



RESEARCH ARTICLE

SUBSTANCE ABUSE PATTERN IN EASTERN UTTAR PRADESH, INDIA: INSIGHTS FROM A COMMUNITY-BASED STUDY

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ABSTRACT

Background: Substance abuse is a growing public health concern in India, with tobacco and alcohol consumption contributing significantly to morbidity and mortality. In Eastern Uttar Pradesh, particularly in Varanasi, substance use is widespread, with limited research on socio-demographic factors influencing its prevalence. **Objective:** This study aims to analyse the patterns and prevalence of substance abuse in Varanasi and examine the association between substance abuse and socio-demographic factors such as age, gender, marital status, education, and residence. **Methods:** A community-based, cross-sectional study was conducted between November 2023 and June 2024 in both rural and urban areas of Varanasi, involving 634 participants. Stratified multistage cluster sampling was used, and data were collected using a pre-tested interview schedule. Statistical analysis was performed using IBM SPSS Statistics (version 28), employing descriptive statistics and chi-square tests. **Results:** The overall prevalence of substance abuse was 36.9%, with chewing tobacco and alcohol being the most commonly abused substances. Significant associations were found between substance abuse and factors such as age (productive adults), gender (higher prevalence in females), marital status (higher rates in married individuals), and education (higher rates among illiterate or low-educated participants). No significant associations were observed with caste or residence. **Conclusion:** This study highlights the need for targeted public health interventions addressing the socio-demographic determinants of substance abuse. Efforts should focus on high-risk groups, including younger individuals, women, and those with lower educational levels. Public health initiatives, such as awareness campaigns and de-addiction services at community level, are vital for reducing substance abuse in the region.

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INTRODUCTION

Substance abuse is a significant public health issue worldwide, contributing to morbidity, mortality, disability, and a heavy disease burden.¹ India is no exception, grappling with high rates of tobacco and alcohol consumption, both of which pose serious health risks. According to the Global Burden of Disease (GBD) 2019 estimates, tobacco use alone led to 8.71 million deaths globally,² with a substantial portion of these fatalities occurring in South-East Asia, including India. This region accounts for 81% of smokeless tobacco (SLT) users and 22% of smoked tobacco users aged 15 years and above.^{3,4} Substance abuse defines a comfortable level of consumption, while substance abuse reflects the addictive natures attached to addiction. Substance abuse, particularly tobacco and alcohol, not only affects physical health but also imposes a heavy economic burden, particularly in lower-income populations. It leads to increased healthcare costs, loss of productivity, and

worsens social inequalities. In India, tobacco has become a major public health issue. According to the World Health Organization (WHO), tobacco use is a major risk factor for several diseases, including cancer, lung disease, cardiovascular disease, and stroke. It is responsible for nearly 1.35 million deaths annually in the country, making it a significant contributor to India's disease burden.⁵ Substance abuse refers to the consumption of psychoactive substances, such as tobacco, alcohol, and other legal or illicit drugs, in quantities beyond medical use.⁶ Numerous studies have established a strong link between substance use and non-communicable diseases (NCDs), disability, premature mortality, and the overall strain it places on healthcare systems.³ Opioid misuse, including morphine and oxycodone, leads to addiction and physical dependence. Illicit drugs like heroin, cocaine, and methamphetamines cause severe dependence, while prescription drug abuse, including benzodiazepines and stimulants, results in addiction and cognitive impairment. Chronic alcohol consumption leads to Alcohol Use Disorder

(AUD), and tobacco use increases the risk of cancer and cardiovascular diseases.^{7,8} Substance abuse is also closely linked to mental health issues, with many individuals turning to tobacco and alcohol as coping mechanisms for stress, anxiety, and depression. Addressing the mental health aspect is essential for effective prevention and treatment. In India, alcohol is the second most commonly used substance after tobacco, with 21.4% of the population using alcohol, followed by cannabis (3.0%) and opioids (0.7%).³ India is the second-largest consumer of tobacco products and the third-largest producer of tobacco globally. According to the Global Adult Tobacco Survey (GATS), 35% of Indian adults consume tobacco in some form. Among them, 21% use only smokeless tobacco, 9% smoke tobacco products exclusively, and 5% consume tobacco in multiple forms, including smoking, chewing, or both.⁹ Moreover, there are notable differences in tobacco and alcohol use patterns between urban and rural populations. Rural areas often report higher consumption rates, which may be influenced by cultural practices, limited access to healthcare, and lower levels of awareness. Similarly, the Global Status Report on Alcohol and Health (2014) estimates that around 30% of India's adult population consumes alcohol.¹⁰ However, notable variations in tobacco and alcohol use exist across different population groups. Studies indicate that tobacco consumption is significantly higher among construction workers compared to other occupational groups.¹¹ Government efforts to curb substance abuse, such as the implementation of the Cigarettes and Other Tobacco Products Act (COTPA) and nationwide awareness campaigns, have shown some success in reducing consumption rates, although challenges remain in enforcement and reaching marginalized populations. Regarding alcohol consumption, Puducherry and Tamil Nadu report the highest prevalence in the country, making them the leading states in alcohol use.¹²

The National Family Health Surveys (NFHS-4 and NFHS-5) offer valuable insights into substance use patterns across India. The NFHS-5, conducted between 2019 and 2021, indicates that 28.6% of individuals aged 15 years and above use some form of tobacco, including both smoking and smokeless forms. This prevalence is notably higher among men than women, though a significant proportion of Indian women also engage in tobacco use. The data from NFHS-4 (2015-16) revealed that 45% of men and 7% of women aged 15 and above used tobacco, showing a decline in tobacco consumption from NFHS-4 to NFHS-5—likely influenced by awareness campaigns and regulatory actions. Concerning alcohol consumption, NFHS-5 shows that 1% of boys and 0.3% of girls aged 15–19 years currently consume alcohol. Among adults aged 15 and above, 18.8% of men and 1.3% of women reported alcohol use.^{13,14}

Substance abuse, particularly tobacco and alcohol, remains a significant public health issue in Eastern Uttar Pradesh, contributing to preventable diseases, disability, and mortality. Despite national efforts such as COTPA (Cigarettes and Other Tobacco Products Act) and NTCP (National Tobacco Control Programmed), substance abuse continues to be widespread, especially in rural and marginalized communities. Existing studies have explored the national and state-level trends, but there is limited research on socio-demographic determinants of substance use in Eastern Uttar Pradesh. Education plays a critical role in substance abuse patterns, with lower literacy levels associated with higher tobacco and alcohol consumption. Similarly, caste-based disparities have been observed, where OBC and SC/ST populations report higher tobacco and alcohol use compared to general category individuals. Occupational

status also influences substance abuse, with non-government employees showing significantly higher consumption rates than government workers. Furthermore, rural populations tend to use smokeless tobacco more frequently, while urban areas may have greater access to cessation resources. Understanding the interplay of these socio-demographic determinants is crucial for designing effective, evidence-based interventions targeting high-risk groups. This study aims to analyse the prevalence and patterns of substance abuse in Eastern Uttar Pradesh and examine its association with education level, caste, occupational status, gender, marital status and residence. Additionally, the study seeks to provide evidence-based policy recommendations for targeted intervention strategies that align with national and global health initiatives to reduce substance abuse among vulnerable populations.

METHODS

Study Design and Research Strategy: This study was a community-based, descriptive, cross-sectional study conducted in both rural and urban areas of Varanasi. The research aimed to assess substance abuse patterns among adults in the region.

Study Setting and Area: The study was conducted in both rural and urban areas of Varanasi over a period of eight months, from November 2023 to June 2024, ensuring comprehensive data collection and seasonal variation coverage.

Inclusion and Exclusion Criteria

Inclusion Criteria:

- Adult males and females aged 18 years and above.

Exclusion Criteria

- Individuals suffering from serious illnesses that could hinder participation.
- Respondents who did not provide informed consent for the interview.

Sample Size Estimation

- **Source of P:** NFHS-5 Prevalence of use of source of health care.
- Non-public Sector (Rural Urban combined– 47.9% and 52.55%): 50.2%

The sample size was calculated by the following formula-

$$n = \frac{Z_{1-\alpha/2}^2 * p (1 - p)}{d^2}$$

Were

- **P** = 0.502 (the estimated proportion of individuals not utilizing healthcare services from the non-public sector)
- **1 - P** = 0.498 (the complementary proportion of individuals utilizing services)
- **Z** = 1.96 (the critical value for a 95% confidence level)
- **MOE** = 0.05 (the margin of error, set at 5%)

Thus

$$N = \frac{(1.96)^2 \cdot 0.502 \cdot 0.498}{(0.05)^2} = 384.15$$

- For incomplete information responses @ 10% - 384 + 10% = 422.56;

- design of effect @ $1.5 - 422.56 * 1.5 = 633.84$
- Then Total Sample Size = **634**

Sampling Technique: A stratified multistage cluster sampling technique was employed. In the first stage, households were identified where at least one family member had experienced an illness in the past six months. In the second stage, the head of the household was selected as the primary respondent. If unavailable, the eldest family member was interviewed. This approach ensured systematic data collection and minimized selection bias.

Data Collection and Analysis: Data was collected using a pre-designed and pre-tested interview schedule, which included structured questions on socio-demographic characteristics and substance abuse patterns. All collected data were entered and analyzed using IBM SPSS Statistics (version 28). Descriptive statistics were used to summarize the data, while inferential statistical method, Chi-square test was applied to identify factors associated with substance abuse. A p-value of <0.05 was considered statistically significant.

Limitations of the Study: Obtaining accurate and unbiased responses in a community-based study posed challenges due to recall bias and subjective reporting by participants. The study relied on self-reported data, which may have led to underreporting or misclassification.

Ethical Considerations: Ethical approval was obtained from the Institutional Ethics Committee of IMS, BHU, Varanasi, Uttar Pradesh, India, in 2023. Written informed consent was obtained from all participants before their enrolment in the study. To ensure confidentiality, participant data was anonymized and securely stored with restricted access.

RESULTS

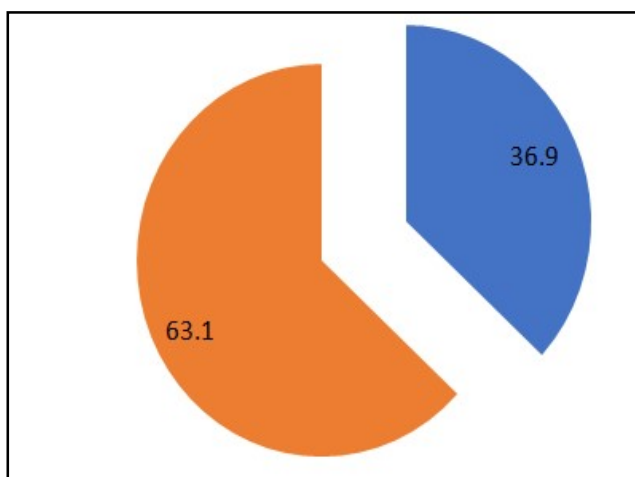


Figure 1. Graphical Representation of Substance Abuse Prevalence Among Respondents (N=635)

Fig 1 shows the overall prevalence of substance abuse among 635 respondents. A total of 234 respondents (36.9%) reported substance abuse, while 401 respondents (63.1%) did not. Fig 2 presents the distribution types of substance abuse among 234 respondents. Chewing tobacco is the most common form of Substance abuse in Varanasi district (61.5%). Alcohol use was reported by 51 respondents (21.8%), smoking was less prevalent, with only 20 respondents (8.5%) reporting smoking.

The use of chewing powder (Gull), which is one of the commonest mode of substance abuse in this area, was reported by 36 respondents (15.4%).

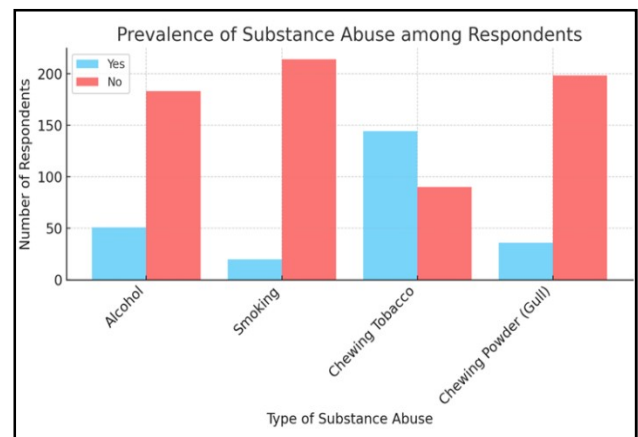


Figure 2. Type of Substance Abuse Among Respondents (N=234)

Table 1. Substance Abuse and Their Association with Socio-demographic Characteristics

Age Group	Substance Abuse (635)		Chi-square	p-value
	Yes (234)	No (401)		
Below 40	89 (38%)	227 (56.6%)	32.785	.000*
40-59	84 (35.9%)	132 (32.9%)		
Above 60	61 (26.1%)	42 (10.5%)		
Gender				
Male	82 (35%)	260 (64.8%)	52.788	.000*
Female	152 (65%)	141 (35.2%)		
Marital Status				
Married	195 (83.3%)	320 (79.8%)	20.331	.000*
Unmarried	11 (4.7%)	58 (14.5%)		
Widowed/Widower	28 (12%)	23 (5.7%)		
Caste				
General	19 (8.1%)	50 (12.5%)	3.203	0.202
OBC	166 (70.9%)	278 (69.3%)		
SC/ST	49 (20.9%)	73 (18.2%)		
Qualification				
Illiterate	103 (44%)	136 (33.9%)	19.59	.000*
Up to Secondary/Higher secondary	115 (49.1%)	188 (46.9%)		
Graduation and above	16 (6.8%)	77 (19.2%)		
Residence				
Rural	122 (52.1%)	233 (58.1%)	2.135	0.144
Urban	112 (47.9%)	168 (41.9%)		

Table 1 shows the analysis of socio-demographic factors and substance abuse among 635 respondents, revealing significant associations with age, gender, marital status, and education level ($p < 0.05$), while caste and residence (Rural Urban Variation) did not show significant relationships ($p > 0.05$). Adult productive age group is showing significantly higher prevalence of substance abuse.

Gender differences were significant, with a higher prevalence among females (65%) compared to males (35%) ($p = 0.000$). Married individuals had the highest substance abuse prevalence (83.3%), followed by widowed/widower (12%) and unmarried (4.7%) individuals ($p = 0.000$). Education is showing a positive effect on addiction. Although no significant association was found between caste ($p = 0.202$) and substance abuse prevalence was highest among OBC (70.9%), followed by SC/ST (20.9%) and General category (8.1%). These findings suggest that productive age, female gender, lower educational levels, and marital status are key socio-demographic factors influencing substance abuse.

DISCUSSION

The findings of this study on substance abuse in Eastern Uttar Pradesh align with national trends and reveal important socio-demographic factors that influence substance abuse. With a 36.9% prevalence of substance abuse among respondents, alcohol and chewing tobacco emerged as the most commonly used substances, consistent with reports from the National Family Health Survey (NFHS) and other studies highlighting the widespread consumption of alcohol and tobacco in India, especially in rural areas (Ministry of Health and Family Welfare, Government of India, 2019).¹⁵

Prevalence and Patterns of Substance Abuse: According to GATS – 2 surveys in India (2016-17)⁹, 28.6% adults aged 15 and above use tobacco in any form. In our study (2023-24), 31.49% individuals used tobacco in any form (chewing 144, gul powder 36 and smoking 20), which is quite close to the GATS finding. But there is no major shift in addiction pattern in 7-year period, is the major point of worry. One of the limitations of this finding is the multiple response. Alcohol and chewing tobacco are reported as the most commonly abused substances in this study, a pattern that mirrors the findings of studies across India. According to the Global Burden of Disease (GBD) study, alcohol and tobacco remain the leading contributors to substance-related disorders, with India reporting a particularly high prevalence of alcohol use and related morbidity (GBD 2016 Alcohol and Drug Use Collaborators, 2018). The high prevalence of substance abuse in rural areas can be attributed to lower awareness levels and limited access to healthcare, as observed in various studies on rural health (Sinha & Sinha, 2012).^{16,17}

Age as a Factor in Substance Abuse: The study highlights a higher prevalence of substance abuse among individuals under 60 years of age, with low prevalence among individuals over 60 years. This trend corresponds to findings in the literature that younger populations are more likely to engage in substance abuse due to factors such as peer influence, stress, and social pressures (Patel et al., 2019).¹⁸ Studies suggest that substance abuse disorders peak in adolescence and young adulthood, contributing to the significant morbidity and mortality associated with these behaviors in this age group.¹⁶

Gender Differences in Substance Abuse: One of the most striking findings of this study was the higher prevalence of substance abuse among women (65%) compared to men (35%). This contradicts the widely held belief that men are more likely to engage in substance use. As documented by Bhatia et al. (2013)¹, gender differences in substance abuse are often masked due to social stigma and underreporting, particularly in conservative rural settings where women may engage in substance use in private spaces. The increasing visibility of substance abuse among women in India is a growing concern and underscores the need for gender-sensitive public health policies.²⁰

Marital Status and Substance Abuse: Marital status was a significant factor, with married individuals exhibiting the highest prevalence of substance abuse. This finding echoes previous studies, which have shown that married individuals may use substances to cope with stressors such as family responsibilities, financial pressures, or relationship difficulties. According to the National Drug Dependence Treatment Centre

(NDDTC) report, married individuals, particularly in rural areas, often resort to substances as a means of coping with social and economic pressures.^{21,22}

Educational Status and Substance Abuse: The strong association between lower educational status and higher substance abuse prevalence found in this study is consistent with the findings of multiple studies. Lower levels of education are often linked to limited awareness about the harmful effects of substance abuse and fewer opportunities for socioeconomic mobility, which increases susceptibility to substance abuse.¹⁹ This relationship between education and substance abuse highlights the need for targeted public health education, particularly in low-literacy regions.

Caste and Residence: Interestingly, caste and residence did not show significant associations with substance use, suggesting that substance abuse patterns are widespread across different social and geographical groups. The NFHS-5 (2019-20) reports that substance abuse in India is not confined to specific social or caste groups, but rather it is a broader public health issue affecting various communities.¹⁵

Implications for Public Health Interventions: The findings of this study call for targeted public health interventions focused on high-risk groups such as younger populations, women, and those with lower educational attainment. The Ministry of Social Justice and Empowerment's (MoSJE) National Action Plan for Drug Demand Reduction emphasizes the importance of early intervention programs, particularly in schools and rural areas, to prevent substance abuse.²³ Moreover, the availability of community-based de-addiction services and accessible healthcare is crucial for effective prevention and treatment.

CONCLUSION AND RECOMMENDATIONS

This study provides valuable insights into the socio-demographic factors influencing substance use in Eastern Uttar Pradesh. Policymakers should focus on developing evidence-based interventions targeting high-risk populations such as younger individuals, women, and those with low educational levels. Community-based awareness programs, de-addiction services, and educational campaigns should be prioritized, with a focus on reducing stigma and promoting health education. Future research should investigate the underlying psychological, cultural, and economic drivers of substance abuse and explore the effectiveness of different intervention models in rural and urban settings. Additionally, government reports, such as those from the National Drug Dependence Treatment Centre (NDDTC), can offer further direction for policy development in this area.

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