

## Prevalence and Management of Tooth Plaque Among University Students

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### Abstract

Dental plaque is a biofilm of microbes which has a cross-linkage with the host tissues. Study objective was to assess prevalence and management of dental plaque among university students. An observational study was conducted from July-2018 to September-2018, at different departments of Punjab University and Lahore College for Women University, Lahore, Pakistan. A total of 300 students with tooth plaque and age between 18-25 years were included in the study. The results showed that tooth plaque was more prevalent between 24-25 years of age. Significant association was found between the following: 'importance of oral hygiene' and gender ( $p=0.025$ ) and economic status ( $p=0.001$ ), 'yellowing of teeth' and age ( $p=0.001$ ) and economic status ( $p=0.001$ ), 'inherent characteristics' and economic status ( $p=0.01$ ), 'brushing daily' and age ( $p=0.015$ ) and economic status ( $p=0.003$ ), 'type of tooth paste used' with gender ( $p=0.001$ ) & economic status ( $p=0.016$ ) and finally between 'visits to dentist' and age ( $p=0.03$ ) & economic status ( $p=0.005$ ). Tooth plaque was more prevalent in people with low economic status.

**Keywords:** Dental plaque, biofilms, students.

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### Introduction

Dental plaque or oral biofilm plays a causative role in dental caries and periodontal disease. It is structurally organized and densely packed layer of bacteria on the surface of tooth. It can form on any surface in oral cavity such as enamel, gingiva, oral mucosa, dental implants and dentures<sup>1</sup>. Listgarten and coworkers highlighted the complex nature of dental plaque by electron microscopy on tooth surface. It may be colorless or yellow sticky mass. It may progress to gingivitis and calculus<sup>2</sup>.

Growth of microorganisms depends upon the availability of nutrients, low salivary flow and acidic pH and host defenses. The causative agents are

groups of bacteria that are lactobacillus, streptococci and actinomycetes. Plaque can cause swelling, pain, bad breath, redness and infectious gums that bleed easily<sup>3</sup>. Men and elderly are more likely to develop plaque but its prevalence vary according to age, gender, genotype, medical status and economic status. Eating balanced diet, less sugary and carbohydrate rich food, reduces the incidence of tooth plaque<sup>4</sup>. Home remedies are used to remove dental plaque, brushing teeth daily with fluoride toothpaste using proper brushing technique and avoid sugary food before bed prevents formation of plaque<sup>5</sup>.

Microorganisms are less susceptible to antiplaque agents and develop resistance to these agents. Commonly used anti plaque agents are chlorhexidine, triclosan, delmopinol, aminofluoride and phenolic compounds<sup>6</sup>. Plaque can be removed mechanically by powered floss, chewing sticks and

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irrigation devices are used by dentist for professional removal of dental plaque<sup>7</sup>.

Tooth plaque is a common disease and people lack confidence due to yellow teeth and usually unaware of its effects in their life style. Present study raised this issue and conducted to assess prevalence and management of tooth plaque among university students. According to our knowledge, no study has been conducted so far in Lahore Pakistan on this topic.

### Subjects and Methods

An observational, questionnaire-based study design was adapted during the period from July-2018 to September-2018, using convenient sampling technique. Data was collected from students of different departments of Punjab University and Lahore College for Women University, Lahore Pakistan. Students who had tooth plaque and age ranging from 18-25 years were included and those who do not have dental plaque were excluded. A total of 300 patients participated in the study.

Students were approached and only interested students were selected to fill the questionnaire. The data collection forms were filled during face-to-face interaction with students. Data collection form consisted of three parts, part A consisted of demographic data, part B prevalence and part C management of dental plaque.

Data was analysed using SPSS version 22, statistical significance was determined by using chi square test and  $p < 0.05$  was considered as statistically significant.

Study was approved from Institute of Pharmacy, Lahore College for Women University, Lahore Pakistan. Students of different departments of Punjab University and Lahore College for Women University, Lahore were informed verbally about the study objective and purpose to meet the criteria of informed consent to participate in study.

**Table 1.** Demographic characteristics of study participants (n= 300)

Demographic character	Options	f (%)	Std. Dev	Mean
<b>Age</b> (18-25 years)	18-20	27(9%)	0.655	2.55
	21-23	81(27%)		
	24-25	192(64%)		
<b>Gender</b>	Male	141(47%)	0.500	1.53
	Female	159(53%)		
<b>Family income</b> (per month)	No income		0.628	2.08
	to10,000	48(16%)		
	10,000-25,000	180(60%)		
	More than 25,000	72(24%)		

**Table 2.** Association of Prevalence and Management with demographic characters

Prevalence	Age (p-value)	Gender (p-value)	Economic status (p-value)
Importance of oral hygiene	0.167	0.025	0.001
Yellow teeth	0.001	0.071	0.001
Inheritable character	0.850	0.300	0.011
Knowledge about tooth plaque	0.486	0.422	0.331
Presence of tooth plaque in different age group	0.409	0.175	0.615
<b>Management</b>			
Brushing teeth in a day	0.015	0.720	0.003
Type of brush used	0.848	0.588	0.230
Type of tooth paste used	0.873	0.001	0.016
Visit to a dentist	0.038	0.732	0.005

### Results

Demographic characteristics of study participants are depicted in Table 1. Results showed that 141 (47%) were male and 159 (53%) were female. Age ranges from 18 to 25 years. Most of the patients were between 24 to 25 years of age (64%).

Results further showed that the most important factors responsible for the development of tooth plaque were yellowing of their teeth (24%) and their parent's teeth (28%). Stinking mouth (20%), sensitivity (43%), bleeding gums (38%), and use of junk food (70%) along with the environmental factors (17%).

Results showed that common method used for the management of tooth plaque includes 'brushing in a day' along with 'brushing techniques' with the 'type of tooth paste used' and 'the flossing' as well as 'visit to the dentist'.

The association between demographics and possible factors for the prevalence and management of tooth plaque is depicted in Table 2. Results showed that significant associations were found between 'Importance of oral hygiene' and gender ( $p=0.025$ ) & economic status ( $p=0.001$ ), 'Yellow teeth' and age ( $p=0.001$ ) & economic status ( $p=0.001$ ), 'Inheritable character' and economic status ( $p=0.011$ ). Significant associations were also found between 'Brushing teeth in a day' and age ( $p=0.015$ ) & economic status ( $p=0.003$ ), 'Type of tooth paste used' and gender ( $p=0.001$ ) & economic status ( $p=0.016$ ), 'Visit to a dentist' and age ( $p=0.038$ ) & economic status ( $p=0.005$ ).

## Discussion

Dental plaque is a mass of bacteria that grows on surfaces within the mouth. Bacterial plaque is one of the major causes of gum diseases and tooth decay. This observational and survey-based study was conducted for the evaluation of prevalence, management and association of socio-demographic factors responsible for tooth plaque. Gender variation is an important factor<sup>8</sup>. In another study it was found that the socioeconomic status also affects the oral health as dental plaque is more prevalent among medium to low socioeconomic status. In another study it was found that management is not limited by chronological age but depends on the patient's economic status and availability of financial resources<sup>9</sup>. Treatments recommended in current study include brushing properly, tooth paste having fluorides, flossing, scaling and also the use of mouthwashes as it rinse off the teeth to remove any food particle stuck between the teeth. Visit to a dentist is also very important. Various home remedies and eating a balanced diet is important for oral health<sup>10</sup>.

## Conclusion

Tooth plaque was more prevalent in people with low economic status and methods used for the management of tooth plaque include daily brushing, different brushing techniques, using different types of tooth paste and flossing, as well as visiting the dentist.

## References

1. Marsh P, Lewis M, Helen R, Williams D, Wilson M. Dental Plaque. In: Marsh P, Lewis M, Helen R, Williams D, Wilson M, editors. *Marsh and Martin's Oral Microbiology*. 6<sup>th</sup> ed. USA: Elsevier; 2016.pg 81.
2. Marsh PD. Role of the Oral Microflora in Health [Online]. *MicrobEcol Health Dis* 2000;12: 130-137. Available from: <https://www.tandfonline.com/doi/abs/10.1080/089106000750051800>. Accessed on: 6<sup>th</sup> December 2019. [DOI: <https://doi.org/10.1080/089106000750051800>].
3. MacgregorID, Balding JW and Regis D. Motivation for Dental Hygiene in Adolescents. *Int J Paediatr Dent* 1997;7:235-241.
4. Filoche SK, Anderson SA, Sissons CH. Biofilm Growth of Lactobacillus Species is Promoted by Actinomyces Species and Streptococcus mutans. *Oral Microbio. Immunol* 2004; 19: 322-326.
5. Wiki How. How to remove tartar [Online]. Available from: <https://www.wikihow.com/Remove-Plaque>. Accessed: 6<sup>th</sup> December 2019.
6. Darby ML, Walsh MM. Caries management: fluoride and nonfluoride caries preventive agents. In: Bowen DM editor. *Dental Hygiene Theory and Practice*. USA: Saunders Elsevier;2010. pg.580.
7. Menon L, Ramamurthy J. New Vistas in Plaque Control [Online]. *IOSR JDMS* 2014;13: 4-8. Available from: <https://pdfs.semanticscholar.org/5116/37b28ec1d46890121ddf67c8c961ae0b299b.pdf>. Accessed on: 6<sup>th</sup> December 2019.
8. Marquis RE, Clock SA, Mota-Meira M. Fluoride and Organic Weak Acids as Modulators of Microbial Physiology. *FEMS Microbiol Rev* 2003;26:493-510.
9. Boehm TK, Scannapieco FA. The Epidemiology, Consequences and Management of Periodontal Disease in Older Adults. *J Am Dent Assoc* 2007;138:26S-33S.
10. Web MD. Oral Care Guide [Online] Available from:<https://www.webmd.com/oral-health/guide/default.htm>. Accessed on: 6<sup>th</sup> December 2019.