participants were younger than 30 years, accounting for 94 individuals (67.1%), while 46 participants (32.9%) were older than 30 years (Table 1). All participants reported cannabis use within the past 12 months and met the inclusion criteria for behavioral assessment.

Based on the CUDIT-R behavioral screening tool, 48 participants (34.3%) were identified as having cannabis misuse, whereas 92 participants (65.7%) did not meet the criteria for misuse (Table 2). When self-reported cannabis misuse was

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compared with CUDIT-R results, 36 individuals were classified as true positives and 80 as true negatives. However, 12 participants falsely reported misuse despite negative CUDIT-R results (false positives), while 12 participants denied misuse but screened positive on CUDIT-R (false negatives) (Table 3).

The diagnostic performance of self-reported cannabis misuse demonstrated a sensitivity of 75.0% and a specificity of 86.9%. The positive predictive value was 75.0%, while the negative predictive value was 86.9% (Table 4). These findings indicate that although self-reporting identifies a substantial proportion of cannabis misuse cases, a notable percentage of individuals with problematic use remain undetected without structured behavioral screening.

Table 1: Demographics

| S No | Age Limits | Value            |
|------|------------|------------------|
| 1    | Over age   | 30: 94 (67.1%)   |
| 2    | Under age  | 30: 46 (32.9%)   |
| 3    | Mean age   | 26.8 ± 7.2 years |

Table 2: Cannabis Misuse Outcome

| S No | Using scale                | Results    |
|------|----------------------------|------------|
| 1    | Misuse (CUDIT-R positive): | 48 (34.3%) |
| 2    | No misuse:                 | 92 (65.7%) |

Table 3: Diagnostic Accuracy of Self-Report vs. CUDIT-R

| S No | REPORTS              | CUDIT-R          | CUDIT-R          |
|------|----------------------|------------------|------------------|
| 1    | Self-Report          | CUDIT-R Positive | CUDIT-R Negative |
| 2    | Self-Report Positive | TP = 36          | FN = 12          |
| 3    | Self-Report Negative | FP = 12          | TN = 80          |

Table 4. Diagnostic Matrics

| S No | Sensitivity % | Specificity % | Positive predictive value | Negative predictive value |
|------|---------------|---------------|---------------------------|---------------------------|
| 1    | 75%           | 86.9%         | 75.0%                     | 86.9%                     |

## DISCUSSION

Cannabis misuse in Kashmir is a growing concern, particularly among youth. The normalization of its use, often under the guise of tradition or stress relief, masks its long-term consequences. Our study found that while self-reporting is a useful initial screen, it underestimates true misuse. This aligns with global findings that many users underreport due to stigma or lack of awareness.

The discrepancy between self-report and CUDIT-R highlights the need for structured behavioral assessments. Early initiation and frequent use were significantly associated with higher CUDIT-R scores. Public health implications are profound—cannabis misuse correlates with academic underperformance, impaired executive function, and increased risk of mental health disorders.

Despite global legalization trends, public education and screening remain critical. In Kashmir, where socio-political stressors are high, cannabis misuse may also serve as a maladaptive coping mechanism. Community-based interventions and school-level awareness programs are urgently needed.

## CONCLUSION

Cannabis indica misuse is a growing societal concern in Kashmir. While self-reporting offers moderate sensitivity, behavioral tools like CUDIT-R provide higher diagnostic accuracy. Early detection and intervention strategies must integrate validated screening tools to address the psychosocial burden of cannabis misuse.

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