

## Prevalence Of Gingivitis And Periodontal Diseases In Children Aged Between 6-12 Years

Research Article

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## Abstract

Gingivitis is the inflammation of soft tissues without the migration or movement of the junctional epithelium in an apical direction. Characteristics of the conditions include redness, edema and bleeding gums. Gingivitis on prolonged duration leads to the formation of periodontitis. Several epidemiological studies on gingivitis and periodontitis has been conducted in various parts of India by dental professional. These epidemiological studies are helpful in planning and implementation of oral health programs. Moreover assessments of gingivitis and periodontitis in early stage will reduce the chance of tooth loss. Therefore, the aim of the study was to determine the prevalence of gingivitis and periodontal diseases among children aged between 6-12 years paediatric population. It was a retrospective study. Case sheets of 1596 pediatric patients reported to the Institution were reviewed. Information on the patient's age, gender, periodontal findings were collected from the electronic system in the college. The data are collected via the electronic database and compiled in an excel sheet. Incomplete or repeated patient records were excluded from the study. Descriptive and inferential (Chi-square test) were done. Mean age group of participants was 9.5 years. Out of 1596 patients, 1590 were diagnosed with gingivitis and 6 were diagnosed with periodontitis. In this study, we observed that the majority of patients were 10 years (19.4%) and the least predominant age group was 6 years (4.6%). Gingivitis was most common in 10 years, while periodontitis was seen most commonly in 11 years of age. Males (57.8%) have a higher predilection to periodontal diseases than female (42.2%) subjects. Association of the age and gender to gingivitis was found to be statistically non-significant. No significant association was seen between age and gender to periodontitis. We can conclude that gingivitis was more common than periodontitis. Gingivitis was most commonly diagnosed in the age group of 10 years and periodontitis was most commonly seen in 11 years of age. Age and gender has no prevalence on gingivitis and periodontitis.

**Keywords:** Age; Gender; Gingivitis; Periodontitis; Prevalence.

## Introduction

Gingivitis is defined as bleeding of gums in at least one site of the tooth, which is the mildest form of gingivitis and most commonly diagnosed oral health problem. [1, 2] Also, known as reversible dental plaque induced inflammation of the gingiva without clinical loss of attachment or increased bone loss. [3, 4] Gingivitis is of various types such as chronic gingivitis, which may or may not be plaque induced, drug-related, steroid hormone related,

pregnancy gingivitis, etc. The most common type is the chronic gingivitis [5-7].

Gingivitis is a multifactorial etiology, which has been a result of many factors acting together. Most of the factors involved are bacterial biofilm, genetic, socioeconomic, iatrogenic, demographic and behavioral factors. [8-10] The most common factor is accumulation of plaque on the tooth surface, which further leads to inflammatory reaction causing redness, bleeding on probing, edema and sometimes pain. It is seen that gingivitis is the first

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step to gingival diseases in children, adolescents or adults leading to the formation of periodontitis [11, 12].

Periodontitis affects the supporting dental structures, starting with the gingiva to the alveolar bone. [13, 14] This is known to be caused by complex communities of bacteria which are grown on the tooth surface leading to the destruction of the tooth. Periodontitis is an inflammatory response which is explicit leading to the tissue destruction [15, 16].

Periodontitis is known to be caused by pathological microorganism on the tooth surface which is accumulated due to poor oral hygiene. [17-19] It is known to develop when there is an increase in the number of gram negative bacteria and anaerobes. [20, 21] The species responsible for the periodontitis formation is Aggregatibacter, P. gingivalis, T. Denticola and other fungi and viruses such as candida albicans, or herpes are also seen to be a part of formation of gingivitis or periodontal disease. [22, 23] It is known to premature loss of tooth and leads to affecting the quality of life. Just as gingivitis is classified, periodontitis as well is classified into acute and chronic localized or generalized [24, 25]. Previously our team has a rich experience in working on various research projects across multiple disciplines [26-28, 3, 10, 29-38].

The aim of the study was to study the prevalence of gingivitis and periodontal diseases in children aged between age 6-12 years. The need for the study was aiming for preventive programs to improve the gingival and oral health, ensuring happy and healthy smiles in children.

## Material And Method

### Study Design

This study is a university setting study conducted in Saveetha Dental college, predominantly. Prof of the study include digital data. Ethical approval to utilize the case record was obtained from the institutional Ethical committee (ICE) of a private dental college,

Chennai, India - SDC/SIHEC/2020/DIASDATA/0619-0320. Two examiners were involved. All Patients below 18 years of age were included in the study. Patients above 18 years and those with mental or physical disability were excluded from the study.

### Sampling

It is a retrospective study, data collected from June 2019- April 2020. A total of 1596 case sheets were reviewed. Cross verification of data for error was done by presence of additional reviewers and by photographic evaluation. Consecutive sampling done to minimise sampling bias. It was generalized to patients below 18 yrs reported to the Institution.

### Data collection

Data on the patient's age group, periodontal findings, Gender were collected from an electronic system in the college. Data was entered in Excel in a methodical manner and imported in spss software. Incomplete or repeated patient records were excluded from the study. Analytics: IBM spss 2.0 software was used for data analysis. Independent variables included in the study were Age, Gender of the subject. Dependent variables included are the patient's periodontal findings. Descriptive statistics include frequency of distribution of patient's age, gender.

## Result And Discussion

Mean age group of the participants in the study was 9.5 years. Frequency distribution of the patients was done by the age groups, where the most common age group was 10 years (19.4%), followed by 11 years (17.6%). The least common age group was 6 years (4.6%). - [Figure 1]. Frequency distribution of the patients was done by gender, where the most common gender was males (57.8%) more than female subjects. (42.2%) - [Figure 2]. Gingivitis (99.6%) was found to be more common in 10 years, and prevalence of periodontitis was most common in 11 years (0.4%) among the subjects - [Figure 3]

Figure 1. Bar graph represents the age group of patients with periodontal disease. X-axis represents the age of the patient and Y-axis represents the percentage of patients with periodontal disease. Children at the age of 10 years (Yellow) had more periodontal disease compared to other age groups.

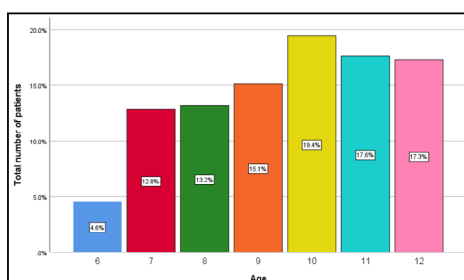
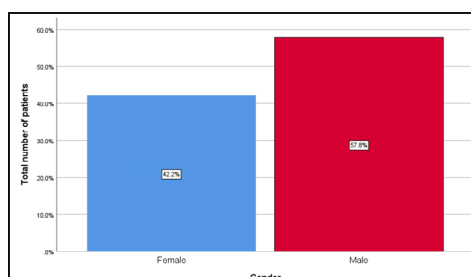


Figure 2. Bar graph represents the gender of patients with periodontal disease. X-axis represents the gender of the patient and Y-axis represents the percentage of patients with periodontal disease. Male (Red) children had more periodontal disease compared to female (Blue) children.



Association was done between the age of the patient and gingivitis, which was found to be statistically non-significant. ( $p=0.329$ ), proving there was no association between age and gingivitis. [Figure 4] Association was done between the gender of the patient and gingivitis, which was found to be statistically non-significant. ( $p=0.132$ ), proving there was no association between the gender and gingivitis. [Figure 5]

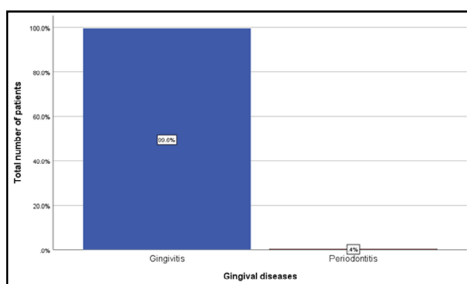
Association was done between the age of the patient and periodontitis, which was found to be statistically non-significant. ( $p=0.329$ ), proving there was no association between age and periodontitis. [Figure 6] Association was done between the gender of the patient and periodontitis, which was found to be statistically non-significant. ( $p=0.132$ ), proving there was no association be-

tween the gender and gingivitis. [Figure 7]

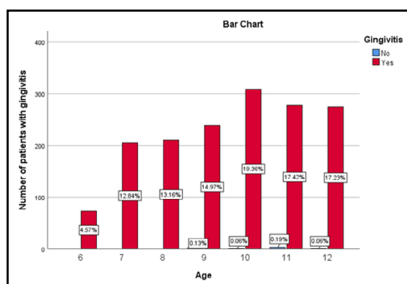
Oral health is essential for general health and well being throughout life and is known as a marker for the overall health status of the child. In our study we observed that out of 1596 children, 1590 were diagnosed with gingivitis and the other 6 were diagnosed with periodontitis.

Unlike the studies reported by Chauhan et.al, it was diagnosed that increased cases of healthy gingiva were present than gingivitis. It was higher when compared to Gaengler et.al, [39] and LeRoy [40], where it was diagnosed that almost 99.4% of the children population was diagnosed with the gingivitis, whereas Hago-san and Levoy reported that gingival cases were diagnosed as 59% and 84.3% respectively. Studies reported by Xiao et.al, [41] and

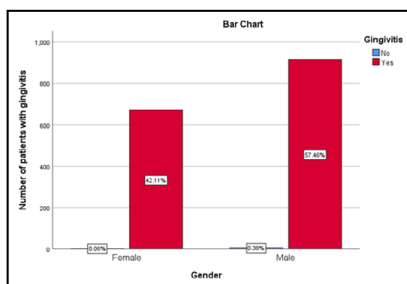
**Figure 3.** Bar graph represents the frequency of patients with periodontal diseases. X-axis represents the gingival diseases and Y-axis represents the total number of patients. Commonest periodontal disease among children was gingivitis (Blue) compared to periodontitis (Red).



**Figure 4.** Bar graph represents the association of the age of patients to gingivitis. X-axis represents the age of the patient and Y-axis represents the number of patients with gingivitis. No gingivitis (Blue), gingivitis (Red). Chi-square test was done and association was found to be statistically non-significant (Pearson's chi-square test,  $p=0.329$  ( $p>0.05$ ), proving that there was no association between the age and gingivitis.



**Figure 5.** Bar graph represents the association of the gender of patients to gingivitis. X-axis represents the gender of the patient and Y-axis represents the number of patients with gingivitis. No gingivitis (Blue), gingivitis (Red). Chi-square test was done and association was found to be statistically non-significant (Pearson's chi-square test,  $p=0.132$  ( $p>0.05$ ), proving that there was no association between the gender and gingivitis.



**Figure 6.** Bar graph represents the association of the age of patients to periodontitis. X-axis represents the age of the patient and Y-axis represents the number of patients with periodontitis. No periodontitis (Blue), Periodontitis (Red). Chi-square test was done and association was found to be statistically non-significant (Pearson's chi-square test,  $p=0.329$  ( $p>0.05$ ), proving that there was no association between the age and periodontitis.

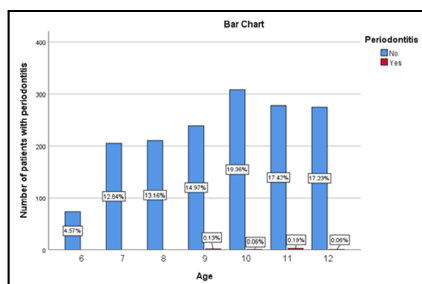
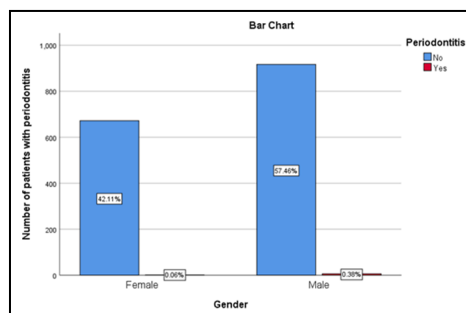


Figure 7. Bar graph represents the association of gender of the patients to periodontitis. X-axis represents the gender of the patient and Y-axis represents the number of patients with periodontitis. No periodontitis (Blue), Periodontitis (Red). Chi-square test was done and association was found to be statistically non-significant (Pearson's chi-square test,  $p = 0.132$  ( $p > 0.005$ ), proving that there was no association between the gender and periodontitis.



Bhavya et.al, [42] reported that 100% of the population were diagnosed with gingival diseases, which were the highest compared to all other findings.

The high prevalence was attributed towards the oral hygiene of the tooth, the sexes at different ages in them. Furthermore, high prevalence diseases of the gingiva and periodontitis (40.2%) to 10-12 years old and the least prevalence was seen in 6-7 (14.5%) When gingival index was considered 81% of the population examined had gingivitis out of which 65% had moderate gingivitis and 15% mild gingivitis. In contrast to our results Vineeth et al [43], who did the study on school going children of rural areas of India using Loe and Silness index, have reported 84.37% overall prevalence which is high. Similar high prevalence was seen in studies of Pandit et.al, [44] that the gingival status of school going children in different parts of India. According to the present study, the females were higher in diagnosis for gingival diseases than males. Although in most countries sex difference was greater. Our institution is passionate about high quality evidence based research and has excelled in various fields [45-55].

The factors could be that women could be more careful about their health than male or maybe the lower oral health maintenance [23, 56]. The limitations of the study included poor socioeconomic status, poor oral hygiene, single center study and poor material education. Future studies acknowledge the risk factors, educate the dental students, early diagnosis and keep motivating patients for better oral hygiene.

## Conclusion

Within the limits of the study, we can conclude that the prevalence of gingivitis was most common in 10 years, while periodontitis was most common in 11 years. However, there was no statistical significance between the age and gender to gingivitis and periodontitis.

## Authors Contributions

First author (Palak Mayur Shah) performed the analysis, and interpretation and wrote the manuscript. Second author (Dr. Ganesh Jeevanadan) contributed to conception, data design, analysis, interpretation and critically revised the manuscript. Third author (Dr. Manjari Chaudhary) participated in the study and revised the manuscript. All the three authors have discussed the results and contributed to the final manuscript.

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