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An Epidemiological Survey on Periodontal Health Related Awareness of Betel Nut Chewing in Mangalore Population

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Abstract

Introduction: Betel nut, an addictive substance ranks fourth after nicotine, ethanol and caffeine. An estimated population of about 600 million chews betel nut across the world. Chewing betel nut has potential harmful effects on the gingival and periodontal health. **Aim:** To evaluate the awareness of effect of betel nut chewing on the periodontium in Mangalore population. **Methods:** The study population for the survey consisted of 150 patients between the age group of 20-60 years visiting the outpatient, Department of Periodontics, A.B Shetty Memorial Institute of Dental Sciences. A questionnaire was distributed which consisted of 15 questions. A prior consent was taken from all patients. The results were statistically analyzed using Pearson's Chi square test. **Results:** A total of 150 patients were investigated, out of which 36% betel nut chewers belonged to an age group of 30-40 years. Prevalence of betel nut chewing was found to be 65% in males and 35% in females. Bleeding gums, halitosis, burning sensation, stains/yellowish deposits, gingival recession, and sensitivity of teeth were significantly higher among the betel nut chewers. Majority of the patients reported that the risk associated with betel nut consumption was oral cancer. **Conclusion:** The results indicated that betel nut chewing showed significant effects on the periodontium like gingival recession, bleeding gums, halitosis, burning sensation, stains and sensitivity of teeth. It can be concluded that more than two thirds of betel nut chewers were younger than 50 years and had a male predilection. The patients also showed lack of awareness regarding the deterioration of their periodontal health.

Keywords: Arecoline, Periodontitis, Gingival Recession, Halitosis, Oral Hygiene

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Introduction

Piper betel/betel is a branching vine that belongs to the family Piperaceae^[1]. Areca catechu (areca nut) is the seed of areca palm, commonly grown in Asia, the tropical Pacific and parts of east Africa^[2]. The acquired habit of betel nut chewing commonly seen among Indian population is known as "paan chewing"^[3]. Areca nut is available in various forms such as ripe, unripe, boiled, raw, fermented or even processed with sweeteners and flavours. It also includes betel leaf or its flower along with spices, tobacco, condiments lime^[4]. The habit

was most commonly found to be prevalent among the male population^[5]. Children and teenagers in India were found to chew occasionally or regularly^[6]. Social acceptability, religious beliefs, deduced health benefits along with addiction are some attributable factors responsible for the prevalence of betel nut chewing^[7]. There is deterioration in human health due to betel nut consumption^[8]. The World Health Organisation and International Agency for Research on Cancer classified group 1 human carcinogens, which includes betel nut^[9]. It also includes alcoholic beverages, salted fish, coal-tars^[10].

Nitrosamine is the most prominent constituent which is carcinogenic in nature [11]. Periodontitis is an inflammatory disease which is an immune-mediated condition caused by gram-negative anaerobic microorganisms. It is characterized by destruction of soft tissue and alveolar bone. The primary etiological agents are caused by the dental plaque-associated microorganisms and contributing factors responsible for periodontal diseases are malocclusion, systemic diseases, smoking and use of smokeless tobacco [12]. The habit of betel nut chewing causes excessive masticatory load and presence of various components in quid affects the teeth and supporting periodontal tissues and also results in different diseases of the oral cavity [13]. Betel nut chewing results in copious red saliva caused due to the stains produced by the use of betel quid (BQ) on a daily basis [14, 15]. Balendra has performed a study and detected that there is breakdown of periodontal tissues due to betel nut chewing [3]. According to some investigators, loss of periodontal attachment and calculus formation was seen among the betel nut chewers [16]. Bleeding gums is the initial symptom of periodontal disease [17]. Early detection of periodontal diseases is very

essential which requires patient education and creating awareness regarding control and maintenance of periodontal health. Thus, the aim of this study is to determine the awareness of the effect of betel nut chewing on the periodontium in Mangalore population.

Material and Methods

This is a questionnaire-based survey which was conducted for a period of 3 months from September 2018 to November 2018 in the Department of Periodontics, A.B. Shetty Memorial Institute of Dental Sciences. The sample was selected by simple random stratified technique. The study population consisted of 150 patients. Informed verbal consent was obtained from all the patients. The patients willing to participate in the survey with minimum twenty complement of teeth between the age group of 20-60 years were included in the survey. Patients who had undergone oral prophylaxis before six months, pregnant and lactating mothers and patients with debilitating diseases (rheumatoid arthritis, cerebral palsy, chronic obstructive pulmonary diseases) were excluded from participating in the survey.

QUESTIONARRE FORM	
Name: Address:	Age/Sex: Phone Number:
1) Do you have the habit of Betel Nut Chewing? a. Yes b. No	9) Do you have bad breath? a. Yes b. No
2) Which type of Betel Nut do you use? a. Thoombak b. Paan masala c. Khaini d. Mawa	10) Do you have a burning sensation in the mouth? a. Yes b. No
3) How frequently do you chew Betel Nut? a. Daily b. Weekly c. Monthly d. Occasionally	11) Have you noticed stains/ yellowish deposits in the teeth? a. Yes b. No
4) Where do you place Betel Nut inside the mouth? a. Buccal sulcus b. Labial vestibule c. Beneath the tongue d. Chewed singly	12) Do you have sensitivity of teeth? a. Yes b. No
5) How long have you been chewing Betel Nut? a. For the last 1 month b. For the last 6 months, c. For the last 1 year, d. More than 1 year	13) Have you ever noticed downward movement of gums? a. Yes b. No
6) How did you start the habit of Betel Nut Chewing? a. Family b. Peer pressure c. Self d. Others	14) Regular chewing of Betel Nut can cause: a. Tooth decay b. Mouth Ulcer c. Oral Cancer d. All of the above
7) Do you have any Systemic diseases? a. Yes b. No If yes, specify	15) Have you ever tried to stop the habit of Betel Nut chewing? a. Yes b. No
8) Have you ever noticed bleeding from the gums? a. Yes b. No	

Data collection and Patient education

A questionnaire form was given to all the patients. All the patients were asked to mark the answers in the questionnaire form. All the

patients were educated and awareness was created after the questionnaire was distributed regarding the deteriorating effect on the periodontium due to betel nut chewing. Patient education was made using charts stating the

adverse effects of betel nut chewing and motivated to stop the habit. Patients were asked to visit cessation centers in Mangalore. The data was collected and then statistically analyzed. A questionnaire was designed to evaluate the effects of betel nut chewing on periodontium and risk factors associated with habitual betel nut chewing. Demographic information such as name, age, sex and address were collected. Other factors such as frequency, duration, presence of systemic diseases were also obtained.

Statistical analysis

The data collected was analyzed using SPSS Software. Frequencies were used to document qualitative variable studied. To test the association between betel nut chewing and effect on hard and soft tissues of the oral cavity, Chi square (χ^2) test was carried out $p < 0.05$ was considered to be statistically significant.

Results

A total number of 150 patients were included in the survey. The data was collected and the following observations were analyzed. The age distribution in the present study varied from 20 to 60 years. Betel nut chewers were highest between the age group of 30-40 years (36%). Patients were subjected to Pearson's Chi square (χ^2) test. (fig 1)

Fig 1: Association between age and the habit of betel nut chewing

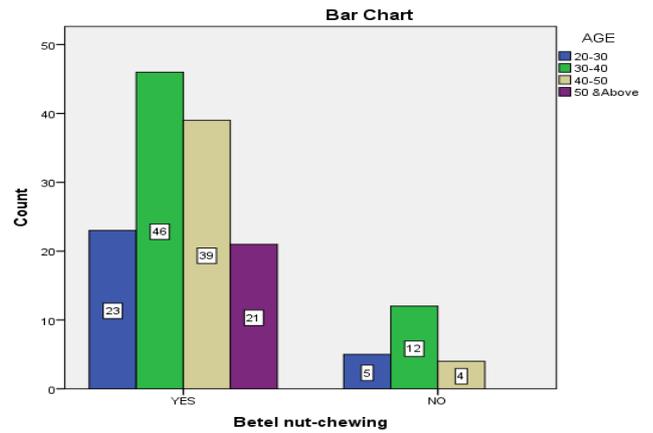
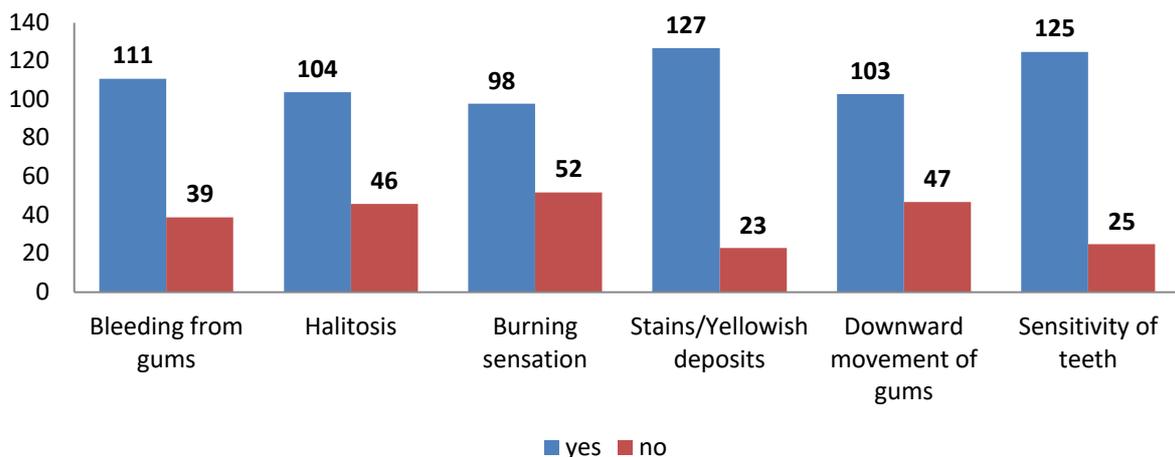


Table 1: Association between age and the habit of betel nut chewing

	Value	Asymp. Std. Error ^a	Approx. T ^b	Approx. Sig.
Interval by Interval Pearson's R	-.183	.061	-2.264	.025 ^c

Pearson's Chi square was done for association between age and betel nut chewing. Pearson's 'R' value obtained was (-0.183), where $p = 0.025$ which was statistically significant. Thus, age is considered as a confounding factor for the consumption of betel nut chewing (table 1)

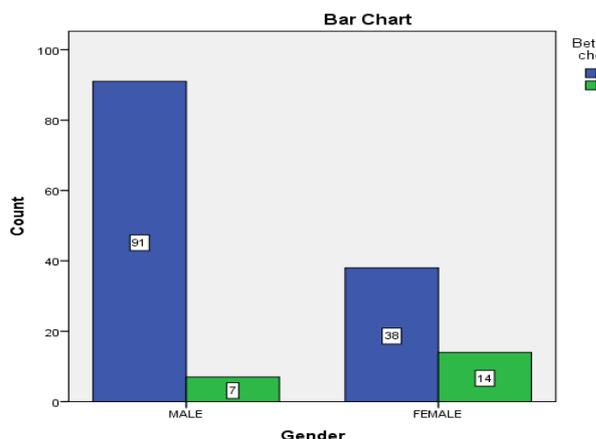
Fig 2: Effect of betel nut chewing on the hard and soft tissues of the oral cavity



The incidence of stains/yellowish deposits was the highest among the betel nut chewers. Sensitivity of teeth, bleeding from gums, halitosis, downward movement of gums

(gingival recession) and burning sensation were also commonly seen among the betel nut chewers (fig 2).

Fig 3: Association between gender and betel nut chewing



91(71%) betel nut chewers were male population and the rest 38(29%) were female population. The results obtained were subjected to Pearson’s Chi square (χ^2) test. Thus, betel nut chewing habit was commonly seen among the male population.(fig 3)

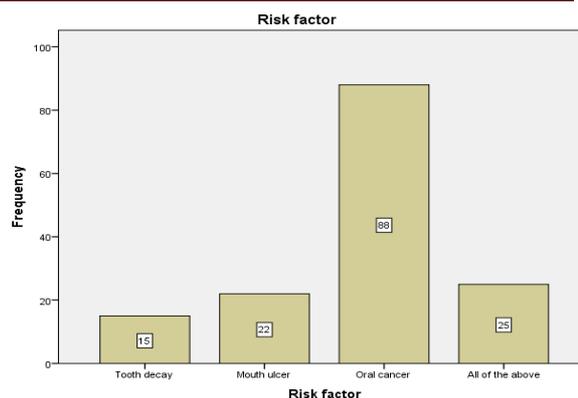
Table 2: Association between gender and betel nut chewing

	Value	Asymp. Std. Error ^a	Approx. T ^b	Approx. Sig.
Interval by Interval Pearson's R	.271	.083	3.429	.001 ^c

Pearson’s Chi square was done for association between age and betel nut chewing. Pearson’s ‘R’ value obtained was (0.271), where $p < 0.001$ which was statistically significant. Thus, gender is considered as a confounding factor for the consumption of betel nut chewing (table 2).

Fig 4: Risk factors associated with betel nut chewing

The questionnaire assessed the risk factors associated with betel nut chewing. The risk factors included tooth decay, mouth ulcer, oral cancer. 88(59%) betel nut chewers reported that oral cancer was the risk factor associated with the consumption of betel nut, 25 (17%) betel nut chewers reported all of the above, 22 (15%) betel nut chewers reported that mouth ulcer and 15 (10%) betel nut chewers reported that tooth decay was the risk factor associated with betel nut chewing.



Discussion

Chewing areca nut/betel quid is an ancient habit in India. According to Ahmed *et al*; 1997, chopped areca nuts were wrapped in a vine leaf to prepare a quid known as ‘paan’ [18]. Tobacco is also added by certain people [19]. Arecoline plays an important role in periodontal diseases along with factors like level of oral hygiene, dietary factors and general health [20]. The present study revealed a correlation between age and betel nut chewing. The highest prevalence was seen between 30-40 years. Bouchard *et al*; 2017, have classified age under non-modifiable predisposing factor [21]. Surveys performed in rural and urban India, Nepal and Pakistan over the last 2½ decades, 20%-40% of betel quid chewers were 15 years of age and above [22-26]. Seedat and Van Wyk, 1998 reported that areca nut chewing was commonly seen above 65 years of age but is now common in young [18]. The present study revealed a significant correlation between gender distribution (Male population) and betel nut chewing. According to Bouchard *et al*; 2017, gender was also a non-modifiable predisposing factor. According to Albandar, 2002; Hermann *et al*; 2009; Eke *et al*; 2015 showed that male gender greatly increased the risk of periodontal disease [21]. However, Warnakulasuriya, 1992 stated that in Central Province of Sri Lanka, the chewing habit was equal for men and women [18]. The present study revealed that 85% (127) betel chewers complained of stains/yellowish deposits. According to Pihlstrom *et al*; 2005, food debris along with microbial content causes plaque formation leading to periodontal diseases [27]. According to Chatrchaiwiwatana *et al*; 2006 in betel nut chewers, calculus deposition increased

which affected gingival and periodontal tissues [28]. Betel nut causes stains that get embedded in oral tissues [15]. Mehta *et al*; 1955 stated that thick deposits resulted in gingival and periodontal membrane separation from the necks of teeth causing loose teeth [28].

In the present study, betel quid chewers complained of bleeding gums (74%), teeth sensitivity (83%), gingival recession (69%), halitosis (69%) and burning sensation (63%). Mavropoulos *et al*; reported that consuming betel nut on a daily basis increases the gingival blood flow which increases bleeding from gums [29]. Bleeding gums, an indicator of periodontal disease, can be self-detected [17].

According to Robertson *et al*; greater recession and attachment loss was evident in sites adjacent to mucosal lesions in smokeless tobacco users than in other sites due to abrasive nature of smokeless tobacco [30, 31]. Parmar *et al*; reported difficulty in mouth opening and burning sensation among betel nut chewers [5]. Payne *et al*; revealed that smokeless tobacco stimulates monocyte secretion of PGE2 and IL1 beta, which play a role in periodontitis [32]. The present study revealed that oral cancer is an important risk factor associated with betel nut chewing. Areca nut causes injury to oral mucosa due to its abrasive nature causing local trauma. Continuous exposure, leads to pre-neoplastic lesions and finally to malignancy [33]. Betel nut sold in various forms entices younger generation to consume it which has the potential for addiction [18]. All the groups of the society should be educated to connect gingival bleeding to gum disease [34]. Therefore, creating awareness and educating the society of the deleterious effects of betel nut chewing is essential.

Limitations

This was only a questionnaire based survey with no clinical assessment of the oral cavity. More studies in a larger population have to be performed to spread awareness about the harmful effects of betel nut chewing on the gingival and periodontal tissues. Future studies can be done related to the deleterious effects of different types of betel nut and its deteriorating effects of each type on hard and soft tissues of the oral cavity.

Conclusion

Based on the present findings of the survey, bleeding from gums, halitosis, burning sensation, stains/yellowish deposits, downward movement of gums (gingival recession), sensitivity of teeth were significantly higher among the betel nut chewers. It can be concluded that more than two thirds of betel nut chewers were younger than 50 years, with the highest between the age group of 30-40 years and has a male predilection. Chewing betel nut adversely affects an individual's oral hygiene, gingival and periodontal health. More focus should be given to the regulation and periodontal health related awareness initiatives for betel nut consumption. Consideration of evidence based risk-stratified screening approaches for periodontitis, ideally led by periodontists and dentists. Betel nut control policies should be implemented by policy makers to quit and eradicate the habit.

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Ethical Permission: Obtained

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