

# Prevalence of Caries and Periodontal Disease in Betel Quid Chewers in Relation to Gender

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## ABSTRACT

**Aim:** The aim of our study is to evaluate the prevalence of dental caries and periodontal disease in betel quid chewers in relation to gender and to determine the treatment need and priorities in Betel quid chewers attending Baqai Dental College.

**Material and Method:** A cross sectional study conducted among patients selected from the out patient department of Baqai Dental College Karachi. A total of 100 patients aged between 22 to 60 years participated in the study. Patients with consumption of minimum seven betel quid since at least 6 months were included. Informed consent was obtained before the study began and each patient completed a questionnaire. The purpose of which was to access and obtain the information about the betel quid habits. Patients were asked to proceed for an oral examination as soon as they had finished filling the questionnaire. Reliability and validity of data was analyzed by chi square test using SPSS 19.0 version.

**Result:** A Total of 100 patients were examined in this survey. The total number of sound teeth in males was 443(84%) and total number of teeth with decay was 85(16%). The total number of sound teeth in females was 207(76%) and total number of teeth with decay was 65(24%).Female subjects showed 61% of pocket 4-5mm, mostly observed in lower right first molar. In males 4-5mm pocket was 80%, Bleeding on probing was 1% in females and 4% in males. Pocket greater than 6mm was 27% in females and 16% in males.

**Conclusion:** The present study concluded that effect of dental caries in betel quid chewers is less. A high prevalence rate of periodontal disease was found in betel quid chewers.

**Keywords:** caries and betel quid chewers, Periodontal disease and betel quid chewers, Prevalence of betel quid chewing, Betel quid chewers and adults

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## INTRODUCTION

Tobacco chewing is very common and widespread in South Asian countries and one third of the tobacco is produced in smokeless form(1). Currently major forms of tobacco that are available are betel quid, gutka, packaged chewing tobacco products and bidis(2). Betel quid is the fourth most commonly used psychoactive substance after caffeine, alcohol and tobacco(3). Smokeless tobacco users in Pakistan and India together have been estimated to number 100 million(4). In Pakistan about 34% of males and 13% females use tobacco in different forms(5).

**Table 1: Total number of participants**

Total number of participants (n)	100
Males	66
Females	34

**Table 2: Total number of sound and decay teeth**

Teeth	Sound	Decay
upper right first molar	74	26
upper right second molar	92	8
upper left first molar	84	16
upper left second molar	87	13
lower left first molar	62	38
lower left second molar	88	12
lower right first molar	73	27
lower right second molar	90	10
<b>Total</b>	<b>650</b>	<b>150</b>

In 2005 a study among the adolescents and adults of a Karachi squatter settlement reported that 40% of the population were using at least one chewable product of betel on a daily basis(6). Another study conducted in Karachi showed higher consumption of betel quid among boys than girls(7). Betel quid chewing with and without tobacco is carcinogen to humans(8). There is an increase in consumption among youth of chewing pan masala which consists of areca nut, catechin, lime, cardamine and unspecified flavoring agents with gutka or without tobacco(9). These habitual chewing contributes to diseases of the oral cavity and may also affect teeth and supporting periodontal tissues due to excessive masticatory load and exposure to various components of betel quid(10). It has been suggested that betel chewing may provide protection against dental caries(11-13). Studies also reported that there is no difference in the prevalence of dental caries in betel quid chewers in Asian population (14, 15). Although little is known about cariostatic property of betel quid it has been suggested that betal stain, often coats the surface of the teeth, may act as protective varnish(16). there is also in-vitro evidence that the tannin content of betel may have antimicrobial properties and that contributes to the cariostatic role of betel quid(17).

*In vitro*, studies have demonstrated that areca extracts containing arecoline that inhibits growth and attachment of and pro-

tein synthesis in human cultured periodontal fibroblasts (18, 19). These findings concluded that areca may be cytotoxic to periodontal fibroblasts and may exacerbate pre-existing periodontal diseases and loss of periodontal attachment is greater in betel quid chewers (20). There is significantly higher prevalence of bleeding on probing in betel quid chewers when compared to non betel quid chewers (21). Adult population and newer smokers are more prone to have severe active periodontal disease at any site, indicating to be an important risk factor for severe active periodontal disease(22).

The objective of our study is to evaluate the prevalence of dental caries and periodontal disease in betel quid chewers in relation to gender and to determine the treatment need and priorities in Betel quid chewers attending Baqai Dental College.

**MATERIAL AND METHOD**

A cross sectional study conducted among patients selected from the out patient department of Baqai Dental College Karachi. A total of 100 patients aged between 22 to

60 years participated in the study. Patients with consumption of minimum seven betel quid since at least 6 months were included. A sextant will be examined only if there are two or more teeth present which are not indicated for extraction. Terminally ill patients, psychiatric patients, patients with learning disabilities, patients with antibiotic treatment in last three months, patients with periodontal treatment in last six month, pregnant and breastfeeding patients and those with history of diabetes were excluded from the study.

Informed consent was obtained before the study began and each patient completed a questionnaire the purpose of which was to access and obtains the information about the betel quid habits. Patients were asked to proceed for an oral examination as soon as they had finished filling the questionnaire.

Clinical examination was performed using mouth mirror, CPITN probe, sickle probe, and tweezer. A well develop WHO oral health assessment form was used for data collection. Caries was detected by visual and

**Table 3: Number of decayed and carious teeth in female betel quid chewers**

	Sound	%	Decayed	%	Total
Upper right first molar	20	27	14	53.8	34
Upper right second molar	30	32.6	4	50	34
Upper left first molar	24	28.6	10	62.5	34
Upper left second molar	29	34.5	5	30.8	34
Lower left first molar	20	32.3	14	36.8	34
Lower left second molar	26	29.5	8	66.7	34
Lower right first molar	28	38.4	6	22.2	34
Lower right second molar	30	33.3	4	40	34
<b>Total (females)</b>	<b>sound</b>	<b>207</b>	<b>Decay</b>	<b>65</b>	

**Table 4: Number of decayed and carious teeth in male betel quid chewers**

	Sound	%	Decayed	%	Total
Upper right first molar	54	73	12	46	66
Upper right second molar	62	67.4	4	50	66
Upper left first molar	60	71.4	6	37.5	66
Upper left second molar	58	65.5	8	69.2	66
Lower left first molar	42	67.7	24	63.2	66
Lower left second molar	62	70.5	4	33.3	66
Lower right first molar	45	61.6	21	77.8	66
Lower right second molar	60	66.7	6	60	66
<b>Total (Males)</b>	<b>Sound</b>	<b>443</b>	<b>Decay</b>	<b>85</b>	

tactile detection using GV black caries classification system. If the area of pit and fissure is soft or there was any catch the area diagnosed as carious. Arrested caries will be counted as carious and hypoplastic teeth with exposed soft dentine considered as carious. Six sights of index teeth according to WHO recommendation will be evaluated for periodontal index. Following probing bleeding of sight within 20 seconds recorded as bleeding on probing. All the examiners were trained according to WHO guidelines for reliability and validity of data.

**STATISTICAL ANALYSIS**

Frequency distribution, mean, standard deviation and percentages were analyzed using SPSS 19.0 version. Chi square test was done to assess the relationship of effect of caries and periodontal disease in betel quid chewers with gender.

**RESULT**

A Total of 100 patients were examined in this survey. The number of male and female participants is shown in Table 1. The

prevalence of dental caries in betel quid chewers in male and female is shown in Table 2 and Table 3. The total number of sound teeth in males was 443(84%) and total number of teeth with decay was 85(16%). The total number of sound teeth in females was 207(76%) and total number of teeth with decay was 65(24%).The dental decay is observed more in upper and lower first molars of both genders. The total number of sound teeth in betel quid chewers was 650 and decay teeth were 150 (Table 4).

The prevalence of periodontal disease in betel quid chewers in male and female is shown in Table 5. Female subjects showed 61% of pocket 4-5mm, mostly observed in lower right first molar. In males 4-5mm pocket was 80%, mostly observed in upper right first molar. Bleeding on probing was 1% in females and 4% in males. Pocket greater than 6mm was 27% in females and 16% in males. The mean and standard deviation for prevalence of dental caries and periodontal disease is shown in Table 6 and 7.

**DISCUSSION**

Betel quid is nowadays an alarming issue, especially in socially deprived areas. Lack of awareness, poverty, and low income, all are reasons that one adapts this habit of chewing. Uptil now studies done in Pakistan solely focused on the use of betel quid among school children and adults. Habitual eating of betel quid causes discolouration of teeth, dental caries, wornout dentition and periodontal diseases. Therefore we conducted a study comprised of 100 subjects attending outpatient department, department of Operative dentistry, Baqai Dental College. All patients included were adult patients resident of Gadap area.

In this study, prevalence of dental caries and periodontal disease in betel quid chewers in relation to gender was evaluated. The result of the present study showed that 24% of teeth found decayed in females and 16% in males. Chatrchaiwiwatana (23) showed that betel quid was inversely propotional to dental caries. Moller (11) showed relationship of dental caries in betel quid chewers in Bali and Java. The result showed that 55%of female patients were more prone to dental caries than males that were 44%. Studies showed the effect of caries in betel quid chewers is less; tannin a constituent of betel quid may have antimicrobial properties which contribute cariostatic property of betel quid (17). Betel stain often covers the tooth surface and acts as a protective varnish (16). Lesser prevalence among betel quid chewers could be due to continuous chewing which increases salivary secretions that contain high level of antibodies which prevents microbes to adhere to tooth surface.

The prevalence of periodontal disease in betel quid chewers in this study showed that females showed 61% of pocket 4-5mm and 80% in males. Bleeding on probing was 1% in females and 4% in males and pocket greater than 6mm was 27% in females and 16% in males. Choudhury et al (24) reported that betel quid chewing leads to poorer periodontal health. Ling et al (25) showed 42.6% bleeding on probing in be-

**Table 5: Periodontal status of Betel quid chewers**

Variable	Females			Male		
	Bleeding observed on probing	Pocket 4-5mm	Pocket greater than 6mm	Bleeding observed on probing	Pocket 4-5mm	Pocket greater than 6mm
Upper right first molar	5.90%	58.80%	12%	0%	87.90%	12.10%
Upper right second molar	0%	70%	30%	9%	75%	15%
Upper left first molar	0%	82%	17%	9%	78%	12%
Upper left Second molar	0%	26%	8%	6%	81%	12%
Lower left first molar	0%	64%	35%	0%	84%	15%
Lower left second molar	0%	35%	65%	3%	76%	21%
Lower right first molar	0%	88%	12%	0%	85%	15%
Lower right second molar	0%	65%	35%	3%	73%	24%

**Table 6: Status of Dental Caries in Betel quid chewers**

Teeth	Sound		Decayed	
	Mean	Standard Deviation	Mean	Standard Deviation
Upper right first molar	1.27	0.447	1.54	0.508
Upper right second molar	1.33	0.471	1.50	0.535
Upper left first molar	1.29	0.454	1.63	0.5
Upper left second molar	1.34	0.478	1.31	0.48
Lower left first molar	1.32	0.471	1.37	0.489
Lower left second molar	1.3	0.459	1.67	0.492
Lower right first molar	1.38	0.49	1.22	0.424
Lower right second molar	1.33	0.474	1.40	0.516

**Table 7: Periodontal status of Betel quid chewers**

Variables	Mean	Std. Deviation
Upper right first molar	2.18	.435
Upper right second molar	2.14	.493
Upper left first molar	2.08	.442
Upper left second molar	2.12	.433
Lower left first molar	2.22	.416
Lower left second molar	2.34	.517
Lower right first molar	2.14	.349
Lower right second molar	2.26	.485

tel quid chewers and greater pocket depth. Mehta et al (26) reported that teeth become dark brown from chewing betel leaves because of deposits of lime on teeth.

### CONCLUSION

The present study concluded that effect of dental caries in betel quid chewers is less. A high prevalence rate of periodontal disease was found in betel quid chewers. Government of Pakistan should impose a ban on consumption of betel quid and other smokeless products. Betel quid chewing should be discouraged by planning public health awareness programs in these socially deprived areas.

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