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TOBACCO ASSOCIATED ORAL LESIONS AND LEVELS OF DEPENDENCE AMONG ADULT MALE PATIENTS VISITING A DENTAL HOSPITAL IN CHENNAI

Manali Deb Barma[1], Pradeep Kumar.R[2], Jayashri Prabakar[3]

Abstract

Background and aim: *Smoke and smokeless tobacco use cause extreme effects on soft and hard tissues in and around the oral cavity. A routine intraoral examination by a dental health professional can reveal most of these lesions at an early stage and prevent serious sequelae. The aim of the study was to assess the tobacco associated oral lesions and level of dependence among male patients attending a private dental college in Chennai.*

Materials and method: *The study was conducted in a hospital setting by retrieving data from the case records of 483 patients from the time period between August 2019 - January 2020. Descriptive statistics and Chi-square tests were used.*

Results: *The study population consisted of male tobacco smokers.The participants were categorised based on index age groups. Habit of smoking tobacco was found in 65.9% and smokeless tobacco was found to be in usage among 34.1% of the population. Leukoplakia (14.3%) was the most common lesion that was observed in the study population after tobacco stains (52.4%), followed by oral submucous fibrosis (10.6%) Statistically significance observed between tobacco induced oral lesion and tobacco dependence ($p < 0.05$). The comparison between form of tobacco usage and nicotine dependence level was also found to be statistically significant ($p < 0.05$).*

Conclusion: *The higher the dependence on tobacco, the more the risk of development of oral mucosal lesions, suggesting a dose response relationship.*

Keywords: *Nicotine dependence, Oral lesions, Smoker, Smokeless tobacco, Tobacco.*

Introduction

Tobacco associated oral diseases contribute significantly to the global disease burden and usage of tobacco is estimated to account for 41% of oral and pharyngeal cancer in men and about 11% in women [1]. The Global Adult Tobacco Survey 2 (GATS-2016-17) conducted in India, showed that about 10.7% of all adults were consumers of smoking tobacco , and the number was higher at 21.4% for smokeless tobacco [2]. The reason for tobacco being so toxic is that it contains a large number of carcinogen, the most significant being polycyclic aromatic hydrocarbons, aromatic amines and nitrosamine which are responsible for cellular damage.

[1] Public Health Dentistry, Saveetha Dental College and Hospitals, Saveetha Institute of Medical and Technical Sciences, Saveetha University, Chennai, India, Email: 151812001.sdc@saveetha.com
[2]Corresponding Author: Professor and Head, Public Health Dentistry, Saveetha Dental College and Hospitals, Saveetha Institute of Medical and Technical Sciences, Saveetha University, Chennai, India, Email: pradeepkumarr.sdc@saveetha.com
[3] Senior Lecturer, Public Health Dentistry, Saveetha Dental College and Hospitals, Saveetha Institute of Medical and Technical Sciences, Saveetha university, Chennai, India, Email: jayashri.sdc@saveetha.com

Research has shown that smoking form of tobacco contains 50 carcinogens whereas smokeless form contains around 28 carcinogens. Therefore smoking and tobacco chewing have been positively associated with the occurrence of oral lesions like leukoplakia, oral submucous fibrosis, tobacco pouch keratosis, ultimately leading to the potential for malignant transformation [3,4]. Authors have suggested, the type and location of the lesion varies with the tobacco used, the way it is used and the frequency and duration of use [5]. Tobacco also leads to a variety of other dental problems like dental caries [6-8] which is microbial [9], multifactorial [10,11] in nature and is due to heavy accumulation of plaque [12-14] and many studies have concluded the association[15]. Tobacco also excessively affects the salivary gland, the major effect being on parotid gland, thus altering the salivary secretions [16,17].

Tobacco is a huge risk factor [18] for developing oral cancer, which deteriorates the quality of a life of an individual, especially nutrition [19]. Aesthetically also, it causes damage to the patients, due to the stains it leaves on the teeth, high prevalence of fluorosis [20,21] was found in patients with the habit of areca nut chewing [22]. Patients with a combination of tobacco habits, mode of use and dependency are considered to be at a higher risk of developing oral lesions due to the added and prolonged exposure to carcinogens [23]. Various studies are present which present the findings related to prevalence of tobacco usage among populations but there is a scarcity of research in assessing the dose response relationship between tobacco usage and tobacco induced oral lesions. Hence the aim of the study is to assess the tobacco associated oral lesions and levels of dependence among adult male patients visiting a dental hospital in chennai.

MATERIALS AND METHODS:

A retrospective study was conducted by evaluating and analysing 483 patient case records visiting a dental hospital from June(2019) to March(2020) who were tobacco users. Prior to the start of the study, an ethical approval number (SDC/SHIEC/2020/DIASDATA/0619-0320) was obtained from Scientific Review Board, Saveetha Dental College, SIMATS. The data was collected by reviewing 86000 patients records. Data such as age, gender, type of tobacco, site and type of lesions were documented. The data from Fagerstrom Dependence scale [24] was used as the questionnaire to assess the dependence on tobacco among the study participants. In scoring the FagerstromTest for Nicotine Dependence, yes/no items are scored from 0 to 1, multiple choice items are scored from 0 to 3. The items are summed to yield a total score ranging between 0-10. The higher the total Fagerstrom score, the more intense is the patient's physical dependence on nicotine. According to the scoring criteria of Fagerstrom score, the participants were categorised into low, moderate, low to moderate and high dependence.The data collected were cross verified with intraoral photographs. Only the patients who are using tobacco for at least a year of all age groups were included. All the patients who are under special care are excluded from this study. Incomplete/censored data were excluded too. Ethical clearance was obtained from the institutional scientific review board of the university. The data collected was entered in the excel sheet. Descriptive analysis and Chi Square test were done using SPSS software.The Statistical significance was set at $p < 0.05$.

RESULTS:

A total of 483 case records of male tobacco users were examined. The mean age of the participants were categorised according to age groups (Table 1). Among the participants, 67.5% had a habit of smoking tobacco, whereas 32.5% were found to be using smokeless forms of tobacco (Figure 1). Figure 2 shows the distribution of participants according to the Fagerstrom Dependence score, 55.4% were moderately dependent, followed by 37.1% who were minimally dependent and 7.5% were highly dependent on nicotine. The following prevalence of tobacco oral lesions were found among the study participants: 52.4% tobacco stains, 14.3% Leukoplakia, 6.8% had smoker's palate, 7.7% had tobacco pouch keratosis, oral submucous fibrosis was found among 10.6% of all participants and smoker's melanosis was seen in 8.3% of the study population (Figure 3). Comparison between tobacco lesions and nicotine dependence showed statistically significance (p= 0.001) as given in Figure 4. There was a statistical significant difference between form of tobacco usage and nicotine dependence as well (Figure 5).

Age (Years)	N (%)	Mean	Standard Deviation
18 - 34 years	212 (43.86)	27.1	3.6

35- 44 years	104 (21.56)	38.8	2.7
45 - 64 years	143 (29.60)	52.1	5.0
65-74 years	24 (4.98)	67.4	2.4

Table 1: Distribution of male tobacco users based on age groups of the study population. Among the study population, the majority of the participants (43.86%) belonged to the 18-34 years of age group (Mean age = 27.1, SD = 3.6).

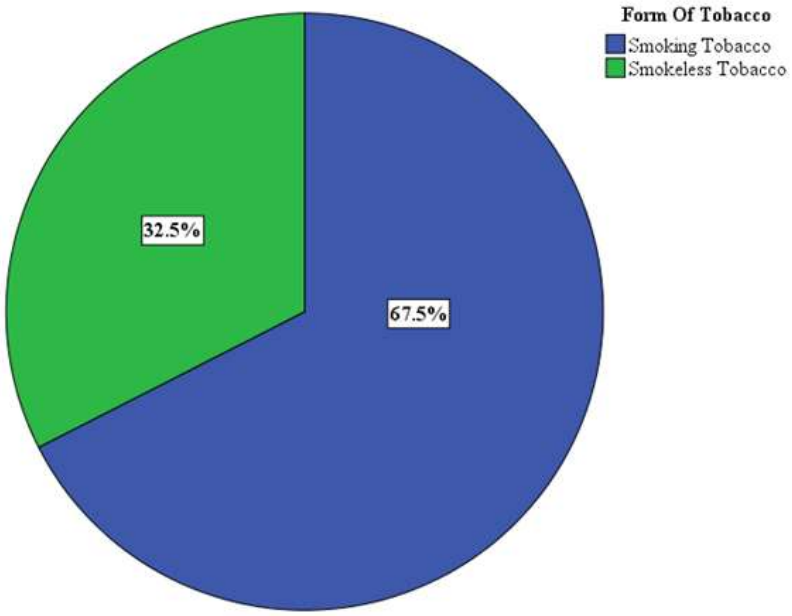

Figure 1: The pie chart represents the distribution of study participants based on the form of tobacco used: smoking tobacco (denoted by colour blue), smokeless tobacco (denoted by colour green). Among the study population, 67.5% of participants used smoking tobacco and 32.5% used smokeless tobacco. Hence, smoking tobacco (denoted by colour blue) was most common among the study population.

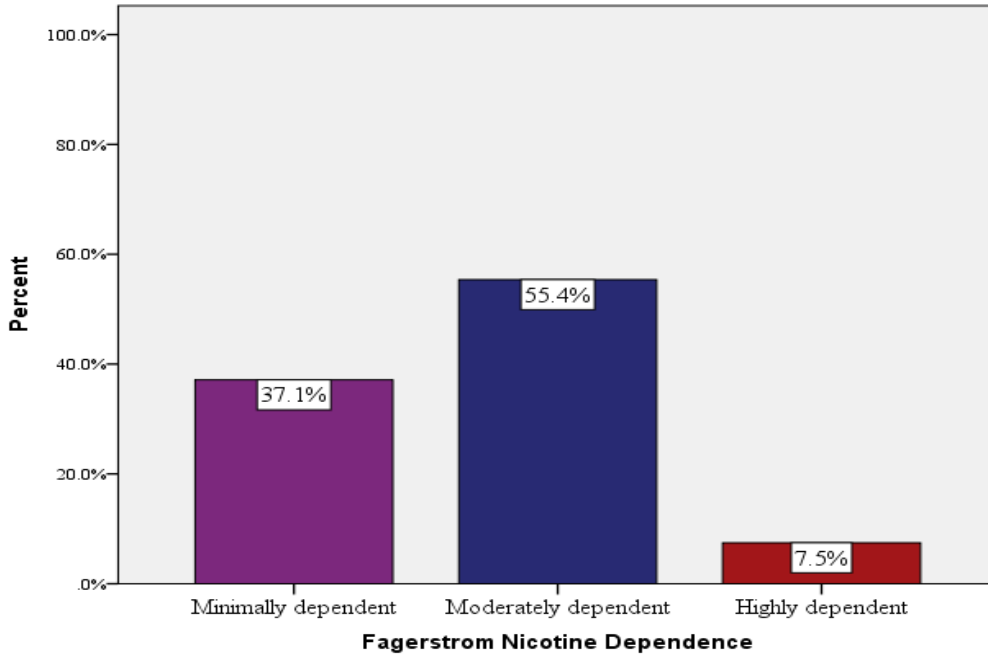

Figure 2: This bar chart represents the distribution of study participants based on their nicotine dependence level assessed by using Fagerstrom Nicotine Dependence Scale. X axis represents the level of dependence and Y axis represents the study participants.The nicotine dependency is categorised into minimally dependent (denoted by colour purple), moderately dependent (denoted by colour blue) and highly dependent (denoted by colour dark red) Among the study population, the majority of the study participants (55.4%) had moderate dependence (denoted by colour blue) on nicotine.

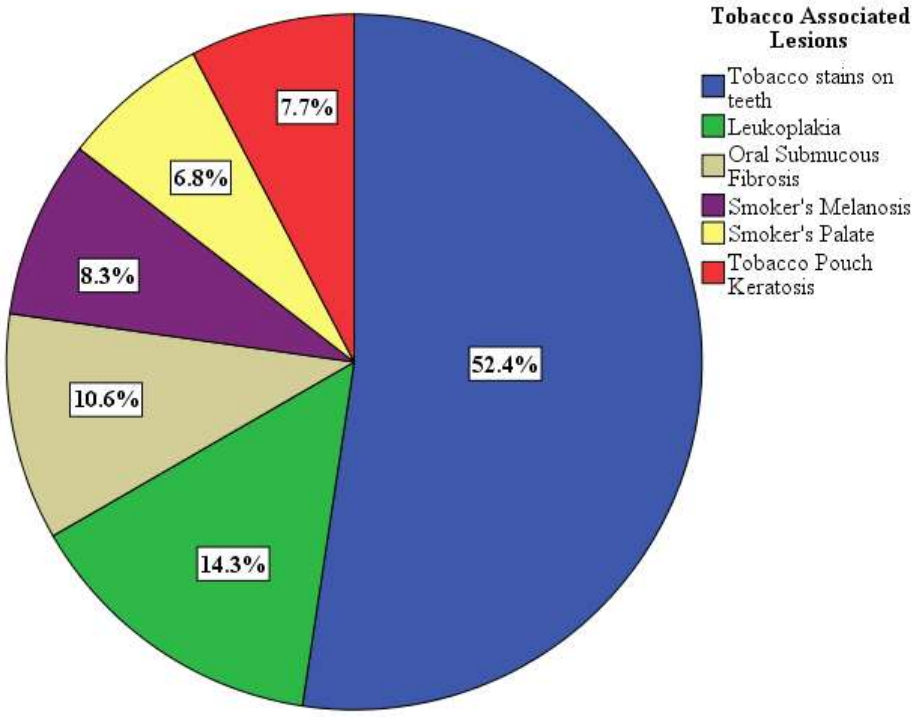

Figure 3: The pie chart represents the distribution of study population based on tobacco associated lesions. X axis represents the tobacco induced lesions and Y axis represents the distribution of study participants. Among

the study population, majority of the participants had tobacco stains on teeth (52.4%), followed leukoplakia (14.3%) and oral submucous fibrosis (10.6%)

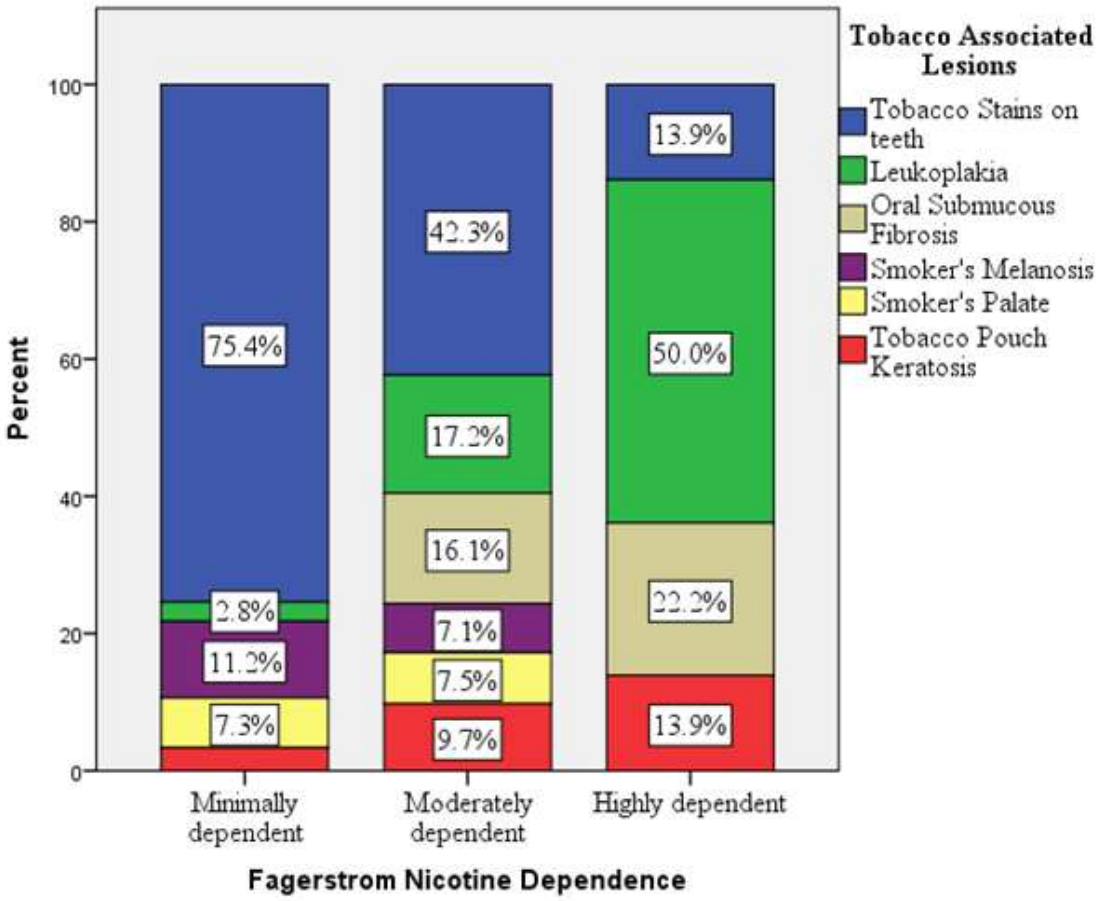

Figure 4: Association between Fagerstrom dependence level and tobacco associated oral lesions among the study population. X axis represents the fagerstrom dependence level and Y axis represents the number of participants having the various tobacco lesions. Pearson's Chi square value =130.51, df = 10, p value = 0.001(<0.05). The association between Fagerstrom dependence level and tobacco induced oral lesions among the study population is found statistically significant.

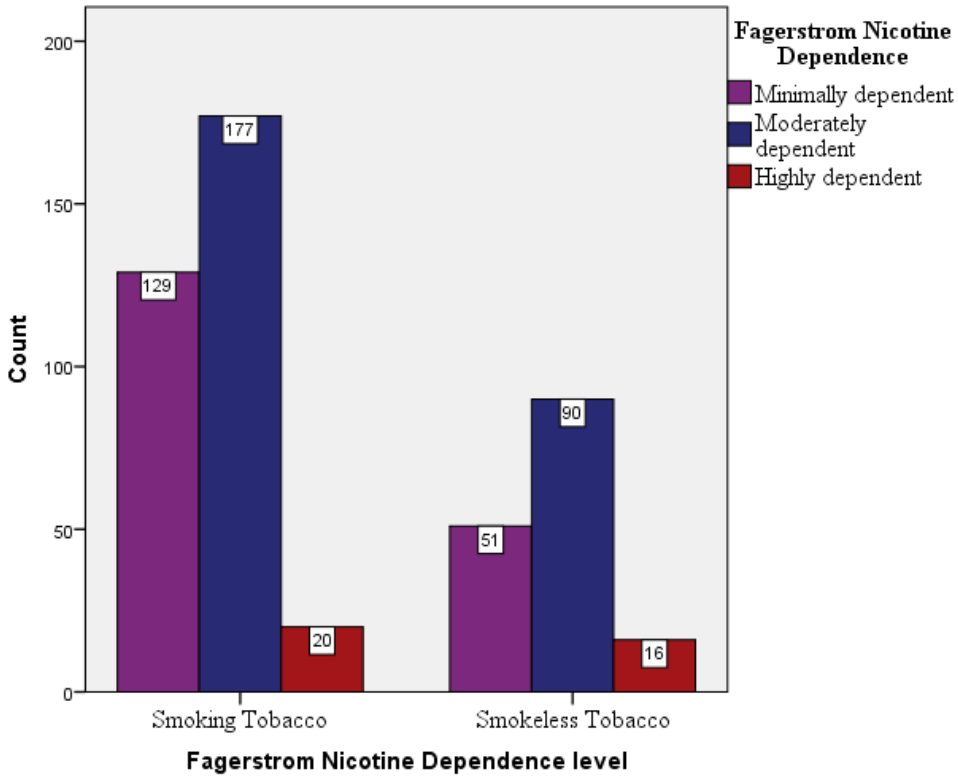

Figure 5: Association between the form of tobacco used and the Fagerstrom nicotine dependence level. X axis represents the form of tobacco used based on Fagerstrom nicotine dependence level and Y axis represents the number of participants based on their nicotine dependence level.The nicotine dependency is categorised into minimally dependent (denoted by colour purple), moderately dependent (denoted by colour blue) and highly dependent (denoted by colour dark red). Pearson's Chi square value = 107.9, df = 15, p value = 0.001(<0.05). The association between form of tobacco and Fagertstrom nicotine dependence level among the study population is found to be statistically significant, thus showing dependence level is higher when using smoking tobacco (37.0%) as compared to using smokeless tobacco (18.6%).

DISCUSSION:

The epidemic that is tobacco is expanding in developing and less developed countries adding to the global disease burden. India is in the second phase of the tobacco epidemic due to its high prevalence of tobacco usage. The frequency and duration of this tobacco habit corresponds to the occurrence of lesions in oral cavities which carry a potential risk for development of oral cancer. Studies have highlighted that the initiation and progression of oral lesions are dependent on the pattern of usage which includes dependence on tobacco by patients [25,26]. With this intention, the present study was conducted to determine the pattern of usage of tobacco associated with tobacco induced oral lesions among patients. The study was conducted assessing the case records of 483 male patients with tobacco habits attending a private dental college in Chennai. Previous studies[5,27,28] have also shown tobacco habit to be more prevalent among male population. Since, tobacco habit is mostly associated with stress and peer pressure, it could be responsible for the initiation of this deleterious habit among the male population [29] . In the present study, prevalence of leukoplakia was highest after tobacco stains, among all the oral mucosal lesions, similar finding was reported by S kumar et al [30] but studies have shown contrasting findings where investigators reported prevalence of oral submucous fibrosis to be higher [27]. A significant statistical value (p = 0.001) was found between tobacco lesion and fagerstrom dependency score (Figure 4) which revealed that the more the dependence on tobacco, the higher the risk of occurrence of oral mucosal lesions, the finding was similar to another study [31]. The possible justification behind this could be that long term contact of tobacco with oral mucosa leads to a variety of changes due to prolonged exposure to carcinogens [27]. Statistically significant association of form of tobacco and Fagerstrom dependence level was found in the current study (Figure 5) and the result coincides to other studies as well [32,33].

CONCLUSION:

Within the limits of the study, it can be concluded that the higher the dependence level on tobacco, the more is the risk of development of oral lesions which could lead to malignancy gradually. As public health professionals, our focus should be on counselling the tobacco dependent people on cessation of their habit and lead a tobacco free life.

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Conflict of interest: There are no conflicts of interest.

REFERENCES:

[1] Petersen PE. Tobacco and oral health--the role of the world health organization. Oral Health Prev Dent. 2003;1(4):309–15.

[2] Ruhil R. Sociodemographic Determinants of Tobacco Use in India: Risks of Risk Factor—An Analysis of Global Adult Tobacco Survey India 2016-2017 [Internet]. Vol. 9, SAGE Open. 2019. p. 215824401984244. Available from: http://dx.doi.org/10.1177/2158244019842447

[3] Kamble KA, Guddad SS, Nayak AG, Suragimath A, Sanade AR. Prevalence of Oral Mucosal Lesions in Western Maharashtra: A Prospective Study. Journal of Indian Academy of Oral Medicine and Radiology. 2017 Oct 1;29(4):282.

[4] Yen AM-F, Chen S-C, Chen TH-H. Dose-response relationships of oral habits associated with the risk of oral pre-malignant lesions among men who chew betel quid. Oral Oncol. 2007 Aug;43(7):634–8.

[5] Behura SS, Masthan MK, Narayanasamy AB. Oral Mucosal Lesions Associated with Smokers and Chewers - A Case-Control Study in Chennai Population. J Clin Diagn Res. 2015 Jul;9(7):ZC17–22.

[6] Mohapatra S, Kumar RP, Arumugham IM, Sakthi D, Jayashri P. Assessment of Microhardness of Enamel Carious Like Lesions After Treatment with Nova Min, Bio Min and Remin Pro Containing Toothpastes: An in Vitro Study. Indian Journal of Public Health Research & Development. 2019;10(10):375–80.

[7] Prabakar J, John J, Srisakthi D. Prevalence of dental caries and treatment needs among school going children of Chandigarh. Indian J Dent Res. 2016 Sep;27(5):547–52.

[8] Prabakar J, John J, Arumugham IM, Kumar RP, Sakthi DS. Comparative Evaluation of the Viscosity and Length of Resin Tags of Conventional and Hydrophilic Pit and Fissure Sealants on Permanent Molars: An In vitro Study. Contemp Clin Dent. 2018 Jul;9(3):388–94.

[9] Prabakar J, John J, Arumugham IM, Kumar RP, Sakthi DS. Comparing the Effectiveness of Probiotic, Green Tea, and Chlorhexidine- and Fluoride-containing Dentifrices on Oral Microbial Flora: A Double-blind, Randomized Clinical Trial. Contemp Clin Dent. 2018 Oct;9(4):560–9.

[10] Prabakar J, John J, Arumugham IM, Kumar RP, Srisakthi D. Comparative Evaluation of Retention, Cariostatic Effect and Discoloration of Conventional and Hydrophilic Sealants - A Single Blinded Randomized Split Mouth Clinical Trial. Contemp Clin Dent. 2018 Sep;9(Suppl 2):S233–9.

[11] Khatri SG, Madan KA, Srinivasan SR, Acharya S. Retention of moisture-tolerant fluoride-releasing sealant and amorphous calcium phosphate-containing sealant in 6-9-year-old children: A randomized controlled trial. J Indian Soc Pedod Prev Dent. 2019 Jan;37(1):92–8.

[12] Mathew MG, Samuel SR, Soni AJ, Roopa KB. Evaluation of adhesion of Streptococcus mutans, plaque accumulation on zirconia and stainless steel crowns, and surrounding gingival inflammation in primary molars: randomized controlled trial. Clin Oral Investig [Internet]. 2020 Jan 18; Available from: http://dx.doi.org/10.1007/s00784-020-03204-9

[13] Samuel SR, Acharya S, Rao JC. School Interventions-based Prevention of Early-Childhood Caries among 3-5-year-old children from very low socioeconomic status: Two-year randomized trial. J Public Health Dent. 2020 Jan;80(1):51–60.

[14] Pavithra RP, Jayashri P. Influence of Naturally Occurring Phytochemicals on Oral Health. Research Journal of Pharmacy and Technology. 2019;12(8):3979–83.

[15] Jiang X, Jiang X, Wang Y, Huang R. Correlation between tobacco smoking and dental caries: A systematic review and meta-analysis. Tob Induc Dis. 2019 Apr 19;17:34.

[16] Pratha AA, Prabakar J. Comparing the effect of Carbonated and energy drinks on salivary pH-In Vivo Randomized Controlled Trial. Research Journal of Pharmacy and Technology. 2019;12(10):4699–702.

[17] Petrušić N, Posavac M, Sabol I, Mravak-Stipetić M. The Effect of Tobacco Smoking on Salivation. Acta Stomatol Croat. 2015 Dec;49(4):309–15.

[18] Kannan SSD, Kumar VS, Rathinavelu PK, Indiran MA. Awareness and attitude towards mass disaster and its management among house surgeons in a dental college and hospital in chennai, India. Vol. 173. WIT Press; 2017.

[19] Neralla M, Jayabalan J, George R, Rajan J, P SKM, Haque AE, et al. Role of nutrition in rehabilitation of patients following surgery for oral squamous cell carcinoma. IJRPS. 2019 Oct 16;10(4):3197–203.

[20] Kumar RP, Vijayalakshmi B. Assessment of fluoride concentration in ground water in Madurai district, Tamil Nadu, India. Research Journal of Pharmacy and Technology. 2017;10(1):309–10.

[21] Kumar RP, Preethi R. Assessment of Water Quality and Pollution of Porur, Chembarambakkam and Puzhal Lake. Research Journal of Pharmacy and Technology. 2017;10(7):2157–9.

[22] Kubakaddi A, Bharati P, Kasturiba B. Effect of Fluoride Rich Food Adjuncts and Prevalence of Fluorosis. J Hum Ecol. 2005 Jan 1;17(1):43–5.

[23] Aruna DS, Prasad KVV, Shavi GR, Ariga J, Rajesh G, Krishna M. Retrospective study on risk habits among oral cancer patients in Karnataka Cancer Therapy and Research Institute, Hubli, India. Asian Pac J Cancer Prev. 2011;12(6):1561–6.

[24] Heatherton TF, Kozlowski LT, Frecker RC, Fagerström KO. The Fagerström Test for Nicotine Dependence: a revision of the Fagerström Tolerance Questionnaire. Br J Addict. 1991 Sep;86(9):1119–27.

[25] Al-Maweri SA, Al-Jamaei AA, Al-Sufyani GA, Tarakji B, Shugaa-Addin B. Oral mucosal lesions in elderly dental patients in Sana'a, Yemen. J Int Soc Prev Community Dent. 2015 May;5(Suppl 1):S12–9.

[26] Leelavathi L. Nicotine Replacement Therapy for Smoking Cessation-An Overview. Indian Journal of

Public Health Research & Development [Internet]. 2019;10(11). Available from: http://search.ebscohost.com/login.aspx?direct=true&profile=ehost&scope=site&authtype=crawler&jrnl=09760245&AN=141274498&h=gYL53P0RTDuihXfEOqLsBmolOVY%2Fn1jwd7eokhNcHN%2F5g8CVaYKbt1wU4UOsqeCY51fRbe6Ner1I6TkeG%2FuwDg%3D%3D&crl=c

[27] Aishwarya KM, Reddy MP, Kulkarni S, Doshi D, Reddy BS, Satyanarayana D. Effect of Frequency and Duration of Tobacco Use on Oral Mucosal Lesions – A Cross-Sectional Study among Tobacco Users in Hyderabad, India. Asian Pac J Cancer Prev. 2017 Aug 27;18(8):2233–8.

[28] Saraswathi TR, Ranganathan K, Shanmugam S, Sowmya R, Narasimhan PD, Gunaseelan R. Prevalence of oral lesions in relation to habits: Cross-sectional study in South India. Indian J Dent Res. 2006 Jul;17(3):121–5.

[29] Hallikeri K, Naikmasur V, Guttal K, Shodan M, Chennappa NK. Prevalence of oral mucosal lesions among smokeless tobacco usage: A cross-sectional study. Indian J Cancer. 2018 Oct;55(4):404–9.

[30] Kumar S, Muniyandi M. Tobacco use and oral leukoplakia: cross-sectional study among the Gond tribe in Madhya Pradesh. Asian Pac J Cancer Prev. 2015;16(4):1515–8.

[31] Patil PB, Bathi R, Chaudhari S. Prevalence of oral mucosal lesions in dental patients with tobacco smoking, chewing, and mixed habits: A cross-sectional study in South India. J Family Community Med. 2013 May;20(2):130–5.

[32] Samatha SS, Byahatti SM, Ammanagi R, Tantradi P. Assessing the level of nicotine dependence in smokers visiting a dental college in belgaum city: A questionnaire study. Journal of Education and Ethics in Dentistry. 2015 Jan 1;5(1):25.

[33] Saha I, Islam K, Paul B, Som TK. Nicotine dependence and its correlates among the adult tobacco users in a slum of Burdwan district, West Bengal, India. J Family Med Prim Care. 2017 Oct;6(4):813–8

[34] Farhat Yaasmeen Sadique Basha, Rajeshkumar S, Lakshmi T, Anti-inflammatory activity of Myristica fragrans extract . Int. J. Res. Pharm. Sci., 2019 ;10(4), 3118-3120 DOI: https://doi.org/10.26452/ijrps.v10i4.160