

**Original research article**

**Prevalence of tobacco use, nicotine dependence and associated oral premalignant lesion in rural area of Nanded District of Maharashtra, India**

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**Abstract**

**Background:** The tobacco use is one of the biggest public health threat worldwide. More than 11 million deaths are due to use of direct or indirect use of smokeless tobacco. As smokeless tobacco is strongly associated with oral cancers. Globally among all cancers oral cancer is one of the most common cancers with prevalence being high central and south East Asian Countries. So, for present study the aim is to find out the Prevalence of Tobacco Use, Nicotine Dependence and associated Oral Premalignant Lesion in Rural Area of Nanded district.

**Methods:** A community based cross-sectional study was carried out among 400 individuals aged  $\geq 18$  years. A predesigned, pretested questionnaire was administered to collect socio-demographic characteristics, reasons of use of Tobacco, Stages of oral premalignant lesion etc.

**Result:** In present study the prevalence of use of tobacco in rural population was 54.2%. 14.7% of respondents were having nicotine dependence. Majority of 68.0% of respondents were started smokeless & smoking form of tobacco consumption at age group 11-20 years. In tobacco consumption respondents, Majority (52%) found to have oral Erythroplakia followed by 12.9% had oral leukoplakia and 6.9% had oral sub mucous fibrosis. 3.7% and 6.4% had ulcers and any growth respectively.

**Conclusion:** The habit of tobacco chewing and smoking showed a statistically significant association to with stages oral premalignant lesion. Close follow up and systematic evaluation is required. There is an urgent need for awareness programs of deaddiction in rural areas involving the health workers, allied medical professionals and NGOs.

**Keywords:** Tobacco, smoking, oral cancer, nicotine dependence

**Introduction**

Tobacco use in any form is one of the leading preventable causes of morbidity and mortality in the world. According to the World Health Organization (WHO) estimates, globally, there were 100 million premature deaths due to tobacco in the 20th century. As per Government of India Ministry of Health and Family Welfare, there are 275 million tobacco users in India<sup>[1]</sup>.

Tobacco in India was introduced some 400 years ago by Portuguese by establishing tobacco trade based in Goa<sup>[2]</sup>. India is world's third largest tobacco growing country and Bidi manufacturing is the largest tobacco industry in India.

Smoking tobacco products include bidis, manufactured and hand-rolled cigarettes, pipes, cigars, hookah, water pipes and other locally produced smoking tobacco products, e.g. *chuttas*, *dhumti* and *chillum*. Smokeless tobacco use consists of chewing pan (mixture of lime, pieces of areca nut, tobacco and spices wrapped in betel leaf), chewing *gutkha* or *pan masala* (scented tobacco mixed with lime and areca nut, in powder form), *khaini* and *mishri*. India is one of the fewer countries in the world where prevalence of

dual use of smoking and smokeless tobacco is high<sup>[3]</sup>. In India, cigarette smoking comprises a small part of the tobacco smoking problem and a minor part of the overall tobacco problem, a major problem being beedi smoking and the oral use of smokeless tobacco products.

The tobacco use is one of the biggest public health threats in world wide. Tobacco use is a serious public health challenge in terms of magnitude and the different forms it is used in India. More than 11 million deaths due to use of direct and indirect use of smokeless tobacco, as smokeless tobacco strongly associated with oral cancers. Globally among all cancers oral cancer is one of the most common cancers with prevalence being high central and south East Asian Countries. Tobacco causes over 20 categories of fatal and disabling diseases including cancer, cardiovascular and chronic respiratory diseases.<sup>[4]</sup> Tobacco smoking causes cancer of the lung, oral cavity, nasopharynx, oropharynx and hypo-pharynx, nasal cavity and Paranasal sinuses, larynx, oesophagus, stomach, pancreas, liver, kidney, ureter, urinary bladder, uterine cervix and myeloid leukaemia of the bone marrow.<sup>[5]</sup>

The present study was conducted to evaluate the Prevalence of Tobacco Use, Nicotine Dependence and associated Oral Premalignant Lesion in Rural area of Nanded District.

## Material & Methods

**Study design:** It was a community based cross sectional study, conducted in rural area of Nanded district.

**Study area:** Village's under rural area of a taluka of Nanded District.

**Study duration:** 1<sup>st</sup> April 2022-30 June 2022

**Study population:** Rural population in area of a taluka of Nanded District.

### Inclusion criteria

- Rural population in selected village's under a taluka of Nanded District.
- Those who are above 18 year of age willing to participate in study and give consent.

### Exclusion criteria

- Those who are not willing to participate in this study

**Sample size:** Based on the finding of previous study, the prevalence of tobacco use among tobacco users was taken as 52.70% with 5% absolute error, using formula:  $n = \frac{4pq}{d^2}$  the required sample was 400 participants were selected from villages.

**Sampling technique:** The sampling technique was selected to provide an equal probability of the participants being selected. Present study was conducted in rural area of a taluka of Nanded District of Maharashtra State of India.

**Data Collection Tool:** For present study we have used data collection tool like predesigned semi structured questionnaire, Anthropometry, Digital sphygmomanometer to measure blood pressure (OMRON) and Torch, Disposable stick and gloves.

The predesigned semi structured questionnaire consisted three parts.

### Part-1: Socio-demographic profile and history

Socio demographic profile (name, age, sex, designation, religion, education, marital status, family type, size and total monthly income). Clinical history (present complaint, personal history, past history, family history, details of addiction history).

### Part-2: Fagerstrom scale

For smoking as well as smokeless tobacco will be used to find out tobacco dependence. Both scales include six items each. In each scale a score of 5 or more indicates a significant dependence/while a score of 4 or less shows a low to moderate dependence for both smoking and smokeless tobacco dependence scales.

### Part-3: Examination findings

Their general, systemic and detailed oral examination will be conducted. The oral examination will be conducted in day light with the help of torch and disposable stick and gloves. Participants will be examined for presence of leukoplakia, erythroplakia, sub mucous fibrosis, any ulcer, swelling, loss of tooth, any of the above and or abnormal finding will be marked in the oral examination part. The details will be filled in the case record form. If any abnormality will be found during examination, will be referred to the tertiary care hospital & teaching medical college (where the study will be carried out) for further investigations and treatment. Height will be measured with measuring tape and recorded in centimeters. Their weight will be measured with the weighing scale and recorded in kilogram. Blood Pressure measured by the sphygmomanometer and will be recorded in mm of Hg. Torch, disposable stick

and gloves for oral examination will be used. A pictorial pre validated flipchart will be used to sensitize them which will explain various forms of tobacco, health hazards of it, oral self-examination, modes of quitting of tobacco. Health education will be given to all participants.

**Methodology**

It is a simple random cross-sectional study. After obtaining institutional ethical committee approval, study was carried out. Those who fulfilling inclusion and exclusion criteria of study and ready to give written informed consent. The participants were interviewed through a pre-tested, semi-structured questionnaire to collect data on the demographic data, reason for initiation, form of tobacco used, frequency of consumption, duration for tobacco use, Nicotine Dependence and associated Oral Premalignant Lesion. The questions were explained to them in simple and understandable language. The patients were clinically examined for any tobacco related oral lesions.

**Statistical analysis:** The data was analysed in SPSS software version 25.0<sup>th</sup>. Frequency tables and Chi square tests were used to estimate the distribution and association of the variables, respectively.

**Results**

**Table 1:** Socio-demographic profile of participants

Socio-demographic profile	No. of participants[N=400]	Percentage	
Age-group(in years)	18 -21	31	7.75
	21- 30	110	27.5
	31- 40	137	34.25
	41- 50	97	24.25
	51 and above	25	6.25
	Mean±SD years	38.72 ±11.35	
Gender	Male	275	68.75
	Female	125	31.25
Education	Illiterate	132	33.0
	Primary	150	37.5
	Secondary	79	19.75
	Higher secondary	33	8.25
	Graduate& above	6	1.5
Occupation	Teacher	01	0.25
	Farmer	206	51.5
	Driver	20	5.0
	Labourer	157	39.25
	Student	11	2.75
	Other	05	1.25
Type of Family	Nuclear	147	36.75
	Joint	240	60.0
	Extended Joint	13	3.25

It was seen from Table 1 that out of 400 participants, maximum i.e. 137(34.25%) participants were in the age group of 31-40 years followed by 110(27.5%) between 21-30 years and 25(6.25%) participants were in the age 18-21 years. Total number of male participants were 275(68.75%) and 125(31.25%) were female participants. 150(37.05%) study participants were primary level, 132(33%) were illiterate, 79 (19.75%) were educated up to secondary and very few 6(1.5%) participants were educated up to graduate. More than (60%) of the participant’s belonged to joint family followed by nuclear family which was 36.75% and 13(3.25%) were from extended joint family.

**Table 2:** Tobacco consumption information of participants

Addiction of Tobacco Consumption	Yes	No. of participants	Percentage
	No	217	54.2
Type of Tobacco consumption [n=217]	Tobacco(smokeless)	158	39.5
	Tobacco (smoking)	11	2.75
	Both	48	12.0
Specific time of smokeless tobacco consumption [n=206]	Morning	135	67.5
	Afternoon	00	00
	Evening	00	00
	Night	00	00
	Not specific	71	35.5
Age at which smokeless & smoking form of tobacco consumption stated (In Years)	11 to 20	148	68
	21-30	60	28

[n=217]	31-40	09	04
	41-50	00	00
	50-60	00	00
Reasons for tobacco use [n=217]	Pleasure	84	38.71
	Reduce Stress	79	36.41
	Make Friend	08	3.69
	Shift Duty	03	1.38
	Any Other	43	19.82
Family history of tobacco consumption [n=400]	Yes	204	51.0
	No	196	49.0
Attempted for quitting tobacco[n=217]	Yes	115	53.00
	No	102	47.00

As seen from Table 2 that out of 400 participants, 217(54.2%) were having addiction of tobacco consumption and 183(45.8%) were not having addiction of tobacco consumption. out of 217 tobacco consumers maximum number i.e.158(39.5%) were using smokeless form of tobacco, 11(2.75%) of participants had smoking habit and 48(12.0%) participants had history of tobacco consumption in either form. Out of 206,135(65.35%) consumed tobacco in the morning, followed by 71(35.5%) chewers stated that they did not have any specific time of consumption of tobacco. Out of 217 participants, majority of tobacco consumers 148(68%) of consumers started to consume tobacco at the age of 11 to 20 years, followed by 60(28%) started to consume at the age between 21 to 30 years. Maximum tobacco consumers i.e. 84 (38.71%) were using tobacco for Pleasure, followed by 79 (36.41%) used tobacco for reduce stress, 43(19.82%) were for any other reason and 8 (3.69%) were using due to their make friends and 3 (1.38%) used tobacco for shift of their duties. This indicated that majority of them had pleasure, and were using tobacco for their pleasure only. Out of 400 respondents, 204(51.0%) participants were found to have family history of tobacco consumption and 196(49.0%) did not have.

**Table 3:** Association between gender and Addiction of Tobacco consumption

Gender	Addiction of Tobacco consumption		Total	Chi-square value	P-value
	Yes (%)	No (%)			
Male	176 (64%)	99(36%)	275	32.46	P<0.000**
Female	41 (32.8%)	84(67.2%)	125		
Total	217	183	400		

It was observed from Table 3 that in present study, the prevalence of tobacco usage in male was 64% and 32.8% of females were using some form of tobacco. This shows that male have more prevalence of using tobacco than female. There was statistical significant association between gender and Addiction of Tobacco consumption (p<0.000).

**Table 4:** Nicotine dependency (Fagerstrom scale) for smokeless and smoking form of tobacco consumption

Fagerstrom scale	Nicotine Dependence		Total	Chi-square test	P-value
	Low to Moderate Dependence (≤4)	Moderate to High(>4)			
	No. of participants(%)	No. of participants(%)			
Smokeless	45(84.91%)	161(75.95%)	206	1.484	0.223 NS
Smoking	8(15.09%)	51(24.05%)	59		
Total	53(100%)	212(100%)	265		

It was seen from Table 4 that there were six questions in fagerstrom scale for smoking and smokeless form of tobacco to find out their nicotine dependence for nicotine. According to duration of their first dip to took, More than half of tobacco chewers had craving for their first dip of chewing tobacco within half an hour after getting up. For smoking form more than half of smokers smoked their first cigarette after an hour. Above table shows that, out of 206 tobacco chewers (smokeless), 161(75.95%) were having moderate to high dependency to nicotine while 45(84.91%) had low to moderate nicotine dependency. 51(24.05%) had moderate to high dependency out of 59 smoking form of tobacco (smokers) followed by 8(15.09%) had low to moderate dependences per the Fagerstrom test for nicotine dependence scale. There was not statistical significant association between Nicotine dependence classification and smokeless and smoking form of tobacco consumption (p<0.223).

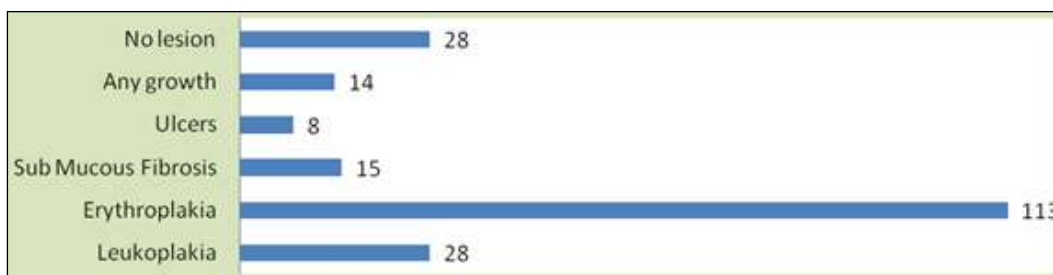


Fig 1: Tobacco consumers according to stages oral premalignant lesion

It was seen from Figure 1 that the distribution of oral premalignant lesion among tobacco consumers. Out of 400, 206 had history of tobacco consumption, Majority of them i.e. 54(54.85%) found to have oral Erythroplakia followed by 28(13.59%) had oral leukoplakia and 15(7.28%) had oral submucous fibrosis and 8 (3.88%) and 14 (6.80%) had ulcers and any growth respectively.

Table 5: Association between gender and Nicotine Dependence in smokeless and smoking form of tobacco

Gender	Nicotine Dependence		Total	Chi-Square Value	P-value
	Low to Moderate dependence (≤4)	Moderate to High dependence (>4)			
Male No. of participants (%)	28(59.57%)	148(87.06%)	176	18.15	P-<0.001
Female No. of participants (%)	19(40.43%)	22(12.94%)	41		
Total	41(100%)	170(100%)	217		

It was observed from Table 5 that nicotine dependency among males showed that, 87.06% had moderate to high dependency, 59.57% had low to moderate dependency. Among females, 40.43% had low to moderate nicotine dependency and 12.94% had moderate to high nicotine dependency. This shows that the males were more nicotine dependent than females among smokeless and smoking form of tobacco. A statistically significant association was present between gender and nicotine dependency among smokeless and smoking form of tobacco.

Table 6: Association between stages oral premalignant lesion and Smokeless and smoking form of tobacco

Stages oral premalignant lesion	Smokeless	smoking form of tobacco	Chi-square test	p-value
	No. of participants (%)	No. of participants (%)		
Leukoplakia	20 (12.42%)	08 (17.78%)	15.73	P=0.008 Significant
Erythroplakia	97 (60.24%)	16 (35.55%)		
Sub Mucous Fibrosis	12(7.45%)	03 (6.67%)		
Ulcers	07(4.34%)	01 (2.22%)		
Any growth	10 (6.21%)	04 (8.89%)		
No lesion	15 (9.31%)	13 (28.89%)		

As seen from Table 6 that the habit of tobacco chewing (smokeless) and smoking form of tobacco showed a statistically significant association to with stages oral premalignant lesion (p=0.008).

Discussion

Tobacco chewing is present in most of the evolving countries, exceptionally those in South East Asia. Tobacco chewing and smoking have been recognized as major risk factors for oral cavity pre- cancerous lesions and cancer in India<sup>[6]</sup>.Tobacco use has been identified to be more among the lower socio-economic groups, particularly in tribal population (52.1%)<sup>[7]</sup> and among adolescent males (65.3%)<sup>[8]</sup>. In present study, out of 400 participants, 217(54.2%) were having addiction of tobacco consumption. The overall prevalence of tobacco use in study Mishra A *et al.*<sup>[9]</sup> was 24.78% that reported by Chaudhry *et al.*<sup>[10]</sup> i.e. 29.6% in Karnataka and 34.6% in Uttar Pradesh but higher than 16.38% reported by Kasat *et al.*<sup>[11]</sup>

Tobacco use in India has been higher among males than among females in India. In present study, the prevalence of tobacco usage in male was 64.0% and 32.8% of females were using some form of tobacco. This shows that male have more prevalence of using tobacco than female. Mishra A, *et al.*<sup>[9]</sup> found that 75.80% were males and 24.19% were females. Male predominance seen in this study was in accordance with Kasat *et al.*<sup>[11]</sup> and Vellappally S *et al.*<sup>[12]</sup>. Whereas a Libin Benance Jacob *et al.*<sup>[13]</sup> found that female predominance (62.2%) was observed when compared to males (37.8%). Mujica V *et al.*<sup>[14]</sup> and Al-Mobeeriek A *et al.*<sup>[15]</sup> have reported a female predominance of 67% and 57.7%, respectively. In present study, Out of 217 tobacco consumers maximum number i.e. 158(39.5%) were using smokeless

form of tobacco, 11(2.75%) of participants had smoking habit and 48 (12.0%) a participants had history of tobacco consumption in either form. Similarly, Mishra A, *et al.*<sup>[9]</sup> found that Tobacco consumption was 44.4% mostly in the form of smokeless tobacco.

Above table shows that, out of 206 tobacco chewers (smokeless), 161(75.95%) were having moderate to high dependency to nicotine while 45(84.91%) had low to moderate dependency. Out of 59 smoking form of tobacco (smokers), maximum i.e. 51(24.05%) had moderate to highdependence, followed by 8 (15.09%) had low to moderate dependence to nicotine as per the Fagerstrom test for nicotine dependence scale. Libin Benance Jacob *et al.*<sup>[13]</sup> found that medium nicotine dependency was more both in both smoking and smokeless tobacco users (82.75% and 53.57%). Aslo Anjali S *et al.*<sup>[16]</sup> similarly medium level of dependency was high among similar tribe kattunaickan (63.8%). In present study majority of them i.e. 113(54.85%) found to have oral Erythroplakia followed by 28(13.59%) had oral leukoplakia and 15(7.28%) had oral submucous fibrosis. 8 (3.88%) and 14 (6.80%) had ulcers and any growth respectively. Mishra A *et al.*<sup>[9]</sup>reputed tobacco induced hyperkeratosis was seen in 31.83% of subjects, leukoplakia and oral submucous fibrosis was 3.31% and 5.43% respectively. Other mucosal lesions such as smoker's palate, lichen planus, cancer, erythroplakia were present in 2.55%.

There was not statistical significant association between Nicotine dependence classification and smokeless and smoking form of tobacco consumption ( $p < 0.396$ ). This present study shows that the males were more nicotine dependent than females among smokeless and smoking form of tobacco. A statistically significant association was present between gender and nicotine dependency among smokeless and smoking form of tobacco. The habit of tobacco chewing (smokeless) and smoking form of tobacco showed a statistically significant association to with stages oral premalignant lesion ( $p = 0.008$ ).

This present study was a small study with less sample size in rural population of central India. Large-scale epidemiological studies should be designed all over India for better understanding of tobacco use and its associated factors. The diagnosis of lesions was based mainly on clinical findings rather than on histopathology because of the unwillingness of majority of the participants with oral lesions for biopsy. So, in large scale awareness should be crated among Tobacco users related to importance of biopsy.

### Conclusion

The prevalence of tobacco usage in male was 64.0% and 32.8% of females were using some form of tobacco. Male have more prevalence of using tobacco than female in rural population. Majority of them used various forms of smokeless tobacco. A family history of tobacco use, pleasure reduce stress were shown to be the prime constituting factors for early onset of the habit. Moderate tobacco dependency was more prevalent among tobacco users. A statistically significant association was present between gender and nicotine dependency among smokeless and smoking form of tobacco. Majority of 54.85% subjects found to have oral Erythroplakia followed by 13.59% had oral leukoplakia and 7.28% had oral sub mucus fibrosis. The habit of tobacco chewing and smoking showed a statistically significant association to with stages oral premalignant lesion. Close follow up and systematic evaluation is required. There is an urgent need for awareness programs of deaddiction in rural areas involving the health workers, allied medical professionals and NGOs.

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