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Original Research Article

ADOLESCENT SUBSTANCE AND ALCOHOL USE IN INDIA: A META-ANALYTIC REVIEW OF PREVALENCE AND SOCIO-DEMOGRAPHIC CORRELATES

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ABSTRACT

Background: Substance use among adolescents is a growing global concern. In India, the problem is escalating due to rapid urbanization, academic pressures, changing family structures, and social influences. Despite various studies conducted in different regions of India, there is limited consolidated data on the overall prevalence and associated patterns of substance and alcohol abuse among Indian adolescents. **Objectives:** To assess the prevalence of substance abuse among adolescents and to determine the socio-demographic factors influencing early use of substances.

Materials and Methods: A meta-analysis was conducted according to PRISMA guidelines, with systematic searches performed on PubMed, Medline, and Google Scholar between 15 June and 15 July 2025. A total of 55 studies were initially identified, of which 14 met the inclusion criteria: cross-sectional, peer-reviewed, English-language, community-based studies from India published in the past 15 years. Studies focusing solely on de-addiction centres were excluded.

Results: The 14 included studies involved adolescents aged 11 to 25 years, with sample sizes ranging from 110 to 7224 participants. The pooled prevalence of substance abuse among adolescents was 21.0% (SE: 0.32%, CI: 20.4–21.7%,). The pooled prevalence of alcohol abuse was 8.5% (SE: 0.22%, CI: 8.0–8.9%,). Key correlates included peer influence, mental health vulnerabilities, family dysfunction, media exposure, and socioeconomic status.

Conclusion: Adolescent substance use in India is driven by a complex web of socio-cultural, psychological, and environmental factors. An integrated public health approach focusing on prevention, early intervention, mental health support, and family engagement to mitigate substance-related harm in this vulnerable population.

Keywords: Adolescents, Alcohol, Substance use disorders, India, Systematic review.

INTRODUCTION

Use of tobacco, alcohol, and other substances is a worldwide problem and affects many children and adolescents. Substance use among adolescents ranges from experimentation to severe substance use disorders.[1]

Epidemiological surveys which were carried out in the last three decades to assess the prevalence of alcohol and drug users in general population in India revealed that 20-40% of adolescents who were above 15 years were current users of alcohol and that 10% of them were regular or excessive users.[2,3] Substance use was earlier considered to be a problem of street children, working and trafficked children, has now become widespread among school going

children from different socioeconomic and educational backgrounds.[4]

According to a study, for Protection of Child Rights, the common substances of use among adolescents are tobacco and alcohol, followed by inhalants and cannabis.[5,6] The transition from school to college predisposes the students to get indulge in substance-using behaviours regarding initiation and maintenance of substance use.[7]

The effect of substance abuse is highest on the psychological health of adolescents with the possibility of developing substance use disorder, leading to major behaviour changes, including mood disorders, depression, anxiety and personality disorders like antisocial personality disorder.[8]

Alcohol and tobacco are easily available substances in the reach of adolescents. The taboo around alcohol has come down significantly in India, especially in metro cities, where it has been accepted as a way of socializing, not only among adults but also among teenagers. 'Try at least once' is how it starts and leads to its continuous usage and addiction.[9] Alcohol use is typically established during adolescence and initiation of use at a young age poses risks for short- and long-term health and social outcomes.[10]

Aim & objective

To analyse the prevalence of substance abuse among adolescents and to determine the socio-demographic factors influencing early use of substances.

MATERIALS AND METHODS

Search Strategy: This meta-analysis was conducted according to the PRISMA guidelines. The systematic search of electronic databases PubMed, Medline and Google Scholar were searched from 15 June to 15 July 2025.

The search strategy included the different combinations of headings and terms like "Alcohol Drinking" [Mesh] OR "Alcoholism" [Mesh] OR "Substance-Related Disorders" [Mesh], "Substance abuse among adolescents in India", "Prevalence of substance abuse in India" and "Prevalence of alcohol abuse in different states of India". All searched articles were the full text articles only.

Study Selection: In total 55 articles were found meeting the search title. After applying the inclusion and exclusion criteria a total of 14 studies were selected for the metanalysis review. The studies were selected across India among different states. The authors performed the title and abstract screening and removed duplicate and non-original research papers.

Inclusion Criteria

1. Peer-reviewed original articles that studied the prevalence of substance use disorders.
2. Studies showing the precise prevalence of substance abuse & alcohol use in India.
3. Study designs were cross-sectional studies.
4. Full text articles with English language only.
5. Articles published within the past 15 years.
6. Community based studies

Exclusion Criteria

1. Limited access articles.
2. Articles published as editorials, letters.
3. Articles giving prevalence of substance abuse & prevalence of alcohol outside India.
4. De-addiction centre-based studies.

Figure 1: Identification of studies

Sample size: The sample size of the study varied according to the setting of the study, whether it is multicentric or unicentric. Overall sample size ranged from minimum 110 subjects to 7224 subjects.

Data Extraction: From each study, data including first author name, publication year, location, study design, sample size, their age groups, overall prevalence of substance use and prevalence of alcohol use. The pooled prevalence of substance use and alcohol use was taken.

Among pooled studies, total sample for analysis was taken as a sum of all participants in included studies. The pooled prevalence of substance abuse and alcohol intake was calculated from the total substance users in the included studies from different places of India.

RESULTS

A total of 14 studies were included, [Table 1]. The sample sizes ranged from 110 to 7224, with a median sample size of 1022. Sample comprised of adolescents from age group 11-19 except study by Sorabgupta et al., Nafizfaizi et al. which comprised participants of comparatively older age groups (16-25).

Most of the studies are from urban and rural regions,[14,15,16] and one study is from tribal area.[21] Peer pressure and institutional influence shows higher prevalence of substance and alcohol use.

The prevalence of substance abuse ranged from 10% to 59.97%,[19,15] mean prevalence is 33.7%. The pooled prevalence is 21.0% which is consistent with Indian data where rates often range from 15–30% while the standard error (SE) is 0.32% and confidence interval (CI) is 20.4%-21.7%. [Table 2]

The prevalence of alcohol abuse ranged from 1.67% to 53.52%,[19,25] mean prevalence is 17.4%. The pooled prevalence came out to be 8.5% aligning with Indian data of 6–15% while the standard error(SE) is 0.22% and the confidence interval(CI) is 8%-8.9%. [Table 2]

Table 1: Characteristics of Included Studies[11-24]

First Author	Study publication year	Study Location	Type of study	Area	Screening measure	Sample size	Age group in years	Prevalence of substance abuse	Prevalence of alcohol abuse
Vartika Saxena[11]	2010	Dehradun	Cross-sectional study	Urban	Interview / questionnaire	511	14-19	46.9%	8.7%
Tufeel,[12]	2013	Ambala	Cross-sectional study	Urban / Rural	Questionnaire	1454	13-19	60.0%	44.49%
Markordar Lyngdoh[13]	2017	Manipur	Cross-sectional study	Urban	Questionnaire	739	11-19	21.38%	4.6%
Dechenla Tsering[14]	2010	West Bengal	Cross sectional study	Urban / Rural	Questionnaire	416	13-19	12.5%	9.13%
Nafis Faizi[15]	2021	Uttar Pradesh	Cross sectional study	urban	Questionnaire	1431	11-25	33.3%	15.9%
Sneh samriti[16]	2018	Bengaluru	Cross sectional study	Urban	Questionnaire	300	12->16	10%	1.6.%
Pratak K Jasani[17]	2019	Gujarat	Cross sectional study	Urban / Rural	Questionnaire	600	17-19	30%	2.17%
Kaisolo Pazhiini[18]	2015	Manipur	Descriptive, cross sectional study	Tribal	Survey method	117	14-17	39%	33%
Raj Narain[19]	2020	Uttar Pradesh	Cross sectional study	Urban	Questionnaire	7224	11-19	14.3%	7.8%
Pragya Singh[20]	2018	Varanasi	Cross sectional study	Urban	Questionnaire	446	11-19	15.5%	11%
Liza Thankam Daniel[21]	2017	New Delhi	Cross sectional study	Urban	Questionnaire	110	11-19	55.38%	11.47%
Sorab gupta[22]	2013	Chandigarh	Cross sectional study	Urban	Questionnaire	256	16-25	57.4%	53.5%
Rajamani[23]	2024	Vellore	Cross sectional study	Urban	Questionnaire	266	11-19	33.8%	28.9%
Ashwani Kumar[24]	2025	Jaipur	Cross sectional study	Rural	Questionnaire	461	14-16	26.4 %	22.2 %

Table 2: Pooled prevalence of substance abuse and alcohol abuse

Category	Pooled Prevalence	Standard Error (SE)	95% Confidence Interval
Substance Abuse	21.0%	0.32%	[20.4% - 21.7%]
Alcohol Abuse	8.5%	0.22%	[8.0% - 8.9%]

Table 3: Key Correlates and Patterns of Substance and Alcohol Abuse Among Indian Adolescents

Factor/Contextual Variable	Estimated Prevalence (%)	SE (%)	95% Confidence Interval	Notable Insights
Urban/Metropolitan Adolescents	45–60	±2.5	[40.2, 64.8]	Higher exposure due to media, easy access, parental absence
Rural/Tribal Adolescents	10–25	±2.0	[6.1, 29.9]	Lower due to stigma/community norms; possible underreporting
Peer Influence (Hostels, Coaching Centres)	35–55	±2.8	[29.6, 60.4]	Common in academic hubs (e.g., Kota); peer pressure critical
Academic Stress (Board/Entrance Exams)	30–50	±2.4	[25.4, 54.6]	Use of stimulants/tobacco for coping and focus enhancement

Mental Health Vulnerabilities (e.g., Anxiety)	25–40	±2.3	[20.5, 44.1]	Substance use as self-medication; support services lacking
Dysfunctional Family Environments	30–45	±2.5	[25.1, 49.9]	Includes domestic violence, parental addiction, neglect
Lower SES (Urban Slums, Marginalized Groups)	35–50	±2.6	[29.9, 55.1]	Escape from poverty/social neglect; cheap substances used
Higher SES (Private/International Schools)	25–40	±2.2	[20.7, 44.1]	Disposable income, autonomy, low monitoring; "elite stress"
Media Influence (Bollywood, OTT, Social Media)	40–55	±2.7	[34.7, 59.3]	Glamorized portrayals normalize risk behaviours
Parental Supervision (Lack thereof)	30–50	±2.5	[25.1, 54.9]	Common in dual-working nuclear families; key vulnerability

The analysis of contextual factors revealed notable variability in adolescent substance abuse prevalence across settings. Urban/metropolitan adolescents showed the highest rates (45–60%, 95% CI: 40.2–64.8), followed closely by those under strong peer influence in hostels or coaching centres (35–55%, 95% CI: 29.6–60.4). Elevated prevalence was also observed among adolescents experiencing academic stress (30–50%) and dysfunctional family environments (30–45%), while rural/tribal populations reported markedly lower rates (10–25%, 95% CI: 6.1–29.9), likely due to cultural stigma and underreporting. Media exposure, low parental supervision, and socioeconomic extremes further emerged as significant risk contexts. [Table3]

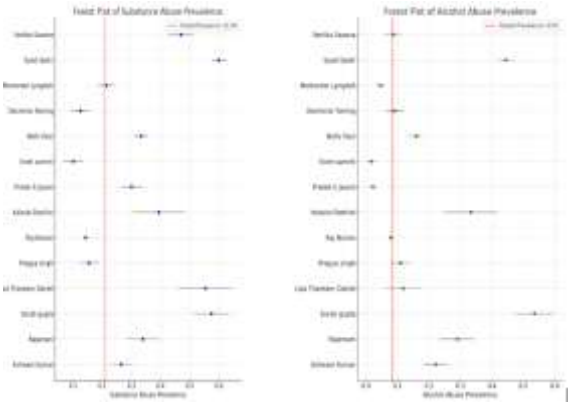

Figure 2: Forest plot Substance abuse and Alcohol abuse

DISCUSSION

The variation in prevalence rates of substance and alcohol abuse observed across Indian studies reflects a complex interplay of socio-cultural, environmental, and psychological factors unique to the country's diverse demographic landscape. For example, studies from north-eastern states such as Manipur and tribal populations reported markedly higher prevalence (21–39%) compared to studies from southern urban centres like Bengaluru (10%). Similarly, alcohol use varied widely, ranging from 1.6% in Bengaluru to 53.5% in Chandigarh, reflecting the influence of cultural, geographical, and social contexts on substance use patterns. The relatively high prevalence of alcohol abuse (8.5%) is particularly concerning, as alcohol is often a gateway substance and may normalize broader substance use behaviour. Substance use among Indian youth is notably higher in urban and metropolitan areas. This trend can be attributed to several factors: greater accessibility to substances, proximity to illicit supply chains, and the relative anonymity afforded by urban life. In large Indian cities, adolescents are frequently exposed to glamorized portrayals of alcohol and drug use through Bollywood, OTT platforms, and social media influencers, which can normalize risky behaviours.

In contrast, studies conducted in rural and tribal regions often report lower prevalence of substance abuse. This could stem from multiple factors: restricted availability, stronger community vigilance, and socio-cultural stigma surrounding substance use. However, the lower figures in these settings may also reflect underreporting, especially where stigma and lack of awareness deter honest disclosures.

One of the most consistent risk factors across Indian studies is the influence of peer groups, particularly in residential educational institutions, hostels, and coaching centres—a trend increasingly visible in academic hubs like Kota, Delhi, and Hyderabad. Adolescents, when removed from their familial environments, often experience loneliness, social anxiety, or a need to fit in. In such settings, peer pressure can strongly influence first-time substance use. The desire for acceptance, the need to appear 'modern' or mature, and the pursuit of social belonging can override individual inhibitions, particularly in the absence of strong coping skills.

India's competitive education system adds another layer of vulnerability. With high-stakes entrance exams and rigid academic expectations, students frequently report stress, anxiety, and burnout. In some cases, substances such as tobacco, cannabis, or prescription stimulants are used to temporarily cope with academic pressure or enhance perceived concentration—especially in environments where academic success is tied closely to family honour and future security.

Moreover, mental health issues among Indian adolescents are increasingly being recognized as critical contributors to substance abuse. However, mental health remains heavily stigmatized and under-prioritized, particularly in government schools and rural areas. Many adolescents struggling with

depression, anxiety, trauma, or low self-esteem do not receive adequate psychological support. In the absence of accessible and youth-friendly mental health services, some turn to substances as a form of self-medication.

The family environment, often seen as a protective factor in Indian society, can also become a source of risk when dysfunctional. Studies indicate that adolescents exposed to domestic violence, substance-abusing parents, or neglect are more likely to adopt similar behaviours. Additionally, families where communication is hierarchical or emotionally distant may fail to provide the emotional scaffolding necessary to help children manage stress and social pressures.

Socioeconomic status (SES) also plays a bifurcated role in India. Adolescents from lower SES backgrounds, especially in urban slums or marginalized communities, may use substances as a means to escape poverty, neglect, or social exclusion. On the other hand, higher SES youth—particularly those in private schools or studying abroad—may have more disposable income, greater autonomy, and less parental oversight, which increases exposure to high-risk behaviours. The pressure to maintain elite social appearances, combined with parental absence (due to work or migration), creates emotional voids that some attempt to fill through substance use.

In summary, the phenomenon of substance and alcohol abuse among Indian adolescents is multi-causal and deeply contextual. Peer influence, academic stress, mental health vulnerabilities, media exposure, family dynamics, and socioeconomic disparities all contribute in varying degrees. These findings underscore the urgent need for multi-sectoral interventions in the Indian context. School-based life skills education, access to culturally sensitive mental health services, parental involvement programs, and community-based prevention initiatives must be integrated into public health strategies. Additionally, policies should focus on early identification and intervention, particularly in institutional settings where youth are isolated from family structures and exposed to group-based risk factors.

Limitations

This study has certain limitations. First, only English-language, community-based studies were included, which may have led to exclusion of relevant data from institutional or rehabilitation settings. Second, reliance on self-reported questionnaires in most studies introduces the possibility of underreporting due to social desirability bias. Third, the included studies displayed heterogeneity in terms of screening tools, age ranges, and operational definitions of substance abuse, which may affect comparability across regions. Nevertheless, the strengths of this meta-analysis lie in its systematic methodology, inclusion of diverse geographic regions, and consolidation of evidence across 15 years of research.

CONCLUSION

Combating adolescent substance use in India demands a multi-pronged approach: strengthening school health programs, improving access to mental health services, fostering parental involvement, and enhancing community-level awareness. A coordinated effort across sectors is essential to build supportive ecosystems where young people can develop healthy coping mechanisms and avoid substance-related harm. A comprehensive public health approach, incorporating awareness, prevention, and access to mental health services, is critical to reduce substance use in this vulnerable population.

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