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Research Article

ASSESS THE PREVALENCE OF SMOKED AND SMOKELESS TOBACCO CONSUMPTION AMONG SENIOR SECONDARY SCHOOL STUDENTS IN PATNA CITY, BIHAR

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ABSTRACT

Introduction: Tobacco use in children and adolescents is reaching pandemic levels. The World Health Organization predicts that India will have the fastest rate of rise in deaths attributable to tobacco in the productive years of adult life, as a consequence of an addiction acquired in youth.

Materials and Methods: A cross-sectional questionnaire study based on global youth tobacco survey was undertaken to study the prevalence of tobacco use among 15-20 years old senior secondary school students. A simple random sampling method was used to select the students from Government and Private schools in Patna city.

Results: In the study population of 512 in the age group of 15-18 years, among the tobacco users majority is using smoke form of tobacco as compared to smokeless form of tobacco. Majority belonged to private institutions as compared to government institutions.

Conclusion: Prevalence of smoking was much higher among the private institution students as opposed to students of government institutions; also, it was observed that the percentage of smokeless tobacco users were higher in this age group when compared to cigarette smokers.

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INTRODUCTION

This is not about just any crop. It is about tobacco, which is the foremost cause of preventable death in the world today. Total number of premature deaths caused by tobacco during the twentieth century has been estimated at about 100 million and, if current trends of tobacco use continue during the twenty-first century, the death toll is projected to go up to one billion. World Health Organization (WHO), predicts that India will have the fastest rate of rise in deaths attributable to tobacco in the first two decades of the 21st century.¹

Today, no part of the world is free from the curse of drug trafficking and drug addiction. With a turnover of around \$500 billion, it is the third largest business in the world next to petroleum and arms trade. About 190 million people all over the world consume one drug or the other, such as heroin, smack, ganja, affeem, bhang, tobacco, etc. Of the various drugs abused, the most widely distributed and commonly used drug in the world is 'Tobacco'. Many social, economic and political factors have contributed to the global spread of tobacco consumption. Fast changing social milieus, social sanctions and other factors are mainly contributing to this proliferation and

has posed serious challenge to individuals, families, societies and nations.²

Tobacco appears to be as old as human civilization. Today, tobacco is cultivated commercially in more than 120 countries and is consumed in almost all countries of the world. China is the world's leading producer of tobacco followed by India, Indonesia, Brazil and United States.³

Many of these deaths will occur in the productive years of adult life, as a consequence of an addiction acquired in youth. The compelling need to save many of these lives from falling prey to tobacco use addiction and the urgent imperatives of avoiding the huge health, economic, social and environmental burdens that would be imposed by tobacco on a nation that aspires for accelerated development. The risks of tobacco use are highest among those who start early and continue its use for a long period. The early age of initiation underscores the urgent need to intervene and protect this vulnerable group from falling prey to this addiction. The most common reasons cited for children to start using tobacco are peer pressure, parental tobacco habits, and pocket money given to children. It is seen that smoking and drinking become symbols of maturity and independence, among the young people. For them, the use of tobacco provides an opportunity for taking part in a behaviour that defies

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established social norms. Boys are more likely than girls to smoke, drink, and use drugs. This holds true in developing countries too, although rates for girls are increasing faster.⁴ Tobacco use in children and adolescents is reaching pandemic levels. The World Bank has reported that nearly 82,000-99,000 children and adolescents all over the world begin smoking every day. About half of them would continue to smoke to adulthood and half of the adult smokers are expected to die prematurely due to smoking related diseases. If current smoking trends continue, tobacco will kill nearly 250 million of today's children⁵

The global youth tobacco survey revealed high (10-20%) prevalence of smokeless tobacco use among young students (13-15 year) in Southeast Asia.⁶

The deaths attributable to tobacco, in India, are expected to rise from 1.4% of all deaths in 1990 to 13.3% in 2020. It is estimated that 5,500 adolescents start using tobacco every day in India, joining the 4 million young people under the age of 15 who already regularly use tobacco. World Health Organization and Centers for Disease Control, USA, developed the Global Youth Tobacco Survey (GYTS) for this purpose. The GYTS is a school-based tobacco specific survey that focuses on students' age 13-15 years.⁷

The objectives of this survey are the following: to document and monitor prevalence of tobacco use; to better understand and assess students' behaviours related to tobacco use and cessation, and tobacco in the media and advertising, their access to tobacco in the marketplace, and information on tobacco in their schools' curricula

Aim of the study: Assess the prevalence of smoked and smokeless tobacco consumption among senior secondary school students in Patna city, Bihar.

Objectives of the study

1. To assess the prevalence of smoked and smokeless tobacco among senior secondary school students in Patna city.
2. To assess the prevalence of smoked and smokeless tobacco among different socioeconomic class of senior secondary school students
3. To determine factors associated with smoking habits among senior secondary school students.

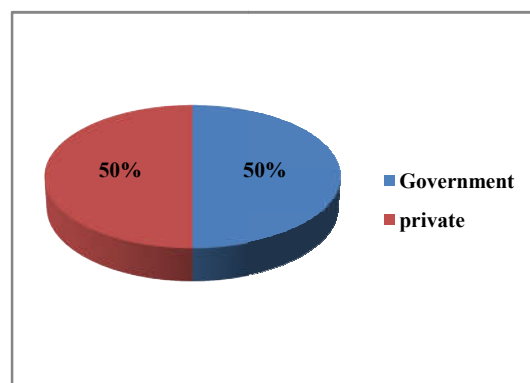
MATERIALS AND METHODS

1. **Approval from authorities:** Official permission was obtained from, Heads/Concerned authority of the selected schools.
2. **Ethical clearance:** Reviewed by the Ethical committee of Buddha Institute of Dental Sciences and Hospital, Patna and clearance was obtained.
3. **Study design:** Study is a descriptive, cross sectional study design.
4. **Source of data:** Data obtained from the government as well as private senior secondary school students in schools in Patna City.
5. **Study group:** All students of age 15-18 years present on the day of survey formed the study group.

6. **Sample size:** Sample comprised of all school students (512) present in the respective schools on the day of survey in Patna city.
7. **Schedule of the survey:** Spread over a period of one month i.e. Aug 2017. Detailed schedule was prepared in advance by informing and obtaining consent from the selected schools.
8. **Sampling technique:** Sample frame consisted of senior secondary schools (Government and Private) in Patna city and was selected by simple random sampling. For study purposes, map of Patna city was divided into four zones: North, South, East and West. In each zone, two schools one government and one private was randomly selected.
9. **Method of collection of data:** Questionnaire consisted of regarding demographic information, tobacco prevalence, role of media in tobacco control and controlling of tobacco methods taught in teaching curricula. Feasibility and validity was tested by a pilot study.
10. **Inclusion criteria:** Students present on the day of survey
11. **Exclusion criteria:** Students not willing/consent to fill the questionnaire
12. **Courtesy report:** Survey findings were translated to a report in a simple, understandable language and sent to the concerned schools.
13. **Statistical analysis:** Descriptive statistics was used to analyze the data. Statistical analysis was performed using SPSS version 22. Chi square test was used to analyze the data. 'p' value of < 0.05 was taken to be statistically significant for the purpose of analysis.

RESULTS

Demographic details: 512 subjects were included in the study. Out of which 256 were from government schools while rest 256 were from private schools. (Pie chart 1)



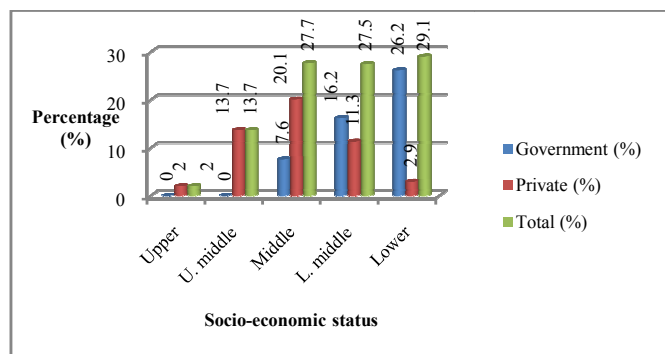
Pie chart 1 shows the distribution of students according to type of school

Table 1 Distribution of students according to Age

Age in years	Government (%)	Private (%)	Total (%)
15	15 (2.9)	0 (0.00)	15 (2.9)
16	115 (22.5)	59 (11.5)	174 (34.0)
17	78 (15.2)	108 (21.1)	186 (36.3)
18	48 (9.4)	89 (17.4)	137 (26.8)
Total	256 (50.0)	256 (50.0)	512 (100.0)

Overall majority of subjects (36.3%) were 17 years old while least (2.9%) were 15 years old (Table 1). According to the

Kuppuswami's classification, majority of subjects (29.1%) were from lower class. While the least (2%) of subjects were from the upper socioeconomic status. (Graph 2)



Graph 2 Distribution of subjects according to socioeconomic status

Oral hygiene practices: 100% students were using tooth brush as the main oral hygiene aid. 93.2% students were cleaning their teeth by using tooth paste only and rest 6.8% by tooth powder. Majority of students both from government school (43.2%) and private school (53.2%) were cleaning their teeth with tooth paste only, while 6.8% of students among government schools and none among private schools were cleaning teeth by using tooth powder. 77.7% were cleaning their teeth once a day only and 84.1% of subjects were using horizontal method of brushing.

Tobacco consumption: Majority (87.3%) of students were not consuming tobacco while only 12.7% were consuming tobacco. Among the government school students 7.2% of the subjects were consuming tobacco while the rest 42.8% of the subjects were not. Among the private school students 44.5% of the population was not consuming tobacco while 5.5% of the subjects were consuming tobacco. (Table 2)

Table 2 Distribution of subjects according to presence or absence of tobacco habit

Tobacco Habit	Government (%)	Private (%)	Total (%)
Yes	37 (7.2)	28 (5.5)	65 (12.7)
No	219 (42.8)	228 (44.5)	447 (87.3)
Total	256 (50.0)	256 (50.0)	512 (100)

50.8% of subjects were using smoked form of tobacco, 33.9% were using smokeless form while 15.3% of the subjects were using both the smoked and smokeless form (Table 3).

Table 3 Distribution of subjects according to form of tobacco consumption

Tobacco form	Government (%)	Private (%)	Total (%)
Smoked	13 (20.0)	20 (30.8)	33 (50.8)
Smokeless	17 (26.2)	5 (7.7)	22 (33.9)
Both	7 (10.7)	3 (4.6)	10 (15.3)
Total	37 (56.9)	28 (43.1)	65 (100.0)

Smoked tobacco: 20(46.5%) among government school and 23(53.5%) among private school students consumes different types of smoked form of tobacco. Majority of subjects among the government schools students were consuming beedi (30.2%), followed by cigarette (16.3%) and majority of subjects among the private schools students were consuming cigarette (34.9%), followed by cigars (11.6%), beedi (7%) respectively. 100% of students were consuming smoked form of tobacco ≤5 times a day. 72.1% of the subjects were

consuming tobacco for more than ≤1 years, 100% of the subjects were consuming smoked form of tobacco at subsequent interval of >5 hours.

Smokeless tobacco: 24(75%) of the students among government school and 8(25%) among private schools were consuming smokeless form of tobacco. Among the government school students majority (53.1%) were using khaini, followed by gutka (15.6), pan masala (6.3%), While among the private school students majority (18.8%) were using gutka, followed by khaini (6.3%). 100 % of subjects were consuming smokeless form of tobacco ≤5 times a day. 65.6% of the subjects were consuming tobacco for more than ≤1 years, followed by 2-5 years (34.4%).

Reasons for tobacco consumption: Majority of the students both among the government school (30.8%) as well as among private school (16.9%) were consuming tobacco due to the peer pressure (Table 4).

Table 4 Distribution of students according to the reasons responsible for Consumption of tobacco

Reasons responsible for consumption	Government (%)	Private (%)	Total (%)
Advertisements	0 (0.0)	0 (0.0)	0 (0.0)
Peer influence	20 (30.8)	11 (16.9)	31 (47.7)
Own interest	8 (12.3)	8 (12.3)	16 (24.61)
Easy availability	0 (0.0)	3 (4.6)	3 (4.6)
Family influence	9 (13.8)	6 (9.2)	15 (23.1)
Any other	0 (0.0)	0 (0.0)	0 (0.0)
Total	37 (56.9)	28 (43.1)	65 (100.0)

Role of media and advertisement: 56.2% students saw anti tobacco messages while 43.8% doesn't saw it. 100% of students don't saw anti tobacco messages in sporting or other events, pro-cigarette advertisements viewed on billboards and pro-cigarette advertisements viewed in news papers or magazines in the past 30 days, object viewed with cigarette brand logo on it and hadn't been offered free cigarettes by the tobacco company representative.

Tobacco control consumption: 100% of students said they had been taught in class about the dangers of smoking but they hadn't been discussed about the reasons why people smoke. 58.5% of subjects hadn't made any effort on quitting tobacco, while 41.5% had made efforts. Majority (22.2%) of the students of government schools as well as private school tried to quit tobacco due to family pressure (Table 5). Majority of students of government school (44.7%) and private school (18.5%) not tried to quit tobacco due to peer pressure. followed by the addiction.

Table 5 Distribution of subjects tried to quit tobacco due to

Reasons of quitting	Government (%)	Private (%)	Total (%)
Family pressure	6 (22.2)	11 (40.7)	17 (62.9)
Finance	0 (0.0)	0 (0.0)	0 (0.0)
Knowledge on its harmful effects	2 (7.4)	3 (11.1)	5 (18.5)
Picture on the cover of tobacco products	0 (0.0)	0 (0.0)	0 (0.0)
Advice of physician	0 (0.0)	1 (3.7)	1 (3.7)
Advice of teachers	2 (7.4)	2 (7.4)	4 (14.8)
Others	0 (0.0)	0 (0.0)	0 (0.0)
Total	10 (37.0)	17 (63)	27 (100)

Prevalence of tobacco consumption: Greater (50.8%) prevalence of tobacco consumption is seen among 18 years old

students, followed by 17 years (29.2%), 16 years (18.5%) and 15 years (1.5%).(Table 6)

Table 6 Prevalence of smoked and smokeless tobacco according to age

Age in years	Smoked (%)	Smokeless (%)	Both (%)	Total (%)
15	1 (1.5)	0 (0.0)	0 (0.0)	1 (1.5)
16	5 (7.7)	4 (6.1)	3 (4.6)	12 (18.5)
17	10 (15.4)	7 (10.8)	2 (3.1)	19 (29.2)
18	17 (26.2)	11 (17.0)	5 (7.7)	33 (50.8)
Total	33 (50.8)	22 (33.9)	10 (15.3)	65 (100.0)

Chi-Square test= 4.3237 df=1, p<0.0001

Greater prevalence of smoked form, smokeless form and both form were seen among 12th class (38.5%, 18.5%, and 10.8%) students as compared to the 11th class (12.3%, 15.4%, and 4.6%). Greater (43.1%) prevalence of tobacco consumption were seen among lower middle class student, followed by lower class (24.6%), middle class (21.5%), upper middle class (7.7%) and upper class (3.1%) students respectively. (Table 7)

Table 7 Prevalence of smoked and smokeless tobacco according to socioeconomic status

SES	Smoked (%)	Smokeless (%)	Both (%)	Total (%)
Upper	2 (3.1)	0 (0.0)	0 (0.0)	2 (3.1)
Upper middle	3 (4.6)	0 (0.0)	2 (3.1)	5 (7.7)
Middle	8 (12.3)	3 (4.6)	3 (4.6)	14 (21.5)
Lower middle	14 (21.5)	10 (15.4)	4 (6.2)	28 (43.1)
Lower	6 (9.3)	9 (13.8)	1 (1.5)	16 (24.6)
Total	33 (50.8)	22 (33.9)	10 (15.3)	65 (100.0)

Chi-Square test= 5.1824, df=1, p<0.0001

DISCUSSION

In this study majority (26.2%) of government school students were from lower socio-economic class, while the majority (20.1%) of private schools students belongs from the middle socioeconomic class which is similar to the findings of study done by V gupta and R singh⁸.

100% of students were using tooth brush as cleaning aid and 93.2% used tooth paste as the dentifrices and 3.9% used dental floss. This is obvious due to the increase awareness regarding oral hygiene. However it is contrast to the findings found on studies done by Al qurashi H *et al*, it was found that 64.5% students brushed their teeth, 20% of them used dental floss. Also in a Canadian study it was found that 73% of students used tooth brush and 42% used dental floss. Also, in a study from Kuwait identified that about 30% students brushed their teeth.⁹ Norwegian study reported 95.5% of adolescents brushing more than once daily. Similarly it was also found on study conducted by Al qurashi H *et al*. it is contrast to our study in which 39.1% students of government school and 38.6% students of private school and overall 77.7% of students were brushing tooth once a day only¹¹.

Prevalence of tobacco consumption: The prevalence of tobacco use among school students in different States of India has been reported to vary from 1.9 per cent (Delhi) to 75.3 per cent (Mizoram)¹³. In the present study done in Patna city, Bihar, prevalence was 12.7%. Similar to our study conducted by Madan *et al*. prevalence was found to be 11%¹⁴. Also prevalence rates among students from the North Eastern Indian

States varied around 10% in Manipur and Meghalaya. The prevalence was higher in Bihar (19.5%), between 8 to 10 percent in Maharashtra and West Bengal and less than 4 percent in Goa and Tamil Nadu¹⁶. But contrary to our study lower prevalence of tobacco was found according to GYTS India 2002–2004 (8.3%), Also Jayakrishnan *et al* reported 8% respectively¹³

In the present study government school students (7.2%) consume more tobacco as compare to the private school students (5.5%). Similar result was found on the study in Haryana in 1995 and 2002 among adolescents¹⁴. Students in government schools were more likely to be tobacco users compared with those in private schools- perhaps because of improved information dissemination and greater stress on health education in private school compared with public schools. This finding is consistent with a study conducted among school adolescents in Pakistan¹⁸. In contrast to our findings Gupta *d et al*. and Kotwal *et al*, Sinha *et al*. found that private school students were 2.56 times more likely to use tobacco compared to governmental school students. Generally, students at private are from more affluent families than those at governmental schools¹⁹.

Smoked form of tobacco: In our study beedi consumption was more among government school students (30.2) as compared to the private school students (7%). whereas the consumption of cigarette was more in private school students (34.9%) as compared to the government school students (16.3%). In contrary to our study the study done by Gupta, 1996; Subramanian *et al*., 2004 found use of cigarettes was 1.7 times higher among government school students than private school students, whereas use of bidis was 2.1 times higher in government schools than in private school. A rather surprising finding was the higher prevalence of cigarette smoking among government school students as compared with private school students, because cigarettes are 8–10 times more expensive than bidis in this setting. This finding is in contrast to the pattern commonly found among adults in India, whereby those of higher socioeconomic class are using cigarettes at higher rates, and those of lower socioeconomic class are using bidis at a higher rate, especially in urban and rural settings, respectively. Over reporting by government school students to identify with the success and glamour promoted by advertising and promotion of cigarettes may partly explain this finding.²³

Smokeless form of tobacco: In our study khaini consumption is more among government school students (53.1%) than private school students (6.3%) Similar finding was also found on the study done by Jayakrishnan *et al*. which showed a high prevalence of smokeless tobacco use among government school students than private school students²⁴.

Reasons responsible for consumptions of tobacco: In our study Peer factor is the major (47.7%) factor responsible for consumption of tobacco followed by 24.61% by the own interest.23.1% of individual by the family influence. This is similar to the studies done by Jindal *et al*. and Al Haqwi *et al*²³.

Media and advertisement: In the present study 93.2% of the individual does not found any role of media and advertisement in the prevalence of tobacco consumption. Only 6.8% of the individual had seen anti tobacco messages in the last 30 days. In contrast to our study, studies of Mukherjee A *et al*²²., Wong

G *et al*²³ and Naing N²⁵ *et al*, found that one third (32.3%) of students reported that they saw tobacco promotional advertisements in the media or at social or sporting events during the last 30 days. Although the advertisement of tobacco products in national electronic media (i.e. Radio and Television) is already banned in India and several other countries, the clips of smoking film stars in different cinemas also influence students to use tobacco. The results of these studies showed that students exposed to tobacco promotional advertisements were 1.32 times more likely to use tobacco than those who were not exposed. Similarly, other research has shown that youth who were regularly exposed to such advertisements were more likely to use tobacco²⁶

Similar to our findings the study of Surani SN *et al*. found that there were no significant relationships found between intention to quit and exposure to pro- and anti-tobacco media messages. This is contrary to results reported in a community survey in two parts of India where it was found that exposure to an anti-tobacco program on the radio increased quitting behaviour. However, there was a significant association found between exposure to marketing and promotions and intention to quit²⁷

Tobacco control: In our study 100% of the students reported that they had been taught the harmful effects of consumption of tobacco in their school curriculum and also 100% said that discussions were not made on the reasons why people smoke. Similar findings was found on the study done by Arora M *et al*.²⁵

In the present study Prevalence of tobacco is greater (50.8%) among the students above 17 years old followed by 17 years (29.2%), 16 years (18.5%) and least 1.5% was found among 15 years old. Prevalence was also more among the 12th class student (67.7%) as compared to the 11th class student (32.3%). In the present study prevalence was more among the lower middle class (43.1%), and the least among the upper class (3.1%). In contrast to the study done by Khude s *et al*⁴, and Levin *et al*²⁸ found prevalence was more among the low socioeconomic status of students, since being relatively inexpensive and readily available; these children often see tobacco as an alternative to food. Chewing of these products is considered less harmful than smoking. Soteriades and Di Franza found that the risk of adolescent smoking increased by 30% for decrease in each level of parental household income²⁸.

Recommendation

- To prevent school students from initiating tobacco use and to better prepare them to become early adopters of a non-smoking culture, tobacco education
- In addition, and probably more importantly, there must be strong policies that will affect the acceptability of smoking or any other form of tobacco use.
- School campuses, should be smoke-free.
- On a broader societal level, tobacco control measures such as those outlined in the World Health Organization Framework Convention on Tobacco Control should be implemented.
- Ensure that sex-disaggregated data and a gender analysis are included in surveillance systems, research, monitoring, and evaluation of tobacco control programmes.

- Due to the early age of onset of substance use found it is recommended that these interventions must target students as young as possible, and involvement of peers and role models would have a high probability of success.

CONCLUSION

This study has demonstrated a high prevalence of tobacco usage among senior secondary school students of Patna city and a generally consistent finding obtained was that tobacco use was higher among government school students as compared to the private school students.

The findings highlight the need for preventive strategies aimed at young individuals, many of whom take up smoking as a habit, early in life. Dental public health efforts, therefore, need to include and emphasize the role of smoking and not only oral hygiene in primary preventive efforts.

The school years are a crucial period in the development or abandonment of adverse habits like tobacco use. Tobacco use in this group should be monitored closely, and young adults should be included in all tobacco control efforts. School offer a potential site for interventions to discourage tobacco use as students spend maximum time in the school premises. Students get indulged easily in the habits they see around and this is the age group when the peer pressure plays a highly influencing role. Reducing tobacco use of all types among young adults should be a national health priority.

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