

ORIGINAL ARTICLE

Periodontal Disease Risk Factors Assessment in Association with Frequency of Tooth Brushing

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ABSTRACT

Aim: To analyze the co-relation between frequencies of tooth brushing as a periodontal risk assessment tool in a population.

Study design: Cross Sectional Survey

Place and duration of study: Bacha Khan Medical College, Mardan from 1st January 2021 to 31st December 2021.

Methodology: Four hundred and eleven participants were enrolled. Data was collected by administering the study questionnaire including 14 items assessing risk factors for periodontal disease as well as their oral hygiene habits. Descriptive statistics were used for data summarization and presentation.

Results: Approximately 34.3% of study participants claimed to brush twice daily and 61.6% once daily. Mean age was 22.1 years and majority of them females constituting 66.7%. 39.33% had a history of bleeding gums while 28.2% had swollen gums. 51% of the subjects reported brushing for less than 2 minutes duration. 67% participants of population were of upper middle socioeconomic status.

Conclusion: The clear correlation establish amongst risk of emerging periodontal disease and occurrence of tooth brushing.

Keywords: Periodontal disease, Oral hygiene, Risk factors, Tooth brushing

INTRODUCTION

Periodontal disease is an enduring inflammatory disease of periodontium linked with the loss of tooth supporting structures¹. Besides certain known risk factors involved, oral hygiene practices particularly tooth brushing has revealed to be the most neglected risk factor in the severity and progression of this disease². It is the second most common oral disease after dental caries¹⁻³. Periodontitis is the commonest of oral disease, showing global prevalence of 11.2%⁴. Being a multifactorial disease, it has numerous risk factors including smoking, diabetes mellitus, genetics, stress and most significantly poor oral hygiene⁵. Continuing proper oral hygiene is of key importance in prevention of periodontal diseases. Various researches have been conducted to create an association among incidence of tooth brushing and the frequency of inflammatory periodontal disease⁶.

Periodontal disease differs contrarily in various areas of the globe. There have been few studies for evaluating frequency of periodontal diseases in Pakistan^{7,8}. Poor oral hygiene habits have an association with the frequency of inflammatory periodontal diseases. Deterrence of the development and evolution of periodontal disease is importantly linked to the conservation of healthy gingiva, via appropriate oral hygiene customs and steady professional dental care.⁹ Thus, asymmetrical or insufficient tooth brushing habit, results in plaque build up, which have been allied with gingival inflammation that may growth to inflammation of periodontal tissues which is one of the major cause of tooth loss^{10,11}.

The purpose of this study is to determine if the frequency of tooth brushing, at a rate of once, twice or thrice daily, shows any association with the prevalence of periodontal disease.

MATERIALS AND METHODS

This descriptive cross-sectional questionnaire survey was done among the patients visiting Dental Department of Bacha Khan Medical College. After approval from the "Ethical Review Committee, an informed verbal consent was obtained from the participants of the study and those who did not want to participate were excluded. A sample size of 411 individuals having the

background knowledge of periodontal diseases was selected. Data collection was done with the help of Questionnaire with 14 questions. The first part of the questionnaire was about demographic data of the participants including name, age, gender, education and socio economic status. The second part was about oral hygiene measures like frequency of brushing, duration of brushing, any other oral hygiene measures and presence of any oral pathology. The third part was based on the questions specifically related to the periodontal risk assessment. Selection of sample size was done with purposive sampling. Data was statistically analyzed by using SPSS-26.0.

RESULTS

Mean age of the participants was 22.1 years with majority of them females constituting 66% (Table 1). Approximately 34.3% of study participants claimed to brush twice daily and 61.6% once daily. Of the 411 subjects, 39.33% had a history of bleeding gums while 28.2% had swollen gums (Table 2). 51% of the subjects reported brushing for less than 2 minutes duration. 67% participants of population were of upper middle socioeconomic status (Table 3).

Table 1: Demographic characteristics of study population (n=411)

Variable	No.	%
Gender		
Male	140	34.0
Female	271	66.0
Age (years)	22.1±3.52	

Table 2: Signs of gingival diseases noticed among participants

	Male	Female
Bleeding gums while brushing	49%	51%
Red swollen gums	17%	73%
Halitosis	77%	23%
Food impaction	29%	71%

Table 3: Brushing habits and duration of brushing among participants

Variable	No.	%
Frequency of brushing		
Once	253	61.6
Twice Daily	158	38.4
Duration of brushing (minutes)		
>2	210	51.0
< 2	201	49.0

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Table 4: Association of periodontal disease with frequency of brushing

Variable	Periodontal Disease yes	Periodontal Disease No
Frequency of brushing		
Once	55%	45%
Twice daily	45%	55%

P-value 0.048

DISCUSSION

The current study was carried out in order to evaluate the risk of periodontal diseases in relation to frequency of brushing among some population of Mardan. The study clearly indicated that poor oral hygiene results in increased risk of development and progression of periodontal diseases when compared to other studies¹²⁻¹⁴. The collected data would help in evaluating the concern of general public towards oral hygiene maintenance and periodontal diseases. Mechanical plaque removal with a manual tooth brush is the primary method for oral hygiene maintenance¹⁵.

In the present study the estimated percentage of brushing frequency was four times more in females than males and was in accordance with a study carried out by Farsi et al¹⁶. The percentage of patients with bleeding gums was almost equal in both the genders with a mere difference of 0.2% in contrast to a study carried out among undergraduate students from King Saud University, College of Dentistry where gingival bleeding was more in females as compared to the males¹⁷. Halitosis is a common feature of poor oral hygiene¹⁶ and that was clearly evident in this study with a higher ration in male than female as reported in another study.¹⁷ According to the results of our study gingival recession was encountered in 77% male and 12% female, a higher number of males might be accredited to poor oral Hygiene maintenance and incorporating the habit of smoking as there is a positive relationship between gingival recession and smoking.

The significant relationship between gingival recession and smoking in our study is in consistent with study done by Muller et al¹⁸. This study has specified that the incidence of tooth brushing in 24 hours has an association with the frequency of provocative periodontal diseases. The group of subjects (45%) that brushes twice daily had an advanced proportion of prevention of periodontal diseases than the group (55%) that brushes once regularly and is in agreement with the study carried out by Akhionbare et al⁹. Daily tooth brushing is the primary way for individuals to remove plaque and control plaque-related diseases such as gingivitis and cavities. In our study 61% of the participants reported that they spend less than 2 minutes on brushing whereas 31% of the participants spent more than two minutes. Oral health experts usually endorse at least two minutes of brushing with the correct procedure, but the average brushing time in the common people is close to 45 seconds^{19,20}.

In view of the current study, it is recommended that some form of precautionary oral hygiene sequencers be boarded on, where stress is placed on regular and higher incidence of tooth brushing specially in population with low socioeconomic status and low education levels, to decrease the prevalence of periodontal diseases in our population. This will greatly increase general population oral health status.

CONCLUSION

Poor oral hygiene increases the risk of development and progression of periodontal diseases.

Conflict of interest: Nil

REFERENCES

- Zhu L, Wang J, Zhang Q, Xia T, Hu S, Yao W, Wei L. Association between the frequency of tooth brushing and esophageal carcinoma risk: an update systematic review and meta-analysis. *J Gastrointestinal Oncol* 2022; 13(2): 499.
- Baskaradoss JK, Tavares M, Al-Mulla F, Al-Ozairi E, Abu-Farha M, Bin-Hasan S, Alsumait A, Devarajan S, Alqaderi H. Association between frequency of tooth brushing and Metabolic Syndrome among adolescents: a 5-year follow-up study. *Int J Environ Res Public Health* 2022;19(1):508.
- Hirano K, Shimbo T, Komatsu Y, Kobayashi D. Frequency of tooth brushing as a predictive factor for future kidney function decline. *J Nephrol* 2022;35(1):191-9.
- Matsui S, Maruhashi T, Kishimoto S, Kajikawa M, Yusoff FM, Nakashima A, Taguchi A, Higashi Y. Poor tooth brushing behavior is associated with high risk of cardiovascular events: A prospective observational study. *Int J Cardiol* 2022;350:111-7.
- Abe M, Mitani A, Zong L, Zhang CD, Hoshi K, Yanagimoto S. High frequency and long duration of toothbrushing can potentially reduce the risk of common systemic diseases in late adolescence. *Special Care Dent* 2022; 42(3): 317.
- Tsuchiya S, Tsuchiya M, Momma H, Nagatomi R, Arima T, Yaegashi N, Igarashi K, Japan Environment, Children's Study Group. Influence of maternal postpartum depression on children's toothbrushing frequency. *Community Dent Oral Epidemiol* 2022; 50(4): 300-10.
- Petersen PE, Baehni PC. Periodontal health and global public health. *Periodontology* 2012; 60(1): 7-14.
- Bokhari SAH, SuhailAM, Malik AR, Imran MF. Periodontal disease status and associated risk factors in patients attending a Dental Teaching Hospital in Rawalpindi, Pakistan. *J Ind Soc Periodontol* 2015;19(6):678.
- Akhionbare O, Ojehanon PI. A study of the effect of frequency of tooth brushing on the prevalence of inflammatory periodontal diseases. *Port Harcourt Med J* 2016;10(3):119.
- Bakdash B. Oral hygiene and compliance as risk factors in periodontitis. *J Periodontol* 1994;65: 539-44.
- Attin T, Hornecker E. Tooth brushing and oral health: how frequently and when should tooth brushing be performed? *Oral Health Preven Dent* 2005;3(3).
- Claydon NC. Current concepts in toothbrushing and interdental cleaning. *Periodontology* 2000 2008;48(1):10-22.
- Pihlstrom BL, Michalowicz BS, Johnson NW. Periodontal diseases. *Lancet* 2005;366(9499): 1809-20.
- Suokko H, Tolvanen M, Virtanen J, Suominen A, Karlsson L, Karlsson H, Lahti S. Parent's self-reported tooth brushing and use of fluoridated toothpaste: associations with their one-year-old child's preventive oral health behaviour. *Community Dent Oral Epidemiol* 2022 Mar 21.
- Chandio N, Micheal S, Tadakmadla SK, Sohn W, Cartwright S, White R, Sanagavarapu P, Parmar JS, Arora A. Barriers and enablers in the implementation and sustainability of toothbrushing programs in early childhood settings and primary schools: a systematic review. *BMC Oral Health* 2022;22(1):1-9.
- Farsi J, Farghaly M, Farsi N. Oral health knowledge, attitude and behaviour among Saudi school students in Jeddah city. *J Dent* 2004; 32(1): 47-53.
- Fernando C, Ha DH, Do LG, Tadakamadla SK. Socioeconomic Status and Toothbrushing in Indigenous and Non-Indigenous Australian Children. *JDR Clin Translational Res* 2022; 31:238-44.
- Müller HP, Stadermann S, Heinecke A. Gingival recession in smokers and non-smokers with minimal periodontal disease. *J Clin Periodontol* 2002;29(2):129-36.
- Martin MA, Avenetti D, Lee HH, Nordgren R, Berbaum ML, Edomwande Y, Cui L, Sandoval A. Community health worker intervention to improve tooth brushing in young children: Results from a cluster randomized controlled trial. *Community Dent Oral Epidemiol* 2022; 29.
- Mendes S, Ferreira D, Bernardo M. Parent-reported toothbrushing behaviour in the Portuguese preschool population. *European Arch Paediatr Dent* 2022;9:1-8.