Original Article

Association of gingivitis with children oral health-related quality of life in Lucknow: A cross-sectional study

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Abstract

Introduction: Gingivitis is codified as the most familiar oral disease in children and teenagers. Several studies reported that most of the children and adolescents have negative impact on quality of life (QoL) due to gingivitis or destructive periodontal disease or poor oral health status. Existing literature in this context on Indian population is sparse. Hence, this study has been shouldered to find out possible coalition between gingivitis and COHRQoL. **Objective:** This study desires to evaluate the confederation of gingivitis and child oral health-related quality of life (COHRQoL) among school children of Lucknow. **Methods:** A cross-sectional survey was conducted in school going children with the age group of 11–14 years, with a representative sample of 400 students in Lucknow city. For data on oral health-related quality of life (OHRQoL), a predesigned questionnaire (CPQ11-14) was used for demographic information and questions on oral symptoms, functional limitations, emotional, and social well-being. Gingival status was evaluated by Gingival index (Loe and Silness 1963). **Results:** QoL was found to be moderately affected in children with severe gingivitis as compared with children with no gingivitis, mild, and moderate gingivitis, but this difference was found to be statistically nonsignificant ($P = 0.896$). **Conclusion:** The present findings indicated that the existence of substantial levels of gingivitis might be fatalistically related with how children perceive their oral health and daily life.

Keywords: Child, epidemiology, gingivitis, oral health, periodontal diseases, quality of life

Introduction

Gingivitis kindred with dental plaque affects the protective tissues of the teeth and may lead to the development of a wide range of clinical signs and symptoms, such as bleeding, bad breath edema, redness, and gingival enlargement.[1] A number of sociodental indicators or, as they have more recently been named oral health-related quality of life (OHRQoL) measures, were developed to assess subjective aspects of oral health, subjective perceptions about health are central to the assessment oral health and needs some OHRQoL measures have been incorporated into systems for analysis of oral health and dental needs.[2]

Traditionally, gingival outcomes were measured by normative clinical measures that consider only the physical status of the individual. These measures only evaluate the patient's health analysis according to professional judgment, avoiding any social or psychological influences on oral health, and relatively less importance is placed on the patient's self-recognized oral health and needs.[1]

Primary healthcare physician can play a very vital role in early diagnosis of gingivitis by diagnosing its clinical features like bleeding gums, redness, inflammation, etc., Hence, the role of

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primary healthcare physician, being the first point of contact for general population becomes paramount.

Therefore, previous efforts endorsed from the evaluation of child oral health-related quality of life (COHRQoL) to be an addition of normative measurements that document the full impact of oral disease according to child's daily life. Several studies reported negative impacts of poor dental status on QoL. The relation between gingival conditions and OHRQoL was investigated with divergent findings.

Previous studies suggest that degrading periodontal disease has a negative effect on the adolescent QoL, yet gingivitis has a significant effect.[1] The full association between gingivitis and COHRQoL was not comprehensively assessed. Thus, this study desires to evaluate the confederation of gingivitis and COHRQoL.

Methodology

The study was carried out by a single investigator who was pretrained and calibrated before the start of the study in the Department of Public Health Dentistry, Sardar Patel Post Graduate Institute of Dental and Medical Sciences, Lucknow. Kappa coefficient value for intraexaminer reproducibility was 0.86. After training of the examiner, a pilot study was held on 50 school going children to check the validity and operational feasibility of the study. Cronbach's alpha was applied for intraexaminer reliability of the child perception questionnaire (11–14 years) to estimate the OHRQoL followed by clinical examination of gingiva and it was found to be 0.84. No adjustment was found to be necessary. These children were not the part of final sample. Sample size was calculated using the standard formula:

$$n = z^2 \{p(1-p)\}/e^2$$

where n is the size of the sample, z is the critical value at a specified level of confidence, and e is the difference between sample proportion and population proportion.

The calculation of sample size was performed to seek the results at 95% confidence level for which the value of $z = 1.96$. The allowable error taken was $e = 0.05$. The estimated sample was selected by multistage cluster random sampling technique.

In total, 400 school going children were involved in the study through stratified random sampling. In the first stage, Lucknow city was divided geographically into five areas, i.e. East, West, North, South, and Central. A list of schools located within Lucknow was received from the District School Officer (DSO). Around 20–30 schools came under these geographical areas.

In the second stage, two schools from each of the geographical areas mentioned were selected randomly. Survey was conducted on students aged 11–14 years of age. Students present on the day of the examination and whose parents or guardian had given consent were included in the study. Medically compromised subjects, students under orthodontic treatment, students with space maintainers, students suffering from any systemic diseases, and student whose parents or guardians had not given consent were not included in the study.

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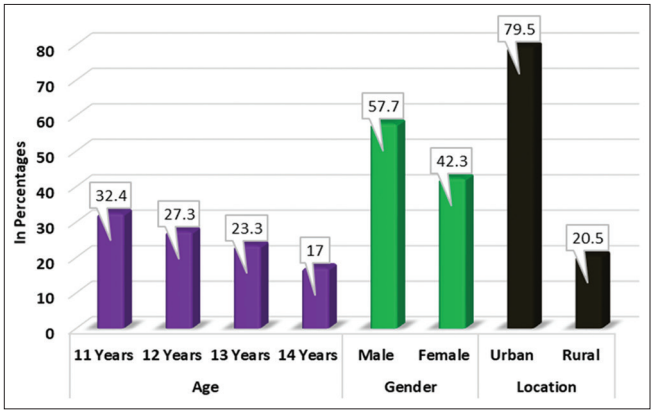
The study was carried out over a period of 5 months from January 2017 to June 2017. Approval from the Ethical Committee of the Institute was obtained (10th January, 2017). The QoL symptoms and signs were recorded on the basis of child perception questionnaire (11–14 years) followed by clinical examination for gingivitis. The statistical analysis was done using SPSS Version 15.0. The values were represented in *N* (%) and mean ± SD. Chi-square test, Mann–Whitney *U*-test, and Kruskal–Wallis test were used.

Results

Graph 1 shows the age of children ranged from 11 to 14 years. Maximum number of children were aged 11 years (n = 128; 32.4%) followed by those aged 12 years (n = 108; 23.3%), 13 years (n = 92; 23.3%), and 14 years (n = 67; 17%). Median age of children was 13 years. Majority of children were males (n = 228; 57.7%). There were 167 (42.3%) females. Male-to-female ratio of the children was 1.37:1. More than three-fourth (n = 314; 79.5%) children were from urban locations. In total, 81 (20.5%) were from rural locations. Almost all (n = 391; 99%) children used to clean their teeth with brush. In total, 3 (0.8%) used to clean their teeth with finger and 1 (0.3%) used stick. Toothpaste was the preferred material for cleaning the teeth, used by 382 (96.7%) children followed by 8 (2%) who used toothpowder and 5 (1.3%) who used charcoal. Majority (n = 269; 68.1%) used to clean their teeth twice a day, 108 (27.3%) used to clean the teeth once a day, and 18 (4.6%) used to clean the teeth thrice a day.



Graph 1: General profile of children enrolled in the study

Table 1 shows the total dimensional scores for oral symptom score, functional limitations, emotional well-being, and social well-beings were 3.13 ± 2.83, 4.20 ± 4.16, 6.90 ± 5.79, and 8.22 ± 7.36, respectively.

Figure 1 shows that majority of children's QoL was almost unaffected (85.1%). There were 52 (13.2%) children whose QoL was slightly affected and 7 (1.8%) who had a moderate effect on QoL. None of the children had severely affected QoL.

Figure 2 shows that the maximum number of children (n = 182; 46.1%) had moderate gingivitis, 175 (44.3%) had mild gingivitis, and 36 (9.1%) had severe gingivitis. There were 2 (0.5%) cases having no gingivitis.

Table 2 shows that for all the variables, irrespective of the category, majority of children had unaffected QoL. No significant association between QoL and gingivitis, age and gender could be seen ($P > 0.05$). QoL of rural children (19.8%) was more affected as compared with that of urban children (13.7%), thus showing a significant difference between two locations ($P = 0.044$). No significant association between type of cleaning and frequency of cleaning on QoL was observed. However, a significant association between material used and QoL was observed ($P = 0.024$). QoL of children was significantly affected by selfperceived oral health ($P < 0.001$). However, no significant association between QoL and oral health-related general health was observed ($P = 0.166$).

Discussion

Oral diseases are among the most common diseases encountered by children in developing countries.[3] Oral health problems are considered important factors causing a negative impact on daily performance and QoL because it influences how individuals grow, enjoy life, chew, speak, taste food, and socialize.[4] Gingivitis is a mild form of gum disease which can be reversible by daily brushing, flossing, and regular cleaning by dentist; this procedure is called scaling along with proper medication.[5]

Adolescent oral health is influenced by many factors; good oral health is also associated with broader social and economic determinants.

OHRQoL and oral health status symbolize two different concepts; the former one putting the greatest prominence on subjective and individual perception aspects, although oral health status is more in approximation with objective aspects and normative assessment.[6]

Present study findings are similar to the study conducted in Brazil,[1] which showed that there was no association found between marked gingivitis and OHRQoL.

Present study findings are also similar to study conducted in Mayanmar,[2] which also showed that there was no association found between marked gingivitis and OHRQoL.

The results of the present study are in contrast with the study conducted by Nurelhuda *et al.*,[7] which shows significant association between Gingival index scores and OHRQoL.

The children of the current study belonged to 11- to 14-year age group. Similar, age group were studied by Tomazoni *et al.*[1] In this study, 57.7% children were males and 42.3% were females, which is in contrast with the study conducted by Athira *et al.*[8] and Peres *et al.*[9] in which 48% and 53.7% were males and 52% and 46.3% were females.

More than three-fourth (79.5%) children were from urban locations; it is been observed that urbanization, industrialization, and socialization bring changes in social life and affect oral and general health of the person. Immigrants of new societies bring change in behaviors with respect to living habits, diet, and development of a new lifestyle.

Majority of children were cleaning their teeth with toothbrush (99%) using toothpaste (96.7%) as the material of choice. Apart from this it was noticed that maximum were having a good habit of cleaning their teeth twice daily (68.1%). Feasibly regular reinforcement

Table 1: The dimension wise quality of life (QoL) status

QoL dimension	Mean±SD (Range)
Oral Symptom score	3.13±2.83 (0-19)
Functional score	4.20±4.16 (0-23)
Emotional score	6.90±5.79 (0-25)
Social score	8.22±7.36 (0-36)

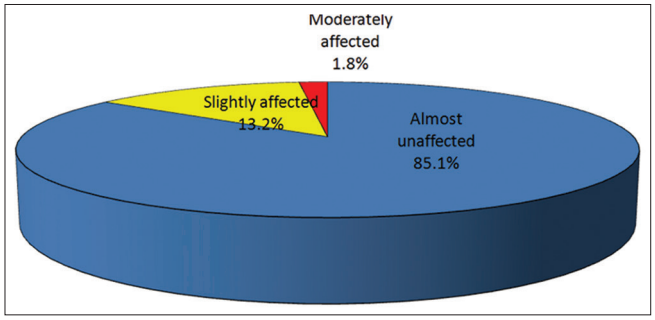


Figure 1: Distribution of cases according to quality of health status

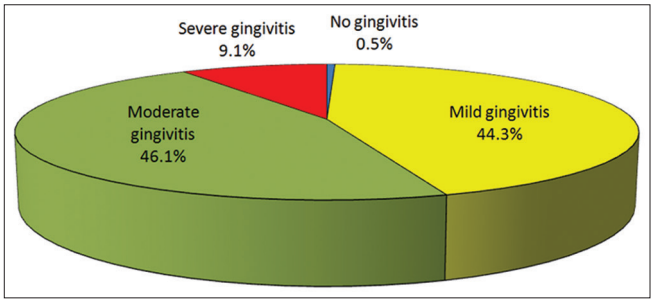


Figure 2: Distribution of children according to gingival health status

Table 2: The association between oral health-related quality of life (QoL) and gingivitis and other demographic and clinical variables

Variable	QoL category						Statistical significance	
	Almost unaffected (*n*=336)		Slightly affected (*n*=52)		Moderately affected (*n*=7)			
	n	%	*n*	%	*n*	%	*H*/*z*	*P*
Gingivitis								
No gingivitis (*n*=2)	2	100.0	0	0.0	0	0.0	0.603	0.896
Mild (*n*=175)	148	84.6	24	13.7	3	1.7		
Moderate (*n*=182)	156	85.7	24	13.2	2	1.1		
Severe (*n*=36)	30	83.3	4	11.1	2	5.6		
Age (years)								
11 (*n*=128)	107	83.6	19	14.8	2	1.6	3.460	0.326
12 (*n*=108)	90	83.3	15	13.9	3	2.8		
13 (*n*=92)	77	83.7	14	15.2	1	1.1		
14 (*n*=67)	62	92.5	4	6.0	1	1.5		
Gender								
Male (*n*=228)	188	82.5	36	15.8	4	1.8	1.662	0.096
Female (*n*=167)	148	88.6	16	9.6	3	1.8		
Type of cleaning								
Brush (*n*=391)	332	84.9	52	13.3	7	1.8	0.710	0.950
Finger (*n*=3)	3	100.0	0	0.0	0	0.0		
Stick (*n*=1)	1	100.0	0	0.0	0	0.0		
Material used								
Toothpaste (*n*=382)	326	85.3	50	13.1	6	1.6	11.228	0.024
Powder (*n*=8)	6	75.0	2	25.0	0	0.0		
Charcoal (*n*=5)	4	80.0	0	0.0	1	20.0		
Frequency of cleaning							*H*	*P*
Once (*n*=108)	88	81.5	17	15.7	3	2.8	1.616	0.446
Twice (*n*=269)	232	86.2	34	12.6	3	1.1		
Thrice (*n*=18)	16	88.9	1	5.6	1	5.6		
Self-perceived oral health								
Excellent (*n*=111)	99	89.2	11	9.9	1	0.9	14.04	<0.001
Very good (*n*=99)	89	89.9	8	8.1	2	2.0		
Good (*n*=146)	114	78.1	30	20.5	2	1.4		
Fair (*n*=35)	32	91.4	2	5.7	1	2.9		
Poor (*n*=4)	2	50.0	1	25.0	1	25.0		
Self-perceived oral health related general health								
Excellent (*n*=115)	105	91.3	10	8.7	0	0.0	6.474	0.166
Very good (*n*=124)	102	82.3	18	14.5	4	3.2		
Good (*n*=116)	97	84.3	18	15.7	0	0.0		
Fair (*n*=27)	21	77.8	5	18.5	1	3.7		
Poor (*n*=14)	11	78.6	1	7.1	2	14.3		

H=Kruskal-Wallis *H*-test; *z*=Mann-Whitney *U*-test; χ^2=Chi-square test

regarding oral hygiene practices on the school children could have swayed their positive oral health behavior.

In one of the studies conducted by Saud *et al.*,[10] it had been found that maximum children had a habit of brushing their teeth once daily with tooth paste and it was found that the participants were not aware of the oral health education regarding the oral hygiene practices, which were directly affecting their OHRQoL, which were examined and participated in the study.

In the present study, the most of the students showed mild (44.3%) to moderate (46.1%) gingival health status, respectively. Similar findings were noticed in the study held by Bakhtiar *et al.*[6] and Barbosa *et al.*[11] The probable reason might be due to the characteristics of the age of children and the level of understanding and sharing experiences in adults and children because of which the oral hygiene is compromised to a certain level.

This problem might be due to the current dietary and lifestyle habits, which are posing a greater threat for oral health. Regardless of good diet and lifestyle, plaque accumulates on teeth which directly affects the gingival health.[9]

Regarding the self-perception of the oral health, QoL was found to be significantly associated with child self-perceived oral health.

The dynamics between the oral and general health had been denied by maximum (28.6%) students in this study. In contrast to findings of this study, maximum children did not responded to the relation of general and oral health in the study conducted by Barbosa *et al.*[11]

This could be due to lack of awareness among the students as well as their families, which could relate the significance of general health with oral health and also shows the lack of awareness programs among the people who could mark a remarkable relation of general health to oral health among the people.

However, one of the limitations of the study was that the comparison between the OHRQoL of school going children between urban and rural was not assessed. Hence, further studies can be done regarding this.

To conclude, poor oral health can profoundly impact on the QoL. Children who suffer from dental pain, dental abscess, gum disease and damaged teeth may become distress. Subsequently, this may lead to negative impacts on their social, functional and psychological well-being. Thus, it is important to improve the oral health of the children.[12]

Conclusion

The present study indicated that the presence of substantial levels of gingival inflammation might be negatively related with how children perceive their oral health and daily life. Indices of COHRQoL used together with normative indicators might be used to improve dental services planning.

The current data of the study had proved as an eye opener that still the people are not much aware about their oral hygiene, which directly or indirectly affects their life style as well as hinder their daily activities. It is a high alerting alarm to make them aware of it and clear the relation and concept of general health with oral health. The beginning should be the school going students as they are the emerging buds of the upcoming population.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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Conflict of interest

There is no conflict of interest.

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