

Cross Sectional Study to find out the Prevalence of Tobacco use among High School & Higher Secondary class Students of Government Schools of Bhopal

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Abstract

Background: Tobacco use, and its negative health, social and economic impacts, is a significant global health challenge. Tobacco consumption in each age group is emerging as public health problem in all countries. More so often difficult in case of school going adolescents due to the easy availability of the tobacco products. Despite of the well-known fact that tobacco use is one of the leading preventable causes of premature death, disease, and disability around the world.

Objectives: (1)To find out the proportion of students consuming tobacco among the students of government schools of class IX to XII.(2)To find out the age of initiation of tobacco consumption among the study group. (3)To find out the risk factors responsible for the tobacco habits among the study group.

Methodology: This was a cross sectional study with multistage sampling method, in which selection of schools was done by systematic random sampling from the list of all government schools of Bhopal district.

Results: The proportion of tobacco use among the study subjects in the current study was 22.69% with 46.21% in boys and 5.92% in girls. proportion of students consuming tobacco among the students of government schools of class IX to XII.In the present study, the mean age of initiation of tobacco use was 12+1.23years.

Keywords: Tobacco use, High School, Higher Secondary class, Bhopal, Reasons for tobacco use

Introduction

Tobacco use, and its negative health, social and economic impacts, is a significant global health challenge. According to the 2015 World Health Organization (WHO) Report on the Global Tobacco Epidemic, in 2013, 21% of adults globally were current smokers – 950 million men and 177 million women. Despite increasing global population between 2007 and 2013, smoking prevalence has actually declined worldwide from 23% in 2007, preventing an increase in the number of smokers in the world. The total remains at 1.1 billion smokers globally in 2013. More than one billion people about one quarter of the adults worldwide currently smoke tobacco.⁽¹⁾Tobacco consumption in each age group is emerging as public health problem in all countries. More so often difficult in case of school going adolescents due to the easy availability of the tobacco products. Despite of the well-known fact that tobacco use is one of the leading preventable

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causes of premature death, disease, and disability around the world, progressive increase in the consumption of tobacco among school going children is growing as a complex problem and approaching economy in shape of multidimensional problems. An estimated 4.9 million deaths occurring annually can be attributed to tobacco use. This figure is expected to rise to about 10 million by the year 2020, if the current epidemic continues, more than 70% of these deaths are expected to occur in developing countries.

⁽²⁾ Among adolescents 6 million deaths are estimated, out of which 0.6 million deaths are premature deaths due to use of tobacco. In India alone, nearly one in ten adolescents has ever smoked cigarettes in the age group of 13-15 years & almost half of these initiated tobacco before 10 years of age.

⁽³⁾ The purpose of this study is to examine the relationship between tobacco use in terms of frequency, quantity & form of use as smoked form or non smoked form.

Objectives

- To find out the proportion of students consuming tobacco among the students of government schools of class IX to XII.
- To find out the age of initiation of tobacco consumption among the study group.
- To find out the risk factors responsible for the tobacco habits among the study group.

Materials and Methods

This was a cross sectional study with multistage sampling method, in which selection of schools was done by systematic random sampling from the list of all government schools of Bhopal district. Students were selected from the classes.

Selection of first school: First school was selected randomly from the sampling frame. So first school, which was

randomly, selected (last digit of highest value rupee note in pocket on the day) from the list was school no.7 with cumulative population of 2143 recognized as first school.

Selection of rest of the schools: Second school selected by adding sampling interval i.e. 2968 into the cumulative population of first randomly selected school the additive value comes out to be 5111, which is less than the cumulative population of school no. 10. Hence second school selected was school no.10 recognized as second school and other schools were selected following the same method. Thus 10 schools selected from the list were school Within each school, a computer-generated random list of classes was generated to select the classes in grades IX to XII for participation in the study. Then after selection of schools random start of student from above mentioned selected schools. All eligible classes in the selected schools were included in the sampling frame. All students in the selected classes were eligible to participate in the study. A total of 130 students were taken from each school. The study procedure was designed to ensure confidentiality.

The total population of the study unit was 29681 students of IX to XII grades in 100 government schools of study area. It was decided to select 10 schools from the list. Selection of schools from the list: The sampling required complete enrollment lists of all the schools with class-wise strength of both boys and girls. This information was collected from the office of District School Education Officer Bhopal. The compiled data of schools used for drawing the study sample. The required sample size was calculated by using the formula:

$$n = (Z_{1-\alpha/2})^2 (1-P) \times P/d^2 \text{ (Daniel, 1999)}$$

Sample size came out to be 1275. So approximate sample size taken as 1300.

Observations

Table 1. Distribution of participants according to socio - demographic profile

Age in years	Males		Females	
	No.	%	No.	%
14-17 yrs	413	76.34	509	67.06
17-20 yrs	128	23.65	242	31.88
20-21 yrs	0	0	8	1.05
Total	541	100	759	100
Class				
IX	235	43.43	295	38.86
X	136	25.13	206	27.14
XI	87	16.08	131	17.25
XII	83	15.36	127	16.75
Total	541	100	759	100
Religion				
Hindu	489	90.43	475	62.60
Muslim	47	8.69	284	37.40
Christian	2	0.38	0	0
Sikh	0	0	0	0
Jain	3	0.47	0	0
Total	541	100	759	100

Above table shows that more than half of participants were in the age group 14-17 years, Hindu by religion & majority were from IX standard.

Table 2. Distribution of participants according to tobacco consumption

	Male		Females		Total	
	No.	%	No.	%	No.	%
Tobacco user	250	46.21	45	5.92	295	22.69
Using other than tobacco products	277	51.20	331	43.61	608	46.76
Non user	14	2.59	383	50.47	397	30.55
Total	541	100	759	100	1300	100

Above table shows that 22.39% males and 2.69% females were smokers. 47.40% males & 78.54% females were tobacco chewers. Also both forms were used by 30.21% males & 2.69% females respectively.

Table 3. Distribution of participants according to frequency of tobacco consumption

	Males		Females	
	No.	%	No.	%
Tobacco users				
Daily user	206	82.40	44	97.52
Non daily user	44	17.60	1	2.48
Total	250	100	45	100

Table 3. shows that amongst daily users 82.40% were males and 97.52% were females.

Table 4. Distribution of participants according to the form of tobacco consumed

Form of tobacco use	Males		Females	
	No.	%	No.	%
Smoker	56	22.39	1	2.22
Tobacco chewer	118	47.40	43	95.55
Both forms	76	30.21	1	2.22
Total	250	100	45	100

Above table shows that 22.39% males and 2.69% females were smokers. 47.40% males & 78.54% females were tobacco chewers. Also both forms were used by 30.21% males & 2.22% females respectively.

Table 5. Distribution of participants according to the age of initiation of tobacco consumption

Age in years	No.	%	No.	%
8 yrs	16	06.42	00	00.00
8-9 yrs	22	08.58	00	00.00
9-10 yrs	24	09.64	00	00.00
10-11 yrs	32	12.86	00	00.00
11-12 yrs	15	06.07	05	11.28
12-13 yrs	30	12.14	06	13.49
13-14 yrs	26	10.41	07	15.29
14-15 yrs	35	13.88	12	26.61
15-16 yrs	21	08.57	06	14.28
Don't know	29	11.43	09	19.05
Total	250	100.00	45	100.00

Above table shows that majority (13.88 %) of the males started tobacco by the age of 14-15 years while 26.6 % males and 19.05% females did not know the age of starting tobacco by them. girls initiated tobacco by the same age. In addition, 11.43%

Table 6. Genderwise distribution of participants according to the reasons for starting tobacco

Reasons	Males		Females	
	No.	%	No.	%
Peer pressure	75	30.00	16	35.55
Curiosity	60	24.00	11	24.44
Acceptance by family members	14	05.60	02	04.44
Style statement	07	02.80	01	02.22
Ignorance about after effects	33	13.20	07	15.55
Time pass	31	12.40	05	11.11
Free with other product	30	12.00	03	06.66
Total	250	100.00	45	100.00
p<0.0001				

Above table shows, that peer pressure in both the genders was one of the most common factor for initiation of tobacco consumption contributing for 30.00% in males and 35.55% in females. This association was found to be highly statistically significant. (p<0.0001)

Table 7. Distribution of tobacco use among family members of tobacco users

Tobacco use by family members	Males		Females	
	No.	%	No.	%
Yes	193	77.22	11	21.19
No	57	22.78	34	78.81
Total	250	100	45	100
p value <0.0001				

Above table shows that family members of 77.22% male tobacco users and 21.19% female tobacco users were involved in tobacco consumption respectively. The association was found to be highly statistically significant ($p < 0.0001$).

Table 8. Distribution of tobacco users according to the source of money received by them

Source of money	Males		Females	
	No.	%	No.	%
Pocket money	177	70.80	32	71.11
Job after school	051	20.40	01	02.22
Scholarship	012	04.80	02	04.44
Others	010	04.00	09	20.85
Total	250	100	45	100
p value <0.0001				

Above table shows those 70.80% male students & 71.11% females were given pocket money.

Table 9. Association between tobacco use and the type of family to which they belong

Type of family	Males		Females	
	No.	%	No.	%
Joint	096	32.55	893	88.85
Nuclear	199	67.45	112	11.15
Total	295	100.00	1005	100.00
p value < 0.0001				

Above table shows that 67.45% students who were tobacco users belong to nuclear families & 32.55% tobacco users were from joint families. Tobacco use was significantly associated with the type of family.

Discussion

The study group comprised of 1300 study subjects with boys 541 and 759 girls, of which 40.76% were from 9th standard, 26.30% were from 10th standard, 16.76% were from 11th standard and 16.15% were from 12th standard. Similar studies conducted by J Muttappallymyalil et al.⁽⁴⁾ in Kerala taking 1200 school children, Shailesh et al.⁽⁵⁾ in Kerala taking 1323 school children. Also the studies done with double the sample taken in this study as in case of Bathma et al.⁽⁶⁾ study, Hirani et al study⁽⁷⁾ & Vyas et al.⁽⁸⁾. Another studies done by Sharma et al, Dechlena et al.⁽⁹⁾, Soni et al.⁽¹⁰⁾, Bhambhal et al.⁽⁶⁾ with 550, 478, 600, 400 study subjects respectively. The study found that age group of

study subjects was 14-19 years. Similar studies conducted by Sharma et al in Bhopal, Shailesh et al.⁽⁵⁾ in Kerala, Soni et al.⁽¹⁰⁾ in Delhi, Bhambhal et al.⁽⁶⁾ in Bhopal with same age group. The study found that more than half of subjects were from the age group 14-16 years coming from the standard 9th and 10th. GYTS survey 2009 taken the study subjects from the age group 13-15 years mostly from the standard 9th and 10th. The study subjects when compared for the community, 74.15% were Hindus by religion and 25.46% were Muslim by religion. It clearly shows that Hindu and Muslim community are making up major proportion of the population studying in government schools of Bhopal. Another finding in the study was that fathers of 99.53% students were employed, only 0.46% were not involved in any work during the study. Similar finding in the study done by Shailesh et al.⁽⁵⁾ where 95.5% fathers of study subjects were employed at the time of study. In this study 62.52% fathers were educated up to primary school with

illiteracy found to be 19.53%. Another study done in Kerala by Shailesh et.al⁽⁵⁾ found 35.8 % fathers of study subjects were educated up to high school. This dissimilar finding due to the difference in literacy rate of two states.

Proportion of tobacco among the study group

The proportion of tobacco use among the study subjects in the current study was 22.69% with 46.21% in boys and 5.92% in girls. The proportion of tobacco use was significantly higher among boys than girls. Since the study sample included study subjects in the age group of 13-19 years, some increase could be attributed to the age factor because age was independently associated with tobacco use. In another similar study conducted by Sharma et al⁽¹¹⁾ in South Delhi where the prevalence of tobacco found close to this study i.e. 20.9%. Another study done by Bhambhal et.al⁽⁶⁾ in Bhopal city the prevalence of tobacco found was 29.3% almost close to this study. In another study conducted by Preeti et al⁽¹⁰⁾ in South Delhi among the same age group the prevalence of consumption of tobacco was found to be almost double of this study 49 % among the students with 50.2% boys and 23.3% girls respectively. The prevalence of ever tobacco use was 19.7% in the study in Nepal by Pradhan PMS et al.⁽¹²⁾, prevalence observed by Ankita Singh et al in their study was 44%. In Shailesh et.al⁽⁵⁾ study, Vyas et.al⁽⁸⁾ study prevalence of tobacco use among the study subjects was found to be 11.3% ,8.2% respectively ,quite lower to the value found in the current study. Another study conducted by Gururajet.al⁽¹³⁾. showed point prevalence of tobacco use among 13-15 year olds as 4.9%.

In a study conducted by Pal and Tsering tobacco use in school students were reported by 48.9%.⁽⁹⁾ Current any tobacco use was reported by 58.9% boys 61.4%, girls 51.2%); smokeless tobacco by 55.6% (boys 57.6%, girls 49.2%) and smoking by 19.4% (boys 23.0%, girls 7.8%). Current tobacco use prevalence among students (boys 61.4%, girls 51.2%) was high. A study by Sinha et al observed that among students in the southern region of India in the age group of 13-15 years, the prevalence of any form of tobacco use was 8.2%.⁽¹⁴⁾ Among the males, the rate was 10.3% and among the females, the rate was 5.7%. With regard to smokeless tobacco use, the prevalence observed was 3.4% (4.5% among males and 2.0% among females). But a study among school children in Jaipur observed that any form of tobacco use in males was 2.06% and in females it was 1.7%. With regard to smokeless tobacco use, the same was 0.56% and 0.85%, respectively; this observation was not in accordance with the other studies and also the present study. A study conducted in Goa reported that tobacco use among boys was 13.5% and among girls was 9.5%. A study conducted in Mumbai by Jayant et al reported that the prevalence of tobacco use ranged from 6.9% to 22.5%.⁽¹⁵⁾ Another study conducted in Kerala observed that the prevalence of all types of tobacco use was 29%

and smoking was 2%. A study conducted in Gujarat by Makwana et al observed that the prevalence of tobacco chewing increases with age. The prevalence was 28.4% in the age group of 10-13 years, 33.6% in the age group of 14-16 years, and 36.3% in the age group of 17-19 years. The study also observed that among the users, 66.2% had the habit of only tobacco chewing, 14.6% had the habit of only smoking, and 19.2% had the habit of both smoking and tobacco chewing. These studies supports the finding of prevalence of tobacco use among males in the present study.⁽¹⁶⁾ Another study conducted in Wardha reported that 68.3% boys and 12.4% girls had consumed some form of tobacco products in the last 30 days, with an overall prevalence of 39%.⁽¹⁷⁾ A study conducted in Delhi observed that the prevalence of tobacco use was 5.4% (boys: 4.6%, girls: 0.8%)⁽⁶⁾. Most of these studies support the observations made by the present study.

Age of initiation of tobacco by study subjects

In the present study, the mean age of initiation of tobacco use was 12+1.23years. Similar findings regarding age of initiation was 12 years as per the study done by J Muttappallymyalil et.al⁽⁴⁾ in Kerala and Preeti Soni et.al⁽¹⁰⁾ in Delhi. However, Yousif et.al⁽¹⁸⁾ found it to be 11 years & Hirani et.al⁽⁷⁾ found 11.66+1.89. As per the recent GYTS survey in India, the age of initiation of tobacco was before 10 years of age among middle age adolescents. The mean age for tobacco use initiation in the present study was found quite close with studies from Kathmandu, Kannur, Noida, and Kerala where the mean ages of onset were 14.15, 14.4, 12.4 and 13.2 years, respectively. It clearly shows that early and middle-adolescents are more vulnerable to initiation of tobacco use. Studies by Pal and Tsering & Pedenkar⁽⁹⁾ reported for initiation of tobacco products by school students before 10 years of age similar to the finding in GYTS survey 2009 in India. The present study and other studies also observed that the initiation of tobacco use is usually in the teen period.

Tobacco practices of participants

In the current study, smokeless form of tobacco is more prevalent than smoked form of tobacco in both genders. In this study it was found that only 21.2% boys were involved in smoked form of tobacco while remaining majority involved in smokeless form of tobacco. The prevalence of smoking was 8.1% among boys in a study done by Shailesh et.al⁽⁵⁾ which is quite less than the current study. In case of females students none of the girls involved in smoked form of tobacco similar to the finding observed by Chadda et.al study⁽¹⁹⁾. However, all girls were involved in smokeless form of tobacco where more than three fourth were engaged in pan masala and gutka similar to the finding in the study done by Mishra et.al in Bhopal. In addition pan masala and gutka were convenient to hide from their parents and

teachers, as use of these products is usually not allowed in younger age by their parents and teacher. In National Youth Tobacco Survey (2014) in USA study was done to determine how frequently (the number of days in the preceding 30 days) U.S. middle school (grades 6–8) and high school (grades 9–12) students used cigarettes, e-cigarettes, cigars, and smokeless tobacco products. Among current users (≥ 1 day during the preceding 30 days) in high school, frequent use (≥ 20 days during the preceding 30 days) was most prevalent among smokeless tobacco users (42.0%), followed by cigarette smokers (31.6%), e-cigarette users (15.5%), and cigar smokers (13.1%); a similar pattern was observed for those who used during all 30 days. Among current users in middle school, frequent use was greatest among smokeless tobacco users (29.2%), followed by cigarette smokers (20.0%), cigar smokers (13.2%) and e-cigarette users (11.8%). Current use of two or more types of tobacco products was common, even among students who used tobacco products 1–5 days during the preceding 30 days: 77.3% for cigar smokers, 76.9% for cigarette smokers, 63.4% for smokeless tobacco users, and 54.8% for e-cigarettes users. In one retrospective study conducted by Gargett et al.⁽²⁰⁾ in Barananki, Uttar Pradesh, 81.7% consumed tobacco more than five times a day.

Risk factors for tobacco

In the current study, amongst tobacco users, it was found that 35% boys & 8% girls buy it from shop 7.5% receive it from family and 5% receive it from friends. In a study conducted by Gururaj et al.⁽¹³⁾ one-third of current tobacco users (30.8%) purchased tobacco product in a store and one-fifth used it at home. In the current study amongst tobacco users, 92.5% boys and 100% girls reported that they never faced any difficulty in buying the tobacco products from the shop. In 2009, as per GYTS survey findings in India, approximately half the current smokers bought their cigarettes in a store and 56.2% were able purchase to purchase without any difficulty or refusal by shopkeepers because of their age. This suggests that the law regarding sale of tobacco products to minors and prohibition of sale around educational institutions needs to be enforced to protect youth from easy access to tobacco products. In the current study amongst tobacco users 40% boys spend more than ten rupees on the tobacco products while 54% girls spend 2-5 rupees on purchase of tobacco products. In the current study 44% tobacco users reported that tobacco is free with non tobacco products. In GYTS 2009, 8.1% of students surveyed had been offered free cigarettes by a cigarette company representative⁽³⁾. Greater focus on effective implementation of laws related to a ban on indirect advertisement, promotion and sponsorship of tobacco products is required.

In the current study, family members of 77.22% boys and 21.19% girls were using tobacco in any of the form.

This finding is significantly associated with tobacco habits amongst the study group. In families where members were involved, they often use study objects to procure tobacco products from shops. The results of this study revealed that adolescent students from families with at least one member using tobacco were 1.79 times more likely to use tobacco compared to those with no members using tobacco. In the current study peer pressure was the most common reason significantly associated for starting tobacco amongst both male and female participants of the study group. The findings were in agreement with the observation by WHO that adolescents whose parents or siblings smoke or whose friends do so are particularly likely to use tobacco themselves. Another finding in the present study was that the participants receiving pocket money were significantly associated with tobacco consumption. Jha (1994) too reported that examples set by family members, and peer pressure are strongly associated with tobacco use by young people.⁽¹⁾ Other studies in India support the observation too. The results of a longitudinal study too emphasized that close friends', siblings', and parents' smoking were all important influences on children's smoking. If parents as role models use tobacco especially in front of students, it conveys a wrong message about the social acceptability of Tobacco and contributes to normalization of the behavior. Among those who reported smoking, 12% initiated smoking before age 10.⁽³⁾ This is less than the 50% reported in GYTS of 8 states in India.

One of the major determinants of tobacco use was found to be peer pressure. Naresh R et al finding similar to this study in Gujarat and main inducing factor for addiction was found to be friends (61.69%) which in the present study was 30.00% in case of males and 35.55% in females⁽²¹⁾. In the current study tobacco use was found to be significantly associated with the family member usage, role models, peer pressure and the participants mostly belong to nuclear families. In the context of Indian culture, the family retains a considerable influence over the adolescent as compared to western countries, however the scenario is now changing and adolescents are gaining freedom early and relate more with their peer group. This finding could be related to the family pattern which we are developing in India. In this study 56.69% study subjects were from nuclear families.

Results

- The proportion of tobacco use among the study subjects in the current study was 22.69% with 46.21% in boys and 5.92% in girls. proportion of students consuming tobacco among the students of government schools of class IX to XII.
- In the present study, the mean age of initiation of tobacco use was 12+1.23years.
- In the current study, smokeless form of tobacco is more prevalent than smoked form of tobacco in both

genders. In this study it was found that only 21.2% boys were involved in smoked form of tobacco while remaining majority involved in smokeless form of tobacco.

- In the current study, amongst tobacco users, it was found that 35% boys & 8% girls buy it from shop 7.5% receive it from family and 5% receive it from friends.
- In the current study, family members of 77.22% boys and 21.19% girls were using tobacco in any of the form.
- In the current study peer pressure was the most common reason significantly associated for starting tobacco amongst both male and female participants of the study group.

Conclusion

After conducting this study, it is clear that tobacco consumption among adolescents is on rising trends. Smokeless form of tobacco is more prevalent among adolescents comparatively and age of initiation of tobacco is on decreasing trends. The common factors found responsible for tobacco consumption was peer pressure, use by family members, students receiving pocket money, unaware of the hazards of tobacco use.

Recommendation

IEC activities are needed to promote healthy behavior along with the use of tobacco should be strictly banned in the campus. Mobilization of non tobacco users to promote students who are using tobacco in any forms. Anti tobacco programme need to focus during the early age of students so as to prevent the burden of new generation being involved in this issue. Coordinated multi-component interventions needed to coalesce in policies and programmes so as to effectively reduce the proportion, age of initiation and intensity of tobacco consumption among the school going children.

Limitation of study

The study had some limitations. As the study is cross sectional in nature and tobacco chewing was self reported so there is possibility of being data under reported due to the taboo associated with it. Also on the day of visit students consuming tobacco might be absent that day. Keeping this in mind large sample collected and allowable error taken. Another limitation that in this study only school going children of standard IX to XII were included.

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