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EFFECT OF SMOKED AND SMOKELESS TOBACCO IN THE ORAL CAVITY

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ABSTRACT

Smoking is one of the most important public health problems in the world. Tobacco usage [Cigarette, cigar, pipe, hookah etc] results in a very strong addiction syndrome. In addition to chewing tobacco leaves, other forms of smokeless tobacco are used in India and other countries. Gutka is the most abundantly consumed smokeless tobacco form in India. Betel quid used in South Asia often contains smokeless tobacco. The study was aimed to find the effect of smoked and smokeless tobacco in the oral cavity. Data was collected retrospectively from the records of saveetha dental college. The population included in the study were the patients who had a habit of smoking and using smokeless tobacco. Descriptive statistics, cross tabulation analysis and chi squared tests were done. Most common lesion found in the patient's using smokeless tobacco was Tobacco Pouch Keratosis and that in patients using smoked tobacco was leukoplakia. There was a positive correlation between gender and oral lesion. [p>0.001]. Within the limits of the study it was found that tobacco pouch keratosis was the most common lesion found in the patients who used smokeless tobacco and leukoplakia was the most common lesion in the patients using smoked tobacco.

Keywords: Gukta; oral lesions; smokeless tobacco; smoked tobacco

INTRODUCTION

Tobacco is derived from two main species *Nicotiana tabacum* and *Nicotiana rustica*. The most important ingredient from the leaves of these plants is nicotine - a volatile alkaloid **[1-3]**. The packaging, moisture content and pH of the product influence the content and rapid absorption of chemicals through the oral mucosa **[4, 5]**. In addition to chewing tobacco leaves, other forms of smokeless tobacco are used in India and other countries. Gutka is the most abundantly consumed smokeless tobacco form in India. Betel quid used in South Asia often contains smokeless tobacco **[6, 7]**.

Chewing tobacco and other smokeless tobacco products are known to be deleterious to oral health **[8, 9]**.

Smoking is one of the most important public health problems in the world. [10]Tobacco usage [Cigarette, cigar, pipe, hookah etc] results in a very strong addiction syndrome. Although smoking rate is decreasing in developed countries, sadly, smoking is a common practice in developing countries **[11]**. The most important reasons for this situation are marketing strategies of international tobacco companies and lack of education in developing countries **[12, 13]**.

The main categories of oral mucosal soft-tissue lesions due to tobacco usage are oral cancer- Oral squamous cell carcinoma [SCC] and verrucous carcinoma, oral potentially malignant disorders- leukoplakia, erythroplakia and erythroleukoplakia, and tobacco pouch lesion, oral submucous fibrosis [OSMF]**[14, 15]**.

The smokeless tobacco is carcinogenic to humans and the main target organ being the oral cavity where the products are applied locally **[16]**. The population attributable risk of smokeless tobacco for the development of oral cancer is estimated at 66 % to tobacco chewers **[17]**. Cancers of the oral cavity arise in the lining epithelium of the oral cavity and the two main histological types reported are SCCs and verrucous carcinomas **[18]**.

Placing tobacco in the oral cavity, namely in the buccal mucosa, gingival sulcus, inner aspect of lower lip, floor of the mouth initially leads to keratotic or hyperkeratotic changes. These changes are localized to the site where tobacco is placed **[18-20]**.

Leukoplakias are usually diagnosed after the fourth decade of life **[21]**.

Oral submucous fibrosis is a chronic, insidious disease that affects the submucosa of the oral cavity resulting in progressive limitation of mouth opening **[21, 22]**. This disease is common among gutka users since

it contains both smokeless tobacco and areca nuts **[18, 20, 23]**.

A grayish white discolouration of the palate with multiple red elevated dots , often encountered in chronic smokers **[18, 20, 23-25]**. Previously our team has a rich experience in working on various research projects across multiple disciplines **[26–40]**.

This is a serious potentially malignant lesion encountered in people who place the glowing end of the cigar/ cigarette inside the mouth. The clinical appearance is often a mixture of red and white plaques **[41, 42]**.

MATERIALS AND METHODS

Study setting

The retrospective study was carried out in an institutional setting, with the advantage being a wide range of data availability in a digital format and the disadvantage being the assessment of a single location only. The approval of the Institutional ethics Committee was sought and the study involved one guide, one reviewer and one assessor.

Study design

The study was designed based on the set inclusion criteria of patients from the out patients department and patients with the habit of smoking and consuming tobacco. Cases which did not fall under this inclusion criteria were excluded from the study. And also patients with nutritional deficiencies and systemic disorders were excluded.

Sampling technique

The study was based on a non probability convenience sampling. To minimise the sampling bias, all the case sheets of patients with tobacco consuming or smoking habits were reviewed and included.

Data collection and Tabulation

Data collection was done using the patient database with the timeframe work of June, 2019 to April, 2020. Case sheets of around 232 patients were reviewed. Cross verification of data was done by a reviewer. The collected data was tabulated based on the following parameters: Patient Details - Name, Age, Gender, Patient Identification Number. Tobacco smoking or tobacco consuming status with the oral lesion presented.

Statistical analysis

The variables were coded and the data was imported to SPSS. Using SPSS Version 20.0, categorical variables were expressed in terms of frequency percentage and bar graphs were plotted.

The statistical significance of associations was tested using the Chi-square test.

RESULTS AND DISCUSSION

Graph (1) shows the frequency of smokeless tobacco status. It was found that

43.1 % did not have the smoking habit and 56.9% had the smoking habit.

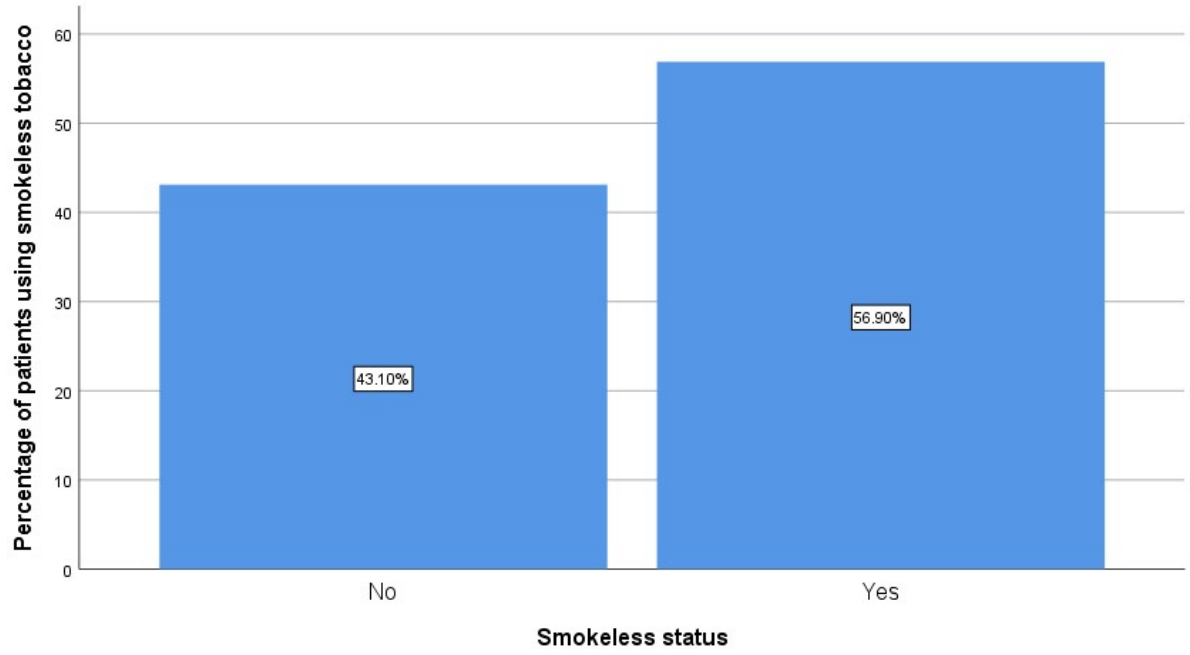
Graph (2) shows the frequency of using smoking tobacco status. 47% of the study population uses smoking tobacco. It was found that 54.3% did not have the smokeless habit and 45.6 % had the habit.

Graph (3) shows the correlation between gender and smoking status. All the 5.1% of females did not have the habit of smoking and in males 45.6% had the habit of smoking and 49.1% did not have the habit. The P>0.001 which shows a significance between gender and smoking.

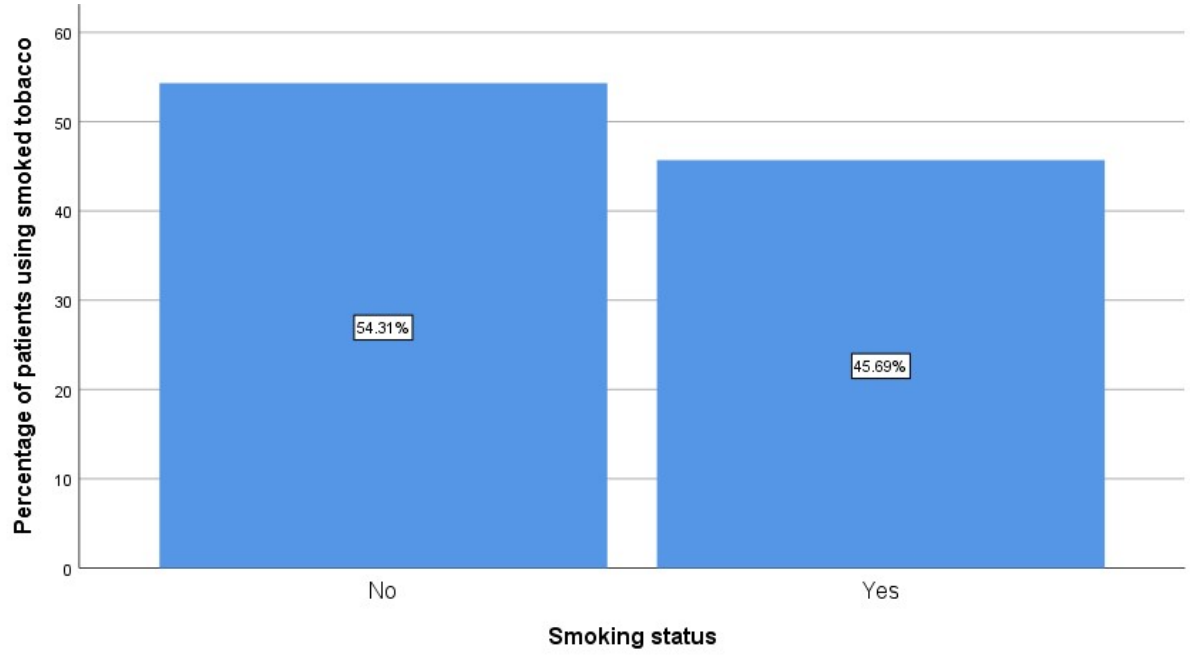
Graph (4) shows the correlation between gender and smokeless status.
Among the females, 4.7% had the habit of using smokeless tobacco and 0.4% did not have the habit . Among males, 52.1% had the habit of using smokeless tobacco and 42.6% did not have the habit. P>0.001 which shows significance.

Graph (5) shows the lesions present in the patients using smoked tobacco . The lesions present in the patients using smoked tobacco were angular cheilitis 3.7%, candidiasis 0.9%, chemical burn 0.9%, leukoedema 1.8%, leukoplakia 35.8%, leukoplakia/ burning mouth syndrome 0.9%, Leukoplakia/ smoker's melanosis 0.9%, oral mucositis 1.8%, oral mucositis/ squamous cell carcinoma, 0.9%, , Oral Submucous Fibrosis / squamous cell carcinoma 12.2%, 0.9%, Oral Submucous Fibrosis/tobacco pouch keratosis 0.9%, squamous cell carcinoma 3.7%, smoker's melanosis 1.8%, smoker's palate 8.4%, smoker's palate/ leukoplakia 0.9%, smoker's palate/smoker's melanosis 0.9%, tobacco pouch keratosis 20.7%. Most common lesion was leukoplakia.[35.8%]

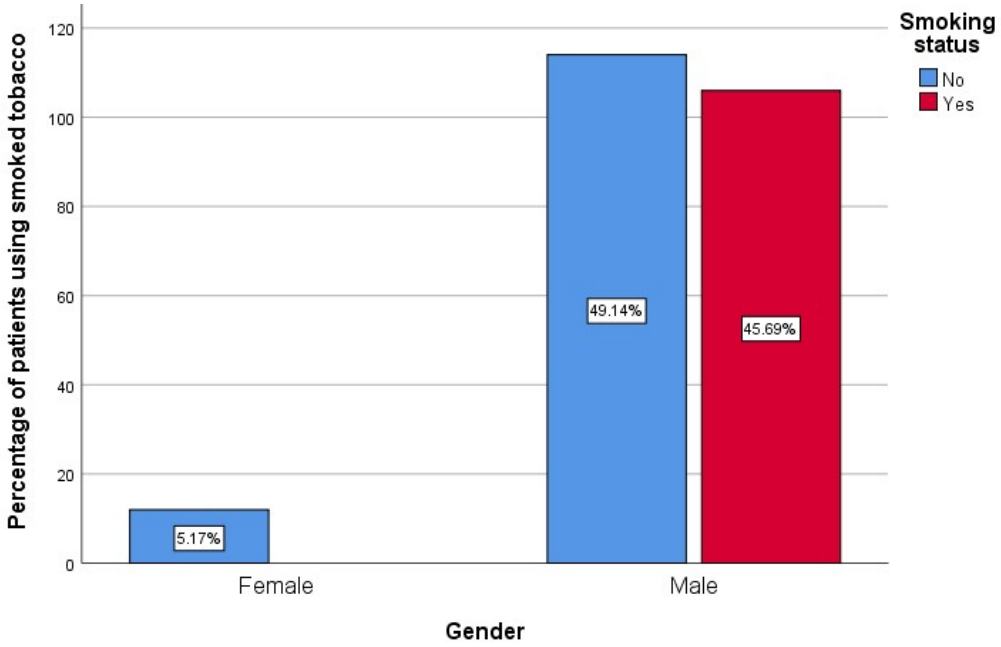
Graph (6) shows the lesions present in the patients using smokeless tobacco. The lesions present in the patients using smokeless tobacco were angular cheilitis 3.7%, candidiasis 0.9%, chemical burn 0.9%, leukoedema 1.8%, leukoplakia 35.8%, leukoplakia/ burning mouth syndrome 0.9%, Leukoplakia/ smoker's melanosis 0.9%, oral mucositis 1.8%, oral mucositis/ squamous cell carcinoma 0.9%, Oral Submucous Fibrosis 12.2%, Oral Submucous Fibrosis /squamous cell carcinoma 0.9%, Oral Submucous Fibrosis/tobacco pouch keratosis 0.9%, squamous cell carcinoma 3.7%, smoker's melanosis 1.8%, smoker's palate 8.4%, smoker's palate/ leukoplakia 0.9%, smoker's palate/smoker's melanosis 0.9%, tobacco pouch keratosis 20.7%. Most common lesion was tobacco pouch keratosis followed by Oral Submucous Fibrosis [35.8%].



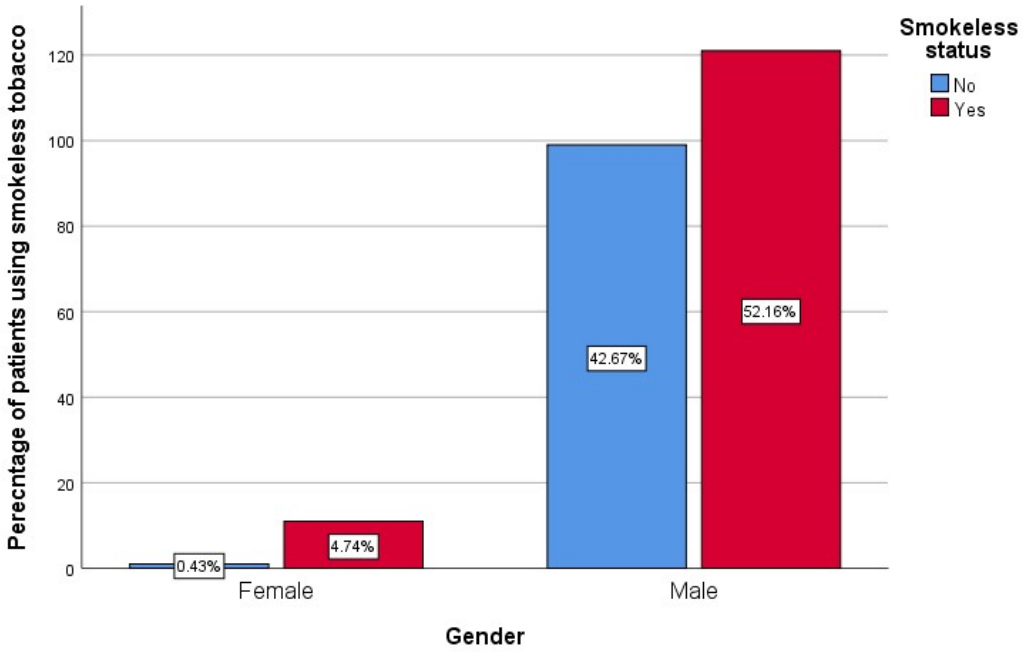
Graph 1: Bar chart shows the frequency of the patients using smokeless tobacco status. X axis denotes the smokeless tobacco status and Y axis denotes the percentage of the patients using smokeless tobacco. It was found that 43.1 % did not have the smoking habit and 56.90 % had the smoking habit.



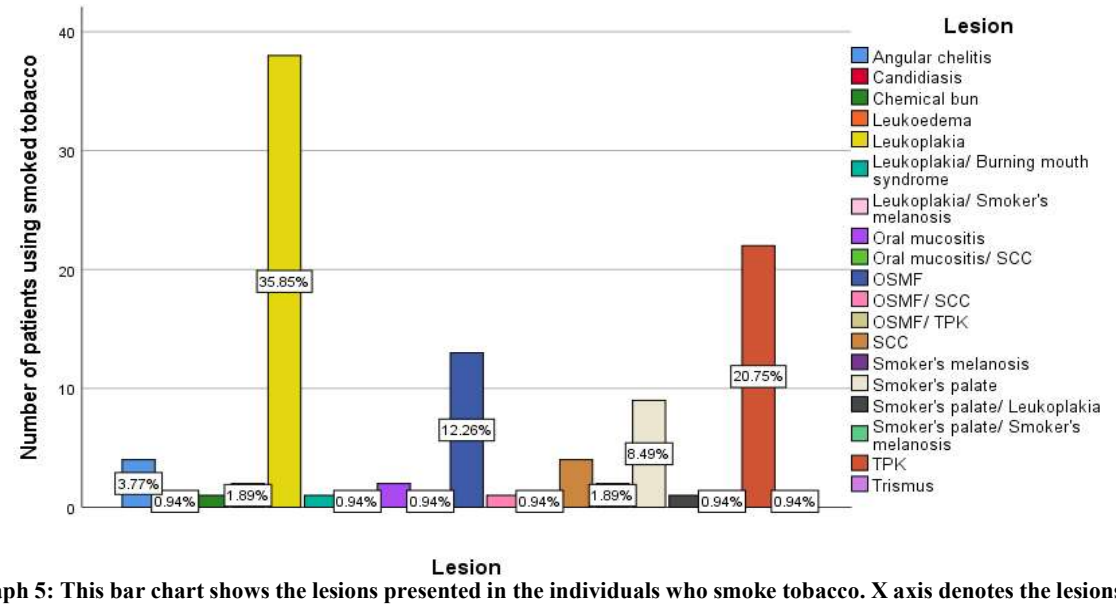
Graph 2: This bar chart shows the frequency and percentage of the patients using smoking tobacco status. X axis denotes the smoked tobacco status and Y axis denotes the percentage of the patients using smoked tobacco. It was found that 54.3% did not have the smokeless habit and 45.69 % had the habit.



Graph 3: This bar chart shows the association between gender and smoking status. X axis denotes the gender and Y axis denotes the percentage of males and females using smoked tobacco. All the 5.1% of females did not have the habit of smoking and in males 45.6% had the habit of smoking and 49.1% did not have the habit. There was a significant association between smoking status and gender. (Chi square test, p <0.01, p value=0.001)

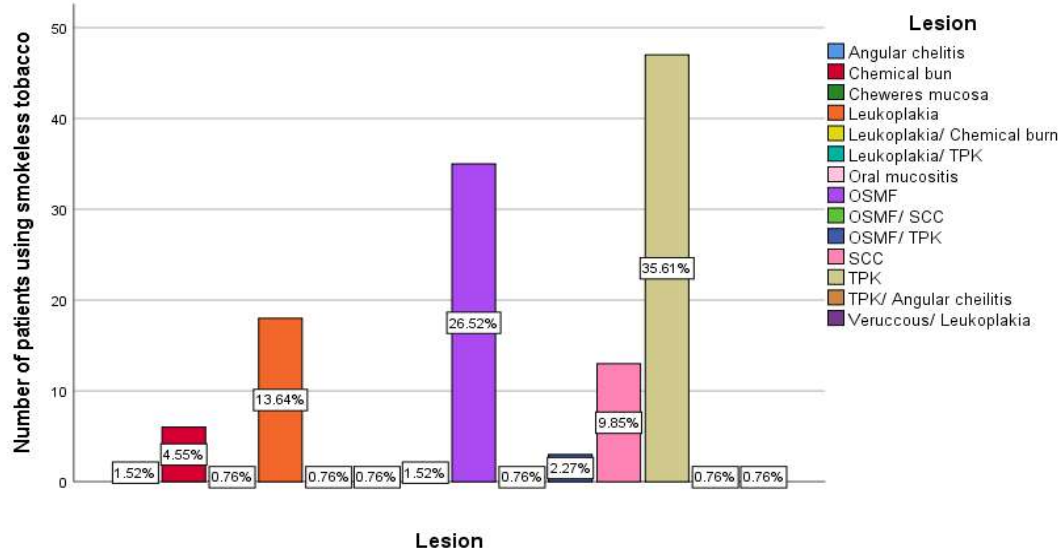


Graph 4: This bar chart shows the association between gender and smokeless status. X axis denotes the smokeless status and Y axis denotes the gender distribution. Among the females, 4.7% had the habit of using smokeless tobacco and 0.4% did not have the habit . Among males, 52.1% had the habit of using smokeless tobacco and 42.6% did not have the habit. It was found the habit was more common in males (91.6%) than females (8.3%). There was a significant association between smoking status and gender. (Chi square test, p< 0.01, p value=0.013)



Graph 5: This bar chart shows the lesions presented in the individuals who smoke tobacco. X axis denotes the lesions and Y axis denotes the percentage of patients using smoked tobacco. It was found that leukoplakia was the most common lesion in patients using smoked tobacco. Angular cheilitis 3.7%, candidiasis 0.9%, chemical burn 0.9%, leukoedema 1.8%, leukoplakia 35.8%, leukoplakia/ BMS 0.9%, Leukoplakia/ smoker's melanosis 0.9%, oral mucositis 1.8%, oral mucositis/ SCC 0.9%, OSMF 12.2%, OSMF/SCC 0.9%, OSMF/TPK 0.9%, SCC 3.7%, smoker's melanosis 1.8%, smoker's palate 8.4%, smoker's palate/ leukoplakia 0.9%, smoker's palate/smoker's melanosis 0.9%, tobacco pouch keratosis 20.7%

(BMS: Burning Mouth Syndrome, SP: Smoker's Palate, SM: Smoker's Melanosis, OSMF: Oral Submucous Fibrosis, SCC: Squamous Cell Carcinoma, TPK: Tobacco Pouch Keratosis)



Graph 6: This bar chart shows the lesions present in the individuals who use smokeless tobacco. X axis denotes the lesion present and Y axis denotes the number of patients using smokeless tobacco. It was found that tobacco pouch keratosis was the most common lesion in patients using smoked tobacco. Angular cheilitis 1.5%, chemical burn 4.5%, chewer's mucosa 0.7%, leukoplakia 13.6%, leukoplakia/chemical burn 0.7%, Leukoplakia/ TPK 0.7%, oral mucositis 1.5%, OSMF 26.5%, OSMF/SCC 0.7%, OSMF/TPK 2.2%, SCC 9.8%, tobacco pouch keratosis 35%, TPK/angular cheilitis 0.7%, verrucous/ leukoplakia 0.7% (OSMF: Oral Submucous Fibrosis, SCC: Squamous Cell Carcinoma, TPK: Tobacco Pouch Keratosis)

This present study gives us insights into habits, knowledge and attitudes of respondents towards problems of consuming tobacco and smoking tobacco and dentist's role in the prevention of smoking.

In the South Asia region over one third of tobacco consumed is smokeless and it is also found that the patients place the tobacco in a particular region for a longer time which is the reason for the more frequent occurrence of tobacco pouch. Keratosis in the patients consuming smokers' tobacco. According to Abdul Hamid *et al* **[2]** betel nut chewing is more common in the South Asian population.

In this study it was found that there is a positive significance between male gender and tobacco habits. According to Howell *et al* **[43]** it was found that oral cancer was more common among males who have the habit of smoking.

According to Walsh *et al* **[44]**, there is a greater prevalence of smoking tobacco than smoking tobacco in India. Use differs by age, gender and social class. Among the women tobacco users, smokeless tobacco is the predominant form of tobacco used.

According to Tonchev *et al* **[45]** bidi smoking is common in countries like Bangladesh, Pakistan and Sri Lanka. It also states that even at equal intake or duration levels, black-tobacco smoking was associated with a 2-4 fold increase in cancer risk compared to brown tobacco smoking.Our institution is passionate about high quality evidence based research and has excelled in various fields **[46–52]**. We hope this study adds to this rich legacy.

Limitations:

The limitations of the study being limited sample size, geographical boundaries

Future Scope:

Future studies can be done with danger sample size to emphasise the result. Dentists should give the patients more knowledge about the ill effects of using tobacco on the oral cavity.

CONCLUSION

Within the limits of the present study the most prevalent oral lesion in smokers is Leukoplakia and people using smokers' tobacco is tobacco pouch Keratosis. The oral health ill-effects of tobacco in whole or past the well-known. A professional interest in tobacco intervention can make a big difference in the health of an individual or outcome of given disease

AUTHORS CONTRIBUTION

First author (R.Keerthana) performed the analysis, and interpretation and wrote the manuscript. Second author (Dr.Manjari Chaudhary) contributed to conception, data

design, analysis, interpretation and critically revised the manuscript and also participated in the study and revised the manuscript. Both authors have discussed the results and contributed to the final manuscript.

CONFLICT OF INTEREST:

The authors declare there is no conflict of interest.

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