

# Research & Reviews: Journal of Dental Sciences

## Tobacco Consumption Pattern and its Risk Factors Among Central BHIL Tribes of Rajasthan

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### Research Article

Received date: 26/05/2016  
Accepted date: 22/06/2016  
Published date: 29/06/2016

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**Keywords:** Tobacco consumption, Periodontal disease, Oral hygiene

#### ABSTRACT

**Objective:** To assess the tobacco consumption habits and its effect on periodontal disease among Bhil tribes of Rajasthan.

**Methods:** The target population is of Bhil tribe males who participated in a festival called as Gavri in Udaipur district Rajasthan. The sample comprised of 416 males. Due to the problem in interpretation with tribes one villager was being appointed with the doctor to assist for data collection. Two such teams were appointed, for which kappa's statistics (0.89) was calculated two days prior to commencement of the study. Data analysis was carried out using the statistical package for social sciences (SPSS) version 20.0 with chi square and multiple linear regression analysis.

**Results:** Overall periodontal disease was 100% with shallow pocket and deep pocket contributing a major part (67.7%). In the present study only (29%) of sample were non tobacco users.

**Conclusion:** Based on the findings of this study, tobacco consumption is well spread and demonstrates marked periodontal deterioration among Bhil Tribes.

### INTRODUCTION

Tribes have very interesting customs and social practices. These tribes are so standoffish that even today they are far distinct from the 'civilized' society around them. It is always difficult to approach the tribes as they are living in isolation and natural surroundings far away from civilization with their traditional values, customs, beliefs and myth intact and Bhil is among one of them. The name Bhil originated from bil, meaning bow, which describes their original talent and strength. The Central Bhil is usually shy and loves their independence. Festivals, dance, drama, and music are a large part of their culture. Each village is led by a head man who deals with disputes. This headman is known as Gameti.

In South and South-east Asia tobacco habits have been preserved which are very specific and often reveal differences from province to province and among different tribes. Smoking of tobacco is a worldwide habit, smoking patterns show extreme variability. Areca nut, often used with betel quid and chewable tobacco is the fourth most commonly used psycho-active substance in the world, ranking after caffeine, alcohol and nicotine [1]. High prevalence of consumption of these items has been reported in South and South East Asia [1-3]. Having an ancient history, they are an integral part of the culture and sometimes erroneously believed to have medicinal benefits [4,5].

Today there is no country where tobacco is not consumed [6]. Consumption of tobacco is a major risk factor for mortality [7]. Recent shifts in global tobacco consumption indicate that an estimated 930 million of the world's 1.1 billion smokers live in developing countries [8,9], with 182 million in India alone [10].

Background information of the study is that no study has been conducted on tobacco habits of Bhil tribes till date. The aim of this study is to provide for the first time a comprehensive data of the Bhil tribe. The data and their cartographic representation illuminate the physical condition of Bhil tribe's habitat, physical condition and their socio cultural expression is to find correlation between the tobacco consumption and its effect on periodontal health in these unexplored tribal communities.

## METHODS

The areas were selected according to the state human resource and tribal welfare department, Government of India. A village is an important settlement unit of the Bhil society in Bhil dialect is known as PHALA. It consists of a few hamlets known as PARA or PADA. These hamlets consist of several isolated huts lying a little far away across a perennial water body or opposite slope of hills.

Local nearby village heads were taken in confidence regarding the study and verbal consent was taken from the participants. The parents gave the verbal consent for the participants who were under 18 years of age. The consent procedure and the study had been independently reviewed and approved by the institutional ethical and review board of the Darshan Dental College, Udaipur (Rajasthan). Research has been conducted in full accordance with the World Medical Association Declaration of Helsinki. These tribes are generally nomads by nature and live in scattered small communities. So the residence location and number of people in the family were assessed with the help of local villagers. A stratified random sampling technique was used to select the areas of concern from various parts of their residence in Rajasthan state. A total of 416 male Bhils sample size was collected in the month of August 2007 during a dance based festival called as GAVRI. All the subjects who were present on the days of survey and showed keen interest to participate in the study were included. Subjects who were not ready for check-up because of their tradition and customs (cultural taboos) and females (as there was not sufficient sample size for tobacco habits) were excluded from the study.

A self-prepared questionnaire was used to collect the tobacco habits extensively. The questionnaire comprises of products consumed, duration and frequency per day extensively. Tobacco habits were basically divided into chewable and smoked form. Under the heading of smoking form (Bidi and Hookah) and for smokeless form (Supari, Paan, Gutka, Khaini) were selected according to a pilot study on 123 sample population, one month prior to study.

Due to the problem in interpretation with tribes one villager was being appointed with the doctor to assist for data collection. Two such teams were appointed, for which kappa's statistics (0.89) was calculated two days prior to commencement of the study.

Oral health examination was done by doctor with the aid of an artificial light source in a mobile dental van constituting type three form of examination<sup>[11]</sup>. Clinical examination was done using standard explorers, mouth mirrors and CPI periodontal probes according to WHO (World Health Organization) criteria. Community Periodontal Index<sup>[12]</sup> (CPI) was used to record the periodontal condition which was performed using a mouth mirror and CPI probe. A probing force of 20 grams was used to detect bleeding response, calculus and probing depths. If bleeding was observed directly or by using a mouth mirror score 1 was assigned. Score 2 meant the presence of calculus during probing but all the black band of probe was visible. Pocket of 4-5 mm where gingival margin was within the black band of probe was considered as 3 and pocket depth of 6 mm or more where black band on the probe was not visible was considered as score 4. The oral hygiene variables of each subject were assessed using Simplified Oral Hygiene Index (OHI-S) of Greene and Vermillion<sup>[13]</sup>. Six index teeth were examined as recommended by the index. OHI-S has two components - Debris Index (DI) and Calculus index (CI). The average individual debris score and calculus score were determined and these were added together to obtain the OHI-S for each subject.

All the data collected was entered into the spreadsheets. The statistical package for social sciences (SPSS) software version 20.0 was used for data processing and data analysis. Two levels of periodontal condition were defined:

\*Periodontitis (CPI) = 3 (i.e. the presence of at least one site displaying a pocket depth of 4 - 5 mm).

\*\*More severe form of Periodontitis with CPI = 4 (i.e. the presence of at least one site displaying a pocket depth of  $\geq 6$  mm)<sup>[14]</sup>.

The prevalence of periodontitis was compared among age, habit, form of tobacco, duration and frequency of tobacco and alcohol consumption. Chi-square and multiple linear regression analysis tests were conducted for statistical inference.

## RESULTS

Twenty nine percent of the samples were non-tobacco users while 41.1% consumes tobacco in chewable form and the remaining 29.3% were tobacco consumers in smoking form. Among the 15-24 year age group chewable form of tobacco was consumed in abundance. Smoking form was more prevalent in 35-44 year age group. People with no habit were more in the 25-34 year age group (**Table 1**). There was no statistically significant difference reported between the prevalence of tobacco habits with age group ( $p>0.05$ ).

In the present study 32% and 67.8% of the sample reported with fair and poor oral hygiene respectively. Poor oral hygiene score was found maximum among 45-54 year age group (**Table 2**). There was no statistically significant difference reported between the OHI score with age group ( $p>0.05$ ).

**Table 1.** Prevalence of tobacco habits according to age groups.

Age Group	No Habit	Chewable	Smoking	Total
15-24, n (%)	37 (8.9%)	46 (11.1%)	33 (7.9%)	116 (27.9)
25-34, n (%)	34 (8.2%)	46 (11.1%)	27 (6.5%)	107 (25.7)
35-44, n (%)	26 (6.3%)	35 (8.4%)	39 (9.4%)	100 (24%)
45-54, n (%)	25 (6%)	45 (10.8%)	23 (5.5%)	93 (22.4%)
Total, n (%)	122 (29.3%)	172 (41.1%)	122 (29.3%)	416 (100%)
$\chi^2$	7.78			
p value	0.254			

**Table 2.** OHI scores among Bhil tribes according to age.

Age	Good	Fair	Poor	Total
15-24, n (%)	0 (0%)	43 (10.3%)	73 (17.5%)	116 (27.9%)
25-34, n (%)	0 (0%)	38 (9.1%)	69 (6.7%)	107 (25.7)
35-44, n (%)	0 (0%)	28 (6.7%)	72 (11.5%)	100 (24%)
45-54, n (%)	0 (0%)	25 (6%)	68 (16.3%)	93 (22.4%)
Total, n (%)	0 (0%)	134 (32.2%)	282 (67.8%)	416 (100%)
$\chi^2$	0.381			
p value	0.283			

There were merely 0% subjects with healthy periodontal status. Shallow and deep pocket were more prevalent among all the age groups with 38.7% and 29.1%. Overall periodontal disease prevalence was found higher with periodontal pocket contributing a major part. There were very few subjects (32.2%) with bleeding and calculus when compared to 67.8% of population falling under deep and shallow pocket. Age group 35-44 year had maximum periodontal destruction (**Table 3**). There was statistically significant difference reported between the CPI score with age group ( $p < 0.05$ ).

**Table 3.** CPI scores among Bhil tribes according to age.

Age	Healthy	Bleeding	Calculus	Shallow pocket	Deep pocket	Total
15-24, n (%)	0(0%)	29(7%)	14(3.4%)	47(11.3%)	26(6.3%)	116(27.9)
25-34, n (%)	0(0%)	11(2.6%)	27(6.5%)	42(10.1%)	27(6.5%)	107(25.7%)
35-44, n (%)	0(0%)	8(1.9%)	20(4.8%)	36(8.7%)	36(8.7%)	100(24%)
45-54, n (%)	0(0%)	16(3.8%)	9(2.2%)	36(8.7%)	32(7.7%)	93(22.4%)
Total, n (%)	0(0%)	64(15.4%)	70(16.8%)	161(38.7%)	121(29.1%)	416 (100%)
$\chi^2$	27.1					
p value	0.001					

The periodontal conditions were compared with the variables such as type of tobacco, form of tobacco, its frequency i.e. units per day and durations. Among the type of tobacco smoke less form of tobacco can be considered as most destructive form for periodontal health with 36% of population for periodontitis and 22% of more severe form of periodontitis. Hookah with 62% caused maximum periodontal destruction followed by quid (60.4), paan (8.2%), bidi (5.3%) and mawa (5%). For the variables such as frequency and duration the severity can be seen increasing as the variable increase. (**Table 4**).

**Table 4.** Levels of periodontal condition among Bhil tribes according to age.

Variable	Category	*Periodontitis	**More severe form of periodontitis
Type	Non user	1(1)	0(0%)
	Smoke less form	103(36.5%)	62(22%)
	Smoking form	57(20.2%)	59(20.9)
Forms	Non user	1(1%)	0(0%)
	Supari	7(3.2%)	5(1.8%)
	Gutka	40(50.5%)	28(9.9%)
	Paan	43(2.2%)	17(6%)
	Bidi	15(1.1%)	12(4.3%)
	Hookah	55(42%)	59(20.9%)
	Frequency (Units/day)	0	1(0.4%)
	1-5	27(9.6%)	19(6.7%)
	6-10	27(9.6%)	19(6.7)
	11-20	31(11%)	25(8.9%)
	>20	75(26.6%)	58(20.6%)
Duration (in years)	0	1(0.4%)	0(0%)
	1-5	24(8.5%)	19(6.7%)
	6-10	35(12.4%)	32(11.3%)

	11-20	49(17.4)	37(13.1%)
	>20	52(18.4%)	33(11.7%)

\***Periodontitis** (CPI) = 3 (i.e. the presence of at least one site displaying a pocket depth of 4 - 5 mm) and \*\***More severe form of Periodontitis** with CPI = 4 (i.e. the presence of at least one site displaying a pocket depth of  $\geq$  6 mm)

**Table 5** presents multiple regression analysis with CPI as dependent variable and habit, frequency and form of tobacco as independent variables. The dependent variable show great association with habit (49.2%), frequency of tobacco consumption (9%) and form of tobacco (1%).

**Table 5.** Multiple Linear Regression analysis with habit, frequency and duration as independent variables and CPI as dependent variable.

Model	R	R2	Adjusted R2	Std. Error of the Estimate	F value	P value
1	0.702 (a)	0.492	0.491	0.728	401.470	0.000 (a)
2	0.763 (b)	0.582	0.580	0.662	287.312	0.000 (b)
3	0.769 (c)	0.592	0.589	0.655	199.038	0.000 (c)

a Predictors: (Constant), habit  
b Predictors: (Constant), habit, frequency  
c Predictors: (Constant), habit, frequency, form

## DISCUSSION

Periodontal diseases are one of the common oral diseases of mankind. No area of world is free from it <sup>[15]</sup>. Because of the specific nature of the study sample, any comparison of data from different studies is difficult because of the scarcity of literature on the oral hygiene status of tribal community around the world. Previous studies <sup>[16,17]</sup> have proved that people in developing countries usually have limited access to dental care, more extensive gingivitis and higher levels of plaque and calculus than people in more economically developed societies. It is found much worse among the bhil tribes for whom dental health services are a mirage. The reason might be:

1. Oral disease remains largely untreated in this population

2. Bhils have their traditional methods <sup>[18]</sup> and techniques of dental care; they use rattan jot (*Jatropha curcas* and *Jatropha gossipifolia*) and twigs of Jhatbor (*Ziziphusnummularia*) as tooth brush.

They believe that application of latex of tuar (*Euphorbia neriifolia*) with cotton makes loose teeth strong. Other interesting techniques include application of clove oil to relieve toothache, gingivitis is treated with (masudaphoolna) boiled in water which is used as mouthwash.

The overall prevalence of periodontal disease among 35–44 year old tribal population accounted to 100% whereas it was 80.3%, 84.8% and 51.1% among the same age group males of Udaipur region <sup>[19]</sup>, Rajasthan <sup>[19]</sup> and India <sup>[20]</sup> respectively which may be explained by the abundant extraneous deposits observed on the teeth due to poor oral hygiene practices and lack of professional therapy.

Periodontal status and oral hygiene status deteriorated with age and previous data from the previous studies <sup>[21,22]</sup> suggests that age, gender, education, oral hygiene status and tobacco use are risk factors for periodontal disease. The present finding of high mean values of Oral hygiene index is supported by similar finding among the other ethnic communities namely, adult Australian Aborigines <sup>[23]</sup>, Yanomamo Indians Paraguay <sup>[24]</sup>, Venezuela and Lengua Indians <sup>[25]</sup>, where the mean scores were 3.5, 2.5–3.7 and 2.7–4.0 respectively. This difference might be due to the peculiar oral hygiene habits of these tribes. Most of the tribes in this study had never heard about oral hygiene practices.

It was observed from the present study that overall periodontal status was poor with disease prevalence being 100% which is worse than that of the adult population of other countries like Denmark <sup>[26]</sup>, Thailand <sup>[27]</sup> and Jordan <sup>[28]</sup>. It might be due to lack of awareness of oral health needs and exhibits no evidence of sustained dental care.

Tobacco prevalence in the bhil community was found to be higher when compared with the other study done on selected Indian populations in year 2008 by Vellappally S et al. <sup>[29]</sup> where tobacco consumption in smoking form was 26.6% which is less than Bhil tribes with 29.3% smoking. Bhil tribes were also far ahead in terms consumption of smokeless form of tobacco when compared to the squatter settlements of Karachi Pakistan <sup>[30]</sup>.

Conclusion: Given that no studies of this nature have ever been conducted formally on the adult population of Indian tribes and especially bhils, the present study hopes to obtain baseline information of the tribe's oral health status for future reference in the planning of dental health services for the tribe. The study also hopes to analyze if age, oral hygiene and dental visiting practices of the study population have any influence on their oral health status, so that future programs can be aimed to improve their oral health practices which in turn can improve the oral health status substantially.

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