



**ASSESSMENT OF THE USAGE OF SMOKELESS-TOBACCO AND ITS
ILL EFFECTS AMONG THE POPULATION OF BARSANA,
MATHURA- A CROSS-SECTIONAL STUDY**

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ABSTRACT

Background: In India, smokeless tobacco is more prevalent in remote areas where knowledge regarding its adverse effects is lacking. Nirala manjan (Nirala tooth powder) is available in some parts of northern India. People of Barsana were found very commonly using smokeless tobacco and also local abrasive and tobacco-containing toothpowder (nirala).

Aim: This study was done to assess the usage of smokeless- tobacco & to create awareness regarding the ill effects of smokeless tobacco usage among the population of Sri Mata Ji Gaushala, Barsana.

Materials and Method: A total of 100 subjects aged between 18 and 65 years were examined. Socio-demographic characteristics, oral hygiene practices, and nirala or smokeless tobacco use history were surveyed by using a semi-structured interview questionnaire. Community Periodontal Index (CPI) and

Loss of Attachment (LOA) using the WHO probe and a mouth mirror were used to record the periodontal status.

Results: Out of 100 participants examined, 42% used nirala and 42% used both nirala and smokeless tobacco in form of Gutkha.

Conclusion: Barsana has been the most secluded area where the awareness of taking smokeless tobacco in any form which can cause a risk to their oral health is lacking. Thus, this study focused on creating awareness regarding the ill effects of smokeless tobacco usage and prohibiting the use of nirala manjan (tobacco-containing tooth powder) among the population.

Keywords: Smokeless Tobacco, Nirala manjan, Community Periodontal Index, Loss of Attachment

INTRODUCTION

The oral cavity is described as an integral part of the overall health of a human being. It is precisely said by Seymour that “Good general health cannot be accomplished without good oral health.” [1]

Systematic preventive care of the teeth and gums is imperative in preserving the quality of life and complete health, playing a role in monitoring diseases such as diabetes and heart disease [2]. Yet, rural communities frequently lack suitable oral healthcare and later miss out on the profits of good oral health. Because oral health is often neglected and there is a lack of knowledge regarding oral hygiene, the people residing in these remote areas often get encountered various risk factors and increased risk of oral diseases; adverse habits such as smoking, smokeless tobacco usage, etc. [2, 3].

Smokeless Tobacco products contain varying levels of many known carcinogens as well as other plant materials, such as areca nut or tonka bean, comprehensive risk

assessments must address complex mixtures of ingredients. There is sufficient evidence that smokeless tobacco products cause addiction; precancerous oral lesions; cancer of the oral cavity, esophagus, and pancreas; and adverse reproductive and developmental effects including stillbirth, preterm birth, and low birth weight. A high load of smokeless tobacco-related cancers is assessed to happen in India because of the huge population additionally, smokeless tobacco is more prevalent in remote areas where knowledge regarding its adverse effects is lacking [4, 5].

In this study, we have touched a remote area of Mathura, known as Barsana, the birthplace of Goddess Radha. People residing in this area do not possess adequate knowledge about oral health and have neglected oral health care. In this remote area, oral healthcare facilities were not accessible to the public. Therefore, Sri Mata Ji Gaushala, Barsana has been set up as a Satellite center by the Department of Public

Health Dentistry, K. D. Dental College and Hospital, Mathura from the month of September 2022. At this Gaushala, patients were found using smokeless tobacco and also local abrasive and tobacco-containing tooth manjans like nirala, subsequently leading to clinical attachment loss and chronic generalized periodontitis.

Nirala manjan (Nirala tooth powder) is available in some parts of northern India. The dentifrice contains tobacco dust, clove, black spice, geru powder (a red-brown powder used for topical application in ayurvedic medicines), dried ginger powder, and salt. The abrasiveness of Nirala is far more complex and severe destruction of the hard tissues occurs in the short span of two years [6].

Nirala is very commonly used amongst the population of Barsana. The population is not aware of the ill-effects it is causing on their oral health.

The public health impact of smokeless tobacco use can be estimated from the disease risk associated with the particular product, the prevalence and manner of use, and the population burden of diseases known to be associated with smokeless tobacco use. Thereby, this study was done to assess the usage of smokeless-tobacco & to create awareness regarding the ill effects of smokeless tobacco usage among the population of Barsana.

MATERIALS AND METHOD

The cross-sectional study was conducted among 100 subjects, aged between 18- 65 years, residing in Sri Mata ji Gaushala, Barsana, one of the satellite centers of K. D. Dental College and Hospital. The sample size was calculated using G – power software where α err prob = 0.05, Power (1- β err prob) = 0.80, and the total sample size was 61, however, the sample size of 100 was selected to compensate for any permissible error and increase the study's accuracy. The study was conducted in the months of November 2022 and December 2022 and informed consent was obtained from all the participants before participating. This study was carried out after due approval of the Ethical Committee members of K. D. Dental College and Hospital. Subjects who were willing to participate were in the age group of 18 – 65 years, and were using any form of smokeless tobacco (including tobacco containing tooth powder) were included in the study. Subjects with systemic diseases and who did not take any form of tobacco were excluded from the study.

Among these 100 participants, some used only Gutka (smokeless tobacco), some only Nirala and some used both (Gutka and Nirala). The Community Periodontal Index (CPI) and LOA (Loss of Attachment) index⁷ were used to record the periodontal status using the CPITN probe and a mouth mirror.

After the clinical examination of the patients. Tobacco counseling was done and pamphlets regarding the usage of smokeless tobacco and its ill effects were also distributed among the patients.

All the data collected were statistically analyzed using the Statistical Package for the Social Sciences (SPSS Software Version 19, Armonk, New York; IBM. Corporation, USA). The CPI (Community Periodontal Index) and LOA (Loss of Attachment) index scores were compared using the Chi-square test. In the current study, $p \leq 0.05$ was considered as the level of significance.

RESULTS

The study was carried out to assess the usage of smokeless tobacco and its ill effects among the population of Barsana, Mathura. The data were collected and considered for analysis.

Out of the total of 100 participants, 26.0% who used smokeless tobacco belonged to 31-40 years. (p-value = 0.711) (**Table 1**).

Gender-wise distribution of study participants showed that the majority were males (68.0%) and the majority used Nirala. (p-value = 0.314) (**Table 2**).

When the CPI scores between different age groups were compared, 55 participants scored CPI score 2 (Calculus) and 45 scored CPI score 3 (pocket). Among participants with a CPI score 2 and 3, the majority belonged to the 31-40 years age group (p-value = 0.612) (**Table 3**).

On comparing the CPI scores among smokeless tobacco users, the CPI score 2 and CPI score 3 were significantly more among Nirala users. (p-value = 0.892). The result was statistically insignificant (**Table 4**).

When comparing the LOA scores between different age groups, the majority scored Code 1 followed by Code 2, Code 0, and Code 3. Among participants with the LOA code 1 was found highest in the 31-40 years age group and the lowest in the 11-20 years age group. (p-value = 0.670) (**Table 5**).

On comparing the LOA Code scores among smokeless tobacco usage, the majority scored Code 1 followed by Code 2, Code 0, and Code 3. Among participants, all the LOA codes showed that the majority used Nirala and very few participants used only Gutka (p-value = 0.321) (**Table 6**).

Table 1: Age-wise Distribution of Study Participants

AGE	GUTKA	NIRALA	BOTH (GUTKA+NIRALA)	Total	Chi value	p- value
11-20 YEARS	0 0.0%	3 5.2%	2 6.5%	5 5.0%	7.148	0.711
21-30 YEARS	5 45.5%	10 17.2%	6 19.4%	21 21.0%		
31-40 YEARS	2 18.2%	17 29.3%	7 22.6%	26 26.0%		
41-50 YEARS	3 27.3%	11 19.0%	8 25.8%	22 22.0%		
51-60 YEARS	1 9.1%	11 19.0%	5 16.1%	17 17.0%		
61-70 YEARS	0 0.0%	6 10.3%	3 9.7%	9 9.0%		
Total	11 100.0%	58 100.0%	31 100.0%	100 100.0%		

The p-value was 0.321. The result was statistically insignificant

Table 2: Gender-wise Distribution of Study Participants

GENDER	MALE	FEMALE	Total	Chi value	p-value
GUTKA	8 72.7%	3 27.3%	11 100.0%	2.315	0.314
NIRALA	36 62.1%	22 37.9%	58 100.0%		
BOTH (GUTKA+NIRALA)	24 77.4%	7 22.6%	31 100.0%		
Total	68 68.0%	32 32.0%	100 100.0%		

Table 3: Comparison of Cpi Scores Between Different Age Groups

Age	Calculus CPI Score 2	Pocket CPI Score 3	Total	Chi value	p-value
11-20 YEARS	3 5.5%	2 4.4%	5 5.0%	3.547	0.612
21-30 YEARS	8 14.5%	13 28.9%	21 21.0%		
31-40 YEARS	16 29.1%	10 22.2%	26 26.0%		
41-50 YEARS	12 21.8%	10 22.2%	22 22.0%		
51-60 YEARS	11 20.0%	6 13.3%	17 17.0%		
61-70 YEARS	5 9.1%	4 8.9%	9 9.0%		
Total	55 100.0%	45 100.0%	100 100.0%		

Table 4: Comparison of Cpi Scores Among Smokeless Tobacco Users

GENDER	Calculus CPI Score 2	Pocket CPI Score 3	Total	Chi value	p-value
GUTKA	6 10.9%	5 11.1%	11 11.0%	0.229	0.892
NIRALA	33 60.0%	25 55.6%	58 58.0%		
BOTH (GUTKA+NIRALA)	16 29.1%	15 33.3%	31 31.0%		
Total	55 100.0%	45 100.0%	100 100.0%		

Table 5: Comparison of LoA Scores Between Different Age Groups

Age	0-3mm Code 0	4-5mm Code 1	6-8mm Code 2	9-11mm Code 3	Total	Chi value	p-value
11-20 YEARS	1 5.0%	1 2.2%	3 12.0%	0 0.0%	5 5.0%	12.117	0.670
21-30 YEARS	3 15.0%	9 20.0%	7 28.0%	2 20.0%	21 21.0%		
31-40 YEARS	3 15.0%	13 28.9%	6 24.0%	4 40.0%	26 26.0%		
41-50 YEARS	4 20.0%	11 24.4%	6 24.0%	1 10.0%	22 22.0%		
51-60 YEARS	6 30.0%	7 15.6%	2 8.0%	2 20.0%	17 17.0%		
61-70 YEARS	3 15.0%	4 8.9%	1 4.0%	1 10.0%	9 9.0%		
Total	20 100.0%	45 100.0%	25 100.0%	10 100.0%	100 100.0%		

Table 6: Comparison of LoA Scores Among Smokeless Tobacco Users

GENDER	0-3mm Code 0	4-5mm Code 1	6-8mm Code 2	9-11mm Code 3	Total	Chi value	p-value
GUTKA	3 15.0%	8 17.8%	0 0.0%	0 0.0%	11 11.0%	6.999	0.321
NIRALA	11 55.0%	24 53.3%	17 68.0%	6 60.0%	58 58.0%		
BOTH (GUTKA+NIR ALA)	6 30.0%	13 28.9%	8 32.0%	4 40.0%	31 31.0%		
Total	20 100.0%	45 100.0%	25 100.0%	10 100.0%	100 100.0%		

DISCUSSION

The study was conducted among 100 participants aged 18- 65 years of Barsana. At the end of the study, data from all 100 participants were collected and considered for analysis. The subjects' CPI (Community Periodontal Index) and LOA (Loss of Attachment index) were recorded. The clinical parameters were recorded and compared using the chi-square test.

In the study out of the total of 100 participants, the highest number of participants who used various forms of smokeless tobacco belonged to the age group 31-40 years. In the study conducted by Cinthura. C *et al* (2020) [8], results were

in contrast to our study, in which the age distribution of patients who used various forms of tobacco, showed the highest prevalence in the age group of 25-35 years. Also, in the study conducted by Khushboo Goel *et al* (2021) [9], the results were in contrast to our study, in which patients who used various forms of tobacco, showed the highest prevalence in the age group of 45 – 65 years.

Gender-wise distribution of 100 participants showed that the prevalence of smokeless tobacco usage in males was higher (68.0%) than in females. Similarly, in the study conducted by Cinthura. C *et al* (2020) [8], the results were in accordance with our

study. However, in the study conducted by Khushboo Goel *et al* (2021) [9], the results were in contrast to our study, in which the prevalence of smokeless tobacco usage in females was higher.

When the mean CPI scores between different age groups were compared, among a total of 100 participants, the highest score was CPI score 2, found in 55 (55.0%) participants. Similarly, in the study conducted by Anuja Kashyapbhai *et al* (2021) [10], among 60 participants the highest was CPI score 2, found in 52 (86.7%) participants. When comparing the LOA scores between different age groups, among 100 participants, the highest LOA score was Code 1, found in 45 (45.0%) participants. In the study conducted by Anuja Kashyapbhai *et al* (2021) [10], the results were in contrast to our study, in which the highest LOA score was Code 2. However, no other study was conducted that compared CPI scores and LOA scores between different age groups as our study has focused on the usage of smokeless tobacco only. While other studies conducted by Varun Kulkarni *et al* [11], Kishore Kumar Katuri *et al* [12], Anusha Yaragani *et al* [13], and Sushma Mittal *et al* [14] focused on tobacco smokers, chewers, and non-users.

On comparing the CPI scores among smokeless tobacco users, there were significantly more Nirala users, Similar

results were seen when the LOA scores among smokeless tobacco users were compared. However, there was no other study conducted that compared CPI and LOA scores among smokeless tobacco users, as our study had focused on the usage of various forms of smokeless tobacco only.

CONCLUSION

Public outreach programs clarifying the myths regarding Nirala and smokeless-tobacco usage and highlighting the deleterious effects of tobacco should be conducted on a large scale. There is a need for further longitudinal studies in a large number of populations to assess the relationship of smokeless tobacco with periodontal disease to prevent its usage, optimal tobacco counseling approaches need to be developed. Smokeless - tobacco is a recognizable risk factor in the progression of periodontal disease. Results of the present study have shown the highest prevalence of Nirala usage among the population, without the awareness of its ill effects.

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CONFLICT OF INTEREST

There are no conflicts of interest.

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