Original Article

Licit and illicit substance use by adolescent students in eastern India: Prevalence and associated risk factors

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ABSTRACT

Background: Use of tobacco, alcohol, and other substances is a worldwide problem and affects many adolescents. **Objective:** (1) To find out the magnitude of licit and illicit substance use among students; and (2) to find out the association between socioeconomic and demographic characteristics of the students and habits of use. **Materials and Methods:** This was a population-based cross-sectional study conducted during June 2003 to May 2004. In a multistage random sampling among all the districts and schools in West Bengal, India, 416 high school students from two schools were selected. The main outcome measures were substance use, namely, tobacco, alcohol, and cannabinoids. From the schools, all the students in the classes VIII, IX, and X were taken as the study population and were administered a pretested close-ended anonymous self-administered questionnaire relating to pattern, frequency, and correlates of substance use. **Results:** The ultimate response rate was 87.02% and 416 students could be covered in our study. The overall prevalence rates among rural and urban students were 6.14% and 0.6% for illicit drug use, 8.60% and 11.04% for tobacco, and 7.37% and 5.23% for alcohol consumption, respectively. Both licit and illicit substance use was associated more with male students. Current and regular use were mostly restricted to tobacco, and the use of a substance by family members had a significant impact on its use by their children. "Enjoyment" and "Curiosity" were found to have the major influence in their decision to use a substance. **Conclusions:** Early identification of the magnitude and the factors related to substance use can improve scopes for planning and preventive approaches for this vulnerable group before the problems get serious after which interventions become difficult.

Key words: Illicit, licit, students, substance use

Introduction

Use of tobacco, alcohol, and other substances is a worldwide problem and affects many children and adolescents. Consumption of licit and illicit substances has increased all over the world and the age of initiation of substance abuse is progressively falling. Based on the current trends, the World Health Organization (WHO) predicts that by the year 2020, tobacco use will cause more than 10 million deaths per year.[1] Each day in India, an estimated 5500 youth initiate tobacco use, contributing to predictions that by 2020, tobacco will account for 13% of all deaths in India.[2]

The rates of substance abuse vary from one study to the other as different substances and different definitions of substance abuse have been used in each of them. The problem is spreading to all socioeconomic groups; illicit drug trade is spreading to small towns and rural areas, new and multiple drug use has increased among the adolescents and the youth. Prevalence data for children and adolescent substance abuse, smoking, and alcohol are not available for India except a few brief reports on local or regional use. Yet, most of the studies have shown that the problem was on the rise particularly in the student population.[3] Early initiation of drug use is usually associated with a poor prognosis and a lifelong pattern of deceit and irresponsible behavior.[4]

Tobacco use was found to be problematic among students in Chennai and Delhi particularly so for those in the lower grades. Projections of health impact due to tobacco use may be larger than anticipated if these adolescents continue to use tobacco as young adults. Further epidemiologic research and interventions to curb tobacco use among young(er) adolescents are

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warranted. In 2004, baseline surveys of Project MYTRI, a randomized intervention trial in these two Indian cities, found that tobacco use among 6th graders was greater than that among 8th graders. These results were surprising—typically, tobacco use increases with grade level.[5] The prevalence rate of substance use by school students reported by researchers in different studies have been varied ranging from 10-90%.[6-13] In all the surveys among urban Indian school children, smokeless forms of tobacco use (eg, gutkha) were more popular than smoked forms (eg, cigarettes and bidis).[2]

New emerging trends in the use of substances have been seen with multiple drug use becoming more common and tobacco smoking increasing among adolescent girls. Variations in the prevalence rates are noticed, which may be due to the adoption of different methods among different groups of students. Use of substances by family members having a significant relation with that of substance use among the children was also found in other studies. Similar reasons for first use were also found as a major influence in a youth's decision for starting and continuing substance use in other studies as well.[3,6,7,14-18]

Keeping in view the above observations, the present study was designed and conducted with the idea that understanding the current magnitude of substance abuse among students, frequency and pattern and reasons for use may contribute to the preventive and control activities in the future as well as help in the implementation of an educational program for this group.

Materials and Methods

The present study was a population-based cross-sectional study conducted in two high schools of West Bengal, India, conducted during June 2003 to May 2004. The study population comprised all students (male and female) in classes VIII, IX, and X in two schools, which comprised 416 students.

A multistage random sampling was done among all the districts and schools, from which the present schools were selected. In the first stage, out of all the districts in the state of West Bengal, one district was chosen for urban school and another one chosen for rural school. The second stage comprised collection of a list of all the urban schools in the former district and a list of all the rural schools in the latter district from the Department of Education. The third stage involved choosing randomly one urban and one rural school from the list of the earmarked districts. Then all the 478 students in classes VIII, IX, and X in two schools (210 students in urban area and 268 in rural area) were initially taken as the study population. Of the 478 students, 462 (205 students in urban area and 257 in rural area) could be covered. The ultimate response rate was 87.02% and 416 students could be covered in our study. The main outcome measures were Substance use, namely, tobacco, alcohol, and cannabinoids; Lifetime users, current (at least once in the past 30 days) users; and Regular users (20 days or more in the past 30 days), illicit and licit drug use.

Sample frame
This was a self-administered anonymous questionnaire; therefore, perception of the question was required. From the experience of the researchers in this field, we concluded that
(a) The understanding level of students of class VIII onward allows the administration of a self-administered questionnaire, and young students might not understand the questionnaire, which could give rise to false responses and low response rates.
(b) Initiation of substance use usually begins at the age of 13–14 years.
(c) Students of these age groups are usually in classes VIII, IX, and X.
(d) Similar studies on student population have been carried out class VIII onward.
Therefore, the classes chosen represent an ideal population for this study.

Content validity and reliability of study instruments
The survey module was developed on anonymous self-administered questionnaire designed adopting the questionnaire suggested by the WHO (1980) study team[19] prior to the study for ensuring feasibility, acceptability, time management, validity, and reliability. A pilot study was carried out among students in class VIII, IX, and X at other urban and rural high schools of the corresponding districts following which some of the questions from the schedule were modified.

Study instrument
The pretested close-ended questionnaire contained questions relating to addiction and its importance. These were related to the sociodemographic situation prevailing in India. By initial translation, back-translation, and re-translation followed by pilot study, the questionnaire was custom-made for the study. Since the questionnaire was administered in both urban and rural areas, the questions were prepared in the local language, that is, Bengali, for the rural areas and in English for the urban areas. The data collection tool

used for the study was an interview schedule that was developed at the institute with the assistance from the faculty members and other experts. The interview schedule had two parts: The first part of the interview schedule was on socioeconomic and demographic characteristics. This included the following variables: age, sex, religion, community status, educational status, and per-capita monthly income. The second part of the interview schedule was on the use of substances, such as the source of knowledge about the harmful effects of substance use, the source of initiation, and use of substances by close contacts.

Data collection procedure

The permission to conduct the study in these two schools was taken from the Heads of these schools well ahead of data collection after the Institutional ethics committee approved the study. The school teachers actively co-operated during the whole period of study. All the participants were explained about the purpose of the study and were ensured strict confidentiality, and then verbal informed consent was taken from each of them before the interview. The participants were given the options not to participate in the study if they wanted. An anonymous self-administered questionnaire was coded before they were distributed on which the students marked their answers to a series of printed questions. The students were asked not to write their names and they were seated on alternate seats to ensure confidentiality and prevent overlooking of the answers. Since it was a one time self-administered, anonymous questionnaire, nonresponse could not be sought, and therefore, not included in the analysis. The principal investigator collected the data and disseminated the information on substance use in the health education sessions.

Statistical analysis

The collected data were thoroughly sorted and entered into Excel spread sheets and analysis was carried out. The procedures involved were transcription, preliminary data inspection, content analysis, and interpretation. Statistical software SPSS version 10.0 for Windows was used to calculate proportions, and in the tests of significance, Chi-square test and Z test were used in this study. The level of significance was set at $P < 0.05$ and confidence interval at 95%.

Indicators used

1. **Ever users (lifetime users):** All the users who used or abused drugs irrespective of time and frequency in his/her life.
2. **Current users:** All the users who used or abused drugs at least once during the past 30 days.

3. **Regular users**: All the users who used or abused drugs for 20 or more days during the past 30 days.

Substance use
The repeated or periodic self-administration of drugs to the extent of experiencing harm from its effects or from the social or economic consequences of their use.

Licit substance use
Use and sale of substances which are legal and not forbidden by the law. For example, tobacco and alcohol.

Illicit substance use
Use and sale of substances which are illegal and forbidden by the law. For example, cannabis, opiates, and tranquillizers.

Results

Of the 416 students in our study, the number of the male students exceeded that of their female counterparts in both urban and rural schools. Among the urban students, the males were 141 and females were 31 out of a total of 172. Among the rural students, males accounted to 133 and females 111 out of a total of 244. The mean age of a students was 15 ± 3.67. A majority of the study population were Hindus (63% and 88%) followed by Muslims (35% and 9%), and Christians (2% and 3%) among the urban and rural populations, respectively. Majority of the fathers (50%) of the urban students had passed the Higher Secondary level followed by those who completed graduation (33%), whereas 38% of the fathers of the rural students had completed high school level followed by those who completed primary school (30%). Majority of the students did not know the income of the family in both the urban and rural areas.

The prevalence of ever use, that is, lifetime use was estimated as follows: 6.14% and 0.6% for illicit substance use, 8.60% and 11.04% for tobacco, and 7.37% and 5.23% for alcohol consumption among rural and urban students, respectively. The mean age of initiation of substance use was 12.6 ± 2.77 (urban) and 13.9 ± 2.39 (rural). The proportion of rural male users (16.54%) was significantly higher than their female counterparts (3.60%), but it was vice versa among urban students where the proportion of female users (16.12%) exceeded their male counterparts (14.89%); however, it was not statistically significant. All urban current users and regular users were males (current users: 33.33% of ever users, regular users: 9.52% of ever users). Among the rural users, male users exceeded their female counterparts (current users: 50.00% of ever users, regular users: 27.27% of ever users) [Table 1].

Table 1: Distribution of urban and rural users according to gender and frequency of substance use[a]

Gender	Urban (n = 26)			Rural (n = 26)		
	Ever user No. (%)	Current user no. (%)	Regular user no. (%)	Ever user no. (%)	Current user no. (%)	Regular user no. (%)
Male	21 (100)	*7 (33.33)	†2 (9.52)	22 (100)	*11 (50.00)	†6 (27.27)
Female	5 (100)	00	00	4 (100)	1 (25.00)	00
Total	26 (100)	7 (26.92)	2 (7.69)	26 (100)	12 (46.15)	6 (23.07)

*$\chi2$ = 1.22, d.f. = 1, P > 0.05. †$\chi2$ = 2.23, d.f. = 1, P > 0.05. [a]Nonusers: male 120 (urban) and 111 (rural); female 26 (urban) and 107 (rural). Ever users: used or abused substances irrespective of time and frequency. Current users: used or abused substances at least once during the past 30 days. Regular users: used or abused substances for 20 days or more during the past 30 days.

The urban users were restricted to tobacco (11.04%) and alcohol (5.23%). Cannabis use was negligible (0.58%). Among the rural users, in addition to tobacco (8.60%) and alcohol (7.37%), cannabis use was fairly common (4.91%). The use of heroin and cocaine was negligible (1.2%). No other substance use was reported [Table 2].

The use of substances by family members had a significant relationship with that of substance use among the children since the proportion of users with family members using substances was 35.00%among urban students (Z = 2.59, P < 0.05) and 28.94%among the rural students (Z = 2.67, P < 0.05) [Table 3].

"Enjoyment" was stated as the most common reason for starting drugs in both the areas (urban: 52.00% and rural: 42.30%) followed by "Curiosity" and "To be sociable" [Table 4].

Discussion

In the present study, we observed that the prevalence rates were 6.14% and 0.6% for illicit drug use, 8.60% and 11.04% for tobacco, and 7.37% and 5.23% for alcohol consumption among rural and urban students, respectively. The male users exceeded their female counterparts in both the licit and illicit substance use; use of substances by males was recent and continuous, whereas in the case of females, it was experimental.

The study at Chennai and Delhi was aimed to assess whether tobacco use increases with grade level over time, as students moved into higher grades. Self-reported data from a sample of youth (n = 3404) present at three annual surveys (2004, 2005, and 2006) were analyzed. Mixed-effects regression models were used to compare prevalence of lifetime tobacco use and nine psychosocial risk factor scales between two student cohorts, 6th grade (or younger) cohort and 8th grade (or older) cohort. Stratified analyses were also conducted by gender, age, city, and school type. From 2004 to 2006, the 6th grade (or younger) cohort of students reported higher rates of lifetime tobacco use, and these differences were maintained over two years, even when the study sample

Table 2: Distribution of urban and rural students according to individual substance (multiple responses)

Type of drug	Urban (n = 172) no. (%)	Rural (n = 244) no. (%)	Z test, *P* value
Tobacco	19 (11.04)	21 (8.60)	0.8, > 0.05
Alcohol	9 (5.23)	18 (7.37)	0.9, > 0.05
Cannabis	1 (0.58)	12 (4.91)	3.9, > 0.05
Others*	00	3 (1.22)	-

*Others include heroin and cocaine. The drugs for which users were not found were not included.

Table 3: Distribution of urban and rural students according to use of substances by family members

User of substances	Urban (n = 172)		Rural (n = 244)	
	User* no. (%)	Total no. (%)	User† no. (%)	Total no. (%)
Use by family members	14 (35.00)	40 (100)	11 (28.94)	38 (100)
Not used by family members	12 (13.33)	90 (100)	14 (8.38)	167 (100)
Total	26 (20.00)	130 (100)	26 (12.68)	205 (100)

*Z = 2.59, *P*< 0.05.. †Z = 2.67, *P*< 0.05. Note: 42 urban students and 39 rural students did not respond.

Table 4: Distribution of users according to reasons for first substance use

Reasons for first substance use	Urban (n = 26) no. (%)	Rural (n = 26) no. (%)
Enjoyment	13 (52.00)	11 (42.30)
Curiosity	5 (19.23)	3 (11.53)
To be sociable	3 (11.53)	4 (15.38)
Religion	1 (3.84)	1 (3.84)
Relief of psychologic stress	00	4 (15.38)
Improvement of work performance	2 (7.69)	00
Reduce cold/hunger/fatigue	1 (3.84)	00
Total	25 (100)	23 (100)

Note: First urban user and three rural users did not respond.

was stratified by gender, age, city, and school type. Similarly, students in the 6th grade (or younger) cohort scored greater risk for tobacco use on all psychosocial risk factors analyzed here.[5] Studies from Southern Taiwan, South Africa, and USA had similar findings.[7,14,15] The WHO study report on youth and drugs supported our finding that young persons first try drugs on an experimental basis often motivated largely by curiosity

and peer pressure, which is one of the most important reasons for initiation of substance use.[20]

We found that substance use was mostly restricted to the licit and the socially acceptable drugs. Researchers in this field had comparable experiences.[8,9,12] A survey of high school students in Delhi, carried out in 1975, revealed that 34.3% of respondents used psychoactive drugs in the preceding year. The percentage of users of psychoactive substances other than alcohol and tobacco was 15.5%. The percentage prevalence rates by substance ranked as follows: tobacco (35.1), alcohol (26.2), cannabis (12.0), tranquillizers (8.9), amphetamines (5.8), sedatives (4.9), and opium (1.3). The survey was replicated in the same classes of students in 1976. It revealed that the nonresponse vote was slightly lower, as was also involvement with drugs, although the difference between the prevalence rates of drug use in the two years was not statistically significant.[21]

To assess the role of knowledge regarding tobacco, risk-taking attitude, peers, and other influences on tobacco and areca nut use among adolescents, a study was conducted among adolescents in two schools of New Delhi, India. Peer pressure, general stress, and media were important influencers. The students in public schools were found to be using more tobacco and tobacco/areca nut. The difference in use between the genders and the class in which they were studying was statistically not significant. The most important correlate for tobacco use and areca nut use was risk-taking attitude.[22]

Strength of the study
We could unearth the problem of substance use among adolescent school children. We also observed that the current and regular use was mostly restricted to tobacco, and use of the substance by family members had a significant impact on its use by their children.

Limitation of study
We could not follow-up the study due to lack of financial support. The study findings also shows that in spite of several antidrug measures, such as campaigns, education, and prohibition of production and sales, and restrictions of smoking at public places, no considerable decline in the use of drugs could be observed. Besides tobacco, the use of other drugs is comparatively low and antidrug measures are also not well felt or hardly felt.

Future directions of the study
Health impact due to tobacco may be bigger than projected if these adolescents carry on consuming tobacco as young adults. Further epidemiologic exploration and

interventions to curb tobacco use among the growing future generations is the call of the day.

Recommendations
- The emphasis on prevention of initiation of substance use should merit more attention since this will improve the resilience of the people to resist the use of substances.
- A considerable proportion of substance users were adolescents and early onset of the habit calls for effective measures directed against the younger age groups. Therefore, educational intervention at the school level appears to be the most feasible measure to prevent initiatives toward the use of substances.
- Parents should be motivated to share a healthy relationship with their children and give more time to them, especially in the growing up stage when deviant behavior can influence them easily.
- Substance abuse control can be achieved by education, advocacy, and legislation. Generating awareness on the hazards of substance use among students is the most effective educational measure to control it.
- Since in the present study, there was not much significant difference in substance use between the users in urban and rural areas, irrespective of the geographic characteristics all measures should be enhanced universally.

Conclusions

Early recognition of the extent and pattern of substance use among school students can improve scopes for holistic approaches for adolescents before solutions become easier said than done.

References

1. Warren CW, Jones NR, Peruga A, Chauvin J, Baptiste J, Costa de Silva V, *et al*. Global youth tobacco surveillance, 2000-2007. MMWR Surveill Summ 2008;57:1-28.
2. Bate SL, Stigler MH, Thompson MS, Arora M, Perry CL, Reddy KS, *et al*. Psychosocial mediators of a school-based tobacco prevention program in India: Results from the first year of Project MYTRI. Prev Sci 2009;10:116-28.
3. WHO expert committee on drug dependence. Sixteenth report. World Health Organization: Geneva: Tech Rep Ser 1969;407:6-8.
4. Tripathi BM, Lal R. Substance abuse in children and adolescents. Indian J Pediatr 1999;66:557-67.
5. Dhavan P, Stigler MH, Perry CL, Arora M, Reddy KS. Patterns of tobacco use and psychosocial risk factors among students in 6th through 10th grades in India: 2004-2006. Asian Pac J Cancer Prev 2009;10:807-13.
6. Ljubotina D, Galić J, Jukić V. Prevalence and risk factors of substance use among urban adolescents: Questionnaire study. Croat Med J 2004;45:88-98.
7. Yang MS, Yang MJ, Liu YH, Ko YC. Prevalence and related risk factors of licit and illicit substances use by adolescent students in southern Taiwan. Public Health 1998;112:347-52.

8.   Khan MM, Aklimunnessa K, Kabir MA, Kabir M, Mori M. Tobacco consumption and its association with illicit drug use among men in Bangladesh. Addiction 2006;101:1178-86.
9.   Chen KT, Chen CJ, Fagot-Campagna A, Narayan KM. Tobacco, betel quid, alcohol, and illicit drug use among 13- to 35-year-olds in I-Lan, rural Taiwan: Prevalence and risk factors. Am J Public Health 2001;91:1130-4.
10. Madu SN, Matla MQ. Illicit drug use, cigarette smoking and alcohol drinking behaviour among a sample of high school adolescents in the Pietersburg area of the Northern Province, South Africa. J Adolesc 2003;26:121-36.
11. Sutherland I, Willner P. Patterns of alcohol, cigarette and illicit drug use in English adolescents. Addiction 1998;93:1199-208.
12. Rao EV, Mishra K, Mohapatra B. Prevalence of substance abuse among school going adolescents of various high schools of Cuttack city. IPHA 2004, Bhubaneshwar souvenir; Abstract: 28. p. 56-7.
13. Babar AA, Stigler MH, Perry CL, Arora M, Shrivastav R, Reddy KS. Tobacco-use psychosocial risk profiles of girls and boys in urban India: Implications for gender-specific tobacco intervention development. Nicotine Tob Res 2010;12:29-36.
14. Madu SN, Matla MQ. Illicit drug use, cigarette smoking and alcohol drinking behaviour among a sample of high school adolescents in the Pietersburg area of the Northern Province, South Africa. J Adolesc 2005;26:121-36.
15. Centers for Disease Control and Prevention (CDC). Tobacco, Alcohol and other drug use among high school students in Bureau of Indian affairs-Funded schools-US 2001. MMWR Morb Mortal Wkly Rep 2003;52:1070-2. Available from: http://www.cdc.gov/mmwr/ [Last cited on 2009 Aug 23].
16. Kadri AM, Bhagyalaxmi A, Kedia G. A study of socio-demographic profile of substance abusers attending a deaddiction centre in Ahmedabad city. Ind J Com Med 2003;28:74-6.
17. Mohan D, Rustagi PK, Sundaram KR, Prabhu GG. Relative risk of adolescent drug abuse: Part I socio-demographic and interpersonal variables. Bull Narc 1981;33:1-8. Available from: http://www.unodc.org [Last cited on 2009 Aug 24].
18. Derek RN. Pattern of substance abuse among school age children: Clinical paper. Available from: http://www.mental-health-matters.com [Last cited on 2009 Aug 24].
19. Smart RG, Hughes PH, Johnston LD, Anumonye A, Khant U, Mora ME *et al*. A methodology of student drug use surveys. WHO offset publication; 1980. p. 50.
20. WHO expert committee on drug dependence. Sixteenth report. World Health Organization: Geneva: Tech Rep Ser 1969;407:7-27.
21. Mohan D, Thomas MG, Sethi HS, Prabhu GG. Prevalence and patterns of drug use among high-school students: A replicated study. Bull Narc 1979;31:77-86.
22. Kotwal A, Thakur R, Seth T. Correlates of tobacco-use pattern amongst adolescents in two schools of New Delhi, India. Indian J Med Sci 2005;59:243-52.

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