

Prevalence of periodontal status among nicotine dependent individuals of 35-44 years attending community dental camps in Ghaziabad district, Uttar Pradesh

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ABSTRACT

Background: Tobacco is the second driving reasons for mortality worldwide and its broad utilization in the smoking and smokeless form have added to the expanding weight of non-communicable disease. **Aim:** To study the prevalence of periodontal status among nicotine dependent individuals of 35-44 years attending community dental camps in Ghaziabad District, Uttar Pradesh. **Methods:** A cross-sectional study was conducted on 800 individuals with the age range of 35-44 years. A pre-tested questionnaire was used to gather information about the sociodemographic profile and the pattern of substance use. Fagerstrom Test for Nicotine Dependence-Smokeless Tobacco (FTND-ST) and for smokers; Fagerstrom Test for Nicotine Dependence (FTND) for testing dependence. Periodontal status was assessed by Community Periodontal Index (Modified CPI WHO 2013) and loss of attachment (LOA). Statistical analysis was done by the Statistical Package for Social Sciences (SPSS) version 20.0. **Result:** The prevalence of periodontal disease was found to be 78.5% with maximum disease prevalence among males of 42-44 age. Majority of male consumed a smokeless form of tobacco (50.23%), followed by smoke (14.19%) form whereas females predominantly consumed smokeless form (37.36%). The mean number of teeth with pocket (3.37 ± 1.86) and mean of loss of attachment of more than 9 mm (0.67 ± 0.88) was higher among smokeless form of tobacco users as compared to other habit groups. **Conclusion:** Higher prevalence of periodontal disease was seen among nicotine dependent individuals. A model for a comprehensive program in the dental office including the five A's and five R's for tobacco counseling must be applied at every institute.

Keywords: Dental camp, Fagerstrom Test for Nicotine Dependence, Fagerstrom Test for Nicotine Dependence-Smokeless Tobacco, nicotine dependence, periodontal status

Introduction

Tobacco is in charge of the newest plague of the twentieth century, and its utilization is still expanding around the world. Out of 930 million worldwide tobacco users, 182 million smokers abides in

India. World Health Organization (WHO) appraisal evaluated that by 2020, tobacco-related demise may surpass 1.5 million every year or 13% of all passing in India.^[1] Global Adult Tobacco Survey 2 (GATS 2) in Uttar Pradesh the prevalence of tobacco utilization in any form is still high as the contrast with neighboring states.^[2]

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Nicotine dependence includes parts of both mental and physical dependence.^[3] This reliance has been delegated an interminable,

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relapsing ailment. At the end of the day, it is a long haul issue that may have times of relapse and abatement that require rehashed intercession.^[4] The hazard for the improvement of reliance and to what extent it takes to end upward contrasts from individual to individual.^[5]

Tobacco use is a major modifiable risk factor for health, which is one of the leading causes of a range of cardiovascular and respiratory disorders in addition to various cancers in the body.^[6] Smoking cigarettes can have numerous unfriendly consequences for our oral and dental wellbeing. Among these impacts is oral malignant growth, periodontal illness, a main source of tooth loss, delayed healing of extraction socket, awful breath, discolored teeth and tongue; a decreased feeling of taste and smell.^[1] Smokeless tobacco is known to cause tumors of the mouth, lip, tongue, and pancreas along with majority leading to destruction of gum tissue, causing periodontal malady.^[7] Pindborg (1947) was one of the primary specialists to examine the connection between tobacco use and periodontal disease.^[8]

In a 5-year investigation of attachment loss in 800 network abiding grown-ups, tobacco consumers were observed to be at an expanded danger of attachment loss.^[9] The link between smoking and periodontal attachment loss has been frequently reported in epidemiological studies. Besides, the gingival appearance in chronic smokers is known to be disease-masking as the gingiva bleeds less and appears hardened as compared to that of non-smokers. The vasoconstrictive properties of cigarette smoke reduce gingival inflammation. However, advanced periodontitis could be happening in light of the propagation of the underlying inflammatory process.^[7]

Though the prevalence of using tobacco in any form either 'bidi' or 'gutka' is quite evident in Ghaziabad district of Uttar Pradesh, few studies have been done to assess the nicotine dependence in this region. Hence, the present study was conducted to determine the level of nicotine dependence and periodontal status among individual. The association between the severities of periodontal status with various tobacco habits was also assessed. The findings of this study will help to decide the course of counseling and nicotine replacement therapy needed for the patient as a mode of deaddiction management.

Methods

The present study was conducted among 800 nicotine dependents of 35-44 years age attending community dental camps in Ghaziabad District, Uttar Pradesh. 200 each individual were taken from the four blocks of Ghaziabad, namely Razapur block, Muradnagar block, Bhojpur block, and Loni Block. Written consent was taken from all the patients.

The pilot study was carried out on 80 adults in 4 blocks of Ghaziabad. Ethical clearance was taken from the Institutional Ethical Committee (IEC) of the college. Calibration of the principal investigator was done to limit the examiner variability.

Inclusion criteria

1. Patients using tobacco for more than 6 months
2. A patient using tobacco for more than 3 times per day
3. Patients with no history of any periodontal treatment for the past 6 months.

Exclusion criteria

1. Patients with chronic systemic diseases and with conditions biasing the results
2. Pregnant or lactating females
3. Patients using any medication which affects the health of the periodontium
4. Patient undergoing nicotine replacement therapy.

Data collection

Information was collected by using a pre-tested questionnaire, about sociodemographic profile (including age, gender, socioeconomic status), pattern of substance use (frequency, number of years since use, daily consumption, type of substance), soft tissue examination, oral hygiene questionnaire (aids use, frequency) and dental behavior (last visit to dentist).

Questions to determine the presence of substance dependence was assessed using The Fagerstrom Test for Nicotine Dependence-Smokeless Tobacco (FTND-ST) And the Fagerstrom Test for Nicotine Dependence (FTND). Periodontal status was calculated by Community Periodontal Index (Modified CPI WHO 2013) and loss of attachment (LOA). Those individuals having bleeding on probing and periodontal pocket were diagnosed as having the disease.

Statistical analysis

Statistical analysis was finished by utilizing the Statistical Package for Social Sciences (SPSS) version 20.0. Statistical significant with *P* value equal or less than 0.05. Statistical methods like Chi-Square test and One way ANOVA with post-Tukey's test were used for the purpose of analysis.

Result

Out of 800 individuals, 444 were males and 356 were females. The prevalence of periodontal disease among males 413 (93.2%) and that among females was 215 (60.4%). The prevalence of periodontal disease in different age groups and clearly shows that as age increases periodontal disease also increases. The majority of individuals belong to lower (92.6%) and upper lower (79.3%) level of socioeconomic status had periodontal status [Table 1].

Majority of male consumes a smokeless form of tobacco (50.23%), followed by smoke (14.19%) form. While females were predominantly consumed smokeless form (37.36%) followed by both smoke and smokeless form [Table 2].

Graph 1 reveals that 162 (77.9%) of dual tobacco users were prone to disease. 78 (89%) of smokeless tobacco chewers were

Table 1: Distribution of study population according to different parameters and periodontal status

Parameter	Disease Present	Disease Absent	Total	Chi-square	P
Age Group (in years)					
35-38	289 (76.1%)	91 (23.9%)	380 (100%)	12.7268	0.001724*
39-41	220 (78.5%)	68 (21.5%)	288 (100%)		
42-44	119 (85.6%)	13 (14.4%)	132 (100%)		
Gender					
Male	413 (93.02%)	31 (6.98%)	444 (100%)	124.6033	0.00001*
Female	215 (60.40%)	141 (39.60%)	356 (100%)		
Socioeconomic status (SES)					
Upper (I)	5 (27.8%)	13 (72.2%)	18	67.2794	<0.00001*
Upper Middle (II)	42 (60%)	28 (40%)	70		
Lower Middle (III)	198 (75.3%)	65 (24.7%)	263		
Upper Lower (IV)	195 (79.3%)	51 (20.7%)	246		
Lower (V)	188 (92.6%)	15 (7.4%)	203		
Total	628	172	800		

Chi-square test. *Significant difference

Table 2: Distribution of study population according to tobacco habits and gender

Habit	Male	Female	Total number (n)	Chi-square value
Non-User	23 (5.18%)	121 (33.99%)	144 (18%)	112.171
Smokers	63 (14.19%)	29 (8.15%)	92 (11.5%)	P<0.00001*
Smokeless	223 (50.23%)	133 (37.36%)	356 (44.5%)	
Dual User	135 (30.40%)	73 (20.50%)	208 (26%)	
Total	444	356	800	

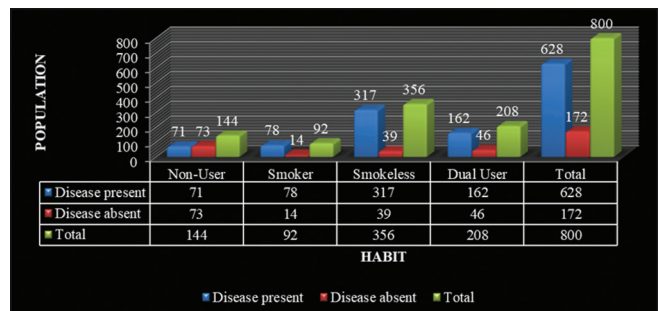
Chi-square test. *Significant difference

affected by the disease. The majority of individuals consumed bidi (49%), closely followed by cigarettes (40.4%). A high prevalence of gutka (29.3%) and khaini (29.9%) among the study population [Table 3].

Prevalence of Leukoplakia was highest. 2.5% of smokeless tobacco user had ulceration. Acute necrotizing ulcerative gingivitis (ANUG) was significantly more among dual tobacco users (10.6%). The abscess was significantly more among smokeless tobacco users (3.4%) [Table 4].

The toothbrush was used by 32.6% smokeless and 23.9% smokers. Tooth brushing frequency 2-6 times a week was significantly more among Smokers (43.5%) and Smokeless tobacco users (43.3%). Nearly 1% each of smokers, smokeless and 2% dual users of tobacco never brushed. The study population did differ significantly as the frequency of tooth brushing and oral hygiene aid usage [Table 5].

Graph 2 reveals high nicotine dependence among smokeless users and majority smokers had low nicotine dependency. Graph 3 reveals that among the dual-tobacco users; 53.4% (111) had a high dependence on smokeless form and 30.3% (63) on smoke form. Nearly 57.9% smokeless tobacco users had bleeding on probing present, followed by 73.6% dual tobacco user [Table 6].



Graph 1: Distribution of the study population according to tobacco habits and periodontal status

The mean number of teeth with pocket was significantly more among smokeless (3.37 ± 1.86) and dual tobacco users (2.68 ± 1.72) [Table 7]. The study population differs significantly as per loss of attachment among the different habits [Table 8]. The correlation between nicotine dependence and periodontal status, and between nicotine dependence and loss of attachment was statistically significant [Table 9].

Discussion

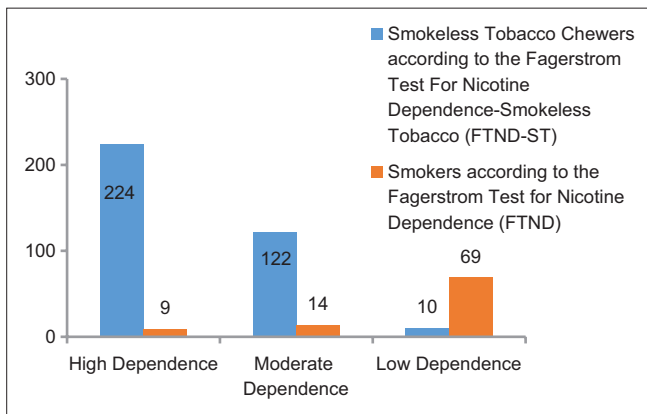
Tobacco is considered as the absolute most preventable reason for driving worldwide mortality and periodontal disease is the main source for tooth loss in adults. In the present study, the prevalence of tobacco use was 78.5%. High predominance of a smokeless type of tobacco in our examination was in consent to investigations of Naveen-Kumar B *et al.*^[10] and Rolandson *et al.*^[11] The high pervasiveness of the utilization of the smokeless tobacco may be credited due to the board accessibility of these items in the city.

In the present investigation, tobacco utilization was more in males. Comparative outcomes were found in an examination by Kadante *et al.*^[12] However, these findings were in contrast to Chilean institution study, where females represented 70.7% of the sample.^[13]

In our examination, the low utilization of tobacco utilization among females can be clarified by the way of social acceptance

Table 3: Distribution of the study population according to the form, frequency, and duration of the smoke and smokeless form of tobacco

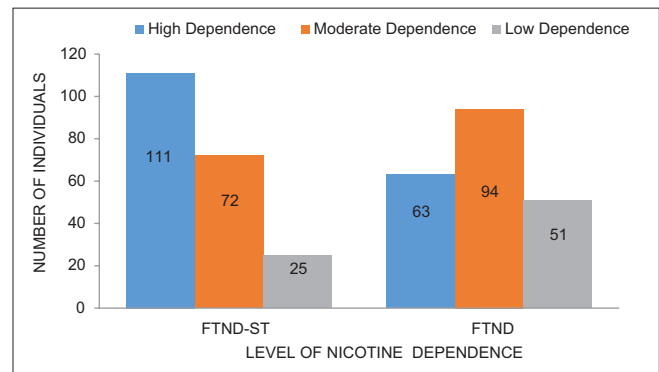
	Smokers (92)	Dual-User (208)	Total (300)
Type of smoke form			
Cigarette	38 (41.3%)	83 (39.9%)	121 (40.4%)
Bidi	42 (45.7%)	105 (50.5%)	147 (49%)
Other	12 (13.0%)	20 (9.6%)	32 (10.6%)
Frequency in packet/day			
<1	44 (47.8%)	111 (53.4%)	155 (51.7%)
1-2	29 (31.5%)	52 (25%)	81 (27%)
>2	19 (20.7%)	45 (21.6%)	64 (21.3%)
Duration of habit in years			
<5	39 (42.4%)	84 (40.4%)	123 (41%)
5-10	31 (33.7%)	83 (39.9%)	114 (38%)
>10	22 (23.9%)	41 (19.7%)	63 (21%)
	Smokeless (356)	Dual-User (208)	Total (564)
Type of smokeless			
Khaini	97 (27.2%)	72 (34.6%)	169 (29.9%)
Gutka	101 (28.4%)	64 (30.8%)	165 (29.3%)
Betel quid with tobacco	78 (21.9%)	28 (13.5%)	106 (18.8%)
Pan Masala with tobacco	42 (11.8%)	261 (12.5%)	68 (12.1%)
Other	38 (10.7%)	18 (8.6%)	56 (9.9%)
Frequency in packet/day			
<1	13 (3.7%)	10 (4.8%)	23 (4.1%)
2-3	154 (43.3%)	95 (45.7%)	249 (44.1%)
>3	189 (53.0%)	103 (49.5%)	292 (51.8%)
Duration of habit in years			
<5	61 (17.1%)	97 (46.7%)	158 (28.0%)
5-10	191 (53.7%)	71 (34.1%)	262 (46.5%)
>10	104 (29.2%)	40 (19.2%)	144 (25.5%)



Graph 2: Level of Nicotine Dependence among smokeless tobacco chewers (n=356) and smokers (n=92)

of females consuming tobacco, and this finding has additionally been shown in an investigation by Rani M *et al.*^[14] The continuous exacerbating of periodontal conditions with increasing age mirrors the dynamic idea of the periodontal malady. The expansion of tobacco use with an expansion of age might be because of expanded peer pressure and expanded interest to experimentations.^[15]

The disease predominance was high in the poorest financial group Similar outcome were found in studies by Kadane



Graph 3: Level of Nicotine Dependence among Dual-users

SS *et al.*^[12] and Gautam DK *et al.*^[16] The purpose behind the decline in periodontal disease with an expansion in status might be because of the paying limit of the subjects for treatment methods, which were discovered exorbitant to those in the low financial status.

Bidi was the most utilized smoked tobacco pursued by khaini and gutka which is in accordance to GATS^[2] and Mohamed *et al.*^[17] Predominance of leukoplakia was high in the tobacco users. This is as per the discoveries of the epidemiological investigation did by Vellapaly S^[1] and Anand *et al.*^[18] It was found that the disease prevalence was more in those who were

Table 4: Distribution of study population based on the prevalence of oral lesions

Oral Mucosal lesion	Non User (144)	Smokers (92)	Smokeless (356)	Dual user (208)	Chi-square value
No lesion	118 (81.9%)	32 (34.8%)	36 (10.1%)	45 (21.6%)	380.454
Leukoplakia	26 (18.1%)	60 (65.2%)	198 (55.6%)	104 (50%)	$P < 0.001^*$
Lichen Planus	0	0	0	0	
Ulceration (aphthous, herpetic, traumatic)	0	0	9 (2.5%)	0	
Acute necrotizing ulcerative gingivitis	0	0	0	22 (10.6%)	
Candidiasis	0	0	0	0	
Abscess	0	0	12 (3.4%)	0	
Other (Tobacco Pouch Keratosis)	0	0	101 (28.4%)	37 (17.8%)	

Chi-square test, *Significant difference

Table 5: Distribution of study population based on the oral hygiene aids usage and frequency of teeth cleaning

	Non User (144)	Smokers (92)	Smokeless (356)	Dual user (208)	Chi-square test	P
Oral Hygiene Aid						
No aid	50 (34.7%)	15 (16.3%)	92 (25.8%)	80 (38.46%)	115.78	$< 0.001^*$
Toothbrush	49 (34%)	22 (23.9%)	116 (32.6%)	28 (13.5%)		
Wooden toothpicks	30 (20.8%)	32 (34.8%)	130 (33.5%)	92 (44.2%)		
Plastic toothpicks	3 (2.1%)	3 (3.3%)	6 (1.7%)	2 (0.96%)		
Thread	6 (4.2%)	15 (16.3%)	5 (1.4%)	4 (1.92%)		
Charcoal	5 (3.5%)	3 (3.2%)	1 (0.3%)	1 (0.48%)		
Chewstick/Miswak	1 (0.7%)	2 (2.2%)	4 (1.1%)	1 (0.48%)		
Others	0	0	2 (0.6%)	0		
The frequency of teeth cleaning						
Twice a day or more	44 (30.56%)	12 (13.04%)	16 (4.5%)	67 (32.2%)	217.255	$< 0.001^*$
Once a day	50 (34.72%)	24 (26.09%)	92 (25.8%)	109 (52.4%)		
2-6 times a week	25 (17.36%)	40 (43.48%)	154 (43.3%)	14 (6.7%)		
Once a week	23 (15.97%)	9 (9.78%)	83 (23.3%)	13 (6.3%)		
2-3 times a month	2 (1.39%)	5 (5.43%)	8 (2.2%)	1 (0.48%)		
Once a month	0	1 (1.09%)	2 (0.6%)	2 (0.96%)		
Never	0	1 (1.09%)	1 (0.3%)	2 (0.96%)		

Chi-square test. *Significant difference

Table 6: Comparison of the study population based on different tobacco habits with bleeding on probing

Periodontal Status	Habit	Absence of Condition (n)	Presence of Condition (n)	Chi-square	P
Bleeding on probing	Non -user (n=144)	73 (50.7%)	61 (42.3%)	34.357	$< 0.001^*$
	Smokers (n=92)	53 (57.6%)	39 (42.4%)		
	Smokeless (n=356)	150 (42.1%)	206 (57.9%)		
	Dual-user (n=208)	55 (26.4%)	153 (73.6%)		

* $P \leq 0.05$ is statistically significant**Table 7: Comparison of the study population based on different tobacco habits with periodontal status (CPI)**

Periodontal Status	Habit	Mean	Std. deviation	F	P
Number of teeth with pocket	Non-user (n=144)	0.74	1.57	78.9877	$< 0.001^*$
	Smokers (n=92)	2.11	1.71		
	Smokeless (n=356)	3.37	1.86		
	Dual-user (n=208)	2.68	1.72		

One way ANOVA. * $P \leq 0.05$ is statistically significant

consuming smokeless tobacco followed closely by smokers. This is in accordance with studies of Shimazaki *et al.*^[19] and Bergström J *et al.*^[20] Smokers had lower bleeding on probing than non-smokers. These results are in contrast to the reporting of Shimazaki *et al.*^[19] Loss of attachment (LOA) was found to

be significantly greater in tobacco which is similar to the study done by Biradar *et al.*^[21]

High nicotine dependency was found among smokeless tobacco users. The majority share of smokers has low nicotine dependence. Comparable discoveries were accounted for by Sieminska *et al.*^[22] and Fagerstrom *et al.*^[23] The discoveries from the present examination calls for attention to the necessities for building up a suitable instructive, preventive and treatment measure combined with successful reconnaissance for tobacco end.

Limitation

The self-reported amount of tobacco of the individuals may not give a fully reliable data. One of the debating points concerning

Table 8: Comparison of the study population based on different tobacco habit with loss of attachment

Loss of Attachment	Habit	Mean	Std. deviation	F	P
A. Number of teeth with loss of attachment 0-3 mm	Non -user (n=144)	2.43	0.64	59.8563	<0.001*
	Smokers (n=92)	1.67	0.96		
	Smokeless (n=356)	1.61	0.75		
	Dual-user (n=208)	1.44	0.59		
B. Number of teeth with loss of attachment of 4-5 mm	Non -user (n=144)	0.67	0.71	11.8155	<0.001*
	Smokers (n=92)	0.65	0.79		
	Smokeless (n=356)	0.92	0.75		
	Dual-user (n=208)	1.06	0.65		
C. Number of teeth with loss of attachment 6-8 mm	Non -user (n=144)	0.29	0.59	23.0799	<0.001*
	Smokers (n=92)	0.46	0.65		
	Smokeless (n=356)	0.80	0.79		
	Dual-user (n=208)	0.84	0.74		
D. Number of teeth with loss of attachment >9 mm	Non -user (n=144)	0.17	0.47	19.3946	<0.001*
	Smokers (n=92)	0.35	0.52		
	Smokeless (n=356)	0.67	0.88		
	Dual-user (n=208)	0.66	0.72		

One way ANOVA with Tukey post-hoc test. *P≤0.05 is statistically significant

Table 9: Correlation between nicotine dependence with periodontal status and loss of attachment

Nicotine dependence	Periodontal status	Loss of attachment
Pearson's correlation coefficient	0.670	0.709
P	<0.001**	<0.001**

**P≤0.05 is statistically significant

the FTND involves the lack of relationship to the smoker's psychological and emotional state (depression, anxiety, stress and alcohol use) at the time of the survey.

Recommendations

- Educational efforts at national and local levels are needed to focus both public and professional attention on the problem of periodontal diseases and its association with tobacco consumption
- Partnership with government and non-government organizations to work in the right direction for tobacco control
- Establishment of smoking/tobacco cessation centre where community-based cessation programme should be taken phase by phase
- Reinforcement of health programs, guest lectures, educational tours and symposium regarding tobacco effects and its dependence on the students and enforce them that they should not adopt this lifestyle.

Conclusion

Effective execution of tobacco control arrangements gives a chance to India to satisfy its responsibilities to meet the objectives – 2030 agenda of Sustainability Development Goal of poverty reduction and good health.

Dental clinicians, general wellbeing experts, expert and business associations, and specialists all have an imperative

task to carry out in advancing periodontal health. In order to avert and control periodontal maladies at a populace level and handle periodontal disparities, a general wellbeing approach is required.

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Conflicts of interest

There are no conflicts of interest.

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