

RESEARCH ARTICLE

Prevalence of Oral Premalignant Lesions in the Adult Bangladeshi Population: A Cross-Sectional Study at Dhaka Dental College and Hospital, Dhaka, Bangladesh

Md. Asraquur Rahman Raihan¹, Muhammad Saifur Rahman², Shamima Sultana Kanta³, Hasinahossen Momotaz⁴, Sujit Sinha⁵, Md. Arifur Rahman⁶, Md. Abdur Rahman⁷, Md. Mukhlesur Rahman Shoyeb⁸, Sourav Biswas⁹, Md. Eiahia Omar Faruq¹⁰

¹Assistant Professor, Department of Periodontology and Oral Pathology, Dhaka Dental College, Dhaka, Bangladesh.

²Lecturer, Department of Periodontology & Oral Pathology, Dhaka Dental College, Dhaka, Bangladesh.

³Assistant Professor, Department of Oral and Maxillofacial Surgery, Dhaka Dental College, Dhaka, Bangladesh.

⁴Assistant Professor (Dentistry), Dhaka Dental College, Dhaka, Bangladesh.

⁵Assistant Professor, Department of Periodontology and Oral Pathology, Dhaka Dental College, Dhaka, Bangladesh.

⁶Assistant Professor, Department of Periodontology and Oral Pathology, Dhaka Dental College, Dhaka, Bangladesh.

⁷Assistant Professor (Orthodontics), Rangpur Medical College, Rangpur, Bangladesh.

⁸Assistant Professor, Department of Orthodontics, Dhaka Dental College, Dhaka, Bangladesh.

⁹Lecturer, Department of Pediatric Dentistry, Shaheed Sohrwardi Medical College, Dhaka, Bangladesh.

¹⁰Dental Surgeon, Directorate General Health Services (DGHS), Dhaka, Bangladesh.

Received: 16 March 2026 Accepted: 06 April 2026 Published: 08 April 2026

Corresponding Author: Md. Asraquur Rahman Raihan, Assistant Professor, Department of Periodontology and Oral Pathology, Dhaka Dental College, Dhaka, Bangladesh.

Abstract

Background: Oral premalignant lesions (OPMLs) represent early mucosal alterations with the potential for malignant transformation into oral squamous cell carcinoma. Bangladesh has a high prevalence of tobacco use, betel quid chewing, and other high-risk habits, which significantly contribute to oral mucosal pathology. However, comprehensive institutional data on the prevalence of oral premalignant lesions among adults remain limited.

Objective: To determine the prevalence and clinicodemographic characteristics of oral premalignant lesions in the adult Bangladeshi population attending a tertiary dental hospital.

Methods: A cross-sectional study was conducted among 800 adult patients attending the Department of Periodontology and Oral Pathology at Dhaka Dental College and Hospital. Participants aged ≥ 18 years were selected through systematic random sampling. Detailed history regarding demographic variables and risk habits (smoking, smokeless tobacco, betel quid chewing, alcohol) was recorded. Clinical oral examination was performed according to WHO diagnostic criteria. Suspected lesions were confirmed histopathologically where indicated. Data were analyzed using descriptive and inferential statistics.

Results: Among 800 participants, 148 individuals were diagnosed with oral premalignant lesions, yielding a prevalence of 18.5%. The most common lesion was leukoplakia (8.6%), followed by oral submucous fibrosis (5.2%), erythroplakia (2.1%), and oral lichen planus with dysplastic features (2.6%). Males showed higher prevalence (22.4%) compared to females (14.1%). Tobacco and betel quid consumption demonstrated significant association with lesion occurrence ($p < 0.05$).

Citation: Md. Asraquur Rahman Raihan, Muhammad Saifur Rahman, Shamima Sultana Kanta, *et al.* Prevalence of Oral Premalignant Lesions in the Adult Bangladeshi Population: A Cross-Sectional Study at Dhaka Dental College and Hospital, Dhaka, Bangladesh. Archives of Dentistry and Oral Health 2026;7(1): 16-20.

©The Author(s) 2026. This is an open access article distributed under the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

Conclusion: The prevalence of oral premalignant lesions among adults in this tertiary care setting is considerable. Tobacco and betel quid use remain major contributing factors. Early detection through routine screening and public health interventions targeting habit cessation are essential to reduce oral cancer burden in Bangladesh.

Keywords: Oral Premalignant Lesion, Leukoplakia, Oral Submucous Fibrosis, Bangladesh, Prevalence.

1. Introduction

Oral cancer is one of the most common malignancies in South-East Asia and constitutes a significant public health concern [1]. The majority of oral cancers arise from pre-existing oral premalignant lesions (OPMLs), which are clinically detectable mucosal abnormalities associated with an increased risk of malignant transformation [2]. Early identification and management of these lesions can significantly reduce morbidity and mortality associated with oral cancer. The most frequently encountered oral premalignant lesions include leukoplakia, erythroplakia, oral submucous fibrosis (OSMF), and certain forms of oral lichen planus [3]. Leukoplakia is defined as a white patch or plaque that cannot be characterized clinically or pathologically as any other disease [4]. Erythroplakia presents as a fiery red patch and carries a higher malignant transformation rate compared to leukoplakia [5]. OSMF is a chronic progressive condition strongly associated with areca nut chewing and is particularly prevalent in South Asian populations [6]. Bangladesh has widespread use of smokeless tobacco, betel quid with areca nut, and smoking habits, which are recognized etiological factors for oral mucosal lesions [7]. Cultural acceptance and easy availability contribute to high exposure rates. Epidemiological data indicate that more than 35% of adults in Bangladesh use some form of tobacco [8]. These practices significantly increase the risk of developing premalignant and malignant oral conditions. Several hospital-based and community-based studies in South Asia have reported varying prevalence rates of oral premalignant lesions ranging from 5% to 25% depending on geographic location and population characteristics [9,10]. However, large-scale data focusing on adult Bangladeshi populations in tertiary care settings remain scarce. Understanding the prevalence and associated risk factors in a defined population is essential for designing targeted preventive strategies. Institutional studies also help in assessing the burden on healthcare facilities and guide resource allocation. Therefore, the present study aimed to determine the prevalence of oral premalignant lesions among adults attending Dhaka Dental College and Hospital and to evaluate their association with demographic characteristics and risk habits.

2. Materials and Methods

2.1 Study Design and Setting

This cross-sectional descriptive study was conducted at the Department of Periodontology and Oral Pathology, Dhaka Dental College and Hospital, over a period of 12 months from January to December 2025. The institution is a tertiary referral center providing specialized dental care to a large urban and peri-urban population, making it suitable for assessing the burden of oral premalignant lesions among adults.

2.2 Study Population

The study population consisted of adult patients aged 18 years and above attending the outpatient department during the study period. A total sample size of 800 participants was determined based on estimated prevalence from previous regional studies and calculated to ensure adequate statistical power with a 95% confidence level and 5% margin of error. Patients who had a previous diagnosis of oral cancer, were currently undergoing treatment for malignancy, or were medically compromised and unable to undergo oral examination were excluded.

2.3 Sampling Technique

Systematic random sampling was employed. Every third eligible patient registering at the outpatient department was invited to participate until the desired sample size was achieved. Written informed consent was obtained from all participants prior to inclusion.

2.4 Data Collection Procedure

Data were collected using a pretested structured questionnaire. Information regarding sociodemographic characteristics (age, sex, occupation, educational status) and risk habits was recorded. Risk factors assessed included cigarette smoking (duration and frequency), smokeless tobacco use, betel quid/areca nut chewing, and alcohol consumption.

2.5 Clinical Examination and Diagnosis

Comprehensive intraoral examination was performed under adequate illumination using sterile mouth mirrors and probes, following World Health Organization (WHO) diagnostic criteria for oral mucosal lesions. Lesions were provisionally diagnosed based on clinical

features. In cases where diagnosis was uncertain or dysplasia was suspected, incisional biopsy was performed under local anesthesia and specimens were sent for histopathological examination to confirm diagnosis.

2.6 Statistical Analysis

All collected data were coded and entered into SPSS version 25. Descriptive statistics such as frequency and percentage were calculated. The Chi-square test was used to determine associations between risk

factors and presence of oral premalignant lesions. A p-value of less than 0.05 was considered statistically significant.

Results all table show and para style description

3. Results

A total of 800 adult participants were examined in this study. Among them, 148 individuals were diagnosed with oral premalignant lesions (OPMLs), giving an overall prevalence of **18.5%**.

Table 1. Distribution of Study Participants by Age and Sex (n = 800)

Age Group (Years)	Male	Female	Total	Percentage (%)
18–30	120	140	260	32.5
31–45	150	110	260	32.5
46–60	130	80	210	26.3
>60	45	25	70	8.7
Total	445	355	800	100

Among the 800 participants, 445 (55.6%) were male and 355 (44.4%) were female. The highest proportion of participants belonged to the 18–30 years and

31–45 years age groups (32.5% each). The smallest proportion (8.7%) was observed in individuals aged above 60 years.

Table 2. Overall Prevalence of Oral Premalignant Lesions (n = 800)

Diagnosis	Frequency	Percentage (%)
No Lesion	652	81.5
OPML Present	148	18.5
Total	800	100

Out of the total study population, 148 individuals were clinically and/or histopathologically diagnosed with oral premalignant lesions, resulting in a prevalence

rate of 18.5%. The remaining 652 participants (81.5%) did not exhibit any premalignant changes.

Table 3. Distribution of Types of Oral Premalignant Lesions (n = 148)

Type of Lesion	Frequency	Percentage (%)
Leukoplakia	69	46.6
Oral Submucous Fibrosis (OSMF)	42	28.4
Oral Lichen Planus (Dysplastic)	20	13.5
Erythroplakia	17	11.5
Total	148	100

Among the 148 diagnosed cases, leukoplakia was the most common lesion, accounting for 46.6% of all OPML cases (8.6% of total population). Oral submucous fibrosis was the second most common

lesion (28.4%). Oral lichen planus with dysplastic features constituted 13.5%, while erythroplakia represented 11.5% of the lesions identified.

Table 4. Gender-wise Distribution of Oral Premalignant Lesions

Gender	OPML Present	OPML Absent	Total	Prevalence (%)
Male	100	345	445	22.4
Female	48	307	355	13.5
Total	148	652	800	18.5

The prevalence of oral premalignant lesions was higher among males (22.4%) compared to females (13.5%).

Of the total 148 cases, 100 occurred in males and 48 in females, indicating a clear male predominance.

Table 5. Association Between Risk Habits and Presence of OPML (n = 800)

Risk Habit	OPML Present	OPML Absent	Total Habit Users	p-value
Smoking	78	210	288	<0.05
Smokeless Tobacco	95	250	345	<0.05
Betel Quid Chewing	102	270	372	<0.05
Alcohol Consumption	12	60	72	0.08

A statistically significant association was observed between tobacco-related habits and oral premalignant lesions (p<0.05). Betel quid chewing showed the strongest association, with 102 out of 372 users developing lesions. Smokeless tobacco users also

demonstrated high lesion prevalence. Smoking was significantly associated with lesion occurrence as well. However, alcohol consumption did not show a statistically significant association (p=0.08).

Table 6. Age-wise Distribution of OPML Cases (n = 148)

Age Group (Years)	Number of OPML Cases	Percentage (%)
18–30	20	13.5
31–45	55	37.2
46–60	50	33.8
>60	23	15.5
Total	148	100

The highest number of oral premalignant lesions was observed in the 31–45 years age group (37.2%), followed by the 46–60 years group (33.8%). The lowest prevalence was seen in younger adults aged 18–30 years (13.5%). This pattern suggests increasing lesion occurrence with advancing age and cumulative exposure to risk habits.

4. Discussion

The present cross-sectional study assessed the prevalence and associated risk factors of oral premalignant lesions (OPMLs) among adult patients attending Dhaka Dental College and Hospital. The overall prevalence of 18.5% observed in this study indicates a considerable burden of potentially malignant oral disorders within the adult Bangladeshi population. This finding is consistent with previous epidemiological studies conducted in South Asian countries, where prevalence rates have ranged between 10% and 25% depending on population characteristics and exposure to risk habits [1,9]. Leukoplakia was identified as the most common lesion, accounting for 46.6% of all diagnosed OPML cases. This observation aligns with global literature, which identifies leukoplakia as the most prevalent oral potentially malignant disorder [3,4]. The high occurrence in the present study may be attributed to widespread tobacco consumption, particularly smoking and smokeless forms, both of which have been strongly implicated in the etiopathogenesis of leukoplakia [4]. The statistically significant association

between smoking and lesion presence (p<0.05) in this study further supports established evidence linking tobacco exposure to epithelial dysplastic changes [2]. Oral submucous fibrosis (OSMF) was the second most common lesion (28.4% of OPML cases). OSMF is predominantly associated with areca nut and betel quid chewing, practices that are culturally entrenched in Bangladesh and other South Asian countries [6]. The significant association between betel quid chewing and lesion development observed in this study corroborates findings from previous research demonstrating a strong dose-dependent relationship between areca nut exposure and OSMF [6,10]. Given the progressive and irreversible nature of OSMF, its relatively high frequency is concerning and highlights the need for community-based preventive strategies. Erythroplakia, although less common (11.5% of OPML cases), is clinically significant due to its high malignant transformation potential [5]. Early detection and histopathological confirmation are essential, as a substantial proportion of erythroplakic lesions exhibit severe dysplasia or carcinoma in situ at diagnosis [5]. Similarly, oral lichen planus with dysplastic features constituted 13.5% of lesions, consistent with reports suggesting a small but definite malignant transformation risk associated with certain subtypes [3]. Gender-wise distribution revealed a higher prevalence among males (22.4%) compared to females (13.5%). This male predominance is in agreement with regional epidemiological patterns and may be explained by higher rates of tobacco and betel

quid consumption among men in Bangladesh [7,8]. Cultural and behavioral factors likely contribute to differential exposure to carcinogenic habits, thereby influencing lesion distribution [7]. Age distribution demonstrated the highest prevalence in individuals aged 31–60 years. This pattern likely reflects cumulative exposure to risk factors over time, as malignant transformation is generally a multistep process involving prolonged epithelial insult [2]. Comparable age-related trends have been documented in other South Asian studies [9,10]. The statistically significant associations observed between tobacco-related habits and OPMLs in this study reinforce the central etiological role of these substances. In contrast, alcohol consumption did not show a significant association, which may be due to relatively lower prevalence of alcohol use in the studied population compared to Western settings [8]. Nevertheless, synergistic effects between alcohol and tobacco have been widely documented in oral carcinogenesis [1]. This study underscores the importance of routine oral examination in dental practice for early detection of potentially malignant disorders. Visual screening remains a cost-effective strategy, particularly in resource-limited countries. Institutional data such as these are valuable for planning targeted awareness programs and cessation interventions. However, certain limitations should be acknowledged. Being hospital-based, the findings may not fully represent the general population. Additionally, reliance on self-reported habit history may introduce reporting bias. Despite these limitations, the relatively large sample size enhances the reliability of the findings. Overall, the results emphasize the urgent need for public health policies focusing on tobacco and areca nut cessation, regular oral screening, and early management to reduce the future burden of oral cancer in Bangladesh.

5. Conclusion

The prevalence of oral premalignant lesions among adults attending Dhaka Dental College and Hospital was 18.5%. Leukoplakia was the most common lesion.

Tobacco use and betel quid chewing were significantly associated risk factors. Implementation of screening programs, awareness campaigns, and habit cessation initiatives is strongly recommended to reduce the future burden of oral cancer in Bangladesh.

6. References

1. Warnakulasuriya S. Global epidemiology of oral and oropharyngeal cancer. *Oral Oncol.* 2009;45(4–5):309–316.
2. World Health Organization. WHO Classification of Head and Neck Tumours. 4th ed. Lyon: International Agency for Research on Cancer; 2017.
3. Neville BW, Damm DD, Allen CM, Chi AC. *Oral and Maxillofacial Pathology.* 4th ed. St. Louis: Elsevier; 2016.
4. Axéll T, Pindborg JJ, Smith CJ, van der Waal I. Oral white lesions with special reference to precancerous and tobacco-related lesions: conclusions of an international symposium held in Uppsala, Sweden. *J Oral Pathol Med.* 1996;25(2):49–54.
5. Shafer WG, Hine MK, Levy BM. *Shafer's Textbook of Oral Pathology.* 7th ed. New Delhi: Elsevier; 2012.
6. Gupta PC, Ray CS. Epidemiology of betel quid usage. *Ann Acad Med Singap.* 2004;33(4 Suppl):31–36.
7. National Institute of Preventive and Social Medicine (NIPSOM), Bangladesh; World Health Organization. *Global Adult Tobacco Survey (GATS) Bangladesh Report 2017.* Dhaka: WHO; 2018.
8. World Health Organization. *WHO Report on the Global Tobacco Epidemic, Bangladesh Profile.* Geneva: WHO; 2019.
9. Mehrotra R, Thomas S, Nair P, Pandya S, Singh M, Nigam NS, et al. Prevalence of oral soft tissue lesions in Vidisha. *BMC Res Notes.* 2010;3:23.
10. Ali M, Joseph B, Sundaram DB. Prevalence of oral mucosal lesions in patients of South India. *J Oral Maxillofac Pathol.* 2013;17(2):201–206.