

SHORT ARTICLE

Tobacco consumption and associated factors among tribal adolescent students in Terai-Dooars region, West Bengal

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ABSTRACT

Background: Tobacco is one of the major causes of preventable deaths worldwide. Around the world, tobacco is one of the leading causes of tobacco-related cancer. **Objectives:** To estimate the proportion of tobacco use among tribal adolescents in Terai-Dooars region, and to determine the related risk factors. **Methodology:** A school based cross-sectional study was conducted among 680 tribal adolescent students of government schools in Terai-Dooars region of West Bengal, from April 2022 to October 2022. After obtaining consent, data on socio-demographics and tobacco consumption were collected. Significance was tested using multivariable logistic regression. **Results:** The proportion of tobacco consumption among tribal adolescent students was found to be 45.7%. Male (58.1%) and female (28.2%) adolescents were found to be regular consumers. Male adolescents primarily prefer smokeless tobacco, with 58% starting their habit between 12-15 years age. Male adolescents preferred smokeless tobacco, with a significant proportion starting their habit between 12-15 years (58%). High consumption of Khaini (52.6%), Guthka (46.6%), and Cigarette (42.4%) is observed. Age (<0.001), sex (<0.001), religion (0.029), socio-economic level (0.004), and family history (0.003) significantly associated with tobacco consumption. **Conclusions:** Overall proportion of tobacco use was high among the tribal adolescents, with most starting smoking at an early age. The major risk factor that contributed was the family members' tobacco use.

KEYWORDS

Tobacco; Adolescent; Tribal; Cigarette; Khaini; Guthka

INTRODUCTION

Tobacco usage is a major global public health issue, causing approximately 8 million deaths annually, making it one of the leading avoidable causes of death. (1) Tobacco use causes 33% of global cancer fatalities, accounting for 27% of India's cancer burden in

2020. (2, 3) The World Health Organization estimates that there are approximately 1 billion smokers globally, (4) with 80% of them residing in low- and middle-income countries (5, 6). By 2025, the global smoking rate is predicted to reach 1.7 billion, (4) with 32.7% of men and 6.62% of women aged 15years

smoking. (7) Most of smokers in developed nations start before the age of 18. (8)

Almost 300 million people in India, a nation with low and moderate incomes, are living in extreme poverty. (9) India, the world's second-largest tobacco producer and user, is a major contributor to annual fatalities, accounting for 9.5% of all fatalities. (10) Approximately 28.6% of adults in India smoke, (11) with teenagers being the most common. Rural tobacco use is 18.1% higher than urban, but tribal areas still have high prevalence. (12, 13, 14) The study in Maharashtra and Central India revealed a tobacco use prevalence of 45.42% and 27.25% among tribal adolescents, respectively. (15, 16)

India's tobacco product is dominated by smokeless tobacco, followed by zarda, gutkha, betel quid with tobacco, khaini, bidi, cigarette, and hookah being the main smoking tobacco products. (17) Adolescent nicotine exposure impacts brain development, leading to persistent use throughout adulthood. The prevalence of tobacco use among tribal adolescent students is not well documented in the study area. Thus, with the following objectives.

1. To calculate the proportion of tobacco use among government school going tribal adolescent students in Terai-Dooars region of West Bengal.
2. To determine the age of initiation and pattern of tobacco usage.
3. To identify associated risk factors of tobacco consumption among tribal adolescent students, if any.

MATERIAL & METHODS

Study type & design and setting

This study was a school-based observational type with a cross-sectional design.

Study setting & duration

This study was conducted at government and government-aided schools between April 2022 and October 2022 in the Terai-Dooars region of West Bengal.

Study population

The study was conducted among the tribal adolescent student both boys and girls of 14 –

19 years of age, who were willing to participate and present on the day of study.

Sample size

The formula for calculating the sample size was ($N = Z^2 p (1-p) / d^2$). With 27.25% prevalence from a related study done in central India (15), 95% Confidence Interval, 5% Allowable Error, 10% non-response rate, and a design effect of 2, were used to calculate the number of participants, which was found to be 672 and it was rounded to 680.

Inclusion criteria

Tribal adolescent students who were willing to participate and present on the day of data collection.

Sampling techniques

A multi-steps random sampling method was applied. In the first step, two districts, Darjeeling and Jalpaiguri were chosen at random from a total of four districts in the Terai-Dooars region. Out of four sub-divisions, Siliguri and Mal sub-divisions were chosen in the second step. Four community blocks, Naxalbari, Phansidewa, Mal, and Nagrakata were chosen from 13 blocks by lottery method in the third step. At the fourth step, a list of all government & government aided schools, which have 50% or more tribal students having grades 8-12 were prepared, and out of 26 schools two schools were selected from each block randomly. So, a total of eight schools were chosen. In the final step, all the tribal student both boys and girls of 14 -19 years of age of the respective schools were enlisted. In order to obtain the necessary sample size, 85 study participants were chosen by simple random sampling method (without replacement) from each school.

Study tools

Data was collected by using pre-designed semi-structured self-administered questionnaire based on questionnaire from Global Youth Tobacco Survey (GYTS). (18) Bengali and Hindi translations were made of the questionnaire. Prior to collecting data, the translated version was validated in respective languages by initial translation, reverse-translation and re-translation, followed by pretesting.

Ethical issues

The Institutional Ethics Committee provided ethical consideration prior to data collection

(Memo No: IEC/NBMC/2020-21/12, date 16.12.2021). Written notice was sent to each school's principal, and permission was obtained. Students were instructed to take part in the study willingly, and informed consent was taken from all adolescents who were 18 years of age or older, and in case of minors, their parents provided informed consent. The assent statement was signed by the minors.

Data Collection

Participants in the study were given instructions on how to complete the questionnaire and submit accurate data. They were assured that all data would be kept confidential. Socio-demographic data, the types of tobacco use, the age at initiation, and family history of tobacco use were all included in the final questionnaire. When determining the proportion of tobacco, ever-used tobacco in any form was taken into account.

Working definitions

Operational definitions used to classify adolescent and tobacco users.

Middle adolescence: Adolescents belong to the age group 14-16 years. (19)

Late adolescence: This group of adolescent in 17-19 years and almost an adult. (19)

Ever users: People who had ever used tobacco in any form, chewing and smoking even once including current tobacco use. (20)

Never users: People who have never tried tobacco products in their lives. (20)

Data analysis

Collected information was checked for completeness, coded, tabulated and analyzed utilising IBM SPSS statistics software version 22 (Chicago, IL) and Microsoft Excel (2013). Statistical analysis comprised calculating proportion and Multivariable logistic regression was used for testing significance of association of risk factors. P-values less than 0.05 are regarded as statistically significant.

RESULTS

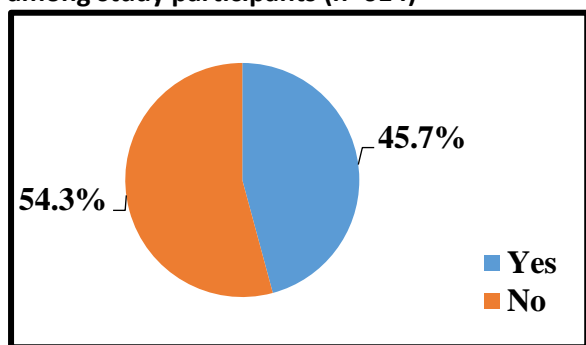
In total 680 students were given the questionnaire, 66 were incomplete or did not have the basic information about tobacco use, and were therefore removed from the final analysis. The remaining 614 questionnaires were included in the analysis. Out of 614 responders, the highest percentage of 53.7% was in the 17–19 age range. The participants were between the ages of 14 and 19, with a mean age of 16.65 years and a standard deviation of ±1.379 years. The study involved 59% male and 41.0% female respondents, with 62.7% Christian and 35.3% Hindu, 56.8% lower-class, 39.9% upper-class, and 71.3% family history of tobacco use of any form. (Table 1)

Table 1 Participants' socio-demographic characteristics in the study (n=614)

Characteristics	Frequency	Percentage
Age group (In years)		
14 - 16	284	46.3
17 - 19	330	53.7
Sex		
Male	362	59.0
Female	252	41.0
Religion		
Hinduism	217	35.3
Christianity	385	62.7
Others*	12	2.0
Socio-economic status (B.G.Prasad's scale, AICPI, July-2022)		
Upper class	20	3.3
Upper-lower class	245	39.9
Lower class	349	56.8
History of tobacco use (any form) in family members		
Absent	176	28.7
Present	438	71.3
Total	614	100

*Others include Buddhism & Islam

Figure 1 Proportion of tobacco consumption among study participants (n=614)



In the present study, overall proportion of ever consumed of any form of tobacco was 45.7%. (Figure 1)

The majority of respondents (58%) began tobacco consumption between 12-15 years, followed by 18.5% in the 16-19 age group, 16.5% in the 8-11 age group, and 7.5% before age 7. (Table 2)

Table 2 Age of initiation any form of tobacco by participants (n=281)

Age group (In years)	Frequency	Percentage
≤ 7	21	7.5
8-11	45	16.0
12-15	163	58.0
16-19	52	18.5
Total	281	100

Table 4 Association between study participants' background characteristics with ever use of tobacco in any form(n=614)

Variables	Ever used tobacco		COR (95% CI)	AOR (95% CI)	p value	
	Yes n (%)	No n (%)				
Age in years	14 - 16	95(33.5)	189(66.5)	1(referent)	1(referent)	<0.001
	17 - 19	186(56.4)	144(43.6)	.389(.280-.541)	.520(.361-.749)	
Sex	Male	210(58.1)	152(41.9)	1(referent)	1(referent)	<0.001
	Female	71(28.2)	181(71.8)	3.522(2.495-4.972)	.354(.244-.515)	
Religion	Hinduism	84(38.7)	133(61.3)	1(referent)	1(referent)	0.05
	Christianity	196(50.9)	189(49.1)	.609(.434-.854)	.133(.017-1.071)	
	Others	1(8.3)	11(91.7)	6.947(.881-54.796)	.098(.012-.785)	
SES	Upper class	4(20.0)	16(80.0)	1(referent)	1(referent)	0.007
	Upper-lower	91(37.2)	154(62.8)	.423(.137-1.304)	5.008(1.558-16.098)	
	Lower class	186(53.3)	163(46.7)	.219(.072-.669)	1.717(1.194-2.468)	
Family H/o	Absent	59(33.5)	117(66.5)	1(referent)	1(referent)	0.003
	Present	222(50.7)	216(49.3)	.491(.341-.707)	1.837(1.234-2.733)	

COR: crude odd ratio, AOR: adjusted odd ratio, CI: confidence interval, SES: socio-economic status, H/o: history of tobacco use

DISCUSSION

The Terai-Dooars region being a tribal population dominated, the percentage of adolescents in both sexes who consumed tobacco was high (58.1% males and 28.2%

The majority of tobacco users (52.6%) consume khaini, followed by guthka (46.6%), cigarette (42.4%), betel quid (16.2%), and bidi (11.7%). (Table 3)

Table 3 Pattern of tobacco used by study participants (n=281)

Tobacco used*	Frequency	Percentage
Smokeless tobacco		
Khaini	148	52.6
Guthka	131	46.6
Betel quid	47	16.7
Smoke tobacco		
Cigarette	119	42.4
Bidi	33	11.7

*Multiple responses

The ever use of tobacco was significantly associated with the respondent's age, sex, Hinduism, socio-economic status, and family tobacco use. After adjusting, related factors of study participants were found to be a significantly associated with upper lower class socioeconomic level ((AOR: 5.008 (1.558-16.095)) and other religion ((AOR: 0.098 (.012-.785))). (Table 4)

females), with the highest percentage occurring in the late adolescence (17–19 years) age group. It may be that smoking tobacco is a social norm in the tribe. The percentage of tribal adolescent who had ever used tobacco in

any form was 45.7%, which was similar with the findings.(16,21,22) In contrast to the results of our investigation, a study carried out in Jabalpur by Toppo NA *et al*. discovered that the overall percentage of tobacco consumption among tribal adolescents was 27.25%. (15) This may be due to difference in place of study. In comparison to our study, the Global Youth Tobacco Survey in India, found a comparatively lower prevalence of tobacco use among students aged 13 to 15 years, at 14.6%. (23) However, according to Sinha DN *et al*., 75.3% of Mizoram's 13-15 years old students were tobacco user. (24)

Among tribal adolescent, 45.7% reported having ever used tobacco in any form. While girls only used smokeless types of tobacco, boys used both smokeless and smoking types of tobacco which was similar to the findings.(16,21,22,23)

In our study, Khaini (52.6%) was the most likely to use smokeless tobacco, followed by Guthka (46.6%), betel quid (16.7%). Majority of the adolescents (42.4%) smoked cigarette, followed by bidi (11.7%). This data was consistent with the Toppo NA *et al*., study. Adolescent girls from a primitive tribe in Odisha were found to have a very high incidence of khaini/gutkha use (77.4%). (25)

The current study found that five years old was the minimum age at which chewing tobacco was initiated. Out of 281 adolescents, the majority (58%) began using tobacco when they were 12 to 15 years old.(15,16) found that the minimum age at which male adolescents in a tribal group began chewing tobacco was also 3 years old. Additionally, they stated that male adolescents began using tobacco at the ages of 11-15 years (55.40%) and (47.50%), respectively. This was similar to what our research revealed. Females started using tobacco products at a younger age than males, starting at age 10. Several other authors have also reported that chewing tobacco or gutkha was first consumed at the age of ten years or younger. (22, 24) In a tribal (Kolam) society, it was discovered that the minimum age at which male adolescents began chewing tobacco was three years old. Similar to our study, where

male adolescents started using tobacco at an earlier age than female adolescents, Quazi S *et al*. reported that adolescent boys began using tobacco at a comparatively younger age than teenage girls. (26) In a study conducted in rural India, Chaturvedi HK *et al*. found that the average age at which tobacco usage began was 17.2 years. (27) In the current study, 53.3% of tribal adolescent from lower socioeconomic classes reported using tobacco in any form, and 50.7% of adolescents reported having a family history of tobacco use. It was similar to the conclusions of Narayan DD *et al*. and Toppo NA *et al*. However, Vinita Singh *et al*, found that 5.4% of the teenagers in the group with lower incomes used tobacco products. (28) This may be due to their low standard of living and also tribal adolescent see their family member as a role model and follow them. A person's identity is greatly shaped by their family, and family members' habits are easily passed down to their offspring.

CONCLUSION

The tribal adolescent students had a high percentage of tobacco use. The current study also shows that adolescent from tribal areas begin smoking cigarettes at comparatively younger ages. This further suggested that family members and the home environment both had elements that influenced tobacco use. Gender and lower socio-economic status of tribal community also plays important contributing factors of tobacco consumption.

RECOMMENDATION

Poor living standards, social customs, and family tobacco consumption influence tribal adolescents to consume tobacco, emphasizing the need for strengthening IEC activities. Thus, it emphasized the need of strengthening the information, education and communication (IEC) activities among the family members and tribal adolescent students to minimize influence.

LIMITATION OF THE STUDY

Since the current study was conducted in schools, tribal adolescents who dropped out or never attended the school could not be included.

RELEVANCE OF THE STUDY

This study closes the information gaps about the percentage of tobacco use among tribal adolescents in the Teria-Dooars region, where there is a dearth of data, particularly regarding tribals. The report also emphasises the risk factors associated to tobacco use.

AUTHORS CONTRIBUTION

All authors have contributed equally.

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Nil

CONFLICT OF INTEREST

There are no conflicts of interest.

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DECLARATION OF GENERATIVE AI AND AI ASSISTED TECHNOLOGIES IN THE WRITING PROCESS

The authors haven't used any generative AI/AI assisted technologies in the writing process.

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