

Research Article

Prevalence of Smokeless Tobacco Usage among Adult Population in Rural Area

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ABSTRACT

Background: Tobacco is a leading risk factor for deaths due to non-communicable diseases in developing countries. India accounts for 70% of the global burden of smokeless tobacco which also attributes to 27% of all cancers in India. Tobacco usage is a major public health issue which needs to be addressed effectively. Objectives were to estimate the prevalence of smokeless tobacco usage in study population and to assess awareness regarding the harmful effects of tobacco usage and COTPA in the study population.

Methods: A community based cross-sectional study was conducted among all adults aged 18 years & above residing in Chandragiri Mandal during March-April 2025. Using simple random sampling, 190 participants were selected and interviewed using pretested semi- structured questionnaire. Data was entered in MS Excel and analysed using Epi Info software. The differences between the qualitative variables were analysed using Chi-square test.

Results: Out of the 190 participants interviewed, 37.9% were using smokeless tobacco at present. Most of the users were above 60 years of age. Smokeless tobacco consumption was more among females. Majority of the participants i.e. 85.1% knew about the harmful effects of tobacco. Almost 44.4% knew about COTPA, 92.9% were in favour of the act and 45.8% believed that pictorial warning helps reduce smokeless tobacco use.

Conclusion: Smokeless tobacco usage was higher among females than males and in the older age group (>60 years). Health education and counselling need to be provided regarding the harmful effects of tobacco.

Key words: tobacco, smokeless, prevalence, COTPA.

INTRODUCTION

Tobacco is widely used in India, particularly among men and in rural areas.¹ All forms of tobacco are harmful, and there is no safe level of exposure to tobacco. It is estimated that there are 267 million tobacco users in India. Among those aged more than 15 years, 28.6% of the population currently use tobacco products with men being 42.4% and women being 14.2%. India accounts for 70% of the global burden of smokeless tobacco. Every year, smokeless tobacco usage kills over 230,000 Indians. According to Global Adult Tobacco Survey (GATS) 2016-2017, the prevalence of smokeless tobacco usage in India was found to be 21.4% of which men account for 29.6% and women account for 12.8%. Smokeless tobacco (ST) refers to various tobacco-containing products that are consumed by chewing, keeping in the mouth or sniffing, rather than

smoking.³ The smokeless forms of tobacco are chewed as raw tobacco leaves or as pan masala (a mixture of areca nut, tobacco and other ingredients), or used as snuff which is inhaled.⁷ Other smokeless forms of tobacco include ghutka, zarda, hans, khaini, mava, etc. The use of smokeless tobacco attributes to nearly 90% of oral cancers in India. Smokeless tobacco products are highly addictive due to nicotine and contain numerous carcinogens and toxic metals. Smokeless tobacco causes cancer of the mouth, esophagus, and pancreas.⁴ Over 80% of 1.3 billion tobacco users worldwide are from low- and middle-income countries, where the burden of tobacco-related illness and death is the heaviest. Tobacco usage is a major public health issue.⁵ Based on the above facts, the present study was conducted to enumerate the different forms of smokeless tobacco usage in study population, to estimate the prevalence of

smokeless tobacco usage in study population, to determine the association between socio demographic factors and prevalence of smokeless tobacco usage in study population, to assess awareness regarding the harmful effects of tobacco usage in the study population and to assess awareness regarding COTPA.

METHODS

A Community based cross-sectional study was conducted in in rural field practice area of Sri Venkateswara Medical College, Tirupati for a period of 2 months (March-April 2025). All adults aged 18 years & above residing in Chandragiri Mandal, consenting to participate and selected by the sampling methods detailed subsequently were included in the study. Subjects who could not be contacted even after two repeated visits were excluded.

According to report from GATS 2016-17, the prevalence of smokeless tobacco usage in adults in India was 21.4%.² Based on this, the sample size of the study subjects is calculated using the formula $N = Z^2 * P * (1-P) / E^2$. Where, N is the sample size, Z = 1.96, P = Prevalence of tobacco usage (21.4%). Taking absolute error (d) as 6%, and by substituting the values, sample size was calculated to be 179.4 which was rounded to 180. Considering a non-response rate of 6%, the adjusted sample size calculated as 187.9 and rounded off to 190.

There are 3 subcentres in the rural field practice area of Sri Venkateswara Medical College, Tirupati namely Chandragiri, Dornakambala and Narasingapuram, catering to a population

of 17379, 10676 and 9794 respectively. From every subcentre, one village was selected by simple random sampling method. The study subjects in each village were selected using probability proportional to size method. One house was randomly chosen and every consecutive house in the right-hand side direction was selected. Purpose of the study was explained; informed consent was obtained. Data was collected using pre-tested semi-structured questionnaire by direct interview method. The questionnaire included questions on sociodemographic profile regarding tobacco usage and their awareness regarding the effects of smokeless tobacco usage. The socioeconomic status of the study participants was determined using Modified BG Prasad classification based on the per capita income of the family with necessary corrections using the latest consumer price index.

Ethical Committee approval was taken from Institutional Ethics Committee and the study was carried out. (Ref No: Lr.No 13/2025 dated 13.02.2025) Before collecting data, all subjects were briefed about the purpose of the study and informed written consent was obtained. Subjects were given the right to withdraw consent at any stage. Data was entered in MS Excel and analysed using Epi Info (7.2.5). Categorical data was presented as frequency and percentage. The significant difference between proportion was tested using Chi-Square test or Fisher Exact test as appropriate. A p value less than 0.05 was considered as statistically significant

RESULTS

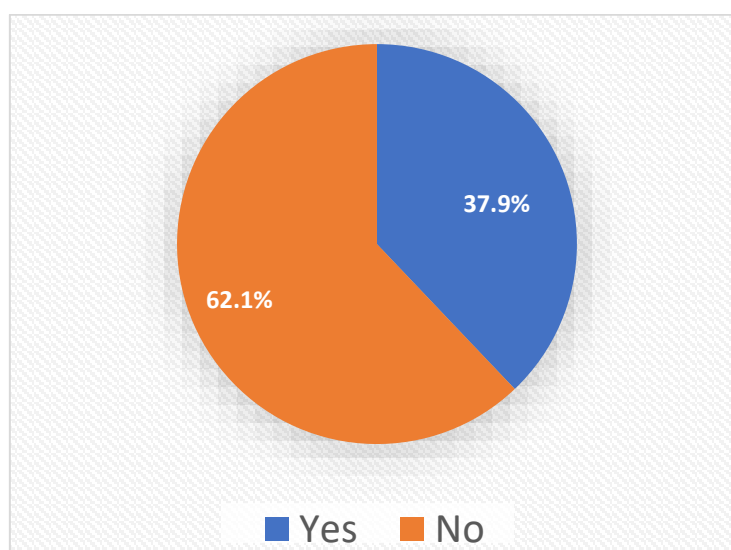


Figure 1. Prevalence of Smokeless Tobacco Usage

Among the study participants, 37.9% were consuming smokeless form of Tobacco.

Table 1. Socio-Demographic Variables

Variable		N (%)	P-value
Gender	Female	51(60.7)	<0.05
	Males	21(19.8)	
Age	<60 years	55(39)	0.500
	>60 years	17(34.7)	
Education	Illiterate	0(0)	0.400
	Literate	72(38.1)	
Occupation	Unemployed	33(46.5)	0.060
	Employed	39(32.8)	
Socio economic status (SES)	Class I & II	12(31.6)	0.370
	Class III, IV&V	60(39.5)	

Majority of Females (60.7%) were consuming smokeless form of tobacco compared to males. And this was statistically significant. Most of the Persons aged <60 years (39%), Unemployed

(46.5%) and SES of Class 3 and above were consuming smokeless form of tobacco compared to their counter parts

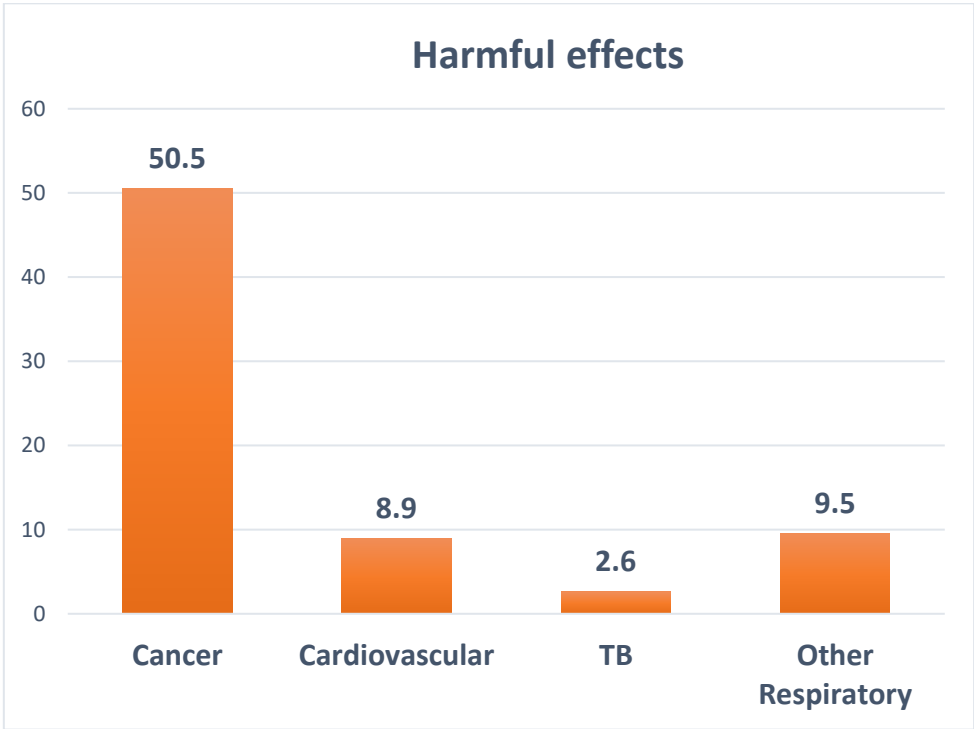


Figure 2. Harmful Effects of Tobacco

Harmful effects of tobacco were known by 85.1% (103/121 participants). Among them, 50.5% knew that risk of cancer, 8.9% knew

about cardiovascular diseases, 2.6% knew about TB and 9.5% knew above other respiratory diseases.

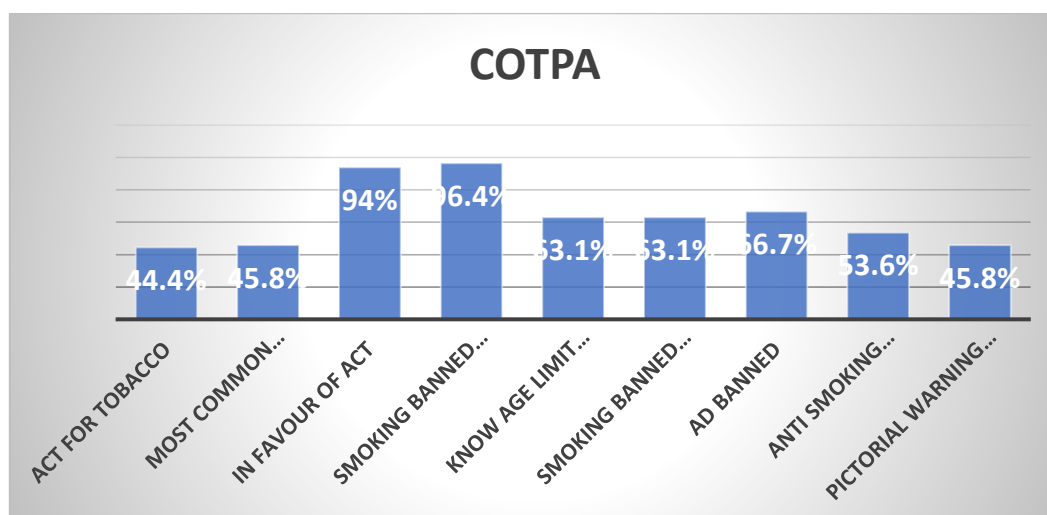


Figure 3. Awareness Regarding COTPA

Among the study participants, 44.4% had awareness regarding Act for tobacco, for 45.8% most common source was TV. 94% were in favour of the act, 96.4% knew that smoking banned in public places. 63.1% knew about the age limit for tobacco sale and smoking banned within 100 yards of educational institution each. 66.7% aware that adds of smoking were banned, 53.6% not followed anti smoking measures and 45.8% aware that pictorial warning reduces smoking.

DISCUSSION

The present study aimed to estimate the prevalence of smokeless tobacco usage in study population, to determine the association between socio demographic factors and prevalence of smokeless tobacco usage in study population and to assess awareness regarding the harmful effects of tobacco usage in the study population and to assess awareness regarding COTPA.

Tobacco consumption is an emerging epidemic especially in low- and middle-income countries like India. Tobacco is a major risk factor for lung cancer, emphysema, oral and throat cancers, pancreatic cancer, premature mortality in women, stillbirth and low birth weight in their offspring.

The present study found that 37.9% of the participants were current users of smokeless tobacco (SLT), indicating a significant public health concern. This prevalence is in line with national data from the Global Adult Tobacco Survey-2 (GATS-2), which reported that 21.4% of Indian adults used SLT, though prevalence rates can vary widely by region and demographic factors.⁶ Our finding that SLT use

was more common among individuals aged over 60 years suggests that tobacco use habits may become entrenched with age and may also reflect lower cessation attempts or awareness levels in older populations.⁷

Interestingly, the study revealed a higher prevalence of SLT use among females compared to males, which contrasts with several national-level surveys where male use typically surpasses female use.^{6,8} However, other regional studies have also shown elevated rates of SLT use among women, particularly in rural and socioeconomically disadvantaged communities where such practices are culturally normalized and sometimes linked to perceived health benefits like relief from dental issues or morning sickness.⁹

A high proportion of participants (85.1%) were aware of the harmful effects of tobacco, which is encouraging and indicates effective dissemination of health education messages. However, awareness did not necessarily translate into lower use, pointing to the addictive nature of nicotine and possibly limited cessation support, especially in rural or underserved areas.¹⁰

Regarding awareness of the Cigarettes and Other Tobacco Products Act (COTPA), 44.4% of the participants were aware of its existence. While this shows some reach of tobacco control policies, there is still a large proportion of the population that remains unaware of legal regulations designed to curb tobacco use. Nonetheless, it is noteworthy that 92.9% of participants supported the act, suggesting a strong public backing for tobacco control measures. Public support is a critical factor in

the successful implementation and enforcement of tobacco control legislation.¹¹

Furthermore, 45.8% of participants believed that pictorial warnings on tobacco products help reduce SLT use. This aligns with global evidence that graphic health warnings are effective in raising awareness and deterring tobacco initiation, especially in populations with low literacy levels.¹² However, the effectiveness may be limited if these warnings are not prominent, culturally relevant, or reinforced through broader education efforts.¹³

This study concluded that, Smokeless tobacco usage was more among females than males. Majority of the participants i.e. 85.1% knew about the harmful effects of tobacco. Almost 44.4% knew about COTPA, 94% were in favour of the act and 45.8% believed that pictorial warning helps reduce smokeless tobacco use. Public awareness has to be improved regarding the morbidity and mortality caused by use of smokeless tobacco products. Efforts have to be made to reduce availability of smokeless tobacco products. Strict implementation of COTPA.

While awareness of tobacco-related harms and support for regulation are relatively high, actual usage rates remain substantial, especially among older adults and females. These findings highlight the need for targeted interventions, including culturally tailored health promotion, gender-specific cessation programs, and better implementation of tobacco control policies at the community level.

Limitations: Since smokeless tobacco usage is considered to be a bad habit, not many participants were willing to be honest about their tobacco usage.

Conflict of interest: Nil

Funding: Nil

REFERENCES

1. Tobacco burden facts India [internet]. [cited 2021 Aug]. Available at India_tob_burden_en.pdf (tobaccofreekids.org)
2. Global Adult Tobacco Survey Fact Sheet India 2016-17 [internet]. Available at <https://www.who.int/publications/m/item/2016-2017-gats-fact-sheet-india>
3. World Health Organization. Fact sheets on tobacco.[Internet]. Geneva. Cited 2022 May 24. Available at (who.int)/ news-room/fact-sheets/detail/tobacco.
4. Smokeless Tobacco: Health Effects| CDC [internet]. Available at https://www.cdc.gov/tobacco/data_statistics/fact_sheets/smokeless/health_effects/index.htm
5. Bharati B, Sahu KS, Pati S. Prevalence of smokeless tobacco use in India and its association with various occupations: A LASI study. *Front Public Health*. 2023 Feb 27;11:1005103.
6. Ministry of Health and Family Welfare, Government of India. Global Adult Tobacco Survey GATS-2 India 2016-17. <https://ntcp.mohfw.gov.in>
7. Rani M, Bonu S, Jha P, Nguyen SN, Jamjoum L. Tobacco use in India: prevalence and predictors of smoking and chewing in a national cross-sectional household survey. *Tob Control*. 2003;12(4):e4.
8. Sorensen G, Gupta PC, Pednekar MS. Social disparities in tobacco use in Mumbai, India: the roles of occupation, education, and gender. *Am J Public Health*. 2005;95(6):1003-1008.
9. Bhisey RA. Chemopreventive and therapeutic potential of curcumin in oral premalignant and malignant lesions. *Oral Oncol*. 2006;42(9):805-810.
10. Sinha DN, Palipudi KM, Gupta PC, Singhal S, Ramasundarahettige C, Jha P. Smokeless tobacco use: a meta-analysis of risk and attributable mortality estimates for India. *Indian J Cancer*. 2014;51(5):73-77.
11. World Health Organization. WHO Framework Convention on Tobacco Control Implementation Database. <https://fctc.who.int>.
12. Hammond D. Health warning messages on tobacco products: a review. *Tob Control*. 2011;20(5):327-337.
13. Raute LJ, Pednekar MS, Mistry R, Gupta PC. Pictorial health warnings on cigarette packs: a population-based study findings from India. *Tob Use Insights*. 2009;2:11-16.