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Dr. Uma Sudhakar
Head, Department of
Periodontics, Thai Moogambigai
Dental College and Hospital,
Chennai, Tamil Nadu, India

Abirami Ganeshanathan
Undergraduate Trainee,
Department of Periodontics,
Thai Moogambigai dental college
and hospital, Chennai, Tamil
Nadu, India

Asha JK
Undergraduate trainee,
Department of Periodontics,
Thai Moogambigai dental college
and hospital, Chennai, Tamil
Nadu, India

Veronica Parvatham J
Undergraduate trainee,
Department of Periodontics,
Thai Moogambigai dental college
and hospital, Chennai, Tamil
Nadu, India

Development of a self-report questionnaire designed for population based surveillance of gingivitis in adolescents and assessment of content validity and reliability

Dr. Uma Sudhakar, Abirami Ganeshanathan, Asha JK and Veronica Parvatham J

Abstract
Background: Oral health plays an important role in defining the general health status of an individual and also for maintaining a good quality of life. Adolescent frequently experiences oral/dental problems predominantly gingivitis, an inflammatory condition of the gingival tissues surrounding the tooth due to poor nutritional habits, poor self- care dental habits and also hormonal changes at the time of puberty.
Aim: The purpose of this population based surveillance study on gingivitis followed by assessment of content validity and reliability is to evaluate the oral health behavior and practices among the adolescents and also to impart the importance of maintaining healthy oral cavity especially in adolescents aged puberty.
Materials and method: 100 randomly selected individuals among which 73 male and 27 female by gender was taken for the study. A set of 25 relevant oral health care practices questionnaire was prepared and responses were recorded and evaluated for statistical analysis.
Results: Only 55% of the study population rate their technique, reliability, validity and efficiency of brushing as beneficial. On correlation between the awareness among brushing, gingival health and overall oral health status of an individual it was found that only 50% of population were aware of oral health and visits dentists frequently.
Conclusion: Lack of awareness about the importance of oral and gingival health can lead to serious complications. Demonstration tasks and counseling the adolescents about control of oral diseases, promotion of oral health and improvement of quality of life should be initiated and evaluated for betterment of overall health status.

Keywords: Gingivitis, adolescent, oral hygiene practices, awareness, hormonal factors

Introduction

Adolescence is the period of transition that occurs between childhood and adulthood. Biological, psychosocial and cognitive changes which initiate during puberty and last throughout adolescence have a direct effect on nutritional status and nutrient needs. Oral health is often ignored in adolescent population due to poor nutritional habits, poor self- care dental habits and exposure to illicit practices adversely affecting the quality of life. In adolescents young adults are prone to periodontal diseases such as gingivitis and periodontitis [1]. Gingivitis is an inflammation of the soft gingival tissues that covers the tooth. Clinical features of gingivitis are redness that appears on the gingival margin, enlargement of blood vessels in sub-epithelial connective tissue, loss of keratinization from the gingival surface and bleeding on probing [2]. The etiology of gingivitis is multi‑factorial and the result of more than one factor acting together. A wide range of factors has been identified such as presence of bacteria biofilm, genetic, socioeconomic, demographic, iatrogenic, and behavioral factors [3]. Dental plaque or calculus is the main etiological factor in the causation of gingivitis which subsequently left untreated leads to periodontitis. According to WHO 48.7% experienced gingivitis due to calculus at the age of 15years [4]. Mechanical control by removing of the deposits is the gold standard in its prevention or progression of disease process. Tooth brushing is the most common mechanical plaque control method however; it is insufficient in the interdental areas.

Corresponding Author:
Veronica Parvatham J
Undergraduate trainee,
Department of Periodontics,
Thai Moogambigai dental college
and hospital, Chennai, Tamil
Nadu, India

It is also demonstrated that periodontitis is frequent and severe in the interproximal areas. Therefore, interdental aids like interdental toothbrushes, toothpicks and floss along with tooth brushes is often recommended [5, 6]. In addition hormonal imbalance as a result of increase in endocrine hormone at the age of puberty becomes a secondary factors or predisposition factor for occurrence of gingivitis among the adolescent age group [7]. There has been an increasing trend in alcohol, drug abuse and tobacco use, more in smokeless forms in the world in recent years which show a general predisposition towards a rise in substance use by the youth for the past few decades. Messages on tobacco related oral problems as a part of routine oral health education for all patients, regardless of their smoking status may prevent non-smokers from taking up smoking and assist smokers to stop smoking. Moreover, the high prevalence of smoking among young adults is of concern, suggesting the critical need to plan effective anti-smoking campaigns, especially among school children, for early prevention and complete cessation [8]. The present study was undertaken to evaluate the oral health behavior and practices among the adolescents and also to create awareness about the importance of maintaining healthy oral cavity especially in adolescents aged puberty.

Materials and Methods
This present study was carried out amongst 100 randomly selected individual. It was a Questionnaire-based study in which, out of the 100 individuals 73 were male and 27 were female. A set of 25 relevant oral health care practices questionnaire was prepared and responses were recorded and evaluated for statistical analysis. The subjects were briefed about the study consent was obtained from them. Ethical committee approval was obtained from the university.

Results
100 random samples consisting of 73 male and 27 female by gender was taken into the study (Graph 1). Relevant questionnaire was prepared; responses were noted among the selected population group under the study and evaluated for statistical analysis by SPSS software Version 26.0. On statistical evaluation it was observed all 100 samples were valid for the study with Cronbach's alpha reliability score being 0.0340. (Significant score). On analysis of the given data the mean age of the study population was observed to be 33.30 years of age with minimum being 14yrs and maximum being 60yrs of age showing S.D of 12.068 with 0.26761 at 95% confidence interval. The questions were individually subjected to chi square test. The chi-square statistic is 354. 667. The p-value is. 0001. The result is significant at $p < .05$. Correlation between the variables was calculated by using Pearson coefficient correlation analysis followed by linear to linear association between the aggregate groups (Table 1). Q2 shows 55% of the study population rate their technique, reliability, validity and efficiency of brushing as good with

statistical significance of 0.031. ($p < 0.01$) About 91% of the study population brushes their teeth daily among which 56% changes their tooth brush every 3 months (Q5) with a statistical significance of 0.091 ($p < 0.01$) at which 64% did not use dental floss with a significance of 0.010 ($p < 0.01$) (Q6) whereas no significance were observed regarding brushing on Q1, Q3, Q4 respectively.

On correlation between the awareness among brushing, Gingival health and overall oral health status of an individual it was found about 50% of population were aware of oral health and visits dentists with significance of 0.068 ($p < 0.01$) (Q7) for routine dental checkup among which 60% were knowledge about the term gingivitis or inflammation of the gum with a significance level of 0.077 ($p < 0.01$) (Q8). 59% experienced bleeding of gums with significance of 0.026 ($p < 0.01$) (Q9) followed by which 46% were not familiar with any gingival problems like redness, swelling showing a significance of 0.0001 ($p < 0.01$) (Q10). 56% of study population are aware of deposits on their tooth surface the major cause of gingival inflammation with a significance of 0.0093 ($p < 0.01$) (Q11) among which 50% feels scaling removes these deposits with a significance of 0.016 ($p < 0.01$) (Q13) and 52% practices the use of mouth wash at least once a week with a significance of 0.0093 ($p < 0.01$) (Q11). No statistical significance were observed when the study populations were questioned about the scaling (Q12), misalignment of teeth (Q14), frequency of intake of hot or cold causing sensitivity (Q16). Since 46% of the 95/100 study population were nonsmokers Q17, Q18, Q19, Q20, Q21 did not show any statistical significance among the 64% of the remaining population 39% responses were post quitting of the habit by self rather than by counseling (Q23, 24) with improvement of good oral health with statistical a significance of 0.0055 ($p < 0.01$) (Q22) either by self or followed by counseling as preferred by 88% of the population (Q25).

Illustrations: Graph 1
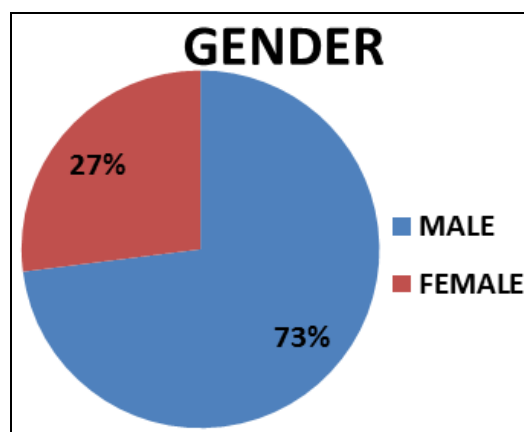
Graph 1: 100 random samples consisting of 73 male and 27 female by gender was taken into the study

Table 1: Correlation between the variables was calculated by using Pearson coefficient correlation analysis followed by linear to linear association between the aggregate groups

Question	Pearson Chi-Square	Linear-By-Linear Association	Asymp/Exact significance	Significance
Q1	4.221	2.096	0.239	NO
Q2	5.432	4.663	0.031	YES
Q3	2.202	0.080	0.333	NO
Q4	1.289	0.357	0.732	NO
Q5	0.539	0.010	0.091	YES
Q6	5.151	0.876	0.010	YES
Q7	3.489	3.323	0.068	YES

Q8	0.901	0.083	0.077	YES
Q9	9.897	0.413	0.026	YES
Q10	17.956	15.595	0.000	YES
Q11	5.282	2.828	0.093	YES
Q12	1.219	0.196	0.658	NO
Q13	8.308	4.920	0.016	YES
Q14	3.647	2.630	0.105	NO
Q15	3.246	2.820	0.093	YES
Q16	2.798	0.129	0.719	NO
Q17	2.614	0.477	0.490	NO
Q18	5.381	1.003	0.317	NO
Q19	2.900	1.523	0.217	NO
Q20	0.768	0.192	0.661	NO
Q21	1.323	0.129	0.720	NO
Q22	7.614	2.597	0.055	YES
Q23	0.009	0.009	0.560	NO
Q24	0.169	0.167	0.424	NO
Q25	2.874	0.092	0.086	YES
The chi-square static is 354. 667. The *p*-value is. 0001. The result is significant at *p*< .05/<0.01				

Discussion

Health is defined as a state of complete physical, mental and social well-being and not merely the absence of disease or illness while oral health is part of general health status of an individual and essential to quality the of life. From time to time poor oral health leads to poor general health and vice-versa because of common risk factors such as poor oral hygiene practices, lack of awareness, use of tobacco, pan chewing, and alcohol which either directly or indirectly affects oral health. Tooth loss has also been associated with increased risk of or facial trauma and malocclusion. Thus, adolescent people form a diverse group in terms of provision of care [1, 9]. A study to check the awareness of interdental aids and their use in daily oral hygiene observed 53% of the patients brush only once a day by Mahatani *et al* in 2017. Out of which 46% of them change their toothbrush once in three months, whereas 28% change it every month and 26% change their toothbrushes when it is convenient [10] where as in the present study about 91% of the study population brushes their teeth daily among which 56% changes their tooth brush every 3 months (Q5) with a statistical significance of 0.091. Based on the results attained above, a majority of the people brush only once a day in contrast to Gupta *et al* who reported 61.9% [11] and Harikiran *et al* who reported 38.5% frequency of twice a day brushing in their respective studies [12]. The frequency of brushing twice a day is relatively low in our study can be attributed to the lack of awareness or enthusiasm among the younger age groups. Similarly that majority of the people replace their toothbrush once in three months this could be due to the lack of awareness of the ill-effects of using the same toothbrush over an extensive period of time, due to which people may not find it essential to replace it [13]. The above study also revealed that only 29% of patients are aware of interdental aids in contrast with our study where 64% did not use dental floss or any interdental aids owing to the lack of awareness about various interdental aids such as interdental brushes and floss. Antunes JLF *et al* in 2002 carried out an epidemiological survey of the oral health of 1,799 adolescents in 35 cities of the state of São Paulo. The study revealed about 34.3% of the adolescents had unhealthy gingival status in one or more of their mouth sextants; 21.5% of them had gingival bleeding. In the present study 56% of study population are aware of deposits on their tooth surface; 59% experienced bleeding of gums with significance of 0.026 (Q9) followed by which 46% were not familiar with any gingival problems like redness, swelling (Q10). Aspects that may interfere with the

risk of gingiva bleeding and dental calculus are relevant for this assessment, such as: the presence of dental plaque, the quality and frequency of oral hygiene; the type of dental care performed; the availability of oral hygiene products; the dentists' preparation as regards preventive and educational practices; and the availability of specific oral health promotion initiatives [14, 15]. A cross sectional study on comparison of gingival health status in adolescents puberty in rural and urban areas observed among the urban population 26.7% of urban adolescents who never visit dentists, and 73.3% of adolescents visit dentists for toothache by Thahir *et al*. In the present study it was found about 50% of population were aware of oral health and visits dentists with significance of 0.068 (Q7) for routine dental checkup. On comparing our study with the above study it can be noted that the level of awareness of the importance of oral and gingival health in urban adolescents is slightly higher than in rural adolescents [16].

Muthu *et al.* conducted a study is to evaluate the oral health attitude and behavior among 18-22yrs of age group observed statistically significant difference was found for improvement in dental visits, frequency and technique of brushing. Again there was the notable difference for using toothbrush with hard bristles and checking the teeth in the mirror after brushing. Interestingly, the reports of bleeding gums increased with the increasing years [17, 18]. In the present study 56% of the population are aware of deposits on their tooth surface as the major cause of gingival inflammation with a significance of 0.0093 (Q11) among which only 50% feels scaling removes these deposits with a significance of 0.016 (Q13) and 52% practices the use of mouth wash at least once a week with a significance of 0.0093 (Q11). Conversely, this might indicate an increase in awareness with education levels. Tin-Oo M. M. *et al* conducted a cross-sectional study among 424 adult patients filled out self-administered questionnaires assessing patient awareness of the effects of smoking on oral health. The study showed 58% percent of the respondents were not aware that smoking can cause delayed wound healing. Non-smokers were significantly more aware that smoking can cause early tooth loss and oral cancer but smokers were more aware that smoking can change taste and smell. According to the literature, cigarette smoking could increase the risk for gingivitis and periodontitis not only in adults but also in younger ages, and it has been shown that it is an important risk factor for periodontal disease [19]. In the present study only 46% of the 95/100 study population were

nonsmokers and among the 64% of the remaining population 39% responses were post quitting of the habit by self rather than by counseling. In contrast to the above study awareness of the effects of smoking largely influence the oral health status between smoking and non-smoking dental patients in the present study. Chrysanthopoulos *et al* in his study showed that smoking was significantly associated with gingival inflammation similar to our study. Assessing patients' awareness about the effects of tobacco smoking on oral health can assist dental professionals in better educating their patients. It should be made mandatory that all dental patients, regardless of smoking status must receive education and awareness about the risk of tobacco and smoking [20].

Conclusion
Ensuring youngsters to have access to oral health care is critical, as oral/dental health care are essential components of primary health care which in turn have significant effect on general health status of an individual. Adolescents similarly need to realize and manage their need for oral health care services through regular dental visits, follow a good oral hygiene practices and should ensure avoidance of harmful oral habits practices like smoking, tobacco chewing and other deleterious habits.

Conflict of interest: Nil
Acknowledgement: None

References
1. Nagaland T, Kadanakuppe S, Raju R. Adolescent's oral health - a review. Int. J Health Sci Res. 2016; 6(9):420-425.
2. World Health Organization. Important target groups. Available athttp://www.who.int/oral_health/action/groups/en.
3. López R, Fernández O, Baelum V. Social gradients in periodontal diseases among adolescents. Community Dent Oral Epidemiol2006; 34:184‑96.
4. Hiremath SS. Textbook of preventive and community dentistry (New Delhi: Elsevier), 2007, 128.
5. Charu Madan, Kapil Arora, Vandana, Sri Krishna Chadha, Bhadravathi, Chaluvaiah, Knowledge, attitude and practices study regarding dental floss among dentists in India. Indian Sock Periodontal. 2014; 3:18.
6. Pinto TM, de Freitas GC, Dutra DA, Kantorski KZ, Moreira CH. Frequency of mechanical removal of plaque as it relates to gingival inflammation: A randomized clinical trial. J Clin Periodontal. 2013; 40:948-54.
7. Bogin BP, Adolescence. An Evolutionary Perspective. Encyclopedia of Adolescence. 2011: 1:275-280.
8. Chadda RK, Sengupta SN. Tobacco use by Indian adolescents. TobInduc Dis. 2003; 1(1):8.
9. World Health Organization. 2006. Constitution of the world health organization-Basic Documents, 45th edition, supplement, October 2006.
10. Anisha A. Mahtani *et al*. Awareness of Interdental Aids and their Regular Use in Daily Oral Hygeine- A Questionnaire Based Study J Pharm. Sci. & Res., 2017; 9(2):202-204.
11. Gupta T, Sequeira P, Acharya S. Oral health knowledge, attitude and practices of a 15-year-old adolescent population in Southern India and their social determinants. Oral Health Prevent Dent. 2012; 10(4):345-54.
12. Harikiran AG, Pallavi SK, Hariprakash S, Ashutosh, Nagesh KS. Oral health related KAP among 11- to 12-year-old school children in a government-aided missionary school of Bangalore city. Indian J Dent Res. 2008; 19(3):236-42.
13. Warren PR, Chater BV. An overview of established interdental cleaning methods. J Clin Dent. 1996; 7(3):65-9.
14. Antunes JLF *et al*. Gingival health and utilization of dental services. Rev Saúde Public, 2008, 42(2).
15. Antunes JLF, Peres MA, Jahn GM, Levy BB. The use of dental care facilities and oral health: a multi-level approach of schoolchildren in the Brazilian context. Oral Health Prev Dent. 2006; 4(4):287-94.
16. Thahir H *et al*. IOP Conf. Ser.: Earth Environ. Sci. 2018; 196:012-030.
17. Muthu J, Priyadharshini G. Evaluation of oral health attitude and behavior among a group of dental students in Puducherry, India: A preliminary cross-sectional study. J Indian Sock Periodontal. 2015; 19(6):683-686.
18. Dagli RJ, Tadakamadla S, Dhanni C, Duraiswamy P, Kulkarni S. Self-reported dental health attitude and behavior of dental students in India. J Oral Sci. 2008; 50:267-72.
19. Tin-OMM *et al*. Awareness of the Effects of Smoking on Oral Health among Dental Patients at the Defense Service General Hospital, Myanmar. International Medical Journal April. 2013; 20(2):1-3.
20. Chrysanthopoulos NA. Prevalence of gingivitis and associated factors in 13-16-year-old adolescents in Greece. Eur. J Gen Dent. 2016; 5:58-64.