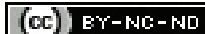


Prevalence of Oral Lesions and Nicotine Dependency among Tobacco Users in an Urban Community of Vellore, South India

LIBIN BENANCE JACOB¹, JS JESIJA², MADHU MOHAN³, RUBY ANGELINE PRICILLA⁴, JASMIN HELAN PRASAD⁵

ABSTRACT

Introduction: Tobacco consumption is one of the most leading causes of preventable deaths around the world. According to the World Health Organisation (WHO), eight million deaths occur annually due to tobacco usage.

Aim: To identify the prevalence of oral lesions among people who use tobacco, their knowledge on health hazards of tobacco use and the dependence on nicotine among adults in the age group between 18 to 60 years.

Materials and Methods: A community-based, cross-sectional study was conducted in Department of Community Medicine, Christian Medical College, Vellore, Tamil Nadu, India, among an urban community of Vellore, between January 2019 to June 2019. This study included 930 participants. An interviewer administered questionnaire was used to assess the prevalence of tobacco and dependence on nicotine among adults. The participants who use tobacco were examined for oral lesions. Univariate analysis was performed to highlight the variables and logistic regression model was used to find the adjusted odds ratios and p-values. A p-value < 0.05 was considered statistically significant.

Results: The total number of adults who participated in this study was 930. The median age group among the study population was 38 years and the mean age was 38.26±12 years. About two-third (62.2%) of the participants were females. The proportion of adults currently using tobacco in any form was 24.19% (n=225), with those using Smoking Tobacco (ST) was 59.1% (n=133), Smokeless Tobacco (SLT) was 38.6% (n=87) and using both ST and SLT were 2.2% (n=5). The prevalence of oral mucosal lesions was found to be 60.1% with smoker's palate (N=96) being the most frequently occurring oral mucosal lesion. The nicotine dependence was found to be significant in the subjects with age more than 45 years and had used tobacco for more than 20 years. On the analysis of the knowledge on health hazards, it was identified that 76.3% of the participants were aware that use of tobacco in any form can cause oral lesions.

Conclusion: This study highlights that oral lesions and nicotine dependence are highly prevalent among the tobacco users. This emphasises the need for community-based oral health awareness programs highlighting the consequences of tobacco usage in order to prevent the incidence of oral cancers.

Keywords: Habit cessation, Leukoplakia, Oral submucous fibrosis, Smoking tobacco, Smokeless tobacco

INTRODUCTION

Tobacco consumption is one of the most leading causes of preventable deaths around the world [1]. According to the World Health Organisation (WHO) report (2011), there were around 100 million deaths due to tobacco usage in the 20th century [2]. Most of the tobacco users acknowledge the harm that they are doing to themselves, yet they continue to use because the nicotine from these tobacco products generates strong urges to use the tobacco products undermining the negative consequences [3]. The burnt tobacco smoke contains a large number of chemicals that are harmful to both smokers and non smokers [4]. Numerous chemicals are present in tobacco smoke, with at least 200 chemicals are known to be harmful and among these 200 chemicals, 50 chemicals have shown to cause cancer [5]. Smokeless Tobacco (SLT) products contain a variety of potentially harmful chemicals, including high levels of Tobacco Specific Nitrosamines (TSNA) and other cancer-causing agents such as benzopyrene, other polycyclic aromatic hydrocarbons as well as radioactive substances [6].

Tobacco products is a well-established cause of oral cancer, which is one of the most common cancers in India and the third most common type of cancer in South-central Asia [7]. A variety of oral mucosal disorders is associated with the use of smoking and SLT and may lead to a potential risk of developing cancer [8]. The most common oral mucosal diseases associated with tobacco use are leukoplakia, erythroplakia, and Oral Submucous Fibrosis (OSMF) and these are considered as potentially malignant disorders by the WHO [9]. Though majority of the tobacco related oral mucosal disorders require only conservative management, they can potentially transform into malignant if it is not diagnosed early [10].

Tobacco is one of the legal consumer products that can harm everyone exposed to it and kill half of those who either use it or are exposed to it [11]. According to the Global Adult Tobacco Survey-2 (GATS-2) reports in the year 2016-17, 28.6% of the Indian population consumes tobacco in some form; 10.7% uses smoke, and 21.4% uses SLT. Khaini (11%) and beedis (8%) are the dominant tobacco products consumed in India and the prevalence of overall use of tobacco is 20% in Tamil Nadu [12]. There is an urgent need for more active and complete awareness camps about the health effects of tobacco. Thus, this study aims to identify the prevalence of oral lesions among people who use tobacco and their knowledge on health hazards of tobacco use and dependence on nicotine among adults in the age group between 18 to 60 years in Vellore. Identification of the prevalence of oral lesions and nicotine dependency among these groups would elicit the intensity of the tobacco cessation counselling programme required for an urban community.

MATERIALS AND METHODS

A community-based, cross-sectional study was conducted in Department of Community Medicine, Christian Medical College, Vellore, Tamil Nadu, India, among an urban community of Vellore, between January 2019 to June 2019. The study proposal was approved by the Institutional Review board and Ethics Committee (IRB No.11565 dated: 01-10-2018). The total population of urban slums in Vellore was approximately 10,000, and adults aged between 18 to 60 years were about 3450. More than half of the urban slum populations are daily wagers. Written informed consent was obtained from all the participants.

Inclusion and Exclusion criteria: The adults including both male and female subjects, aged between 18 to 60 years were included in the study. The adults who were less than 18 years and more than 60 years, who were terminally ill, bed ridden, and mentally disabled were excluded from the study.

Sample size calculation: Based on the findings of a previous study, the prevalence of oral lesions among tobacco users was taken as 35% [13]. With 20% relative precision, using the formula: $n=4pq/d^2$, the required sample was 186 current tobacco users. According to the GATS-2 report, the prevalence of any form of tobacco use in Tamil Nadu was 20% [12]. Hence to recruit 186 people who use tobacco currently, the required sample size to interview would be 930 $\{186 \times (100/20)\}$. Hence, 930 individuals were interviewed to identify people with the usage of tobacco in any form. All those who use tobacco were examined for oral lesions.

Simple random sampling technique was used in this study. The list of people in the age group of 18-60 years were obtained from eight urban communities of Vellore Corporation. Using computer generated random numbers, 1000 subjects were selected to obtain the sample size of 930.

Questionnaire

Global Adult Tobacco Survey-2 (GATS-2): An interviewer administrated questionnaire based on the GATS-2 was used to assess smoking and smokeless usage [14]. The questionnaire contained 10 questions on knowledge about the ill-effects of tobacco use. These were asked to know the knowledge among the participants about the harmful effects of tobacco. Scoring was given for each question, with a maximum score of 16 and the cut-off was kept at 8. The yes/no items were scored as 0 or 1 and the multiple-choice items were scored from 0 to 2. Finally, it was summed to yield a total score of 0 to 16. The participants scoring was as follows:

- Less than 8 was considered to have less knowledge and
- Above 8 was considered to have good knowledge on the harmful effects of tobacco.

Fagerström nicotine dependence test: Based on Fagerström nicotine dependence test, six questions on each smoking and SLT were used to assess the level of nicotine dependence on tobacco use [15]. In this test, yes/no items were scored as 0 or 1 and multiple-choice items were scored from 0 to 3. Finally, it was summed to yield a total score of 0 to 10. Higher the Fagerström score, more intense is the physical dependence on nicotine. The participants who score:

- Between 0 and 4 was considered as low dependence,
- 5 and 7 as medium dependence and
- Above 8 as high dependence of nicotine.

Total 12 questions on willingness to quit was also assessed using the interviewer administrated questionnaire. Oral examination was done by the principal investigator, who is a dental surgeon and trained to identify potentially malignant disorders. Oral lesions such as leukoplakia, OSMF, erythro-leukoplakia, smoker's palate and tobacco pouch keratosis as well as oral cancers were identified during the oral examination that includes intraoral inspection and palpation with appropriate illumination paramount. After examination, a brief education on the harmful effects of tobacco was given to all study participants.

STATISTICAL ANALYSIS

The collected data was entered in Epi-data and analysed with Statistical Package for the Social Sciences (SPSS) version 21.0. Univariate analysis was done to describe the variables of this study using frequencies and percentages. The quantitative variable such as age and frequency of tobacco usage was collected as continuous variable bivariate analysis was done to find significant associations, odds ratios and the 95% confidence intervals for socio-demographic

factors and the outcome factors which included knowledge, nicotine dependence among tobacco users and willingness to quit. Logistic regression model was used to calculate the adjusted odds ratios and p-values between the exposed and outcome variables. A p-value <0.05 was considered statistically significant.

RESULTS

Sociodemographic details: The total number of adults who participated in this study was 930. The median age group among the study population was 38 years and the mean age was 38.26±12 years. Nearly two-third (62.2%) of the participants were females and 16.8% of this study population did not have any formal level of education. [Table/Fig-1] highlights the socio-demographic details of the participants of the study.

Variables	Category	Frequency	Percentage
Age (years)	18-24	140	15.1
	25-34	258	27.7
	35-44	227	24.4
	45-54	174	18.7
	55-60	131	14.1
Gender	Male	352	37.8
	Female	578	62.2
Education	Illiterate	156	16.8
	Primary level (1 st -5 th grade)	95	10.2
	Middle school (6 th -8 th grade)	341	36.7
	High school (9 th and 10 th grade)	148	15.9
	Higher secondary/Diploma (above 10 th grade)	123	13.2
	Graduation/Postgraduation	67	7.2
Marital status	Unmarried	148	15.9
	Married	678	72.9
	Widowed	92	9.9
	Divorced/ Separated	12	1.3
Occupation	Housewife	291	31.3
	Unemployed	104	11.2
	Unskilled labourers	261	28.1
	Semi-skilled labourers	77	8.3
	Skilled labourers	123	13.2
	Small business	47	5.1
	Government or private services	14	1.5
	Executive or professionals	13	1.4
Type of family	Joint	47	5.1
	Extended	345	37.1
	Nuclear	538	57.8

[Table/Fig-1]: Distribution of socio-demographic characteristics (N=930).

Prevalence of tobacco use: In the study population (n=930), currently 225 adults were using tobacco in any form and 66 adults were using in the past. Among the overall current tobacco users (n=225), 71.1% (n=160) were males and 28.9% (n=65) were females. The prevalence of tobacco use is tabulated in [Table/Fig-2]. The proportion of adults currently using tobacco in any form was 24.2% (n=225) with those ST was 59.1% (n=133), SLT was 38.6% (n=87) and using both ST and SLT were 2.2% (n=5). The adults who had used any form of tobacco in the past were 7.1% (n=66).

[Table/Fig-3] highlights the type of tobacco used currently and in the past among the participants. Amongst the 138 current ST users, 29.7% (n=41) were cigarette users, 58% (n=80) were beedi users and 12.3% (n=17) were using both cigarettes and beedis. Of the 92 current SLT users, 20.7% (n=19) were users of betel quid, 20.7% (n=19) were khaini users, 5.4% (n=5) were gutka users and 53.3%

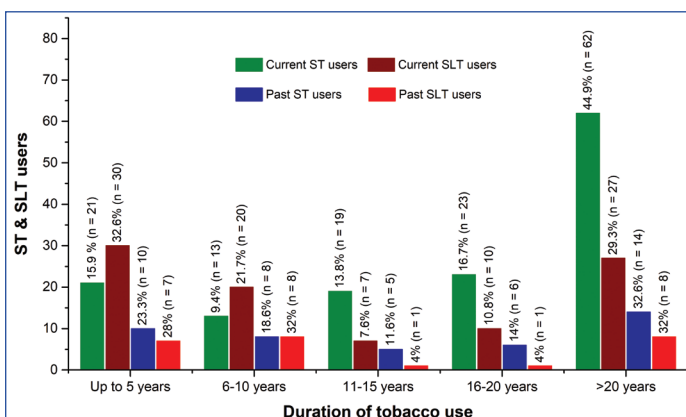
Tobacco users	Male (N=352)		Female (N=578)		Total (n=930)
	n	%	n	%	
Current smoking tobacco users	133	37.8	0	0	133
Current smokeless tobacco users	22	6.3	65	11.2	87
Current smoking tobacco and smokeless tobacco users	5	1.4	0	0	5
Past smoking tobacco users	41	11.6	0	0	41
Past smokeless tobacco users	7	2	16	2.8	23
Past smoking tobacco and smokeless tobacco users	2	0.6	0	0	2
Never used smoking tobacco/Smokeless tobacco	142	40.3	497	86	639

[Table/Fig-2]: Prevalence of tobacco users.

(n=49) were using tobacco paste or snuff. [Table/Fig-4] depicts the duration of tobacco use by the study population. Amongst the tobacco users, 44.9% (n=62) were using ST and 29.3% (n=27) were using SLT for more than 20 years.

Type of tobacco		Current users		Past users	
		n	%	n	%
Smoking tobacco (Current users, n=138; Past users, n=43)	Cigarette	41	29.7	28	65.1
	Beedi	80	58	15	34.9
	Both	17	12.3	-	-
Smokeless tobacco (Current users, n=92; Past users, n=25)	Betel quid with tobacco	19	20.7	6	24
	Khaini	19	20.7	5	44
	Gutka	5	5.4	0	0
	Tobacco paste	49	53.3	14	56

[Table/Fig-3]: Type of tobacco used by the study population.



[Table/Fig-4]: Duration of tobacco use.

ST: Smoking tobacco; SLT: Smokeless tobacco

Prevalence of oral mucosal lesions: In the study population, 291 participants had consumed tobacco at least once in their lifetime. Of the 291 subjects, oral mucosal lesions were observed in 176 (60.5%) adults whereas only 2 (0.3%) had oral mucosal lesions among those who had never consumed tobacco (n=639) in their lifetime. The prevalence of oral mucosal lesions among the tobacco users

Tobacco Users (n=930)	Leukoplakia		Erythroleukoplakia		Oral submucous fibrosis		Tobacco pouch keratosis		Smoker's palate	
	n	%	n	%	n	%	n	%	n	%
Current ST users (n=133)	22	16.5	6	4.5	0	0	4	2.9	82	61.7
Past ST users (n=41)	1	2.4	0	0	0	0	1	2.4	6	14.6
Current SLT users (n=87)	2	2.3	1	1.1	17	19.5	17	19.5	1	1.1
Past SLT users (n=23)	1	4.3	0	0	0	0	1	4.3	3	13
Both ST and SLT (n=7)	3	42.9	0	0	0	0	4	57.1	4	57.1
Never used ST/SLT (n=639)	0	0	1	0.2	0	0	1	0.2	0	0

[Table/Fig-5]: Prevalence of oral mucosal lesions among tobacco users.

ST: Smoking tobacco; SLT: Smokeless tobacco

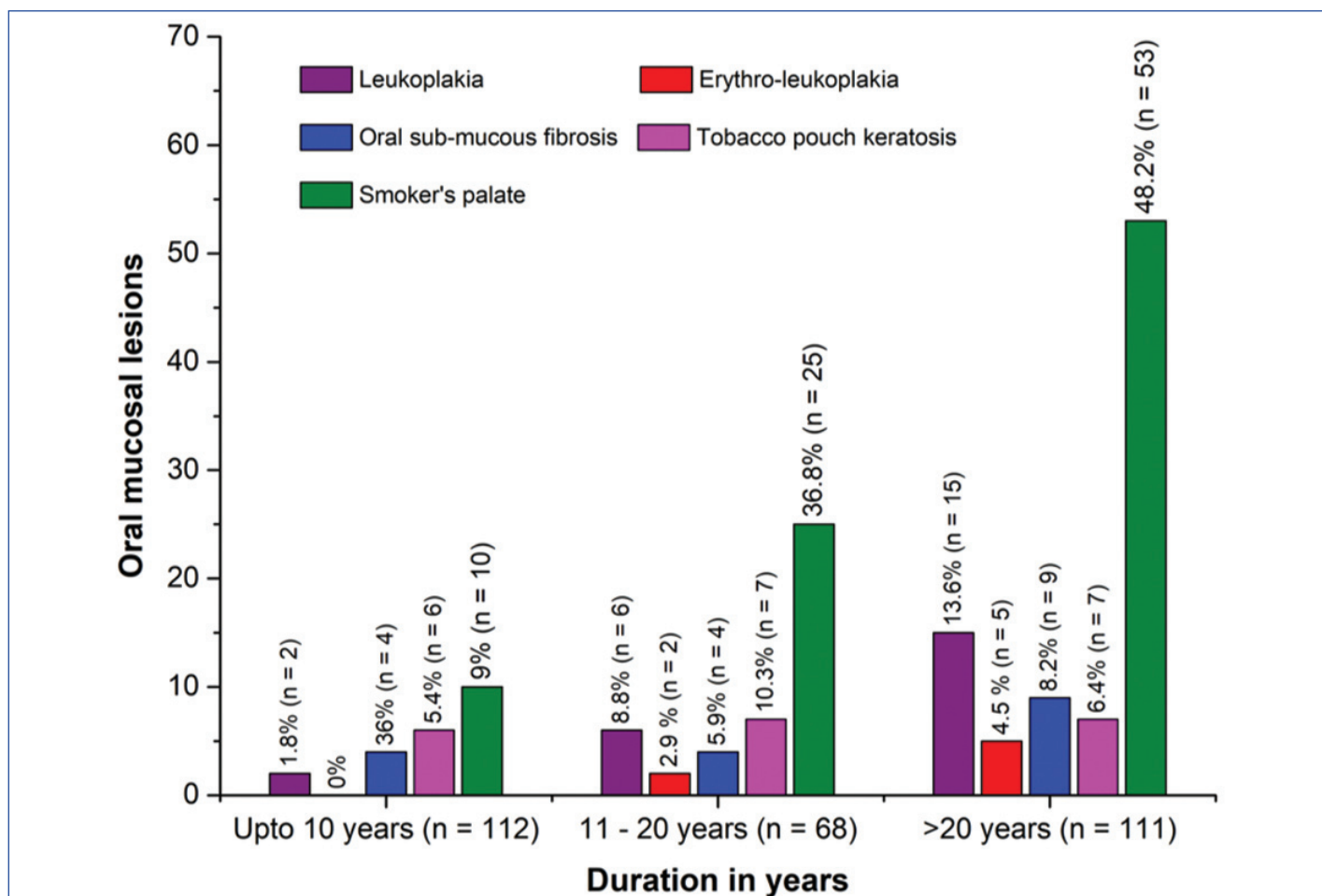
is highlighted in [Table/Fig-5]. [Table/Fig-6] highlights the prevalence of oral mucosal lesions with duration of tobacco use in years. Oral mucosal lesions were observed in 80.1% (n=89) of the adults who used tobacco for more than 20 years (n=111), whereas only 18.8% (n=22) of adults had oral mucosal lesions who used tobacco for less than 10 years. The number of participants who had used tobacco for 10 years, 11 to 20 years and more than 20 years, presented with either single or multiple oral mucosal lesions were 22, 44 and 89 respectively. On statistical analysis, it was found that the prevalence of leukoplakia ($p < 0.001$), erythro-leukoplakia ($p < 0.001$) and smoker's palate ($p < 0.001$) were significantly higher among ST users. The oral submucous fibrosis ($p < 0.001$) and tobacco pouch keratosis ($p < 0.001$) were found to be highly prevalent among SLT users.

Risk factors associated with oral lesions: In bivariate analysis, the type of SLT use and duration of tobacco use more than 20 years were significantly associated with presence of oral lesions {OR 1.94 (95% CI: 1.11, 3.4) and 2.33 (95% CI: 1.33, 4.9), respectively}. However, after adjusting for age, socio-economic status, type and duration of tobacco use; for age {Adjusted OR 2.21 (95% CI: 1.08, 4.52)}, SLT use {Adjusted OR 2.88 (95% CI: 1.56, 5.33)} and duration of use more than 20 years {Adjusted OR 4.33 (95% CI: 2.1, 8.96)} were found to be significantly associated with oral lesions. The analysis of risk factors associated with oral lesions (n=287) is represented in [Table/Fig-7].

Nicotine dependence among current tobacco users: The nicotine dependence among tobacco users is listed in [Table/Fig-8]. Among the ST users of 133 subjects, 78.2% (n=104) had low nicotine dependence, 15.0% (n=20) had moderate nicotine dependence and 6.8% (n=9) had high nicotine dependence. Out of 87 SLT users, 79.3% (n=69) had low nicotine dependence, 18.4% (n=16) had moderate nicotine dependence and 2.3% (n=2) had high nicotine dependence. Among the participants who had used both SLT and ST, 5 had low nicotine dependence.

Risk factors associated with nicotine dependency: [Table/Fig-9] represents the risk factors associated with nicotine dependency among the ST users. In bivariate analysis, age >45 years {OR 4.19 (95% CI: 1.76, 9.97)} and duration of tobacco use >20 years {OR 6.88 (95% CI: 2.58, 18.34)} were significantly associated with nicotine dependency among ST users. However, after adjusting for age, socio-economic status and duration of use among ST users, the duration of tobacco usage for more than 20 years {Adjusted OR 5.34 (95% CI: 1.54, 18.49)} was found to be significantly associated with nicotine dependency. The risk factors associated with nicotine dependency among the SLT users were found to be insignificant [Table/Fig-10].

Knowledge of health hazards: On the analysis of knowledge on health hazards, it was identified that 95.4% (n=888) and 92.6% (n=862) of the total population believed that serious illness can be caused by ST and SLT, respectively. Majority of the subjects (92.1%; n=857) believed that the use of tobacco in any form can cause lung cancer and 76.3% (n=710) of the participants were aware that use of tobacco can cause oral disease. An 89.3% (n=831) of the participants knew that ST could cause heart attack. The reasons for using tobacco are depicted in [Table/Fig-11,12] highlights the



[Table/Fig-6]: Prevalence of oral mucosal lesions with duration of tobacco use.

Variable	Category	Oral lesions		p-value	Unadjusted OR (95% CI)	Adjusted p-value	Adjusted OR (95% CI)
		Yes n (%)	No n (%)				
Age (years)	>45 years (n=136)	32 (23.5)	104 (76.5)	0.778	1.1 (0.63, 1.91)	0.029*	2.21 (1.08, 4.52)
	≤45 years (n=151)	33 (21.9)	118 (78.1)				
Socio-economic status (B.G. Prasad scale)	Lower to middle (n=179)	43 (24)	136 (76)	0.561	1.24 (0.69, 2.21)	0.310	1.37 (0.75, 2.52)
	Upper and upper middle (n=108)	22 (20.4)	86 (79.6)				
Type of tobacco (ever used)	Smokeless (n=110)	33 (30)	77 (70)	0.021*	1.94 (1.11, 3.4)	0.001*	2.88 (1.56, 5.33)
	Smoking (n=177)	32 (18.1)	145 (81.9)				
Duration of tobacco use	>20 years (n=109)	35 (32.1)	74 (67.9)	0.004*	2.33 (1.33, 4.9)	< 0.001*	4.33 (2.10, 8.96)
	≤20 years (n=178)	30 (16.9)	148 (83.1)				

[Table/Fig-7]: Risk factors associated with oral lesions.
*p-value <0.05 was considered as statistically significant

Nicotine dependency	Low dependence		Moderate dependence		High dependence	
	Count	%	Count	%	Count	%
Current smoking tobacco use (n=133)	104	78.2	20	15.0	9	6.8
Current smokeless tobacco use (n=87)	69	79.3	16	18.4	2	2.3
Both users (n=5)	5	100	0	0	0	0

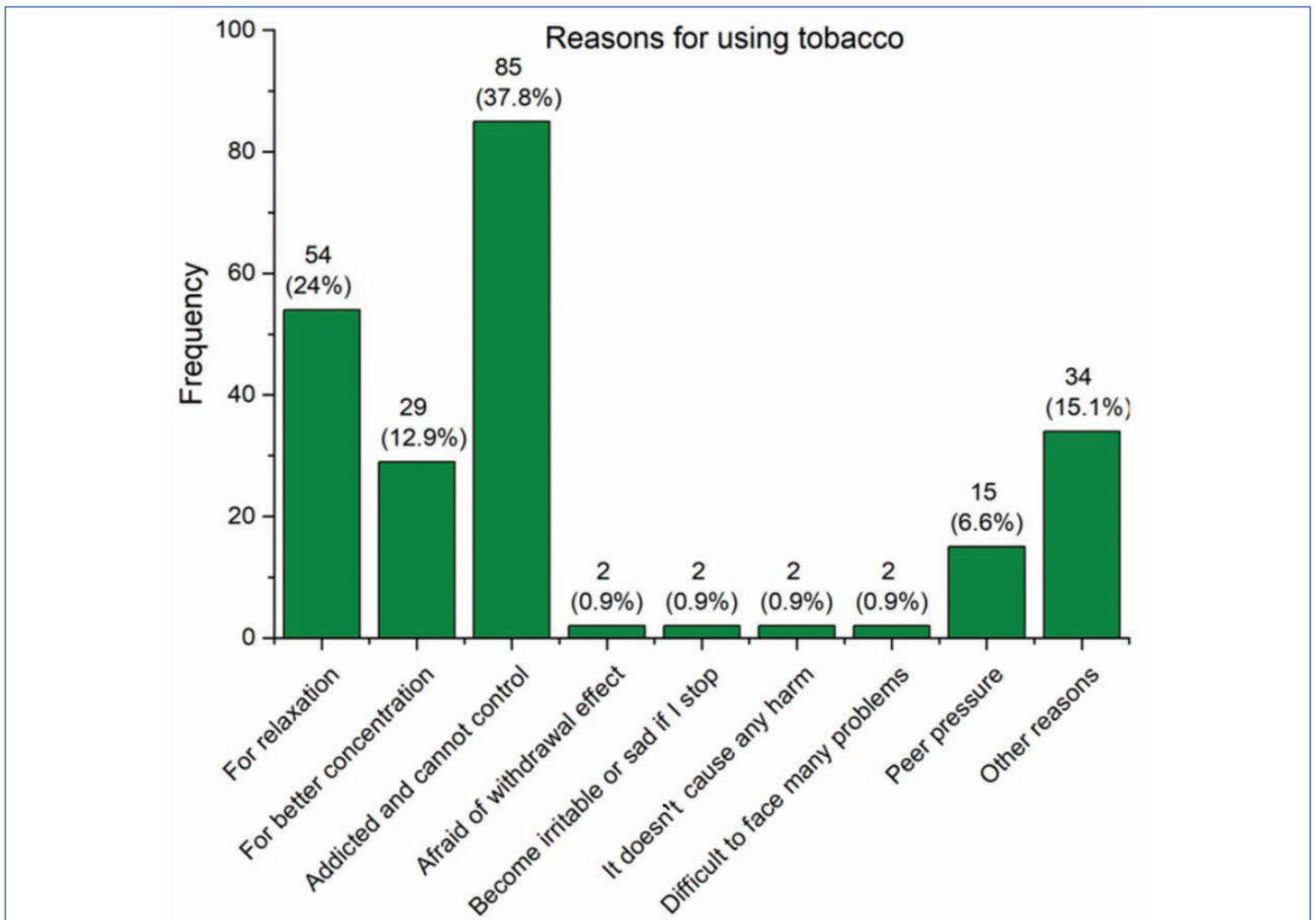
[Table/Fig-8]: Nicotine dependence among tobacco users.

Variable	Category (n=138)	Nicotine Dependency		p-value	Unadjusted OR (95% CI)	Adjusted p-value	Adjusted OR (95% CI)
		High n (%)	Moderate and low n (%)				
Age (years)	> 45 years (n=53)	19 (35.8)	34 (64.2)	<0.001*	4.19 (1.76, 9.97)	0.511	1.21 (0.69, 2.13)
	≤ 45 years (n=85)	10 (11.8)	75 (88.2)				
Socio-economic status (B.G. Prasad scale)	Lower to middle (n=92)	18 (19.6)	74 (80.4)	0.658	0.77 (0.33, 1.81)	0.534	0.75 (0.29, 1.87)
	Upper and upper middle (n=46)	11 (23.9)	35 (76.1)				
Duration of tobacco use	> 20 years (n=62)	23 (37.1)	39 (62.9)	<0.001*	6.88 (2.58, 18.34)	0.008*	5.34 (1.54, 18.49)
	≤20 years (n=76)	6 (7.9)	70 (92.1)				

[Table/Fig-9]: Risk factors associated Nicotine dependency among Smoking Tobacco (ST) users.
*p-value <0.05 was considered as statistically significant

Variable	Category (n=92)	Nicotine dependency		p-value	Unadjusted OR (95% CI)	Adjusted p-value	Adjusted OR (95% CI)
		High n (%)	Moderate and low n (%)				
Age (years)	>45 years (n=54)	9 (16.7)	45 (83.3)	0.434	0.64 (0.23, 1.81)	0.126	2.66 (0.76, 9.32)
	≤45 years (n=38)	9 (23.7)	29 (76.3)				
Socio-economic status (B.G. Prasad scale)	Lower to middle (n=51)	12 (23.5)	39 (76.5)	0.307	1.79 (0.61, 5.29)	0.239	1.98 (0.63, 6.19)
	Upper and upper middle (n=41)	6 (14.6)	35 (85.4)				
Duration of tobacco use	>20 years (n=26)	6 (23.1)	20 (76.9)	0.574	1.35 (0.45, 4.08)	0.362	1.81 (0.51, 6.43)
	≤20 years (n=66)	12 (18.2)	54 (81.8)				

[Table/Fig-10]: Risk factors associated Nicotine dependency among Smokeless Tobacco (SLT) users.
*p-value <0.05 was considered as statistically significant



[Table/Fig-11]: Reasons for using tobacco.

Knowledge based questions	Response	Frequency	%
Does smoking tobacco cause serious illness	Yes	888	95.4%
Does smokeless tobacco cause serious illness	Yes	862	92.6%
Does smoking tobacco cause the following			
(a) Heart attack	Yes	831	89.3%
(b) Stroke	Yes	754	81.1%
(c) Lung cancer	Yes	857	92.1%
Ill-effects of tobacco use			
(a) Oral disease	Yes	710	76.3%
(b) High blood pressure	Yes	25	2.7%
(c) Memory loss	Yes	20	2.1%
(d) Leads to alcohol use	Yes	4	0.4%
If oral disease,			
(a) Oral cancer	Yes	677	72.8%
(b) Swelling of gums	Yes	77	8.3%
(c) Staining of teeth	Yes	38	4.1%
(d) Tooth decay	Yes	67	7.2%

(e) Halitosis	Yes	43	4.6%
Does tobacco contain cancer causing agents	Yes	667	71.7%
Is tobacco use good for health	No	928	99.8%
Benefits of tobacco cessation			
(a) Reduces the side effects	Yes	63	6.8%
(b) Improves survival	Yes	146	15.7%
(c) Improves breathing	Yes	51	5.5%
(d) Improves quality of life	Yes	697	74.9%

[Table/Fig-12]: Knowledge of health hazards

knowledge on health hazards by the tobacco users. In this study, it was found that 85.6% (n=796) of the study population had good knowledge on the ill-effects of tobacco use.

Tobacco cessation: In this study, it was identified that, 45.7% (n=63) of current smoking users and 32.6% (n=30) of SLT users had tried to stop using tobacco. Among the current ST users (n=138) and SLT users (n=92), 76.8% (n=106) and 73.9% (n=68) were planning to quit the habit, respectively. None of the methods including counselling, nicotine replacement therapy, traditional medicines,

and getting telephone support was used by the participants to stop using tobacco. [Table/Fig-13] depicts the positive response of the subjects to the questions on tobacco cessation.

Questions on tobacco cessation	Response	Smoking tobacco users (n=138)		Smokeless tobacco users (n=92)	
		Number of subjects	%	Number of subjects	%
Have you tried to stop using tobacco?	Yes	63	45.7	30	32.6
How long you could stop using tobacco previously?					
≤ 1 week	Yes	19	30.2	6	20
≤ 1 month	Yes	23	36.5	16	53.3
≤ 3 months	Yes	17	27	5	16.7
≤ 6 months	Yes	4	6.3	3	10
Have you visited a doctor within a year	Yes	102	73.9	64	69.6
How many times did you visit a doctor within a year?					
1 or 2 times	Yes	63	61.7	41	64.1
3-5 times	Yes	35	34.3	20	21.7
≥6 times	Yes	4	3.9	3	3.3
Have you been advised to stop using tobacco during consultation	Yes	73	71.6	35	54.6
Are you planning to quit using tobacco	Yes	106	76.8	68	73.9
Reasons for not planning to quit tobacco (ST: n=32, SLT: n=24)					
Addicted	Yes	8	25	8	33.3
Not interested to stop	Yes	9	28.1	4	16.7
Stress due to work	Yes	15	46.9	12	50
When are you planning to quit tobacco?					
Within a month	Yes	10	9.4	6	8.8
Within a year	Yes	1	0.9	1	1.5
Will quit someday	Yes	45	42.4	29	42.6
Not interested in quitting	Yes	9	8.5	3	4.4
Don't know	Yes	41	39.7	29	42.6
Are you confident to stop using tobacco?	Yes	92	66.6	61	66.3
Do you like to get help to quit tobacco?	Yes	48	34.7	31	33.7
Are you willing to attend tobacco cessation program?	Yes	21	15.2	9	9.8

[Table/Fig-13]: Tobacco cessation.

DISCUSSION

Tobacco, being a legally sold consumer product, is one of the largest causes of preventable disease and deaths globally [11]. Tobacco products have a well-established cause for oral cancer and it is one of the most common cancers in India. It has been reported that 28.6% of Indian population use tobacco and every year, eight lakh people die in India due to tobacco-related diseases [16]. The increasing use of tobacco is one of the greatest concerns

around the world due to its serious ill-effects on health. In this study, a female predominance (62.2%) was observed when compared to males (37.8%). Mujica V et al., and Al-Mobeeriek A and AlDosari AM have reported a female predominance of 67% and 57.7%, respectively [17,18].

The prevalence of ST was found to be 14.3% while the prevalence of SLT use was 9.4% in this study. According to the GATS-2 report of 2016-2017, the prevalence of ST was 10.5% and SLT was 10.6% in Tamil Nadu [12]. An increased prevalence of ST use was observed whereas similar prevalence of SLT use was noticed in this study. The overall prevalence of adults using tobacco (24%) was higher than the GATS-2 value of 20%. The prevalence of males currently smoke tobacco (37.8%) was much higher than prevalence of tobacco smoking in Tamil Nadu (21.1%), whereas in India, 28.6% of adults use tobacco [12]. In this study, it was identified that beedi (58%) and snuff (53.3%) were the most commonly used tobacco product.

The prevalence of oral mucosal lesions was found to be 60.1%, which was comparable with the other studies reported in literature [19] But Patil S et al., and Ali M et al., have reported a higher prevalence of oral mucosal lesions by 64% and 58.1%, respectively [20,21] whereas Al-Mobeeriek A and AlDosari AM, and Bhatnagar P et al., have reported a lower prevalence of oral mucosal lesions by 15% and 16.8%, respectively, when compared with this study [18,22]. The most frequently occurring oral mucosal lesion associated with tobacco use among current tobacco users was smoker's palate (59.4%), followed by tobacco pouch keratosis (18.5%), oral submucous fibrosis (18.5%) and leukoplakia (15.9%). Srivastava R et al., have reported that 57.56% of the subjects had oral submucous fibrosis, 23.7% had leukoplakia, 13.12% had lichen planus, and 5.62% had oral cancer [23]. A high prevalence of oral lesions was observed in the subjects who used tobacco products for more than 20 years. The major findings and the parameters analysed by various authors are compared with the present study and is tabulated in [Table/Fig-14] [8,22,23].

Saha I et al., reported that the high nicotine dependence group had 57.75% of ST and 41% of SLT users [24]. But in this study, it was observed that 15.0% and 6.8% of ST users were in the moderate and high nicotine dependence group respectively whereas 18.4% and 2.3% of SLT users were found to be in the moderate and high nicotine dependence group, respectively. The nicotine dependence was found to be significant in the subjects with age more than 45 years and had used tobacco for more than 20 years. This indicates the need for intensive tobacco counselling program at every healthcare centre especially for the chronic tobacco users.

On the analysis of the knowledge on health hazards, it was identified that 76.7% of the participants were aware that use of tobacco can cause oral lesions. In the study population, 73.2% of the subjects were advised to stop using tobacco at some point in their lifetime. However, just advising during the consultation may not help them to stop their habits due to their high addiction of tobacco. This emphasises the requirement of tobacco cessation counselling program at each healthcare centre. Oral health education emphasising the ill-effects of tobacco use was given to all study participants. The participants with prevalence of mucosal lesions were referred to a tertiary healthcare

Author's name and year	Place of study	Number of subjects	Age considered	Parameters assessed	Findings/Conclusion
Patil PB et al., 2013 [8]	Dharwad, Karnataka, South India	1200	>15 years	Oral mucosal lesions and conditions associated with the habit of smoking and chewing tobacco.	High risk of OSMF, leukoplakia, erythroplakia, and oral cancer are associated with smoking, chewing, or mixed habits.
Bhatnagar P et al., 2013 [22]	Modinagar, Uttar Pradesh, North India	8866	15 to 75+ years	Prevalence of oral mucosal lesions in adult patients.	Dental professionals should advise the patients to quit the tobacco.
Srivastava R et al., 2009 [23]	Kanpur, North India	3735	≥20 years	Prevalence of Potentially Malignant Lesions (PML), oral cancer and associated risk factors.	Tobacco smoking and chewing of betel quid are the major risk factors for PML and oral cancer.
Present study (2022)	Vellore, Tamil Nadu South India	930	18 to 60 years	Prevalence of oral lesions and nicotine dependency among tobacco users.	Oral lesions and nicotine dependence are highly prevalent among the tobacco users.

[Table/Fig-14]: Study findings and the parameters analysed by different authors.

centre for further management. Tobacco users who were willing to quit tobacco were referred to tobacco cessation counselling programme which is being conducted by the same tertiary healthcare centre. A higher prevalence of ST (76.8%) and SLT users (73.9%) were willing to quit tobacco use and the results were comparable with GATS-2 report, 2016-2017 [25]. This highlights the need to establish a supportive tobacco cessation program in every healthcare organisation to help the tobacco users who are willing to quit.

Limitation(s)

The limitation of this study could be an underestimation in the reporting of tobacco use among the female participants, which could be due to the social norms, feeling hesitant to disclose their habits openly because of guilt or fear of being judged. The authors recommend to further carry out research to analyse the outcome of tobacco cessation counselling program and also to identify the response of precancerous lesions and condition with habit cessation on a periodic follow-up.

CONCLUSION(S)

This study showed a higher prevalence (60.1%) of oral lesions among the tobacco users. This mandates urgent need for awareness programs on oral health, emphasising the ill-effects of tobacco usage to prevent the incidence of oral cancers. Healthcare facilitators, especially medical and dental doctors, should counsel all patients who have tobacco habits, irrespective of their presenting complaint or disease. A higher prevalence of ST (76.8%) and SLT (73.9%) users were willing to quit tobacco use after attending a brief tobacco cessation counselling programme. Hence, all healthcare facilities in India, should try to provide a tobacco cessation counselling program in their organisation/institution.

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PARTICULARS OF CONTRIBUTORS:

1. Research Officer, Department of Community Medicine, Rural Unit for Health and Social Affairs, Christian Medical College, Vellore, Tamil Nadu, India.
2. Associate Surgeon, Department of Dental and Oral Surgery, Christian Medical College, Vellore, Tamil Nadu, India.
3. Senior Research Officer, Department of Wellcome Trust, Christian Medical College, Vellore, Tamil Nadu, India.
4. Professor, Department of Community Medicine, Low Cost Effective Care Unit, Christian Medical College, Vellore, Tamil Nadu, India.
5. Professor, Department of Community Medicine, Christian Medical College, Vellore, Tamil Nadu, India.

NAME, ADDRESS, E-MAIL ID OF THE CORRESPONDING AUTHOR:

Dr. JS Jesija,
Associate Surgeon, Department of Dental and Oral Surgery, Christian Medical College,
Vellore, Tamil Nadu, India.
E-mail: jesijafinlay@gmail.com

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