

## Original Article

# Tobacco Consumption and Its Socio-demographic Correlates Among Adolescents Residing in Slum Areas of Bhubaneswar, India

## Abstract

**Background:** Tobacco use is an emerging public health problem among adolescents worldwide. The objectives of the study were to determine the prevalence and pattern of tobacco use among adolescents and assess the factors associated with its use in urban slums of Bhubaneswar, Odisha. **Materials and Methods:** A community-based cross-sectional study was carried out in 11 randomly selected urban slums of Bhubaneswar during the year 2017–2018 among 297 adolescents using a pretested semi-structured schedule. Data were analyzed using SPSS version 21.0; risk analysis was done using odds ratios with 95% confidence intervals (CIs). **Results:** Ninety-one (30.6%) adolescents were current tobacco users; 40 (44%) were consuming smoking form and 67 (73.6%) smokeless form. Betel quid was the most predominant form of smokeless tobacco (35.8%) and the cigarette was the most common smoking form (55%) used. Only 16.5% of adolescents had tried to quit tobacco during the past year, whereas 65.9% showed a desire to quit tobacco in future. Multivariate analysis revealed that tobacco use was significantly associated with older age (adjusted odds ratio [aOR]: 5.5; 95% CI: 2.8–10.6), male gender (aOR: 5.9; 95% CI: 2.9–12.0), employment (aOR: 7.4; 95% CI: 3.6–15.4), illiterate mother (aOR: 3.3; 95% CI: 1.7–6.3), tobacco use by family member (aOR: 3.7; 95% CI: 2.0–6.9), tobacco use by peers (aOR: 6.5; 95% CI: 2.9–14.3), and easy accessibility (aOR: 4.1; 95% CI: 1.5–11.2). **Conclusion:** The prevalence of tobacco use was high among adolescents of slums in Bhubaneswar. Existing schemes for controlling the tobacco epidemic among slum adolescents could be strengthened by incorporating these determinants.

**Keywords:** Adolescents, slums, smoked tobacco, smokeless tobacco, tobacco use

## Introduction

Tobacco use is one of the biggest public health threats throughout the world and responsible for not only the loss of human lives but also leads to heavy social and economic costs.<sup>[1]</sup> Worldwide, more than 7 million people are killed each year due to the use of tobacco products. If the current trend of tobacco use continues, more than 8 million people will die every year from diseases related to tobacco use by 2030.<sup>[2,3]</sup> Adolescence is a period of considerable risk during which adolescents become vulnerable to high-risk behaviors and initiate tobacco use. It is well established that most of adult tobacco users start tobacco use in adolescence.<sup>[4,5]</sup> According to a global youth tobacco survey in India, 14.6% of adolescents aged 13–15 years were currently using any tobacco product; 19% of boys and 8.3% of girls were tobacco users.<sup>[6]</sup> The most prevalent form of tobacco use in India

is smokeless tobacco which includes khaini, gutkha, betel quid with tobacco, and zarda, whereas smoking forms of tobacco used are bidi, cigarette, and hookah.<sup>[7]</sup>

The urban-slum population is a vulnerable section of the society which fares very poorly on issues related to health and other basic amenities. It has been reported that tobacco use is rampant in urban slums in developing countries including India.<sup>[8,9]</sup> According to the 2011 census of India, 24.4% of the total urban population was living in slum areas and the proportion of the urban-slum population is rapidly rising in the states including Odisha.<sup>[10]</sup> The scientific literature on the prevalence and patterns of tobacco use among adolescents living in urban slums of India is scarce. The present study has been undertaken to determine the prevalence of tobacco usage and its patterns and assess the associated sociodemographic factors among the adolescents residing in slum areas of Bhubaneswar city, Odisha.

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## Materials and Methods

### Study participants and study design

This cross-sectional study was conducted during the year 2017–2018 among the adolescents residing in selected slum areas of Bhubaneswar city, the capital city of state Odisha, India. The national estimate of the prevalence of the current use of tobacco in any form among 13- to 15-year-old adolescents was 14.6%.<sup>[6]</sup> With an absolute precision of 5% at a 95% confidence interval (CI) and a design effect of 1.5, the required sample size was estimated at 288. A multistage cluster random sampling technique was used to select the study areas. Bhubaneswar city is divided into three geographical zones: North, South-East, and South-West which comprise 67 wards and 436 slums. Of the three zones, the North zone was randomly selected; 50% of the wards having slum areas (11 wards) in this zone were randomly chosen, and then from each selected ward, one slum was randomly selected. The sample size was equally distributed among the selected slums. Overall, 320 adolescents aged 10–19 years living in the selected slums were approached for the study, and finally, 297 agreed to participate in the study. In each household, one adolescent was considered for the study purpose, and if more than one study subjects were found in a household, only one was selected by a simple random sampling technique.

### Data collection

Before initiation of the study, all the study participants (adolescents) and their parents were informed about the purpose of the study and details of the procedure involved in the study. The adolescents gave assent and their parents provided consent before initiation of the study. We designed a semi-structured schedule based on the opinion of experts and a review of relevant literatures. Then, this schedule was pilot tested on 20 slum adolescents for its legibility and comprehensibility and the final schedule was developed after suitable modifications. The validity of all the questions in the schedule was examined by checking whether all the subjects interpreted the questions the same way or not. Using this schedule, information regarding sociodemographic characteristics such as age, gender, schooling, occupation, educational status of parents, and socioeconomic status was collected by a trained investigator. Furthermore, data on tobacco use, type of tobacco, age of initiation, frequency of use, quitting behavior, tobacco use by a family member, tobacco use by peers, knowledge regarding harmful effects of tobacco, exposure to anti-smoking media messages, etc., were collected.

### Ethics statement

The study was approved by the Institutional Ethics Committee of the authors' institution (Ref. No: KIMS/KIITIEC/115/2015), and all the procedures followed were in accordance with the ethical standards of the responsible

committee on human experimentation and with the Helsinki Declaration of 1975, as revised in 2000.

### Statistical analysis

All the data were scrutinized, edited, and corrected for any discrepancy and analyzed using IBM SPSS Statistics for Windows, Version 21.0. (Armonk, NY: IBM Corp.) and expressed as percentages, odds ratio, and 95% CI. Estimates of the prevalence of all forms of tobacco (smoked or smokeless) use were computed. The outcome measure was the "current tobacco use in any form" and the correlates of tobacco use were independently assessed using univariate logistic regression. The variables which had  $P < 0.1$  in univariate analyses were included in the multivariate logistic regression models. Due to the complex sampling design of the study, the sample data were weighted to get a true representation of the population. The collinearity between the variables was also checked.  $P < 0.05$  was considered statistically significant.

## Results

As revealed in our study, the overall point prevalence of current tobacco use among slum adolescents was 30.6% (91/297). Among the respondents, tobacco use was seen in 58.1% of the boys and 9.5% of the girls [Table 1]. The mean ages of the boys and the girls were found to be 14.9 ( $\pm 2.9$ ) years and 15.0 ( $\pm 2.9$ ) years, respectively. The mean age of initiation of tobacco use was 12.2 ( $\pm 3.2$ ) years for boys and 11.0 ( $\pm 3.0$ ) years for girls. The multivariate logistic regression model revealed that age, gender, occupational status, maternal education, tobacco use by a family member, tobacco use by peers, and easy accessibility were the significant predictors of tobacco use behavior among slum adolescents [Table 2].

Among the current tobacco users, 40 (44%) used the smoked form and 67 (73.6%) used the smokeless form. The cigarette was the most common form of tobacco used (55%), whereas bidi was initiated at an earlier age as compared to other tobacco forms [Table 3]. Concerning the quitting behavior, only 15 (16.5%) adolescents reported that they had tried to quit tobacco during the past year, whereas almost two-third of them showed a desire to quit tobacco in future. Table 4 reveals that around 82.5% believed that "tobacco smoking causes serious illness," as high as 80.5% agreed that "smokeless tobacco can cause serious illness" too. Less than half of the respondents informed that they had noticed anti-smoking and anti-smokeless media messages in the past 30 days, newspaper and television being cited as the most common sources of information.

## Discussion

In this cross-sectional study, the prevalence of current tobacco use among slum adolescents of Bhubaneswar was observed as 30.6%. In a study by Bardhan *et al.* among adolescent slum dwellers of Guwahati, the prevalence was

**Table 1: Univariate analyses showing the association of various factors with the current tobacco use among slum adolescents (n=297)**

Characteristics	Prevalence of current tobacco use, Frequency (%)			Total surveyed	P
	Smoked	Smokeless	Any form		
Age in years					
<15	16 (10.6)	25 (16.6)	33 (21.9)	151	0.001
≥15	24 (16.4)	42 (28.8)	58 (39.7)	146	
Gender					
Male	38 (22.6)	53 (31.5)	75 (58.1)	129	0.000
Female	2 (1.6)	14 (10.9)	16 (9.5)	168	
Schooling					
Attending	3 (3.0)	15 (15.2)	18 (18.2)	99	0.001
Not attending	37 (18.7)	52 (26.3)	73 (36.9)	198	
Occupation					
Unemployed	28 (11.3)	39 (15.8)	58 (23.5)	247	0.000
Employed	12 (24.0)	28 (56.0)	33 (66.0)	50	
Education of mother					
Illiterate	21 (19.1)	29 (26.4)	41 (37.3)	110	0.013
Literate	14 (8.2)	31 (18.2)	40 (23.5)	170	
Education of father					
Illiterate	14 (17.5)	22 (27.5)	31 (38.8)	80	0.062
Literate	23 (11.4)	41 (20.4)	55 (27.4)	201	
Socioeconomic status*					
Lower/LM	26 (18.3)	29 (20.4)	45 (31.7)	142	0.117
Middle	7 (6.3)	24 (21.1)	28 (25.0)	112	
UM/upper	7 (16.3)	14 (32.6)	18 (41.9)	43	
Tobacco use by family member					
No	16 (8.8)	28 (15.4)	37 (20.3)	182	0.000
Yes	24 (20.9)	39 (33.9)	54 (47.0)	115	
Tobacco use by peers					
No	13 (6.3)	37 (18.0)	44 (21.5)	205	0.000
Yes	27 (29.3)	30 (32.6)	47 (51.1)	92	
Easy accessibility in respondent's area					
No	11 (15.3)	8 (11.1)	14 (19.4)	72	0.018
Yes	29 (12.9)	59 (26.2)	77 (34.2)		

\*LM – Lower middle; UM – Upper middle

a little higher (35.0%).<sup>[11]</sup> A lower prevalence (19.4%) was seen in a study from Chennai city and it might be due to the wide age group taken in the study.<sup>[12]</sup> In another study, the prevalence was quite high (88.2%); the authors attributed this to lack of recreation facilities, lesser access to health education, and overall compromised living conditions.<sup>[5]</sup>

In the current study, older adolescents (age ≥15 years) had 5.5 times higher odds of using tobacco than their younger counterparts. The reason may be because as age increases, adolescents more likely to take decisions independently and less likely to be supervised by their parents or guardians. Other studies have also shown a similar result.<sup>[11,12]</sup> It was revealed in our study that male adolescents were almost six times more likely to use tobacco as compared to females. This might be attributed to sociocultural and behavioral differences between male and female adolescents. A higher prevalence of tobacco use among males is consistent with earlier studies.<sup>[5,11,12]</sup> We observed in our study that tobacco

usage was significantly higher among those adolescents who were employed compared to those unemployed. This can be ascertained due to the fact that when employed, one becomes financially independent, and thus, purchasing power increases. Stress due to a job can also be a reason for the same. Similar findings have been reported in earlier studies.<sup>[9,13]</sup>

In the present study, the odds of tobacco use increased 3.3 times among adolescents who had illiterate mothers than adolescents having literate mothers. This could be due to the reason that literate mothers might be practicing skills of positive parenting and communication. Counseling of children on a healthy lifestyle by the literate mothers may also be another reason for the lesser number of tobacco users. It was evident from our study that an adolescent with a family member using tobacco had higher odds of tobacco use. This finding is in corroboration with the results of other studies.<sup>[5,14-16]</sup> In our study, the adolescents whose peers consumed tobacco were 6.5 times more likely to consume

**Table 2: Multivariate logistic regression analysis showing the association of various factors with the current tobacco use among slum adolescents (n=297)**

Characteristics	Model 1 Current tobacco use in any form		Model 2 Current tobacco use in any form	
	aOR (95% CI)	P	aOR (95% CI)	P
Age in years				
<15	1	0.00	1	0.00
≥15	6.8 (3.3-13.9)		5.5 (2.8-10.6)	
Gender				
Female	1	0.00	1	0.00
Male	7.7 (3.6-16.7)		5.9 (2.9-12.0)	
Schooling				
Attending	1	0.233	-	
Not attending	1.7 (0.7-4.2)			
Occupation				
Unemployed	1	0.00	1	0.00
Employed	10.8 (4.4-27.0)		7.4 (3.6-15.4)	
Education of mother				
Literate	1	0.014	1	0.001
Illiterate	4.1 (1.3-12.4)		3.3 (1.7-6.3)	
Education of father				
Literate	1	0.829	-	
Illiterate	1.1 (0.4-3.6)			
Tobacco use by family member				
No	1	0.00	1	0.00
Yes	4.4 (2.1-9.3)		3.7 (2.0-6.9)	
Tobacco use by peers				
No	1	0.00	1	0.00
Yes	5.9 (2.6-13.5)		6.5 (2.9-14.3)	
Easy accessibility in respondent's area				
No	1	0.016	1	0.006
Yes	4.1 (1.3-13.1)		4.1 (1.5-11.2)	

P<0.05 statistically significant; Model 1 Wald F=11.516, P<0.001 and Model 2 Wald F=14.852, P<0.001 indicate that both models fit the data and there is an improvement in the final model. The classification table of the final model reports that overall expected model performance is 83.2%; that is, 83.2% of the cases can be expected to be classified correctly by the model. aOR – Adjusted odds ratio; CI – Confidence interval

**Table 3: Responses to queries put across to tobacco smokers (n=40) and smokeless tobacco users (n=67)**

Queries	Smoked tobacco, n (%)		Smokeless tobacco, n (%)			
	Cigarette	Bidi	Gutkha	Khaini	Betel quid	Pan masala
What is the type of tobacco used?	22 (55.0)	18 (45.0)	19 (28.3)	17 (25.4)	24 (35.8)	7 (10.4)
Did you try to quit tobacco in last year?						
Yes	15 (16.5)					
No	76 (83.5)					
Will you quit tobacco in the future?						
Yes	60 (65.9)					
No	22 (24.2)					
Do not know	9 (9.9)					
Average age (year) of initiation, mean±SD (range)	13.4±2.9 (9-18)	10.0±2.0 (8-17)	11.5±3.3 (7-18)	10.4±2.7 (7-17)	12.7±2.9 (7-18)	11.7±3.9 (7-17)
Average frequency in a day, mean±SD (range)	4.8±2.2 (1-8)	7.6±2.1 (4-12)	3.2±1.3 (1-6)	3.8±1.7 (1-7)	2.7±1.2 (1-5)	1.7±0.76 (1-3)
How soon (min) after waking up do you use tobacco? mean±SD (range)	50.9±21.6 (20-90)	26.4±16.3 (5-60)	46.3±30.4 (5-100)	40.6±43.1 (5-180)	64.8±43.6 (5-180)	78.6±14.6 (50-90)

SD – Standard deviation

**Table 4: Responses to queries put across to all participants (n=297)**

Queries	Response (%)	
	Yes, frequency (%)	No, frequency (%)
Does tobacco smoking cause serious illness?	245 (82.5)	52 (17.5)
Does smokeless tobacco cause serious illness?	239 (80.5)	58 (19.5)
Have you noticed anti-smoking media messages during the past 30 days?	139 (46.8)	158 (53.2)
Where did you notice anti-smoking media messages*		
Newspaper	85 (61.1)	
Television	84 (60.4)	
Billboard	50 (35.9)	
Radio	44 (31.6)	
Magazine	43 (30.9)	
Have you noticed anti-smokeless media messages during the past 30 days?	117 (39.4)	180 (60.6)
Where did you notice anti-smokeless media messages*		
Newspaper	76 (64.9)	
Television	71 (60.7)	
Billboard	40 (34.2)	
Radio	38 (32.5)	
Magazine	37 (31.6)	

tobacco compared to those whose peers did not. Similar observations have been reported in previous studies.<sup>[11,17,18]</sup> These findings suggest that tobacco use by family members and peers strongly influences the tobacco behavior of slum adolescents. We also found that ease of access to tobacco products in slum areas was significantly associated with higher odds of tobacco consumption among the adolescents dwelling in those areas. In an earlier study, it was shown that perceived accessibility independently contributed to the escalation of tobacco use among youths.<sup>[19]</sup> In another survey conducted in Myanmar, the trend of tobacco use by adolescents rose with the increasing accessibility of tobacco year by year.<sup>[20]</sup>

In the present study, the majority (73.6%) of slum adolescents were smokeless tobacco users, and most of them were using betel quid (35.8%) and gutkha (28.3%). Earlier studies have also shown that the smokeless form of tobacco was more commonly used by adolescents.<sup>[5,11]</sup> The practice of use of areca nut as a custom in this part of eastern India may be a reason for easy accessibility and higher use of the smokeless form of tobacco, i.e., betel quid. The average age of initiation of smoked/smokeless tobacco ranged from 10.0 to 13.4 years, with 29.7% having initiated before 10 years of age in the present study. Das *et al.* also observed in their study that the age of initiation of tobacco consumption was 10–13 years, with around 22.6% had initiated tobacco use before 10 years of age.<sup>[5]</sup> Special attention needs to be given to this age group by adopting behavioral change communication strategies to protect them from the harmful effects of tobacco in later life. We noticed in our study that almost two-third of the study participants had shown the desire to quit tobacco in future. Similar results have been reported in the global youth tobacco survey conducted in India.<sup>[6]</sup> However, only 16.5% of slum adolescents in our study had tried to quit

tobacco during last year which is in contrast to the finding of the global youth tobacco survey, in which 67.2% of adolescents had attempted to quit tobacco.<sup>[6]</sup>

Although awareness regarding the harmful effects of tobacco was high, the prevalence of tobacco use among slum adolescents of Bhubaneswar was still high. This emphasizes the need for behavioral change communication interventions, as only being aware has not helped them adopt good habits.

The cross-sectional design of the study is the main limitation that precludes us to affirm the cause–effect relationships of the significant associations. Furthermore, there might be an introduction of reporting bias as the data are based on self-reporting and recall of past experiences. However, in light of the findings of the present study and existing evidence, it is clear that tobacco control policy in India is not adequate in addressing the issue, and thus, there is a need to modify the current “cigarette and other tobacco products act” with a focus on this emerging high-risk group. More such surveys, as well as qualitative research, need to be carried out in urban slums to have an in-depth understanding of the slum community behavior toward tobacco use and identify the gaps in the implementation of the government policies.

## Conclusion

The prevalence of tobacco use among adolescents residing in slums of Bhubaneswar was high. Sincere efforts are needed to strengthen the existing schemes for controlling the tobacco epidemic among slum adolescents which could be achieved by incorporating the determinants observed in the study.

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## Conflicts of interest

There are no conflicts of interest.

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