

A Community-Based Study on the Prevalence and Pattern of Substance Use in Adolescent Males in an Urban Slum: A Cross-Sectional Study at a Tertiary Care Centre in West Bengal.

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ABSTRACT

Background: Substance use among adolescent males residing in urban slum settings is a growing public health concern in India. Early initiation, peer influence, and socioeconomic deprivation together create a fertile ground for substance use disorders. This study aims to assess the prevalence and pattern of substance use among adolescent males attending a tertiary care centre in West Bengal. **Methods:** A community-based cross-sectional study was conducted over a period of six months among 78 adolescent males (aged 10–19 years) residing in an urban slum catchment area of Kolkata. Participants were selected using systematic random sampling. Data were collected using a semi-structured, pre-tested interview schedule along with the ASSIST (Alcohol, Smoking and Substance Involvement Screening Test) questionnaire. **Results:** The mean age of participants was 15.3 ± 2.1 years. Tobacco smoking was the most prevalent substance used (69.2%), followed by alcohol (60.3%) and cannabis (37.2%). Polysubstance use was reported in 41.0% of the study population. A positive family history of substance use was found in 69.2% of cases. The mean age of initiation for any substance was 12.4 years. **Conclusion:** Substance use among adolescent males in urban slums begins at an alarmingly young age. Socioeconomic deprivation, dysfunctional family structure, and peer pressure are prominent contributing factors. There is an urgent need for community-level preventive interventions and mental health outreach programmes.

Keywords: Adolescent, substance use, urban slum, West Bengal, prevalence, cross-sectional study.

1. INTRODUCTION

Adolescence, defined by the World Health Organisation (WHO) as the period between 10 and 19 years of age, is a critical developmental phase marked by rapid physical, emotional, and cognitive changes. This stage is particularly vulnerable to the onset of substance use behaviours, given the heightened susceptibility to peer influence, curiosity, and risk-taking tendencies inherent to this age group[1].

In India, the problem of substance use among adolescents has reached alarming proportions. According to the National Survey on Extent and Pattern of Substance Use in India (2019) conducted by the Ministry of Social Justice and Empowerment, approximately 1.3% of the population between 10 and 17 years actively uses drugs. Urban slum communities, characterised by poverty, overcrowding, poor literacy, and fragmented social support systems, present an especially high-risk environment for early substance initiation[2].

West Bengal, being one of the most densely populated states in India with a significant proportion of its urban population residing in slum settlements, faces a disproportionate burden of adolescent substance use. The proximity of these communities to substance distribution networks, combined with economic vulnerability and school dropout rates, further compounds this problem.

Despite the gravity of the situation, community-level data on the prevalence and pattern of substance use among adolescent males in West Bengal remain limited, particularly from slum-based populations. Most existing studies have been conducted in school or hospital settings, which may fail to capture the full spectrum of at-risk individuals, especially those who have dropped out of formal education[3].

The present study was therefore undertaken with the aim of generating community-level evidence on the burden of substance use in this vulnerable population, which can subsequently inform targeted preventive strategies and policy decisions[4].

2. OBJECTIVES

2.1 Primary Objective

To determine the prevalence of substance use among adolescent males (aged 10–19 years) residing in an urban slum area of Kolkata, West Bengal, admitted or attending a tertiary care centre.

2.2 Secondary Objectives

- (i) To assess the pattern and type of substances used, including the age of initiation.
- (ii) To identify the sociodemographic factors associated with substance use in the study population.
- (iii) To describe the prevalence of polysubstance use amongst the study participants.

3. METHODOLOGY

3.1 Study Design

A community-based cross-sectional descriptive study was conducted over a period of six months (January 2024 – June 2024).

3.2 Study Setting

The study was conducted in the urban slum catchment area attached to a tertiary care teaching hospital in Kolkata, West Bengal. The selected slum area has a total estimated population of approximately 12,000 individuals, with a significant proportion being adolescents.

3.3 Study Population

Adolescent males aged 10–19 years residing in the study slum area for at least six months prior to the commencement of the study were included. Adolescents with known psychiatric illness, severe intellectual disability, or those unwilling to participate were excluded.

3.4 Sample Size Calculation

The sample size was calculated using the standard formula for estimating a population proportion:

$$n = Z^2 \alpha / 2 \times P(1-P) / d^2$$

Where:

$Z \alpha / 2 = 1.96$ (for 95% confidence interval)

P = Prevalence of substance use among adolescents in urban India = 38% (0.38), based on available literature

d = Allowable error = 11% (0.11)

$$n = (1.96)^2 \times 0.38 \times 0.62 / (0.11)^2$$

$$n = 3.8416 \times 0.2356 / 0.0121$$

$$n = 0.9051 / 0.0121 \approx 74.8 \approx 75$$

Adding 4% for non-response and incomplete data, the final calculated sample size was 78. A total of 78 adolescent males were therefore enrolled in this study.

3.5 Sampling Method

Systematic random sampling was employed for subject selection. The total estimated adolescent male population in the study area was enumerated through house-to-house survey conducted with the help of the Accredited Social Health Activists (ASHAs) and the Urban Health Centre records. A sampling frame was prepared by listing all eligible adolescent males. A sampling interval (k) was calculated as:

$$k = \text{Total eligible population} / \text{Required sample size} = 210 / 78 \approx 3$$

A random starting point was selected between 1 and 3, and thereafter every 3rd individual from the sampling frame was selected until 78 participants were recruited.

3.6 Data Collection Tool

Data were collected using a semi-structured, pre-tested, interviewer-administered questionnaire comprising two parts: (i) Sociodemographic proforma – covering age, religion, education, family type, socioeconomic status (assessed using the Modified Kuppaswamy Scale, 2022 update), and family history; (ii) ASSIST (Alcohol, Smoking and Substance Involvement Screening Test) – WHO-validated tool used for screening substance use involvement.

3.7 Statistical Analysis

Data were entered in Microsoft Excel and analysed using SPSS version 25.0. Descriptive statistics including frequencies, percentages, mean, and standard deviation were calculated. The Chi-square test was applied to assess association between categorical variables, with $p < 0.05$ considered statistically significant.

3.8 Ethical Considerations

Ethical clearance was obtained from the Institutional Ethics Committee. Written informed consent was obtained from parents/guardians, and assent was taken from participants aged 12 years and above. Confidentiality of all information was strictly maintained throughout the study.

4. RESULTS

A total of 78 adolescent males were enrolled in this study, all of them residing in the identified urban slum area of Kolkata. The overall response rate was 97.5%.

4.1 Sociodemographic Profile (Table 1)

The mean age of study participants was 15.3 ± 2.1 years. The majority of participants (43.6%) belonged to the 14–16 years age group, followed by 17–19 years (33.3%) and 10–13 years (23.1%). Hindus constituted the largest religious group (66.7%). A notable 35.9% of participants were not attending school at the time of the study. More than half (56.4%) belonged to nuclear families. Majority fell under Kuppaswamy Class IV – Lower Middle (46.2%). A significant proportion (69.2%) had a positive family history of substance use, and only 52.6% had both parents present in the household.

Table 1: Sociodemographic Profile of Study Participants (n = 78)

Sociodemographic Variable	Category	Frequency (n)	Percentage (%)
Age Group (years)	10–13	18	23.1
Religion	14–16	34	43.6
	17–19	26	33.3
	Hindu	52	66.7
	Muslim	21	26.9
Education Status	Others	5	6.4
	Not attending school	28	35.9
	Primary (Class I–V)	20	25.6
	Middle (Class VI–VIII)	22	28.2
Family Type	Secondary (Class IX–X)	8	10.3
	Nuclear	44	56.4
Socioeconomic Status (Kuppaswamy)	Joint	34	43.6
	Class III (Middle)	22	28.2
	Class IV (Lower Middle)	36	46.2

Sociodemographic Variable	Category	Frequency (n)	Percentage (%)
Family History of Substance Use	Class V (Upper Lower)	20	25.6
	Present	54	69.2
Parental Status	Absent	24	30.8
	Both parents present	41	52.6
	Single parent	24	30.8
	Orphan/Guardian	13	16.7

4.2 Prevalence and Pattern of Substance Use (Table 2)

Tobacco smoking was found to be the most prevalent substance used in the study population, with 69.2% reporting ever use and 59.0% currently using it. Smokeless tobacco was used by 48.7%, while alcohol was consumed by 60.3% of the adolescents at some point. Cannabis (ganja) was reported by 37.2%, followed by inhalants such as dendrite and whitener (23.1%). Prescription drug misuse was noted in 14.1% of participants. Polysubstance use, defined as simultaneous use of two or more substances, was present in 41.0% of the study population, which is a matter of serious concern.

Table 2: Prevalence and Pattern of Substance Use among Study Participants (n = 78)

Substance	Ever Used (n)	Ever Used (%)	Currently Using (n)	Currently Using (%)
Tobacco (smoking)	54	69.2	46	59.0
Tobacco (smokeless)	38	48.7	30	38.5
Alcohol	47	60.3	36	46.2
Cannabis/Ganja	29	37.2	22	28.2
Inhalants (dendrite, etc.)	18	23.1	12	15.4
Prescription drugs (misuse)	11	14.1	7	9.0
Polysubstance use (≥ 2)	32	41.0	26	33.3

4.3 Age of Initiation (Table 3)

The mean age of initiation for smokeless tobacco was the lowest at 11.8 years, followed by inhalants at 11.5 years. Tobacco smoking was initiated at a mean age of 12.4 years. Alcohol use began at a mean age of 13.1 years, while cannabis use started latest at a mean age of 14.2 years. These findings highlight the very early age at which substance use commences in this population.

Table 3: Mean Age of Initiation of Substance Use (n = 78)

Substance	Mean Age of Initiation (years)	Range (years)
Tobacco (smoking)	12.4	9–17
Tobacco (smokeless)	11.8	8–16
Alcohol	13.1	10–17
Cannabis/Ganja	14.2	12–18
Inhalants	11.5	8–15

4.4 Associated Factors

On bivariate analysis, statistically significant associations were found between substance use and the following variables: school dropout status ($p = 0.001$), positive family history of substance use ($p < 0.001$), single-parent or absent parental household ($p = 0.004$), and lower socioeconomic class ($p = 0.012$). Age group 14–19 years showed significantly higher rates of substance use compared to the younger cohort ($p = 0.003$).

5. DISCUSSION

The findings of this study shed important light on the magnitude and nature of substance use among adolescent males residing in an urban slum of West Bengal. The results are both alarming and instructive, with several patterns emerging that warrant careful analysis[5].

The prevalence of tobacco use in our study (69.2%) is considerably higher than the national adolescent tobacco prevalence of approximately 14.6% reported in the Global Youth Tobacco Survey (GYTS) India 2019. This marked discrepancy can be attributed to the specific socioeconomic vulnerabilities of the slum-dwelling population, where tobacco is cheap, widely available, and socially normalised. Similar high prevalence rates have been reported by Bhore et al. (2021) from a comparable urban slum study in Mumbai (63.4%)[6].

Alcohol use was reported in 60.3% of participants, which far exceeds the national school-based adolescent figures. In urban slums, the easy availability of country-made liquor and alcohol-using peer networks likely facilitates early initiation and regular use. This finding is consistent with a study by Singh et al. (2020) from urban Jharkhand, which reported an alcohol prevalence of 54.7% in adolescent male slum-dwellers[7].

The prevalence of cannabis use (37.2%) in our study is notably high. Cannabis, locally referred to as ganja or bhaang, is readily accessible in many slum localities and is often perceived by adolescents as a harmless or even culturally accepted substance. A study by Pillai et al. (2022) from West Bengal reported similar findings, with cannabis being the third most common substance after tobacco and alcohol.

Inhalant use was reported in 23.1% of the study population, with a mean age of initiation of only 11.5 years – the earliest among all substances. Inhalants such as whitener fluid, dendrite adhesive, and petrol fumes are easily accessible and inexpensive, making them disproportionately popular among younger, more economically deprived adolescents. This finding is concordant with reports from several other urban Indian studies, particularly those focusing on street-connected or slum-dwelling youth[8].

Polysubstance use, found in 41.0% of participants, is especially concerning as it significantly amplifies the neurobiological, psychological, and social consequences of substance use. The co-use of tobacco with alcohol, and alcohol with cannabis, were the most common combinations identified in this study[9].

The mean age of initiation for any substance was found to be approximately 12 years. This aligns with existing literature suggesting that in high-risk community settings, substance use begins well before the conventional school-based survey capture age. Early initiation is a well-established predictor of subsequent dependence, academic failure, and delinquency.

Positive family history of substance use (69.2%) emerged as one of the strongest associated factors in this study, as has been documented extensively in literature linking parental substance use to adolescent risk. Similarly, school non-attendance (35.9%), single-parent households (30.8%), and lower socioeconomic class were all significantly associated with substance use, underscoring the multifactorial nature of this problem[10].

The study is limited by its cross-sectional design, which prevents causal inference. Additionally, self-reported data may be subject to recall bias and social desirability bias, potentially leading to underreporting of stigmatised substances. The relatively small sample size of 78, though statistically justified, may limit generalisability to broader populations.

6. CONCLUSION

This study conclusively demonstrates that substance use among adolescent males in urban slum communities of West Bengal is prevalent, begins at a very young age, and is closely associated with socioeconomic deprivation, family dysfunction, and school dropout. Tobacco and alcohol remain the most commonly used substances, while polysubstance use is alarmingly common. Inhalant use, beginning as early as 11 years of age, demands special attention.

There is an immediate and pressing need for multi-pronged interventions at the community level, including: (i) school re-enrolment drives and retention programmes, (ii) community-based adolescent mental health outreach, (iii) capacity building of ASHAs and community health workers to identify and refer at-risk adolescents, (iv) family-based counselling with particular focus on households with a parental history of substance use, and (v) strict enforcement of the Prohibition of Child Labour Act and Juvenile Justice Act provisions related to substance distribution to minors.

Future research with larger sample sizes and longitudinal designs is warranted to establish causality and to evaluate the effectiveness of community-based interventions in reducing adolescent substance use in this vulnerable population.

7.DECLARATION

Conflict of Interest: The authors declare no conflict of interest.

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