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Attitude and Knowledge of High School Students Towards Substance Abuse

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Abstract

Background: Substance abuse is a major public health concern, especially among adolescents, who are vulnerable due to peer influence and risk-taking behaviors. While global studies exist, research on high school students' attitudes and knowledge of substance abuse in southern India is limited. Thus, this study was taken up with the aim of assessing students' awareness and attitudes toward substance abuse.

Methods: A cross-sectional study was conducted among students aged 13–17 years from rural and urban areas of Krishna district, Andhra Pradesh, India. Stratified random sampling was used to select schools and participants from standards IX, X, XI, and XII. Data were collected using two validated questionnaires: Dr. Om Prakash's 'Knowledge and Attitude Addiction Questionnaire for Adolescents' and CSR's Evaluation Instrument for Knowledge on Effects of Alcohol, Tobacco, and Other Drugs. Data were analyzed using descriptive and inferential statistics, with a p-value of <0.05 considered statistically significant.

Results: Of the 300 students, 61.3% were male, and 55.7% were from rural areas. Rural students exhibited better awareness of substance abuse risks, with 70.7% recognizing the dangers of chewing tobacco, compared to 55.1% in urban areas (p = 0.041). Females were more concerned about addiction (93.1% vs. 78.3%, p < 0.001). Family history of substance use influenced attitudes, and mass media was the primary source of information.

Conclusion: The study highlighted the need for targeted, gender-sensitive interventions, with a focus on school-based programs and mass media, to address knowledge gaps and misconceptions about substance abuse among adolescents.

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Introduction

Substance abuse is defined as the excessive or harmful use of a drug in ways that are detrimental to an individual, society, or both. It encompasses both physical and psychological dependence. Physical dependence, arising from prolonged use, results in altered physiological states wherein withdrawal symptoms manifest upon discontinuation. Conversely, psychological dependence denotes an intense craving to continue drug use even without physical symptoms of dependence.[1] Substance abuse has emerged as one of the most pressing social, economic, and healthcare challenges in both developed and developing countries.

Globally, alcohol dependence was reported as the most prevalent substance use disorder, with an estimated 100.4 million cases in 2016.[2] In India, regional disparities in substance abuse have been highlighted. A study assessing the prevalence of substance abuse across states and union territories revealed that alcohol use (5.3%) was higher than alcohol abuse (3.76%) in Andhra Pradesh. Gender differences were also noted, with higher alcohol and tobacco consumption among males (6.71% alcohol and 4.06% tobacco) compared to females (3.4% tobacco and 3.06% alcohol).[3] The United Nations Office on Drugs and Crime (UNODC) World Drug Report 2021 estimated that around 275 million people globally used drugs in 2020. Alarmingly, over 36.3 million people (13%) were found to suffer from drug use disorders. Despite this, only 1 in 7 individuals received adequate treatment. Additionally, the report highlighted a 40% reduction in adolescents' perception of cannabis as harmful, raising concerns about the normalization of substance use among youth.[4]

Substance abuse has severe consequences on both individual health and societal well-being. Physiologically, it causes damage to vital organs, including the heart, brain, lungs, and liver. The associated health complications include strokes, seizures, mental confusion, and impaired memory and attention. It weakens the immune system, increasing susceptibility to infections and illnesses. Socially, substance abuse disrupts relationships, fractures social networks, and often drives individuals into financial distress.[5]

The consumption of illicit substances has been on the rise globally, with a troubling trend of earlier initiation of use among adolescents.[6] Experimentation, risk-taking behaviors, and vulnerability to peer influence characterize adolescence. Unfortunately, some of these behaviors pose significant risks to both the individual and society.[7] Studies indicate that adolescents often begin experimenting with substances such as inhalants and tobacco, eventually progressing to alcohol and other addictive substances by their third decade of life.[8] According to a study conducted by the National Commission for Protection of Child Rights, the most commonly abused substances among children and adolescents are tobacco and alcohol, followed by inhalants and cannabis. The mean age of onset was reported to be 12.3 years for tobacco, 12.4 years for inhalants, 13.4 years for cannabis, and 13.6 years for alcohol. Subsequently, more complex substances, such as opium, pharmaceutical opioids, and heroin, were introduced between 14.3 and 14.9 years of age. Injection drug use typically began at 15.1 years.[9]

Substance abuse among youth is strongly associated with academic difficulties, including lower grades, truancy, and school dropouts.[7,10] Early onset of substance use interferes with the development of educational, social, and life skills, necessitating both primary and secondary preventive strategies.[11] Given that India has one of the most significant proportions of children and adolescents (aged <18 years: 45% of the population; 5–19 years: 35.3% of the population), interventions targeting this demographic are critical.[12,13] UNODC executive director Ghada Waly emphasized the link between low perceived risk and higher rates of drug use, stressing the importance of bridging this perception-reality gap to safeguard public health.[4] Schools have been identified as ideal settings for such interventions.[14] Peer-led health education programs have demonstrated effectiveness in primary prevention, leveraging peer influence, which is often stronger than that of adults.[15] These programs operate under the premise that friends seek advice from friends and are influenced by group attitudes and behaviors.[16]

Despite the alarming rates of substance abuse among youth and the availability of studies conducted globally, research focused on child and adolescent substance use in India remains limited. Most available data stem from isolated, small-scale studies at the regional level, failing to provide a comprehensive understanding of the issue. India has launched several campaigns to raise awareness about substance abuse.[17] However, the reach and measurable success of these efforts remain uncertain, highlighting the need for more targeted interventions and evaluations.

Given the scarcity of data regarding the knowledge and attitudes of students in southern India, this research aims to fill this gap by assessing the awareness and perspectives of high school students toward substance abuse. With the high prevalence

of substance abuse in India and the increasing vulnerability of adolescents, the findings from this research are expected to contribute to the development of evidence-based interventions targeting youth in the region. Thus, this study was taken up with the aim to assess the knowledge and attitude of high school children towards the harmful effects of substance abuse.

Materials and Methods

This cross-sectional study was conducted among high school students aged 13 to 17 years in Krishna district, Andhra Pradesh, India. The sample included students of both genders enrolled in standards IX, X, XI, and XII. Prior to initiating the study, ethical clearance was obtained from the Institutional Ethics Committee to ensure compliance with ethical guidelines and protocols, approval number UG/SRS/685/21.

A stratified random sampling technique was employed to select the study population. Two schools each from rural and urban areas of Krishna district were chosen through random sampling. From these selected schools, a minimum of 30 students each from standards IX and X and 30 students each from standards XI and XII, who were present on the day of data collection, were selected using simple random sampling to ensure an unbiased selection process, enhancing the representativeness of the sample. Written informed consent was obtained from parents and assent from the participants, ensuring voluntary participation, and written permissions were obtained from the school authorities.

Students aged 13–17 years of both genders who provided informed consent and demonstrated willingness to participate were included in the study. Learning-impaired students and those with conditions that hindered their ability to comprehend or respond to the questionnaire were excluded. The purpose and significance of the study were explained to participants, emphasizing anonymity and confidentiality to encourage honest responses.

The study considered multiple variables, including age, gender, region (rural or urban), socio-economic status, family structure, standard studying, exposure to substances, and substance use history among family members. These variables were analyzed to determine their influence on students' attitudes and knowledge regarding substance abuse.

The study employed two primary instruments to assess the knowledge and attitudes of participants toward substance abuse:

- Dr. Om Prakash's "Knowledge and Attitude Addiction Questionnaire for Adolescents (KAAQA): This self-report, semi-structured, 11-item questionnaire was specifically designed following a series of de-addiction awareness programs targeting school children. It effectively evaluates adolescent attitudes and perceptions about addiction.[8]
- CSR's Evaluation Instrument for Knowledge on Effects of Alcohol, Tobacco, and Other Drugs: This questionnaire was adapted to assess the participant's knowledge regarding the physical and mental risks associated with regular substance use. Responses were evaluated based on participants' opinions on individuals engaging in substance abuse behaviors.[18]

The instruments were administered in English, as it was the medium of instruction in the selected schools. For better comprehension, clarification was provided in Telugu when required, ensuring that all participants fully understood the questionnaire items. Before administering the questionnaire, detailed instructions were provided to the participants, ensuring clarity and comprehension. The questionnaire was distributed in classrooms under supervised conditions to avoid peer influence. Teachers and researchers were present to assist if required.

Collected data were entered and analyzed using Statistical Package for the Social Sciences (SPSS) software version 21.0. Descriptive statistics such as frequencies and percentages were used to summarize demographic data and responses. Analytical tools, including the Chi-square test, were employed to assess associations between categorical variables. A p-value of less than 0.05 was considered statistically significant.

The study adhered to ethical principles outlined by the Declaration of Helsinki. Participants were assured of their anonymity, and all data were handled with confidentiality.

Results

A total of 329 students participated in the study; however, 29 responses were excluded due to incomplete forms and improper marking of answers. Thus, a total of 300 valid responses were analyzed and compared.

Among the 300 respondents: 127 students (42.3%) were in the age group of 12–14 years, 173 (57.7%) were in the 15–17 age group, 184 students (61.3%) were male, and 116 students (38.7%) were female; 133 students (44.3%) hailed from urban areas, while 167 students (55.7%) were from rural areas.

Table 1 highlights the participants' perceptions of substance abuse risks based on gender and region. For smoking tobacco, 60.3% of both males and females perceived it as a great risk, with no significant gender (p=0.14) or regional differences (p=0.738). Chewing tobacco was viewed as a great risk by 64.7% of males and 57.8% of females, with no significant gender difference (p=0.244); however, a significant regional variation was noted (p=0.041), with urban students perceiving higher risk. Regarding alcohol consumption, 58.2% of males and 48.3% of females considered it a great risk, showing no significant gender (p=0.422) or regional differences (p=0.085). For other drugs, 53.8% of males and 53.4% of females perceived them as a great risk, with no significant gender (p=0.803) or regional differences (p=0.066).

On assessment of the overall knowledge of students regarding the harmful effects of tobacco, alcohol, and other drugs, 60.3% of participants recognized that smoking one or more packs of cigarettes daily poses a serious health risk. However, 21% believed there was only some risk, and 12.3% were uncertain. Among the participants, 62% identified a great risk from chewing tobacco daily, while 16.3% perceived some risk, and 14.3% remained unsure. Of the total sample, 54.3% acknowledged significant health risks associated with alcohol consumption, while 22% saw some risk, and 13% were uncertain. Regarding drugs like marijuana, cocaine, heroin, and LSD, 53.6% perceived great risk, 13.6% noted some risk, and 24.6% were unsure.

Table 2 presents insights into the sources of information on addiction. A majority of students in both rural (82.63%) and urban (74.43%) areas had heard or read about substance abuse, with no significant difference (p=0.083). Awareness through mass media was significantly higher among rural students (70.65%) compared to urban students (57.89%) (p = 0.021). Most students recognized substance abuse as a physical or medical illness (rural: 79.64%, urban: 78.95%; p=0.883) and a social evil (rural: 68.86%, urban: 69.92%; p=0.843), with no significant differences. While 95.20% of rural and 88.72% of urban students acknowledged its harmful effects on the body, this difference was statistically significant (p = 0.036). Knowledge about the availability of medicines and treatment options showed no significant regional variations (p=0.649 and p=0.537, respectively). However, rural students (70.65%) were significantly more likely to believe substance abuse is preventable compared to urban students (53.38%) (p=0.002).

Table 3 compares the attitudes of rural and urban participants toward substance abuse. A majority of rural students (89.22%) expressed fear about substance abuse, similar to urban students (87.22%), with no significant difference (p=0.591). Rural students (88.02%) were more likely to express concern about substance abuse compared to urban students (78.95%) (p=0.033). Most students from both regions reported taking precautions against substance abuse, with no significant difference between rural (92.81%) and urban students (91.73%) (p=0.726). Both groups had similar responses regarding maintaining contact with individuals who might be involved in substance abuse, with rural students (19.76%) and urban students (15.04%) showing no significant difference (p=0.287). Regarding openness in discussing addiction, a higher percentage of urban students (52.63%) reported rarely discussing addiction compared to rural students (41.92%), but this difference was not statistically significant (p=0.127).

Table 4 examines differences in attitudes between male and female students. While most students were afraid of substance abuse (male: 86.96%, female: 90.52%), there was no significant gender difference (p=0.349). However, a significant gender difference was observed in concerns about substance abuse, with 93.10% of females expressing concern compared to 78.26% of males

Table 1: Knowledge about substance abuse assessed on the basis of gender and region

	Gender and region comparison		No risk	Little risk	Some risk	Great risk	Can't say	Total	P-value
			n (%)	n (%)	n (%)	n (%)	n (%)		
Smoking tobacco	Gender	Male	4 (2.2%)	7 (3.8%)	36 (19.6%)	111 (60.3%)	26 (14.1%)	184	0.14
		Female	7 (6.0%)	1 (0.9%)	27 (23.3%)	70 (60.3%)	11 (9.5%)	116	
		Total	11 (3.7%)	8 (2.7%)	63 (21.0%)	181 (60.3%)	37 (12.3%)	300	
	Region	Rural	8 (4.8%)	4 (2.4%)	36 (21.6%)	97 (58.1%)	22 (13.2%)	167	0.738
		Urban	3 (2.3%)	4 (3.0%)	27 (20.3%)	84 (63.2%)	15 (11.3%)	133	
		Total	11 (3.7%)	8 (2.7%)	63 (21.0%)	181 (60.3%)	37 (12.3%)	300	
Chewing tobacco	Gender	Male	3 (1.6%)	9 (4.9%)	26 (14.1%)	119 (64.7%)	27 (14.7%)	184	0.244
		Female	0	10 (8.6%)	23 (19.8%)	67 (57.8%)	16 (13.8%)	116	
		Total	3 (1.0%)	19 (6.3%)	49 (16.3%)	186 (62.0%)	43 (14.3%)	300	
	Region	Rural	3 (1.8%)	14 (8.4%)	30 (18.0%)	92 (55.1%)	28 (16.8%)	167	0.041
		Urban	0	5 (3.8%)	19 (14.3%)	94 (70.7%)	15 (11.3%)	133	
		Total	3 (1.0%)	19 (6.3%)	49 (16.3%)	186 (62.0%)	43 (14.3%)	300	
Drinking alcohol	Gender	Male	5 (2.7%)	12 (6.5%)	36 (19.6%)	107 (58.2%)	24 (13.0%)	184	0.422
		Female	6 (5.2%)	9 (7.8%)	30 (25.9%)	56 (48.3%)	15 (12.9%)	116	
		Total	11 (3.7%)	21 (7.0%)	66 (22.0%)	163 (54.3%)	39 (13.0%)	300	
	Region	Rural	9 (5.4%)	13 (7.8%)	43 (25.7%)	81 (48.5%)	21 (12.6%)	167	0.085
		Urban	2 (1.5%)	8 (6.0%)	23 (17.3%)	82 (61.70%)	18 (13.5%)	133	
		Total	11 (3.7%)	21 (7.0%)	66 (22.0%)	163 (54.3%)	39 (13.0%)	300	
Other drugs	Gender	Male	3 (1.6%)	12 (6.5%)	25 (13.6%)	99 (53.8%)	45 (24.5%)	184	0.803
		Female	4 (3.4%)	5 (4.3%)	16 (13.8%)	62 (53.4%)	29 (25.0%)	116	
		Total	7 (2.3%)	17 (5.7%)	41 (13.7%)	161 (53.7%)	74 (24.7%)	300	
	Region	Rural	6 (3.6%)	7 (4.2%)	23 (13.8%)	82 (49.1%)	49 (29.3%)	167	0.066
		Urban	1 (0.8%)	10 (7.5%)	18 (13.5%)	79 (59.4%)	25 (18.8%)	133	
		Total	7 (2.3%)	17 (5.7%)	41 (13.7%)	161 (53.7%)	74 (24.7%)	300	

* P value <0.05 is statistically significant. The chi-square test was used.
† CSR's Evaluation Instrument for Knowledge on Effects of Alcohol, Tobacco, and Other Drugs

(p<0.001). More females (95.69%) reported taking precautions against substance abuse compared to males (90.21%), though this difference was not significant (p=0.083). Both male and female students had similar responses regarding maintaining contact with individuals at risk for substance abuse (p=0.278). When asked about discussing addiction, a significant gender difference was observed, with more males (52.72%) reporting never discussing addiction compared to females (37.07%) (p=0.003). Two additional questions further assessed participants' perceptions: 37.7% believed that trying a substance once could lead to addiction, while 35% were uncertain, and 15% saw no risk; regarding stress management through substances, 36% disagreed with the idea that substances help manage stress, while 29.3% were unsure.

A YES/NO question was used to assess the presence of substance use among family members of participants. The findings revealed that 88.7% of

Table 2: Sources of knowledge about substance abuse assessed on the basis of region

KAAQA questions	Rural		Urban		P-value
	Yes / True (%)	No / False (%)	Yes / True (%)	No / False (%)	
Have you heard or read it?	138 (82.63%)	29 (17.36%)	99 (74.43%)	34 (25.56%)	0.083
Know through mass media	118 (70.65%)	49 (29.34%)	77 (57.89%)	56 (42.11%)	0.021
Is physical/medical illness	133 (79.64%)	34 (20.35%)	105 (78.95%)	28 (21.05%)	0.883
Is a social evil	115 (68.86%)	52 (31.13%)	93 (69.92%)	40 (30.08%)	0.843
Usage is harmful to the body	159 (95.20%)	8 (4.79%)	118 (88.72%)	15 (11.28)	0.036
Medicines are available	105 (62.87%)	62 (37.12%)	87 (65.41%)	46 (34.59%)	0.649
Is preventable	118 (70.65%)	49 (29.34%)	71 (53.38%)	62 (46.62%)	0.002
Is treatable	92 (55.08%)	75 (44.91%)	78 (58.65%)	55 (41.35%)	0.537

‡ P value <0.05 is statistically significant. The chi-square test was used.
§ KAAQA - Knowledge and Attitude Addiction Questionnaire for Adolescents

Table 3: Attitudes toward substance abuse assessed based on region

KAAQA questions	Rural				Urban				P-value
	Yes	%	No	%	Yes	%	No	%	
Afraid	149	89.22	18	10.78	116	87.22	17	12.78	0.591
Concerned	147	88.02	20	11.98	105	78.95	28	21.05	0.033
Takes precautions	155	92.81	12	7.29	122	91.73	11	8.27	0.726
Gathers knowledge	0	0	167	100	0	0	133	100	-----
Maintain contact	33	19.76	134	80.24	20	15.04	113	84.96	0.287
How open do you discuss addiction?	Never	Occasionally	Often	Very frequently	Never	Occasionally	Often	Very frequently	0.127
	70 (41.92%)	46 (27.54%)	19 (11.38%)	32 (19.16%)	70 (52.63%)	26 (19.55%)	19 (14.28%)	18 (13.53%)	

|| P value<0.05 is statistically significant. The chi-square test was used.
¶ KAAQA - Knowledge and Attitude Addiction Questionnaire for Adolescents

participants reported no substance use in their family, whereas 11.3% had family members who used substances.

To summarise, rural students showed greater awareness of the harmful effects of substances and addiction prevention compared to urban students. Gender differences revealed that girls exhibited more concern about addiction but were less comfortable discussing related issues than boys. A significant portion of participants lacked explicit opinions about substance-related risks, indicating the need for targeted educational interventions.

Discussion

This study aimed to assess the knowledge and attitudes of high school students toward substance abuse in rural and urban areas of Krishna district, Andhra Pradesh. The findings shed light on significant disparities in awareness, attitudes, and percep-

Table 4: Gender-based attitudes

KAAQA questions	Male				Female				P-value
	Yes	%	No	%	Yes	%	No	%	
Afraid	160	86.96	24	13.04	105	90.52	11	9.48	0.349
Concerned	144	78.26	21.74	13.3	108	93.10	8	6.90	<0.001
Takes precautions	166	90.21	18	9.79	111	95.69	5	4.31	0.083
Gathers knowledge	0	0	184	100	0	0	116	100	-----
Maintain contact	36	19.57	148	80.43	17	14.65	99	85.35	0.278
How open do you discuss addiction?	Never	Occasionally	Often	Very Frequently	Never	Occasionally	Often	Very Frequently	0.003
	97 (52.72%)	32 (17.39%)	21 (11.41%)	34 (18.48%)	43 (37.07%)	40 (34.48%)	17 (14.65%)	16 (13.8%)	

** P value<0.05 is statistically significant. The chi-square test was used.
* KAAQA - Knowledge and Attitude Addiction Questionnaire for Adolescents

tions of substance use risks based on gender and location, emphasizing the importance of targeted interventions and awareness programs.

The study included 300 valid responses, with 42.3% of participants aged 12–14 years and 57.7% aged 15–17 years. Males constituted 61.3% of the sample, while females accounted for 38.7%. Rural participants (55.7%) outnumbered their urban counterparts (44.3%), allowing for robust comparisons based on geographical differences.

Knowledge regarding the harmful effects of substance abuse varied significantly between rural and urban students. While 62.0% of the respondents believed chewing tobacco posed a significant risk, urban students (70.7%) demonstrated higher awareness than rural students (55.1%). Alarmingly, 3% of rural students perceived no risk, highlighting gaps in knowledge ($p = 0.041$). Similar findings were noted in the study conducted by Tsering D et al. where urban students demonstrated better awareness about tobacco-related harms compared to their rural counterparts.[19] This suggests a need for improved outreach efforts targeting rural areas.

Mass media emerged as the primary source of information, with rural participants (70.65%) relying more heavily on it than urban students (57.89%) ($p = 0.021$). This aligns with findings by Tsering D et al. which reported mass media as the primary information source.[19] Preventive awareness also differed significantly between groups. While 63% of the overall population believed addiction is preventable, rural students (70.65%) were more optimistic compared to urban students (53.38%) ($p < 0.05$). This reinforces the need for urban-targeted preventive campaigns to bridge the knowledge gap.

The data indicated that rural students (88.02%) expressed greater concern about addiction risks than urban students (78.95%) ($p = 0.033$). Similar trends were observed in gender-based attitudes, with females (93.10%) showing more concern than males (78.26%) ($p < 0.001$). This heightened concern among females aligns with studies conducted by Prakash O et al., where female students displayed greater awareness and worry about addiction compared to males.[8]

However, both genders showed reluctance to discuss addiction-related issues openly, with 52.72% of males and 37.07% of females unwilling to engage in such conversations. This mirrors findings by Singh M et al., indicating stigma and lack of safe spaces as barriers to dialogue.[20]

When assessing perceptions about specific substances, 60.3% believed daily smoking posed a great risk. In comparison, 62% recognized chewing

tobacco as highly risky, 54.3% identified alcohol consumption as highly risky, and 53.6% considered illicit drugs highly harmful. These results are consistent with reports by WHO (2018), which found a significant percentage of youth globally underestimate the health risks associated with substance use.[21]

Regarding addiction risk, 37.7% believed trying substances once could lead to addiction, while 35% were unsure. A smaller segment (15%) believed there was no risk. Additionally, 36% rejected the idea that substances could help manage stress, but 29.3% remained uncertain. These findings are comparable to studies by Tikoo VK et al., which highlighted misconceptions about addiction and stress management as areas requiring intervention.[9]

Family history of substance use also influenced participants' attitudes and knowledge. Similar patterns were observed in research by Vendhan G et al., showing familial substance use as a risk factor for youth experimentation.[22]

The study underscores the effectiveness of mass media in disseminating information but highlights the need for enhanced outreach in urban areas. Rural populations showed better knowledge and more concern, suggesting ongoing awareness campaigns are more impactful in these areas. Gender disparities further necessitate gender-sensitive approaches.

Recommendations

To effectively address substance abuse among high school students, implementing school-based educational programs with interactive and peer-led learning approaches, as supported by Mellanby AR et al. is essential.[16] Targeted awareness campaigns should be designed, focusing on rural populations through mass media and urban groups via interactive platforms. Promoting open communication channels by addressing stigma through workshops, family counseling, and support groups can foster a supportive environment. Additionally, gender-specific interventions should be developed to address variations in attitudes and concerns. Emphasis on early intervention strategies, including preventive education and early detection programs, starting at younger ages, is crucial for long-term impact.

The strengths of this study include its large sample size from both rural and urban areas, enabling meaningful comparisons. The use of validated questionnaires and ethical considerations adds to the reliability and validity of the findings. However, the study has limitations, such as its cross-sectional design, which limits causal inference, and the exclusion of students with learning impairments, potentially affecting the generalizability of the findings. Moreover, self-reported data may be influenced by social desirability bias.

Future Recommendations

Future research should focus on longitudinal studies to track trends in substance use and attitudes over time, enabling causal inferences and intervention assessments. Expanding sample diversity to include marginalized populations and students with learning impairments can enhance generalizability. Incorporating qualitative methods, such as focus group discussions, can provide deeper insights into students' perceptions and social influences. Additionally, evaluating the effectiveness of school-based peer-led interventions and digital platforms in promoting substance abuse awareness is recommended. Collaborations with policymakers and educators are essential to develop targeted, gender-sensitive, and culturally appropriate prevention programs addressing both rural and urban needs.

Conclusion

The findings of this study underscore the need for targeted, gender-sensitive interventions and enhanced school-based programs leveraging peer-led approaches. Mass media proved effective in raising awareness, particularly in rural areas, but urban-focused strategies need improvement.

Addressing misconceptions, promoting open communication, and reducing stigma through family and community engagement are critical. Collaborative efforts between educational institutions, healthcare providers, and policymakers can help implement evidence-based strategies to prevent substance abuse among adolescents and ensure sustained positive outcomes.

Declarations

Ethics Approval and Consent to Participate

The study was reviewed and approved by the Institutional Ethics Committee, Dr. Pinnamaneni Siddhartha Institute of Medical Sciences & Research Foundation, approval number - UG/SRS/685/21. Written informed consent was obtained from parents and assent from the participants.

Availability of Data and Material

The datasets used and/or analyzed during the current study are available from the corresponding author upon reasonable request.

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Declaration Regarding the use of Generative AI

We assume full responsibility for the entire content of the manuscript.

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Conflict of interest

'The Author(s) declare(s) that there is no conflict of interest'.

References

1. Griffin JB JR. Substance Abuse. In: Walker HK, Hall WD, Hurst JW, editors. Clinical Methods: The History, Physical, and Laboratory Examinations. 3rd ed. Boston: Butterworths; 1990.
2. GBD 2016 Alcohol and Drug Use Collaborators. The global burden of disease attributable to alcohol and drug use in 195 countries and territories, 1990-2016: a systematic analysis for the Global Burden of Disease Study 2016. Lancet Psychiatry. 2018;5:987-1012. Available from: doi.org/10.1016/S2215-0366(18)30337-7.
3. Sivapuram MS, Nagarathna R, Anand A, Patil S, Singh A, Nagendra HR. Prevalence of alcohol and tobacco use in India and implications for COVID-19 - Niyantrita Madhumeha Bharata Study Projections. Journal of Medicine and Life. 2020;13:499-509. Available from: doi.org/10.25122/ jml-2020-0079.
4. UN Office of Drugs and Crime. UNODC World Drug Report 2021: pandemic effects ramp up drug risks, as youth underestimate cannabis dangers [Internet]. Vienna: UNODC; 2021 Jun 24 [cited 2021 Sep 6]. Available from: https://www.unodc.org/unodc/press/releases/2021/June/unodc-world-drug-report-2021_pandemic-effects-ramp-up-drug-risks--as-youth-underestimate-cannabis-dangers.html
5. Agardh EE, Danielsson AK, Ramstedt M, Holm AL, Diderichsen F, Juel K, et al. Alcohol-attributed disease burden in four Nordic countries: a comparison using the Global Burden of Disease, Injuries and Risk Factors 2013 Study. Addiction. 2016;111:1806-1813. Available from: doi.org/10.1111/add.13430.
6. United Nations Office on Drugs and Crime. World Drug Report 2016. United Nations publication, Sales No. E.16. XI.7. Vienna: UNODC; 2016.
7. Griffin KW, Botvin GJ, Nichols TR. Long-term follow-up effects of a school-based drug abuse prevention program on adolescent risky driving. Prevention Science. 2004;5:207-212. Available from: doi.org/10.1023/b:prev.0000037643.78420.74.
8. Prakash O, Giri OP, Mishra AK, Kumar S, Kulhara P. Knowledge and attitude of Indian adolescents towards addiction: Findings from an exploratory survey. Journal of Mental Health & Human Behavior. 2009;14:74-79. Available from: https://ipsnz.org/wp-content/uploads/2019/10/origi nal1-1-1.pdf.
9. Tikoo VK, Dhawan A, Pattanayak RD, Chopra A. Assessment of Pattern and Profile of Substance Use among Children in India. National Commission for Protection of Child Rights (NCPCR) by National Drug Dependence Treatment Centre [NDDTC], All India Institute of Medical Sciences [AIIMS], New Delhi; 2013.
10. Ellickson PL, McGuigan KA, Adams V, Bell RM, Hays RD. Teenagers and alcohol misuse in the United States: by any definition, it's a big problem. Addiction. 1996;91:1489-1503. Available from: doi.org/10.1046/ j.1360-0443.1996.911014898.x.
11. Squeglia LM, Jacobus J, Tapert SF. The influence of substance use on adolescent brain development. Clinical EEG and Neuroscience. 2009;40:31-38. Available from: doi.org /10.1177/155005940904000110.
12. Office of the Registrar General and Census Commissioner, India. Census of India 2011. New Delhi: Ministry of Home Affairs, Government of India; 2011.
13. Planning Commission, Government of India. Report of the working group on adolescents for 11th Five Year Plan (2007–2012) [Internet]. New Delhi: Government of India; 2007 Mar [cited 2021 Sep 20]. Available from:

http://planningcommission.nic.in/aboutus/committee/wrkgrp11/wg11_adoldev.pdf

14. Stanhope M, Lancaster J. Public health nursing: population-centered health care in the community. 7th ed. St. Louis: Mosby Elsevier; 2015.
15. Allott R, Paxton R, Leonard R. Drug education: a review of British Government policy and evidence on effectiveness. Health Education Research. 1999;14:491-505. Available from: doi.org/10.1093/her/14.4.491.
16. Mellanby AR, Rees JB, Tripp JH. Peer-led and adult-led school health education: a critical review of available comparative research. Health Education Research. 2000;15:533 545. Available from: doi.org/10.1093/her/15.5.533.
17. Fonseca K. "DRUGS ARE NOT COOL" – Biggest 'Drug Free India' campaign for youth launched [Internet]. Mumbai: Youth Incorporated Magazine; 2019 Feb 20 [cited 2021 Oct 7]. Available from: https://youthincmag.com/drug-free-india-campaign-for-youth-launched.
18. Kalpana L, Kavya HG. Knowledge towards ATOD: a study. Journal of Clinical and Diagnostic Research. 2012;6:38-41. Available from: https://jcdr.net/articles/PDF/2076/9%20-%203599.(A).pdf
19. Tsering D, Pal R, Dasgupta A. Substance use among adolescent high school students in India: A survey of knowledge, attitude, and opinion. Journal of Pharmacy and Bioallied Sciences. 2010;2:137-140. Available from: doi.org/10.4103/09757406.67005.
20. Singh M, Bala N, Garg PD, Bansal S, Bumrah S, Attri A. Substance abuse in Children and adolescent: A Retrospective Study. International Journal of Medical Research and Review. 2017;5:352-356. Available from: doi.org/10.17511/ijmrr.2017.i03.22.
21. World Health Organization. Fact sheet about alcohol [Internet]. Geneva: World Health Organization; 2018 [cited 2021 Oct 7]. Available from: https://www.who.int/news-room/fact-sheets/detail/alcohol.
22. Gajalakshmi V, Asma S, Warren CW. Tobacco survey among youth in South India. Asian Pacific Journal of Cancer Prevention. 2004;5:273-278. Available from: https:// journal.waocp.org/article_24268_f6002cada80460e4a9796718611648c4.pdf.