

# Prevalence patterns and profile of adolescent tobacco users findings from a youth survey: A cross-sectional study

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## ABSTRACT

**Aim:** To assess the prevalence of smoking and smokeless tobacco use among 16--19-year-old government and private college student of Bhubaneswar city. **Materials and Methods:** A cross-sectional descriptive study was designed and data on tobacco usage was collected from 906 students aged 16--19-year old government and private college students of Bhubaneswar city using modified youth tobacco survey (YTS) closed-ended questionnaire. Data was analyzed using descriptive statistics and Chi-square tests were used to determine the significant differences in the variables of interest. **Results:** Out of 906 study subjects, mean age of initiation of use of tobacco product was found to be 14.8 among males and 15.3 among females. The responses of study subjects upon there believe that tobacco companies try to lure young people to use tobacco products, 54.7% males, 45.3% females reported as yes. 63 (9.9%) of students from private college reported using smokeless tobacco whereas 27 (10%) of students from government college used chewing tobacco. The results were statistically significant. A total of 84 (16.9%) males followed by 18 (4.4%) females reported to have ever tried smoking. The results were statistically significant. **Conclusion:** It was encouraging to find that during the period of the survey, majority of students did not use tobacco of any form. Regular and systematic education programs catering to teachers, children, and also their parents should be undertaken. Enabling teachers to educate the young impressionable minds regarding lifestyle disorders should be a cornerstone activity in preventing the establishment of lifestyle disorders like tobacco and alcohol use within the community.

**Keywords:** Smokeless, smoking, tobacco use

## Introduction

The epidemic of tobacco use is one of the greatest threats to global health today. It is one of the preventable cause of disease and disability around the world. According to estimates made by the World Health Organization (WHO), currently about 5 million people die prematurely every year in the world due to

the use of tobacco and by 2030, it would double to 10 million deaths every year, with about 7 million of the deaths taking place in developing countries. India will have the fastest rate of rise in deaths attributable to tobacco and many of these will occur in the productive years of adult life, as a consequence of an addiction acquired in youth.<sup>[1]</sup> The main risk factors for developing oral cancer is attributable to tobacco use. India's tobacco problem is more complex than probably that of any other country in the world, with a large consequential burden of tobacco related disease and death. According to the National survey on drug use and health, nearly all tobacco use begins in childhood and adolescence.<sup>[2]</sup>

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In a nationwide sample of individuals aged 16–26 years from 2012 to 2013 examined patterns of single, dual, and polytobacco use. The most common use patterns involved cigarettes: 49% of all single users smoked cigarettes, 69% of dual users combined cigarettes and another tobacco product, and most polytobacco users smoked cigarettes in combination with two or more tobacco products. These results and others highlight the sizeable youth population that engages in concomitant tobacco use (dual and polytobacco) and unique risk factors associated with these consumption patterns.<sup>[3]</sup>

Adolescents, in today’s world, are increasingly exposed to changing lifestyles that have very negative impact on health. Addictions developed in adolescence are likely to persist into adult life. One such addiction being tobacco use among children and adolescents is reaching at its pandemic levels. The World Bank has reported that between 82,000–99,000 children and adolescents all over the world begin smoking every day. About half of them will continue to smoke into 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 children.<sup>[4]</sup>

Adolescents and young adults of colleges are often targeted by the tobacco industry. Various tobacco companies are trying to attract youth and young adults by manipulating the ingredients like by adding exotic flavors, and making colorful appearance of packaging which are appealing to the youth.<sup>[5]</sup>

According to WHO and GATS (Global Adult Tobacco Survey) report, 2016–2017 in its second round in Odisha after seven years of its first round, revealed that smoking has been dropped during this period but the percentage of non-smoking tobacco still remains the same. The percentage of non-smoking tobacco consumers is just double the national average in Odisha.<sup>[6]</sup>

As there is high prevalence of tobacco usage among the adolescent and limited data is available on the tobacco use by the youth of Bhubaneswar city, this study was carried out with an aim to conduct a YTS using modified (YTS) questionnaire among 16–19 year college students of Bhubaneswar city Odisha.

## Materials and Methods

### Study design

A cross-sectional descriptive study based on modified youth tobacco survey (YTS) 2011 questionnaire was conducted among college going students aged 16–19 years from junior and degree colleges in Bhubaneswar city, Odisha. Ethical approval was granted from institutional ethics committee of Kalinga Institute of Dental Sciences (KIMS/KIIT/IEC/12/2017).

### Study duration

The study was carried out for a period of 4 months from the month of April 2017 to July 2017. Bhubaneswar is the capital state of Odisha.

Sample size determination was done based on empirical data for the given prevalence by 30%; using the formula, the sample size was derived. A total sample size was 906 was derived.

Prevalence is = 30%      Where  $P$  = Prevalence

Margin of error = 10%       $D$  = Design effects

Power of the study = 90       $E$  = error

Design effect =  $(-1)$

Alpha = 0.05, 95% confidence interval

$$N = \frac{(Z_{\alpha/\alpha})^2 P (1 - P) D}{E^2}$$

$$N = (1.96)^2 0.60 (1-0.70) 1$$

$$(0.1 0.60)$$

$$= 3.8416 \times 0.30 (0.70) 1$$

$$0.0009$$

$$= 906 \text{ (SAMPLE SIZE)}$$

The population list of college students was obtained from the Directorate of Higher Education, Bhubaneswar. Total number of junior and degree colleges in Bhubaneswar is 81. Out of which 19 are government college and 62 are private college. Stratified Random Sampling Technique was used. Bhubaneswar city is divided into three administrative zones: north zone, south east zone, and south west zone by using a software (computer generated random allocation) from the list of the colleges obtained from Directorate of Higher Education; to keep equal proportion of samples, three government and seven private colleges was selected.

### Inclusion criteria

- Student between the age group of 16–19 years will be included in the study
- Participants who will be present at the time of the study, individuals who are eager to participate will give informed consent.

### Exclusion criteria

- Students who will be absent at the time of distribution of questionnaire
- Students who did not give their consent.

### Questionnaire

The proforma consisted of a pretested questionnaire based on YTS 2011. Information regarding smoking and smokeless tobacco was ascertained using this questionnaire from the YTS, 2011 which has been taken from centers of diseases control (cdc) and modified to suit the present study. The questionnaire consisted of 27 closed-ended questions pertaining to attitude

and practice regarding tobacco use adopted from YTS. The questionnaire measures the knowledge attitude toward tobacco use and exposure to media advertising.<sup>[7]</sup>

Chewing tobacco is a type of smokeless tobacco made from cured tobacco leaves. It may be sweetened and flavored with licorice and other substances. It comes in the form of loose tobacco leaves, pellets, or “bits” (leaf tobacco rolled into small pellets), plugs (leaf tobacco pressed and held together with some type of sweetener), or twists (leaf tobacco rolled into rope-like strands and twisted). It is placed in the mouth, usually between the cheek and lower lip, and may be chewed.<sup>[8]</sup>

The definition of smoking as the inhalation of the smoke of burned tobacco that may occur occasionally or habitually as a consequence of a physical addiction to some chemicals, primarily nicotine, cannot be fully accepted today since several clinical, biological, metabolic, epidemiologic, statistic, and socioeconomic factors which play a basic role in determining individual damage due to smoking are missing in this assessment.<sup>[9]</sup>

**Data collection**

The data was collected using the pretested closed-ended questionnaire. Students who fulfilled the inclusion criteria were included in the study. They were asked to sit in a classroom then the investigator distributed the questionnaire to the participants and they were asked to fill up the questionnaire after the study participants filled the questionnaire then it was collected by the investigator.

**Statistical analysis**

The data obtained was compiled systematically, transformed from a precoded proforma and was entered into Microsoft Excel (Version 2013), descriptive statistics was used to analyze the data using SPSS version 23.0 Chi-square test was carried out for comparison between government and private college and between male and female.

**Results**

The study population consists of 906 students, 62.80% males and 37.20% females belonged to the government college and 51.50% males and 48.50% females belonged to the private college, respectively [Table 1].

The mean age of initiation between males and females of government and private college students is 15.38 and 14.74, respectively [Table 2].

When the students were asked that do they believe that tobacco companies are trying to get young people under 18 to use tobacco, 271 (54.7%) males followed by 224 (45.3%) females responded as yes. The results were statistically significant as *P* value is 0.01. 144 (53.5%) of students from government college and 125 (46.5%) of students from private college responded

as yes. There was no statistical significance between both the colleges [Table 3].

When the students were asked that have they used chewing tobacco like snuff or dip, 77 (15.5%) males followed by 13 (3.2%) females responded as yes. The results were statistically significant as *P* value is <0.0001. The responses from the government college students reported to be 27 (10.0%), followed by 63 (9.9%) from the private college students. There was no statistical significance between both the colleges [Table 4].

When the students were asked have they ever tried smoking even one or two puffs, 84 (16.9%) males followed by 18 (4.4%) females responded as yes. The results were statistically significant as *P* value is <0.0001. 36 (13.4%) students from government followed by 66 (10.4%) of students from private college responded as yes. The results were statistically not significant [Tables 5].

Table 6 depicts that 42 (8.5%) males followed by 13 (3.2%) females responded as one out of their four closest friend use chewing tobacco. The results were statistically significant as

**Table 1: Demographic distribution of study population**

		Gender		Total	
		Males	Females		
College type	Government	<i>n</i>	169	100	269
		%	62.8%	37.2%	100.0%
	Private	<i>n</i>	328	309	637
		%	51.5%	48.5%	100.0%
Total	<i>n</i>	497	409	906	
	%	54.9%	45.1%	100.0%	
Chi-square value			9.811		
<i>P</i>			0.002, S		

**Table 2: Age of initiation of chewing tobacco like snuff, or dip, such as pan, guttka**

	<i>n</i>	Mean	Std. deviation	<i>t</i>	<i>P</i>
Gender					
Males	71	14.859	3.2963	-0.558	0.579, NS
Females	13	15.385	1.8046		
College type					
Govt	26	15.385	3.5897	0.875	0.384, NS
Pvt	58	14.741	2.8810		

**Table 3: Students response on that do they believe that tobacco companies try to get young people under 18 to use tobacco products**

Options	Gender		College type	
	Males <i>n</i> (%)	Females <i>n</i> (%)	Government <i>n</i> (%)	Private <i>n</i> (%)
YES	271 (54.7%)	224 (45.3%)	144 (53.5%)	125 (46.5%)
NO	262 (64.1%)	147 (35.9%)	389 (61.3%)	246 (38.7%)
Chi-square	13.282,		5.75,	
<i>P</i>	0.01, S		0.056, NS	

**Table 4: Prevalence of tobacco use among male, females, students of government college and students of private college**

Options	Gender		College type	
	Males n (%)	Females n (%)	Government n (%)	Private n (%)
Yes	77 (15.5%)	13 (3.2%)	27 (10.0%)	63 (9.9%)
No	419 (84.5%)	396 (96.8%)	242 (90.0%)	573 (90.1%)
Chi-square	38.149,		0.952,	
P	* < 0.0001, S		0.9589 NS	

Chi-square test, \*P<0.001 highly significant, NS=non-significant

**Table 5: Response of students on have they ever tried cigarette smoking even one or two puff**

Options	Gender		College type	
	Males n (%)	Females n (%)	Government n (%)	Private n (%)
YES	84 (16.9%)	18 (4.4%)	36 (13.4%)	66 (10.4%)
NO	413 (83.1%)	391 (95.6%)	233 (86.6%)	571 (89.6%)
Chi-square	35.376,		1.756,	
P	* < 0.0001, S		0.416, NS	

Chi-square test, \*P<0.001 highly significant, NS=non-significant

**Table 6: Students responses on their four closest friend use chewing tobacco snuff or dip**

Options	n(%)	None	One	Two	Three	Four	Not sure	Chi square, P
Gender								
M	n	280	42	31	22	35	87	62.43, * < 0.0001, S
	%	56.3%	8.5%	6.2%	4.4%	7.0%	17.5%	
F	n	325	13	5	8	9	48	0.506, 0.992, NS
	%	79.7%	3.2%	1.2%	2.0%	2.2%	11.8%	
College								
Govt	n	182	17	9	9	13	39	0.506, 0.992, NS
	%	67.7%	6.3%	3.3%	3.3%	4.8%	14.5%	
Pvt	n	423	38	27	21	31	96	0.506, 0.992, NS
	%	66.5%	6.0%	4.2%	3.3%	4.9%	15.1%	

Chi-square test, \*P<0.001 highly significant, NS=non-significant

P value is < 0.0001. 17 (6.3%) of students from government college followed by 38 (6.0%) of students from private college responded as one out of their four closest friend use chewing tobacco. The results were statically not significant.

## Discussion

Tobacco use is a serious public health challenge globally. It has assumed the dimension of a pandemic resulting in enormous disability, disease, and death. In every country, there is great variation in the consumption patterns.<sup>[7]</sup> According to the most recent estimate by the World Health Organization (WHO), 4.9 million people worldwide died in 2000 as a result of their addiction to nicotine and currently 5.4 million people die each year from this global tobacco epidemic.<sup>[8]</sup> This figure is expected to rise to about 10 million by the year 2020, if the current epidemics continues and

more than 70% of these deaths are expected to occur in developing countries.<sup>[10]</sup>

The result of the present study showed that the prevalence of chewing tobacco was more in males as compared with females which is in accordance with the study conducted by Prajapati *et al.* where it was found that the majority of male adolescents consumed tobacco in the form of gutkha. Male students were easily succumbed to peer pressure leading to addiction. College age, particularly adolescence, is a critical time for the health and future development of boys and girls. Experience and behavior during these formative years can influence lifelong health, as well as put current health at risk.<sup>[11]</sup>

In the present study, the mean age of initiation of chewing tobacco was 14.8 ± of 3.29 years and 15.3 ± of 1.80 years, respectively. Thakor *et al.* stated that the mean age group of children who consumed betel nut was 14.34 ± 1.83 years and 14.03 ± 1.41 years, respectively.<sup>[12]</sup> In the present study, significantly higher number of government college students found getting tobacco products very easy when they wanted some as compared with private college students.

In the present study, the prevalence of ever smoking among college students was 21.3% and it was significantly higher among the males, that is, 16.9%, which is similar with the study conducted by Mohamed *et al.* and Anwar *et al.* where the prevalence of ever smoking among students was 21.0% and it was significantly higher among males.<sup>[13]</sup> In a study conducted by Rani *et al.* showed that among the population of 15 years or older—47% men and 14% of women—either smoked or chewed tobacco.<sup>[14]</sup> In a study conducted by Basakhetre *et al.*, 5.9% were tobacco users.<sup>[15]</sup> In a study conducted by Raj *et al.*, the prevalence of smoking was 16.2% (male = 28.4% and female = 5.38%), the results of this study was similar to the present study.<sup>[16]</sup>

The prevalence of smoking is more in males as compared with females because women smoke more in situations of difficulty and negative emotion, while men smoke more for stimulation and in pleasurable settings. Women are more likely to start smoking again while feeling sadness or depression. Men, on the other hand, are more likely to slip up or relapse when they are at work or when drinking alcohol.

The mean age of initiation of smoking tobacco in our study was 14.7 ± 2.77 years among males and 14 ± 4.26 years among females. In a study conducted by Meena *et al.*, the average age of initiation of tobacco was 12.76 for boys and 12.40 for girls. Other studies showed that initiation of tobacco use (cigarette or other products) starts at around 13--14 years in most of the countries.<sup>[17]</sup> A study conducted by O'Loughlin *et al.*, the age of initiation was found to be initiators which was 18.2 years compared with 14.5 years among high school initiators.<sup>[18]</sup> In a study conducted by Basakhetre *et al.*, the mean age of initiation of tobacco use was 11.65 ± 2.62.<sup>[15]</sup> In a study conducted by Raj

*et al.*, the mean age of smoking initiation was 16.6 and 17.7 years for male and female, respectively, which is not in accordance with the present study.<sup>[16]</sup>

The influence of friends and family is an important determining factor for initiation of tobacco use among the young adults. In the present study, prevalence of tobacco use was significantly high among males who had friends who used chewing form of tobacco which is in contrast to a study conducted by Mohamed *et al.* and Makeen *et al.* showed that the prevalence of tobacco use was significantly higher for both males and females who had friends who smoked or who used chewing tobacco.<sup>[13]</sup> In a study conducted by Basakhetre *et al.*, the possible causes being peer pressure (35.08%), tension (49.12%), to achieve the aim (5.26%) and influence from parents (10.52%).<sup>[15]</sup> In a study conducted by Kelker *et al.*, 16% mentioned due to reasons such as peer pressure or to imitate family member.<sup>[19]</sup>

In another study conducted by Singh. *et al.*, peer pressure was the main reason for tobacco use among children,<sup>[3]</sup> which is in contrast to the present study. In the present study, 45 (9.4%) student responded as yes when they were refused to buy cigarette because of their age which is similar to the study conducted by Mohamed *et al.* where 12 (4.9%) students responded that they were refused to buy cigarette because of their age.<sup>[12]</sup> In another study conducted by Singh *et al.*, age was not a barrier in buying tobacco products,<sup>[4]</sup> which is contrast to the present study.

## Conclusion

The prevalence of smoking and smokeless tobacco use were higher among the government college students. The result of the present study showed that government college students started using chewing tobacco later than private college students. From the present study, it suggests that the influence of friends and family plays an importance role in influencing the young adults to use tobacco in any form. This study would also play a major role for family physicians because they play a major role in creating awareness among the young adolescence patients, motivate them to quit the habit of smoking and smokeless tobacco, which will be bad for their health. In this way, the physician will help them to quit to smoking.

## Limitations of the study

- YTS is limited to students belonging from 6<sup>th</sup> to 12<sup>th</sup> grade
- The present study was conducted from age groups 16–19 years and hence comparability was limited
- In India, there is a huge dropout rate after schooling so it is important that the survey must be extended to the youth who do not attend school or colleges
- Finally, data were based on the self-report of students, who might under-report or over report their behaviors or attitudes.

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## Conflicts of interest

There are no conflicts of interest.

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