

# Cancer causing chewing habits and related oral lesions – A comparative study among females of socio-culturally different areas of West Bengal

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## Abstract

**Background:** Smokeless tobacco, as well as areca-nut both, causes cancerous and precancerous lesions of the oral cavity. The traditional value of India, as well as West Bengal do not allow females for smoking, but there is no such disapproval for using smokeless tobacco or areca nut. Geographically and socio-culturally, the Northern part of West Bengal differs from its Southern part.

**Aims:** This study aimed to assess the prevalence of different chewing habits, habit products, and habit-related different oral lesions among females in two socio-culturally different areas of West Bengal.

**Methods:** A total of 222 women from areas of North Bengal and 173 women from areas of South Bengal aged 15 years and above were selected. A face-to-face interview was conducted using a structured questionnaire. An oral cavity examination was done to rule out any oral mucosal alterations caused by cancer-causing habits.

**Statistical Analysis:** Chi-square test or Fischer's exact tests were used to compare unpaired proportions as appropriate.

**Results:** In areas of the northern part of Bengal, 42.34% of females were chewers, and in areas of the southern part of Bengal 18.50% of females were chewers. Younger female chewers were more from areas of the northern part of Bengal. Women, residing in different areas of the northern part of Bengal had more habit-related oral lesions, compared to the southern part of Bengal.

**Conclusion:** Special attention should be given to increasing awareness regarding chewing habit-related health hazards among females, especially in areas of North Bengal.

**Keywords:** Arecanut, females, oral lesions, tobacco, West Bengal

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## INTRODUCTION

Premature death due to oral malignancy is a burning issue in India as well as the whole of South Asia. Tobacco consumption can be described as the single leading cause behind it. Around the world, it kills about 6.4 million people annually.<sup>[1]</sup>

As per the global adult tobacco survey, India is the second-largest tobacco consumer and third-largest tobacco producer around the globe.

In our country, tobacco is available in different types and forms. In any form, both smoking and smokeless tobacco are deadly. According to GATS 2016-17, 29.6% of men and 12.8% of women in India currently use smokeless tobacco.<sup>[2]</sup>

Along with smokeless tobacco, areca nut is also an emerging etiology of oral cancer in India. Areca nut is commonly used as an important ingredient of betel quid, chewing of which is culturally practiced in India.<sup>[3]</sup>

At present, tobacco has become a social nuisance; therefore, many people switched over to non-tobacco-containing tobacco products which contain areca nut.

Traditional values of south Asian countries do not allow women to smoke, but there is no such disapproval regarding smokeless tobacco or betel quid use for them.<sup>[4]</sup>

Females, who use smokeless tobacco, have higher chances to get oral cancer than nonusers. Increased chance of cardiac disorder and the adverse reproductive outcome is also associated with smokeless tobacco use in females.<sup>[5]</sup>

As per GATS 2009-10, the percentage of current female smokeless tobacco users in West Bengal was 17.8%; whereas for northeast states such as Tripura, Mizoram, Manipur it was very high at 43.5%, 49.1%, and 37.0%.<sup>[6]</sup>

West Bengal is a state with socio-cultural and geographical diversity. Based on this, areas of the northern part of West Bengal differs from areas near the Capital City Kolkata, which is located near the southern part of the State.

Due to geographical similarity and vicinity of the border; the North Eastern States may have an effect on the customs and lifestyle of people residing in North Bengal.

The study was aimed to know the prevalence of different cancer-causing chewing habits and related oral lesions among females of two socio-culturally different areas of

West Bengal, and compare the pattern of habits and oral lesions between them.

## MATERIALS AND METHODS

This is a cross sectional study of tobacco usage among females, which was conducted for the period of approximately 3 years (from April 2017 to March 2020) in different private Medical and Dental clinics and oral health screening camps around Siliguri a city located in northern part of West Bengal and areas surrounding Kolkata, the capital city of West Bengal; which is present at the southern part of the state and Surrounding areas.

Patients above 15 years who had no systemic disease and were willing to participate in this study were included.

Staff for the study chiefly consisted of medical social workers, qualified dentists, and oral pathologists.

### Study procedure

Medical social workers were trained to take data from the study sample.

First, the purpose of the study was explained to the study participants and informed consent was obtained from them. Face-to-face interview was conducted and their oral cavity were clinically examined using a mouth mirror and explorer under daylight to rule out if any tobacco-related oral lesion was present. All the oral lesions were clinically diagnosed as per WHO criteria and color atlas of oral pathology.

Information regarding demographic characteristic was collected using a questionnaire formatted both in English and the local language Bengali. Along with these, information regarding their tobacco habits was assessed using the WHO steps questionnaire.<sup>[7]</sup>

The study population was divided into five socioeconomic classes based on BG Prasad's Socioeconomic Scale<sup>[8]</sup> and divided into 10 occupational groups based on the ISCO-08 Structure.<sup>[9]</sup>

The questionnaire and the study procedures were approved by the institutional human ethical committee, Department of Physiology in the University of Calcutta. The validity and reliability of the questionnaire were pretested.

### Statistical analysis

In this study, data were noted using a Microsoft Excel spreadsheet and then it was analyzed using SPSS 24.0. and Graph Pad Prism version 5.

Chi-square test or Fischer's exact test were used to compare Unpaired proportions as appropriate. In our study  $\leq 0.05$  *P* value was considered statistically significant.

## RESULT

Around 395 female participants participated in our study. Among them, 222 (56.2%) participants are from areas of North Bengal and 173 (43.8%) participants are from areas of South Bengal.

In our study population, 31.90% of participants used cancer-causing chewing products. As per our study; in areas of North Bengal, 42.34% of females were chewers and in areas of South Bengal 18.50% of females were chewers. Among chewers, in our study, 74.6% are from the northern part of Bengal and 25.4% are from the southern part of Bengal.

Females in the northern area of West Bengal in age group of 35-44 used cancer-causing chewing habits most (32.98%) and females in the southern area of West Bengal from the age group of 45-54 used cancer-causing chewing habits most (34.37%). In our study, females from the youngest age groups (15-24) who used cancer-causing habit products were mostly from areas of the northern part of West Bengal.

Most of the females from the northern part of West Bengal, who used cancer-causing habit products, belonged to the socioeconomic group of Class-II, and females from the southern part of West Bengal, who used cancer-causing habit products most, belonged to the socioeconomic group of Class-III.

Most of the female chewers from the northern part of West Bengal completed their secondary education and most of the female chewers from the southern part of West Bengal completed only primary education or had no formal education.

In North Bengal, females from urban areas used cancer-causing habits most (55.31%); whereas, in South Bengal, people from the rural area (56.25%) used cancer-causing habits most.

In both, the part of Bengal; housewives, followed by females from group 9 occupation had cancer-causing habits most. Female students from areas of North Bengal had cancer-causing habits (5.32%) but female students from areas of South Bengal never used any cancer-causing habit products as per our study.

Detail comparison of cancer-causing habits of females from different parts of Bengal is described in Table 1.

In our study, we have found that females from areas of North Bengal had more oral mucosal changes than females from areas of South Bengal. Among females of the northern part of West Bengal, Oral Submucous Fibrosis (OSMF) and oral lichen planus (OLP) was the most common lesion, whereas Submucous Fibrosis (OSMF) was the most common lesions among females of the southern part of West Bengal.

Oral lichen planus (OLP) was the only lesion seen among females who never used any cancer-causing habit products.

Detailed analysis of habit-related oral mucosal changes among females of different locations is described in Table 2.

The distribution of different chewing products used by females of different geographical locations is described in Figure 1. It was found that Dokta (flaked tobacco leaves boiled in water with lime and spices until evaporation, then dried and colored with vegetable dyes<sup>[10]</sup>) and Gutkha (commercially prepared betel quid which consists of sun-dried or roasted, finely chopped tobacco mixed with areca nut, slaked lime, catechu, and flavoring ingredients<sup>[10]</sup>) was used only by females of areas of North Bengal and Gudaku (Tobacco paste consisting of powdered tobacco and molasses<sup>[10]</sup>) was used only by females of areas of South Bengal. The most widely used chewing product among females of both parts of Bengal was arecanut/packet arecanut.

## DISCUSSION

According to district level, household and facility survey-4; 2012–13, in West Bengal; 22.9% of women use any kind of smokeless tobacco product.<sup>[11]</sup>

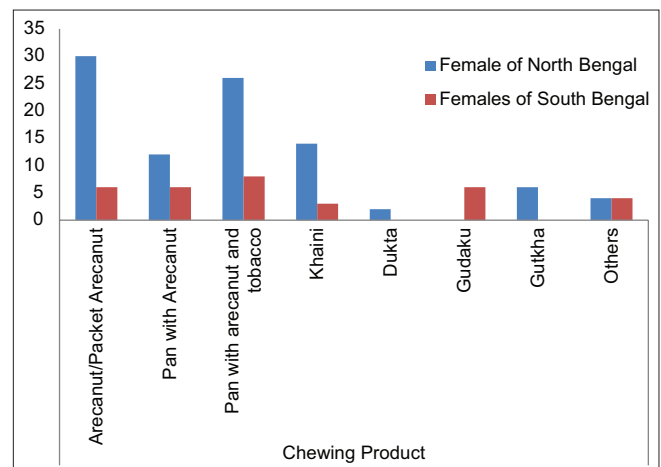


Figure 1: Distribution of different chewing products

**Table 1: Comparison of cancer causing habits of females from different part of Bengal**

|                    | Female of North Bengal who Chew |       | Female of North Bengal who do not Chew |       | Female of South Bengal who Chew |       | Female of South Bengal who do not Chew |       | Total |
|--------------------|---------------------------------|-------|--|-------|---------------------------------|-------|--|-------|-------|
|                    | No                              | %     | No                                     | %     | No                              | %     | No                                     | %     | No    |
| Age Groups         |                                 |       |  |       |                                 |       |  |       |       |
| 15-24              | 9                               | 9.57  | 30                                     | 23.43 | 1                               | 3.12  | 12                                     | 8.51  | 52    |
| 25-34              | 22                              | 23.40 | 45                                     | 35.16 | 2                               | 6.25  | 37                                     | 26.24 | 105   |
| 35-44              | 31                              | 32.98 | 26                                     | 20.31 | 7                               | 21.87 | 38                                     | 26.95 | 102   |
| 45-54              | 25                              | 26.59 | 17                                     | 13.28 | 11                              | 34.37 | 27                                     | 19.14 | 80    |
| 55-64              | 4                               | 4.25  | 7                                      | 5.47  | 2                               | 6.25  | 23                                     | 16.31 | 36    |
| >64                | 3                               | 3.19  | 3                                      | 2.34  | 9                               | 28.12 | 4                                      | 2.83  | 19    |
| Total              | 94                              |       | 128                                    |       | 32                              |       | 141                                    |       | 395   |
| SES                |                                 |       |  |       |                                 |       |  |       |       |
| Class-1            | 13                              | 13.82 | 24                                     | 18.75 | 1                               | 3.12  | 29                                     | 20.56 | 67    |
| Class-2            | 35                              | 37.23 | 44                                     | 34.38 | 9                               | 28.12 | 36                                     | 25.53 | 124   |
| Class-3            | 27                              | 28.72 | 37                                     | 28.91 | 11                              | 34.37 | 35                                     | 24.82 | 110   |
| Class-4            | 11                              | 11.70 | 16                                     | 12.50 | 7                               | 21.87 | 23                                     | 16.31 | 57    |
| Class-5            | 8                               | 8.51  | 7                                      | 5.46  | 4                               | 12.5  | 18                                     | 12.76 | 37    |
| Total              | 94                              |       | 128                                    |       | 32                              |       | 141                                    |       | 395   |
| Education          |                                 |       |  |       |                                 |       |  |       |       |
| Uneducated         | 14                              | 14.89 | 10                                     | 7.81  | 11                              | 34.37 | 24                                     | 17.02 | 59    |
| Primary            | 18                              | 19.14 | 19                                     | 14.84 | 11                              | 34.37 | 17                                     | 12.05 | 65    |
| Secondary          | 38                              | 40.42 | 53                                     | 41.40 | 8                               | 25    | 60                                     | 42.55 | 159   |
| H.S.               | 12                              | 12.76 | 25                                     | 19.53 | 2                               | 6.25  | 18                                     | 12.76 | 57    |
| Graduate           | 10                              | 10.63 | 19                                     | 14.84 | 0                               | 0     | 11                                     | 7.80  | 40    |
| Post Graduate      | 02                              | 2.12  | 02                                     | 1.56  | 0                               | 0     | 11                                     | 7.80  | 15    |
| Total              | 94                              |       | 128                                    |       | 32                              |       | 141                                    |       | 395   |
| Place of Residence |                                 |       |  |       |                                 |       |  |       |       |
| Rural              | 42                              | 44.68 | 64                                     | 50    | 18                              | 56.25 | 82                                     | 58.16 | 206   |
| Urban              | 52                              | 55.31 | 64                                     | 50    | 14                              | 43.75 | 59                                     | 41.84 | 189   |
| Total              | 94                              |       | 128                                    |       | 32                              |       | 141                                    |       | 395   |
| Occupation         |                                 |       |  |       |                                 |       |  |       |       |
| Group-0            | 00                              | 0     | 00                                     | 0     | 00                              | 0     | 00                                     | 0     | 0     |
| Group-1            | 00                              | 0     | 00                                     | 0     | 00                              | 0     | 01                                     | 0.70  | 1     |
| Group-2            | 04                              | 4.25  | 01                                     | 0.78  | 00                              | 0     | 11                                     | 7.80  | 16    |
| Group-3            | 02                              | 2.12  | 01                                     | 0.78  | 01                              | 3.12  | 03                                     | 2.13  | 7     |
| Group-4            | 00                              | 0     | 02                                     | 1.56  | 00                              | 0     | 01                                     | 0.70  | 3     |
| Group-5            | 02                              | 2.13  | 04                                     | 3.12  | 01                              | 3.12  | 05                                     | 3.54  | 12    |
| Group-6            | 02                              | 2.13  | 02                                     | 1.56  | 04                              | 12.5  | 01                                     | 0.70  | 9     |
| Group-7            | 03                              | 3.19  | 02                                     | 1.56  | 01                              | 3.12  | 07                                     | 4.96  | 13    |
| Group-8            | 01                              | 1.06  | 00                                     | 0     | 00                              | 0     | 00                                     | 0     | 1     |
| Group-9            | 05                              | 5.31  | 04                                     | 3.12  | 05                              | 15.63 | 07                                     | 4.96  | 21    |
| Housewives         | 70                              | 74.46 | 87                                     | 67.97 | 20                              | 62.5  | 101                                    | 71.63 | 278   |
| Students           | 05                              | 5.32  | 25                                     | 19.53 | 00                              | 0     | 04                                     | 2.83  | 34    |
| Unemployed         | 00                              | 0     | 00                                     | 0     | 00                              | 0     | 00                                     | 0     | 0     |
| Total              | 94                              |       | 128                                    |       | 32                              |       | 141                                    |       | 395   |

Aparajit Dasgupta *et al.*<sup>[12]</sup> in Kolkata found that 36.5% of female uses smokeless tobacco.

On the other hand, in different northeastern states of India, 51% of female uses smokeless tobacco.<sup>[13]</sup>

We have found that; in our study population, 31.90% of participants used cancer causing chewing products. As per our study; in areas of North Bengal, 42.34% of females were chewers and in areas of South Bengal 18.50% females were chewers. Among chewers, in our study 74.6% are from areas of North Bengal and 25.4% are from areas of South Bengal.

The geographical, environmental, and socio-cultural behavior of the people of north Bengal matches with north eastern states of India. This could be the reason behind the difference in the prevalence of female chewers in our study.

Asper Dasgupta *et al.*<sup>[12]</sup> and Rani *et al.*<sup>[14]</sup> smokeless tobacco use was highest among women more than 35 years. This finding matches with our study; but as per our study, young female chewers were more in areas of North Bengal compared to areas of South Bengal.

Rani *et al.*<sup>[14]</sup> showed that most of the female chewing tobacco users were from the rural area. In our study, we have found that in south Bengal female chewers were more from the rural area and in North Bengal female chewers were more from urban areas.

Dasgupta *et al.*<sup>[12]</sup> who conducted a study in the Kolkata slum area, and Rani *et al.*<sup>[14]</sup> found that the least educated women, poor women, and women with minimal knowledge are more prone to the harmful effects of tobacco than smokeless tobacco use.

**Table 2: Analysis of habit related oral mucosal changes among females of different location**

| Association between oral changes in different part of Bengal |              |              |       |
|--|--------------|--------------|-------|
| oral changes   | North Bengal | South Bengal | TOTAL |
| Absent   | 199          | 164          | 363   |
| Row %  | 54.8         | 45.2         | 100.0 |
| Col %  | 89.6         | 94.8         | 91.9  |
| leukoplakia  | 3            | 3            | 6     |
| Row %  | 50.0         | 50.0         | 100.0 |
| Col %  | 1.4          | 1.7          | 1.5   |
| lichen planus  | 7            | 2            | 9     |
| Row %  | 77.8         | 22.2         | 100.0 |
| Col %  | 3.2          | 1.2          | 2.3   |
| OSMF   | 7            | 4            | 11    |
| Row %  | 63.6         | 36.4         | 100.0 |
| Col %  | 3.2          | 2.3          | 2.8   |
| scc  | 2            | 0            | 2     |
| Row %  | 100.0        | 0.0          | 100.0 |
| Col %  | 0.9          | 0.0          | 0.5   |
| smokers melanosis  | 1            | 0            | 1     |
| Row %  | 100.0        | 0.0          | 100.0 |
| Col %  | 0.5          | 0.0          | 0.3   |
| Tobacco induced keratosis                                    | 3            | 0            | 3     |
| Row %  | 100.0        | 0.0          | 100.0 |
| Col %  | 1.4          | 0.0          | 0.8   |
| TOTAL  | 222          | 173          | 395   |
| Row %  | 56.2         | 43.8         | 100.0 |
| Col %  | 100.0        | 100.0        | 100.0 |

Chi-square value: 6.9999; P value: 0.3209

On the other hand, we found that the majority of female chewers of North Bengal belonged to Class-II Socioeconomic status and the majority of female chewers of South Bengal belonged to Class-III Socioeconomic status.

In both part of West Bengal majority of chewers were housewives. Among them, most were from North Bengal.

We also found that the majority of female chewers of North Bengal had only secondary education, whereas the majority of female chewers of South Bengal had no formal education or had only primary education.

Mishra *et al.*<sup>[15]</sup> in Mumbai found that Masherī was the most commonly used tobacco product among women, followed by chewing tobacco. Pandey *et al.*<sup>[16]</sup> found that Pan with Tobacco was the most commonly used chewing product among young females of Bagalkot District.

Rooban *et al.*<sup>[17]</sup> found that most of the females used other chewing products in India as well as West Bengal.

In our study, we have found that arecanut/packet arecanut was the most commonly used chewing products in both part of West Bengal, followed by pan with arecanut and tobacco.

It is already established that tobacco chewing and arecanut chewing is associated with different oral mucosal

alterations, such as oral squamous cell carcinoma, verrucous carcinoma, oral submucous fibrosis, tobacco pouch keratosis, etc.<sup>[18]</sup>

We also found various oral lesions among women who used different cancer causing chewing products.

We found that female chewers of North Bengal had more oral lesions compared to female chewers of South Bengal. All the oral squamous cell carcinoma we have found was present among females of North Bengal.

In our society, perception is present that females do not use tobacco products, but our study showed that the policy makers should change their perception regarding tobacco usage of females.

In India, a very minimal study was done to explore chewing habits and related oral lesions of housewives. It was found that they were the most neglected group in this respect. In our study, most of the participants were housewives. Hence, from this study, we can easily identify the tobacco usage pattern and related oral lesions among them.

In West Bengal, as well as India, female health is cared by mostly primary health care workers. Using very minimal equipment they can easily identify the females using risk habits for oral cancer. They can also take part to identify oral cancerous and precancerous lesions as well.

Data obtained in our study was based on self report. Hence, there was a high chance of underreporting of habits.

Commonly it is believed that the prevalence of tobacco usage is somewhat similar across a whole state. In our study, we have shown that chewing habits, as well as oral lesions both, were more prevalent among females of North Bengal compared to females of South Bengal.

## CONCLUSION

To control the incidence of oral cancerous and precancerous lesions among females, preventive measures will play the most important role. Based on our study report, we recommend that periodic counseling of tobacco-related habits, as well as oral cavity examinations of females, are very much needed.

During policy making, special attention should be given to increasing awareness regarding tobacco-related health hazards and reducing the chewing habits of females, especially in North Bengal.

### Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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### Conflicts of interest

There are no conflicts of interest.

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