

# Tobacco Abuse Amongst the School Going Students of 15 to 18 Years of Almora District, Uttarakhand: A Cross Sectional Study

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## Abstract

**Purpose:** The present study was done to assess the prevalence of tobacco abuse among school going students of the age group 15 to 18 year old in the rural areas of Almora district, Uttarakhand state, India.

**Materials and Methods:** Schools were grouped into 4 zones north, south and east, west based on their location in district, respectively. Second stage one private and one government school was randomly selected from each zone of rural Almora. All students belonging to age 15 to 18 year were selected from the selected schools. Data was collected by a pretested, closed ended questionnaire.

**Results:** Overall, the prevalence of tobacco consumption among the adolescents was 45.42%. 63% male and 47.1% female adolescents were habituated to it. All female and majority of the male adolescents predominantly consumed a smokeless form of tobacco.

**Conclusion:** The prevalence of tobacco consumption indicates a downward shift in the age for the uptake of tobacco habit by adolescents and a rising prevalence among girls. Our findings suggest that tobacco use prevention and control measures are warranted and should be started very early preferably at primary education level.

*Key words: Prevalance, Tobacco consumption, School children, Smokeless tobacco*

## Introduction

Tobacco is a major public health problem since decades [1]. Given the current pattern of tobacco use globally it is estimated 250 million who are alive today, would die prematurely because of tobacco and mostly in developing countries [2]. India ranks 4<sup>th</sup> in the total tobacco consumption in the world. But, India's cigarette consumption ranks 11<sup>th</sup> in the world. Out of the total production, only 19% of the total consumption of Tobacco is in the form of cigarette whereas 81% is in other forms like, chewing, bidi (Tobacco rolled in tendu leaf), snuff, Gutka paste (Tobacco paste), Jarda, hookah paste etc.

Tobacco and alcohol are the most widely used addictive substances in the Almora district and both have serious public health consequences. Use of tobacco is extremely common throughout the district and most of its use is in the form of cigarettes. As tobacco use in developed countries is decreasing, multinational tobacco companies are targeting youths of developing countries through different promotional activities and advertisements. Use of non-smoking tobacco products is increasing in Almora district of India, as tobacco control programs are very limited and focused only on tobacco products that are smoked.

Tobacco smoking and chewing are the main causes of lung cancer and oral cancer are the second major causes of death in the world. The tobacco death toll is expected to double by 2025 from the present 5 million deaths (approximately). At every 6.5th second, a person dies because of a tobacco related

disease, globally [3]. In India, tobacco use is estimated to cause 800,000 deaths annually [4].

The world Health Organization has predicted that tobacco deaths in India may exceed 1.5 million annually by 2020 [5]. The epidemic of tobacco use is shifting from developed to developing countries, including India, where increased use is expected to result in a large disease burden in the future [6]. Tobacco use is one of the major preventable causes of death and disability worldwide. WHO estimates that 4.9 million deaths annually are attributable to tobacco [7].

Forms of Tobacco chewing prevalent in Almora district and other parts of India include Pan {piper betel leaf sliced with areca nut lime catechu and other spices chewed with or without tobacco}, Pan masala or gutkha [chewable gutkha containing areca nut], Mishri [A powdered tobacco rubbed on the gums] [8].

High-risk behaviors are not only more prevalent, but also result in more serious complications to adolescents than adults. In this context, protecting every adolescent from initiating tobacco use is the best intervention for the promotion of the health status of our nation. Thus, this study aims to estimate the level of tobacco use among school-going adolescents and also identify the factors that influence youth to use tobacco. Identification of the factors responsible for initiating tobacco use among adolescents will be useful for identifying the most effective interventions to prevent youths from taking up the tobacco habit. In addition, the influence of the media, peer

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groups, and family on the students' decisions to initiate tobacco use, their level of knowledge about hazards of tobacco use, their perceptions regarding tobacco use, and their level of exposure to environmental tobacco smoke are also explored in this study. This is the study of first of its kind as it has surveyed the new and high risk population of adolescents aged 15-18 years in Almora district; Uttarakhand; India which was left till now.

## Materials & Methods

The present study was designed to study the prevalence of Tobacco use among 15 to 18 year old school going students in Almora district. At first stage list of all private and government schools was obtained from District Education Office. Then the schools were grouped into 4 zones north, south, east, west based on their location in district respectively. At the second stage one private and one government school was randomly selected from each zone of district. 20 subject's each were selected randomly, based on the table of random numbers from 2 school with equal number of boys and girls. Permission was obtained from the education department and principals of selected schools. Ethical approval was obtained from institutional review board. Informed consent was obtained from subject's parents.

Study population comprised of all the students belonging to age 15 to 18 year from the selected schools of the district. Data was collected by a pretested, closed ended questionnaire. The questionnaire was designed in such a way that there was no skipping or branching pattern and hence requires answering all questions. Knowledge, Attitude and practice towards tobacco use were also assessed in the study. There was no prevalence data for the use of tobacco among students of 15-18 years in the region. Hence, a pilot study was conducted among 200 students. The sample size was calculated on the basis of the results acquired from the pilot study. Based on the results of pilot study, the sample size was estimated to be 1378, but the sample size was chosen as 1400, this is to avoid dropouts or refusal.

### Inclusion Criteria

Adolescent students aged 15-18 years who are permanent residents of Almora district and whose parents gave informed consent.

### Exclusion criteria

Students whose parents do not give informed consent or who are severely ill.

## Results

The results of the study are presented in two sections. The first section describes the general characteristics of the respondents. The second section deals with the prevalence, types and determinants of tobacco use.

The total number of the respondents in the study was 1365. However some of the respondents did not answer some questions either because they were not applicable or because they did not want to answer. *Table 1* shows the General characteristics of population. Nearly equal proportion of

**Table 1.** General characteristics of study population.

Characteristics		Frequency	Percent
Sex	Boys	703	51.5
	Girls	662	48.5
Grade	Ten	386	28.3
	Eleven	596.5	43.7
	Twelve	382	28.0
School	Government	826	60.5
	Non-Government	539	39.5

Note: Number of respondents varies for different variables due to different response rate.

boys (51.5%) and girls (48.5%) participated in the study. About three fifths (60.5%) of the respondents were from governmental schools and two fifths (39.5%) were from non-governmental schools.

### Prevalence of tobacco use

This section deals with the tobacco use pattern of students among grades 10, 11 and 12 from both governmental and non-governmental schools of Almora. Prevalence, type and frequency of tobacco use are presented by sex and type of school as explained in (*Table 2*).

Of the total respondents, nearly half (47.1%) of students ever used any tobacco product. Pan masala and gutkha were the most commonly used smokeless tobacco products. About half (29.4%) boys and one-third (10.3%) girls ever used pan masala or gutkha and more common among students of non-governmental schools (61.1%) than those from governmental schools (38.0%). Of the total respondents, nearly one in seven (13.2%) were current (either regular or occasional) users of any tobacco products, one in four (22.7%) were experimental users (i.e. used any tobacco products not more than 10 times) and one in ten (10.6%) were past users of any tobacco product. More boys (17.4%) were currently using tobacco products than girls (8.6%) and more students of non-governmental schools (18.2%) were using tobacco currently than students from governmental schools (10.0%) as in (*Table 3*).

The average age of initiating tobacco use was 12.64 years. Initiation of tobacco use was earlier by a few months among girls (12.40 years) than boys (12.76 years). Similarly, adolescent students of non-governmental schools initiated tobacco earlier (12.48 years) than students of governmental schools (12.82 years) as shown in (*Table 4*).

A substantial proportion (71.0%) of students reported that at least one family member used tobacco (*Table 5*). When asked about the tobacco use habit of their friends, nearly half of students (43.9%) reported that at least one of their four best friends used tobacco. More boys (63.7%) than girls (23.0%) reported the use of tobacco by friends. Similarly, more students of nongovernmental schools (55.5%) reported the use of tobacco by friends than students of governmental schools (36.3%).

### Knowledge about hazards of tobacco use

Students were asked if they were aware of the harmful effects of tobacco use. Of the total respondents, 1365 (91.4%) students claimed to have knowledge about the hazards of tobacco use. Among the students who reported to have knowledge about

**Table 2.** Prevalence of tobacco use by type of tobacco product.

Category		Type of tobacco			
		Any tobacco Product	Cigarette bidi	Surti Khaini	Pan masala Gutkha
Sex	Boys	82.6 (± 3.1)	22.9 (± 2.2)	5.0 (± 1.4)	29.4 (± 3.1)
	Girls	17.4 (± 3.0)	5.9 (± 1.6)	0.9 (± 0.7)	10.3 (± 3.0)
School	Government	38.0 (± 2.8)	11.7 (± 1.9)	2.4 (± 0.9)	31.3 (± 2.7)
	Non-government	61.1 (± 3.4)	19.3 (± 2.8)	4.0 (± 1.4)	56.3 (± 3.5)
Total		47.1 (± 2.2)	14.7 (± 1.6)	3.0 (± 0.8)	41.2 (± 2.2)

Note: Values in the parenthesis indicate 95% Confidence Interval

**Table 3.** Proportion of students using tobacco by frequency of use.

Category		Frequency of tobacco use			
		Current user	Past users	Experimental users	Never users
Sex	Boys	17.4 (± 2.4)	14.8 (± 2.3)	27.9 (± 2.8)	39.9 (± 3.1)
	Girls	8.6 (± 1.8)	6.1 (± 1.6)	17.4 (± 2.5)	67.9 (± 3.0)
School	Government	10.0 (± 1.8)	10.0 (± 1.8)	19.5 (± 2.3)	62.6 (± 2.8)
	Non-government	18.2 (± 2.8)	18.2 (± 2.8)	27.6 (± 3.2)	39.5 (± 3.5)
Total		13.2 (± 1.5)	10.6 (± 1.4)	22.7 (± 1.9)	53.5 (± 2.2)

Note: Values in the parenthesis indicate 95% Confidence Interval, Twelve cases not reporting the frequency of use were excluded in analysis.

**Table 4.** Proportion of students initiating tobacco before 10 years of age and the average age of initiating tobacco.

Category		Initiating tobacco use	
		Proportion below 10 years of age	Mean age
Sex	Boys	19.2 (± 3.2)	12.76 (± 1.7) years
	Girls	19.1 (± 4.6)	12.40 (± 0.3) years
School	Government	18.9 (± 3.7)	12.82 (± 0.2) years
	Non-government	18.9 (± 3.7)	12.48 (± 0.2) years
Total		18.9 (± 2.6)	12.64 (± 0.2) years

Note: Values in the parenthesis indicate 95% Confidence Interval.

**Table 5.** Proportion of students by the tobacco use habit of family members and friends.

Category		Tobacco use habits of family members		Tobacco use habits of friends	
		At least one family member uses tobacco	No family member uses tobacco	At least one of four best friends uses tobacco	No of four best friends uses tobacco
Sex	Boys	72.4 (± 2.8)	27.6 (± 2.8)	63.7 (± 3.0)	36.3 (± 3.0)
	Girls	70.0 (± 2.9)	30.0 (± 2.9)	23.0 (± 2.7)	76.7 (± 2.7)
School	Government	72.2 (± 2.6)	27.8 (± 2.6)	36.3 (± 2.8)	63.7 (± 2.8)
	Non-Government	69.5 (± 3.2)	30.5 (± 3.2)	55.5 (± 3.5)	44.5 (± 3.5)
Total		71.0 (± 2.0)	29.0 (± 2.0)	43.9 (± 2.2)	56.1 (± 2.2)

Note: Values in the parenthesis indicate 95% Confidence Interval.

the health hazards of tobacco use, (46.5%) have ever used tobacco and (53.5%) were never users (Table 9).

### Perceptions towards tobacco use

The perception of adolescent students was measured with a five-point scale on given statements. Students were asked to mark any one option among 'strongly agree', 'agree', 'can't say', 'disagree' and 'strongly disagree' for each given statement. Finally, the responses 'strongly agree' and 'agree' were merged to "agree", and responses 'strongly disagree' and 'disagree' were merged to disagree" for simplification during analysis.

About half (47.9%) of adolescent students disagreed with the statement that tobacco users are more attractive. A higher percentage of girls (49.0%) than boys (46.9%) disagreed that tobacco users are more attractive. A higher proportion of students from non-governmental schools (53.1%) disagreed with the statement than those from governmental schools

(44.2%) (Figures 1-3).

The proportion of tobacco users among those who agreed with the statement that tobacco users have more friends was higher (48.6%) than those who disagreed (47.5%) or were undecided (45.7%), but the difference was not significant (Table 7)

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### Exposure to pro-tobacco advertisements

Nearly one third (32.3%) of the total respondents replied that they had seen tobacco promotional advertisement in media or at events during the last thirty days. More boys (36.5%) than girls (27.5%) were exposed to tobacco promotional advertisement. The proportion of students exposed to tobacco

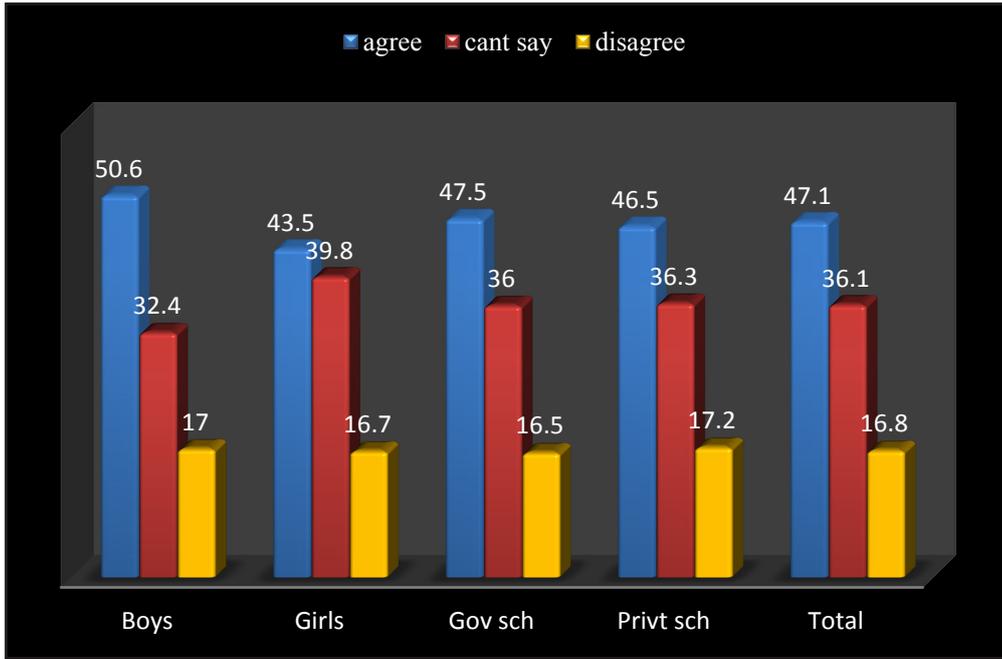


Figure 1. Proportion of adolescent students having different level of agreement on the statement that "tobacco users have more friends".

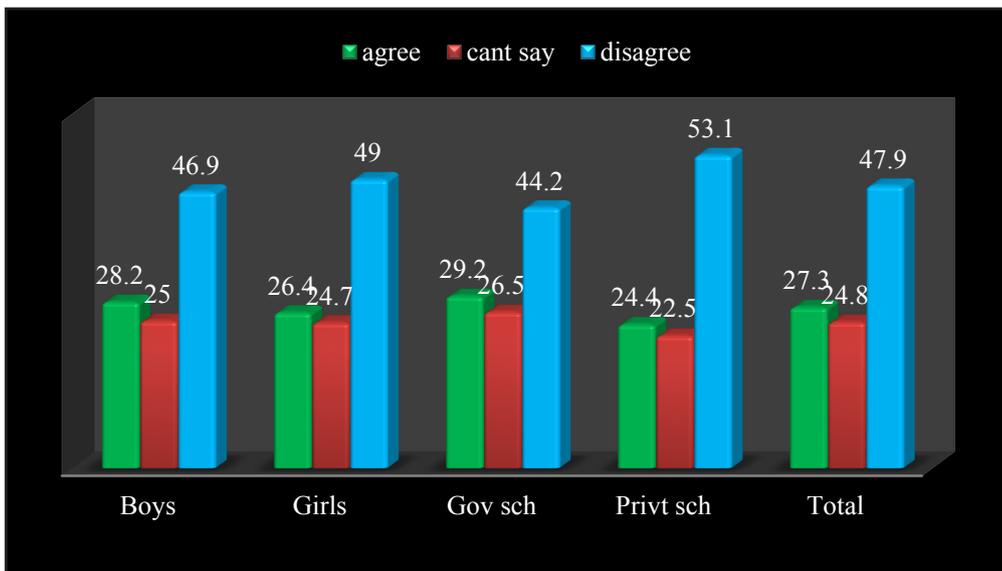


Figure 2. Proportion of adolescent students having different level of agreement on the statement that tobacco users are more attractive.

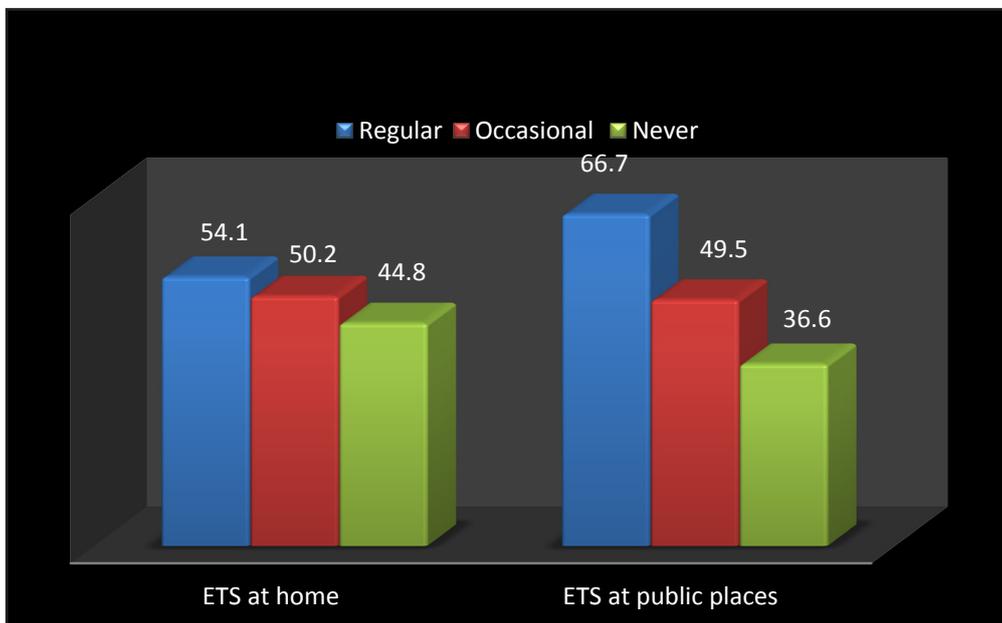


Figure 3. Proportion of adolescent students using tobacco by their level of exposure to Environmental Tobacco Smoke at home and at public places.

**Table 6.** Proportion of students by level of knowledge about hazards of tobacco use.

Category		Level of knowledge about hazards of tobacco use		
Sex	Boys	Good knowledge (a)	Some knowledge (b)	Poor knowledge (c)
	Girls	28.1 (± 3.1)	46.0 (± 3.3)	25.9 (± 2.9)
School	School	33.9 (± 3.1)	39.6 (± 3.2)	26.4 (± 3.0)
	Government	30.1 (± 2.7)	39.1 (± 2.9)	30.9 (± 2.8)
Tobacco user	Non-Government	32.5 (± 3.5)	48.6 (± 3.7)	18.9 (± 2.9)
	Ever user	32.0 (± 3.2)	43.2 (± 3.4)	24.7 (± 3.0)
Total	Never user	30.1 (± 2.9)	42.5 (± 3.1)	27.4 (± 2.8)
	Total	31.0 (± 2.2)	42.8 (± 2.3)	26.2 (± 2.0)

Note: Values in the parenthesis indicate 95% Confidence Interval  
a. Able to report at least two major health hazard/illness.  
b. Able to report one major health hazard/illness.  
c. Not able to report any major health hazard/illness.

**Table 7.** Proportion of adolescent students using tobacco by level of agreement with the statement that "tobacco users have more friends".

Category		Proportion of adolescent students using tobacco by level of agreement on Category the statement that "tobacco users have more friend"		
Sex	Boys	Agree	Can't Say Disagree	Disagree
		Girls	63.5 (± 4.2)	58.9 (± 5.4)
School	Government	30.0 (± 4.5)	33.9 (± 4.9)	38.8 (± 7.8)
	Non-Government	38.0 (± 4.1)	38.1 (± 4.7)	39.6 (± 7.0)
Total	Government	65.1 (± 5.0)	57.1 (± 5.9)	59.1 (± 8.5)
	Total	48.6 (± 3.2)	45.7 (± 3.7)	47.5 (± 5.5)

Note: Values in the parenthesis indicate 95% Confidence Interval

**Table 8.** Proportion of adolescent students using tobacco by level of agreement with the statement that "tobacco users are more attractive".

Category		Proportion of adolescent students using tobacco by level of agreement on the statement that "tobacco users are more attractive"		
Sex	Boys	Agree	Can't Say Disagree	Disagree
		Girls	62.4 (± 5.8)	63.8 (± 6.1)
School	Government	31.2 (± 5.9)	30.0 (± 6.0)	35.3 (± 4.5)
	Non-Government	39.9 (± 5.3)	38.4 (± 5.5)	36.8 (± 4.2)
Total	Government	61.9 (± 7.1)	63.7 (± 7.3)	59.7 (± 4.8)
	Total	47.7 (± 4.3)	47.5 (± 4.5)	46.9 (± 3.2)

Note: Values in the parenthesis indicate 95% Confidence Interval.

**Table 9.** Proportion of adolescent students by their exposure to pro-tobacco Advertisements.

Category		Seen any tobacco promotional advertisement in media or events during last 30 days	
Sex	Boys	Yes	No
		Girls	36.5 (± 3.0)
School	Government	27.5 (± 2.9)	72.5 (± 2.9)
	Non-Government	31.6 (± 2.7)	68.4 (± 2.7)
Tobacco use	Ever Users	33.3 (± 3.4)	66.7 (± 3.4)
	Never Users	35.5 (± 3.1)	64.5 (± 3.1)
Total	Never Users	29.4 (± 2.8)	70.6 (± 2.8)
	Total	32.3 (± 2.1)	67.7 (± 2.1)

Note: Values in the parenthesis indicate 95% Confidence Interval.

promotional advertisement from governmental and non-governmental schools was almost the same (31.6% vs 33.3% respectively). More tobacco users (35.5%) were exposed to tobacco promotional advertisements than non-users (29.4% (Table 9).

## Discussion

The aim of the study was to determine the prevalence of tobacco consumption among 15 to 18 year school going students of Almora District, Uttarakhand and type of tobacco

use among students of Almora district, Uttarakhand and to identify the factors that influence them to initiate tobacco use.

Unfortunately, tobacco use is on the rise in several developing countries including India [9]. Nearly half (47.1%) of students studying in schools of the age group 15 to 18 years old ever used tobacco. High proportions (22.7%) of adolescent students were found using tobacco product for experimentation. Study conducted by Madan et al. [10] and Jayakrishnan et al. [11] among school students showed that the current use of any form of tobacco was found to be 11%

and 8% respectively. Boys were 3.15 times more likely to use tobacco compared to girls. The finding is almost similar to the result of GYTS (Global Youth Tobacco Survey) [12]. The proportion of ever users may be higher among boys than girls as boys in Indian culture enjoy higher level of freedom regarding their individual behaviors than girls both from the family and society. Gender gap in tobacco use is narrowing globally. The prevalence of tobacco use among adolescent especially among girls is alarming [13]. However studies done by Sinha et al. [14], Jayakumary et al. [15] reported that the mean age at initiation of 'exclusive smoking' was significantly lower in girls as compared to boys.

In our study Non-governmental school students were 2.56 times more likely to use tobacco compared to governmental school students. Generally, students at non-governmental schools are from more affluent families than those at governmental schools. Similar to Kotwal et al. [16] our study also revealed that the government school students were more aware than private school students. This lack of knowledge among private school students was also reflected by a higher prevalence of risk-taking attitude among them [17]. Early uptake of tobacco chewing was from private school students as compared to government school students as shown by Sinha et al. [14].

About one in seven (14.7%) students used tobacco in smoking form like cigarettes or *bidis*. Jayakrishnan et al. [11] showed a high prevalence of smokeless tobacco use among school students (4.1%) with current smokers being less than 1%. There is also a popular misconception that smokeless tobacco products are less harming than smoking [18] Contrary to this Madan et al. [10] showed that prevalence of current smoking to be 8.1% and use of smokeless tobacco was 3.2%. One of the important reasons for increase in consumption of smokeless tobacco might be the recent increase in Tax on cigarettes which has resulted in cigarettes becoming more expensive than smokeless tobacco [17].

High proportions (22.7%) of adolescent students were experimental users during the time of the survey and about one in ten (10.6%) students had used tobacco products in the past but were not current users. The result is almost similar to the result from GYTS, where 11.6% of students were using tobacco products currently, among which 15.3% were boys and 6.4% were girls.

The prevalence of tobacco use among school students of Almora district, Uttarakhand; India was higher than earlier tobacco use studies in India. The prevalence rates among students from the North Eastern Indian States varied around 10 percent in Manipur and Meghalaya [19]. The prevalence of 'ever-use tobacco' was high in Bihar (19.5%), between 8 to 10 percent in Maharashtra and West Bengal and less than 4 percent in Goa and Tamil Nadu [14,20,23].

The average age of initiating tobacco use was 12.64 years (12.76 for boys and 12.40 for girls). Experimental use was the main reason for initiating tobacco use by students along with peer pressure. The proportion of students initiating tobacco before they are 10 years of age was lower in this study (18.9%) compared to the GYTS. Youth are perhaps experimenting

sooner with smokeless tobacco products than cigarettes, thus the age of initiating tobacco use among them is lower than the age of first smoking.

A substantial proportion (71.0%) of the students reported that at least one of their family members use any tobacco products. This result (71%) is much higher than the GYTS where 37.8% lived in homes where others smoke. Among the students with tobacco habit around 50% of their fathers were tobacco users which is in accordance with our study [23]. The role of peer groups and teachers in initiating cigarette smoking in students is significant [24,25].

Results of this study indicated that knowledge of the hazards of tobacco use did not influence students' decisions about initiating tobacco use. A substantial proportion of students thought that tobacco users are more attractive and have more friends. Singh et al. [26] showed that 2842 boys (99.2%) boys and 934 girls (99.5%) were aware that tobacco use is harmful and similar proportions disliked it. Jayakrishnan et al. [27] found that awareness about oral cancer was significantly higher among the females when compared to males. The glamour and slogans used in tobacco advertisements also result in the development of favorable perceptions of tobacco use as desired by tobacco companies. Seter siziya et al. [28] found that adolescents said that boys or girls who smoke or chew tobacco have more friends; smoking or chewing tobacco makes boys look less attractive. However Bhojani et al. [29] reported that tobacco use is not a good habit', 'It shows your character and mindset and a lack of control over oneself', 'I don't have any such bad habits', 'It (tobacco use) reduces our dignity in society and creates a bad name in society'.

Nearly 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 this study 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 tobacco [22,30,31].

Limitation of the study can be that the no broad generalization could be made due to limited area of setting and limited sample size. There is a need for similar study which may be conducted in large scale on students as well as general population in order to major draw generalization.

## Conclusion

The study showed that the family, peers, adolescents' sense of wellbeing and self-esteem are strong influences in the smoking habit of adolescents. Since prevention is said to be better than cure, it is important to examine the root cause of the problem as present study found that adolescents with psychological problems have a high chance of initiating smoking. Smoking prevention programs should aim at identifying risk groups and finding measures to protect the vulnerable group from initiation. Adolescents should

be counseled on the effects of keeping bad company and advised to choose their friends wisely. Programs should aim at helping adolescents gain emotional control so that they don't give in to pressures from peers. Also since adolescents learn by imitation, older siblings and family members should be educated on the dangers of smoking in the presence of adolescents and also about leaving cigarettes at the disposal of

adolescents. Students should be supported on ways of dealing with stress so that they don't turn to cigarettes. A similar cross sectional study may be conducted in large scale and comparison can be done between Urban and Rural adolescent students in order to draw generalization for the betterment of mankind.

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