

# Prevalence of Gingivitis and Periodontitis amongst School Children: A Cross Sectional Study

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**Abstract** Gingivitis and periodontitis usually a common problem in school children in rural area especially from lower socioeconomic back ground. The aim of this study was to ascertain the prevalence of gingivitis and periodontitis among the school going children in a rural area of Nepal. This was a cross-sectional study done amongst 542 school going children of age 5 to 16 at Shree Nispakshya secondary school at Kaski district of Nepal. Out of 542 school going children, 117 children were in 5-7 years age group, 132 children were in 8- 10 years age group, 158 children were 11-13 years age group and 135 children were in the age group of 14-16 years, respectively. The gingival index, given by Loe & Silness was used for recording the severity of gingivitis and for periodontal disease, index given by Ramfjord was used for evaluation. The prevalence of gingivitis and periodontitis were 57.01% and 14.02%, respectively. The younger age group children had comparatively lesser percentage of gingivitis and periodontitis than older age group children.

**Keywords:** *Gingivitis, Periodontitis, School Children*

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## 1. Introduction

Many epidemiological studies have been conducted from time to time by dental professionals amongst school children regarding periodontal diseases in different parts of Nepal. These epidemiological studies are helpful in planning and implementing oral health programs. This would help the nation in combating these diseases. Periodontal diseases including gingivitis and periodontitis are serious infection that if left untreated can lead to tooth loss [1]. Gingivitis is reversible with appropriate treatment and good oral care at home, whereas periodontitis is irreversible as this progress with destruction of bone. Untreated gingivitis can advance to periodontitis. Hence if gingivitis and periodontitis are assessed in an early stage it would minimize the chance of tooth loss. The aim of this study was to assess the prevalence of gingivitis and periodontitis and evaluating the pattern of these diseases in different age groups amongst school children in rural area of Kaski district of Nepal.

## 2. Materials and Methods

This cross-sectional study was conducted from December 2012 & April 2013. in Kaski district of Nepal. 542 school children of Shree Nispakshya Secondary School of Kaski district of Nepal were examined. Written permission was obtained from the school authorities.

Children who were permanent resident of Kaski district and were available on day of examination have been included in the study. Children were examined in their school on pre-decided dates. The examination was carried out in broad day-light. Children were seated on a chair in upright position. Intraoral examination was made using mouth mirror and UNC-15 probe. Instruments were disinfected with an antiseptic solution after every use and proper aseptic measures were undertaken between the examinations. The gingival index, given by Loe and Silness [2] was used for recording the severity of gingivitis. Periodontal disease index, given by Ramfjord [3] was used for evaluating periodontitis. Gingival index, given by Loe and Silness measures severity of gingivitis on a scale ranging from 0.1 to 3.0 (0.1-1.0: mild gingivitis, 1.1- 2.0: moderate gingivitis, and 2.1-3.0: severe gingivitis). Periodontal component of periodontal disease index, given by Ramfjord measures severity of periodontitis on a scale ranging from 4 to 6 (4: gingival crevicular depth from CEJ is up to 3 mm, 5: gingival crevicular depth from CEJ is 3-6 mm, and 6: gingival crevicular depth from CEJ is more than 6 mm).

**Sample size calculation:** In a pilot study done prior to the study with 100 subjects showed expected percentage of the gingivitis was 57%. The required sample size was 377, for precision= 5 % and desired confidence level 95% [4].

### 3. Results

Total 542 school children were examined in this study, out of them 117 children belonged to the age group 5-7 years, 132, 158 & 135 children to the age group 8-10 years, 11-13 years and 14-16 years, respectively [Table 1].

**Table 1. Demographic Data According to Age**

Age groups in Years	No. of children
5-7	117
8-10	132
11-13	158
14-16	135
Total	542

The overall prevalence of gingivitis [Table 2] was 57.01% (mild gingivitis: 47.23%, moderate gingivitis:

6.09% and severe gingivitis: 3.70%). In 5-7 years old, gingivitis prevalence was 49.57% (mild gingivitis: 41.88%, moderate gingivitis: 5.98% and severe gingivitis: 1.70%). In 8-10 years old, gingivitis prevalence was 56.06% (mild gingivitis: 48.48%, moderate gingivitis: 4.54% & severe gingivitis: 3.02%). In 11-13 years old, gingivitis prevalence was 68.98% (mild gingivitis: 57.60%, moderate gingivitis: 6.96% and severe gingivitis: 4.43%). In 14-16 years old, gingivitis prevalence was 50.37% (mild gingivitis: 38.52%, moderate gingivitis: 6.66% and severe gingivitis: 5.18%). The average healthy gingiva was 42.98% (50.13% in 5-7 years, 43.14% in 8-10 years, 31.02% in 11-13 years & 49.63% in 14-16 years age group).

**Table 2. Gingivitis According to Age Group**

Age Groups	Total No. Children	Normal	Affected	Mild Gingivitis	Moderate Gingivitis	Chronic Gingivitis
5-7	117	59(50.23%)	58(49.57%)	49(41.88%)	7(5.98%)	2(1.70%)
8-10	132	58(43.14%)	74(56.06%)	64(48.48%)	6(4.54%)	4(3.03%)
11-13	158	49(31.02%)	109(68.98%)	91(57.60%)	11(6.96%)	7(4.43%)
14-16	135	67(49.63%)	68(50.37%)	52(38.52%)	9(6.66%)	7(5.18%)
Total	542	233(42.98%)	309(57.01%)	256(47.23%)	33(6.09%)	20(3.70%)

The total prevalence of periodontitis [Table 3] was 14.12% (10.7% had score 4, 1.85% had score 5 & 1.30% had score 6). In 5-7 years old, prevalence of periodontitis was 1.7% (0.85% had score 4, 0.85% had score 5 & 0% had score 6). In 8-10 years old, prevalence of periodontitis was 3.03% (2.30% had score 4, 0.76% had score 5 &

0.76% had score 6). In 11-13 years old, prevalence of periodontitis was 24.05% (17.72% had score 4, 3.16% had score 5 & 1.90% had score 6). prevalence of periodontitis was 23.70% (19.30% had score 4, 2.22% had score 5 & 2.22 had score 6).

**Table 3. Periodontitis According to Age Group**

Age group in Years	Total No children	Normal	Affected	PDI score		
				4	5	6
5-7	117	115(98.23%)	2(1.7%)	1(0.85%)	1(0.85%)	0
8-10	132	128(96.97%)	4(3.03%)	3(2.30%)	1(0.76%)	1(0.76%)
11-13	158	120(75.94%)	38(24.05%)	28(17.72%)	5(3.16%)	3(1.90%)
14-16	135	103(76.30%)	32(23.70%)	26(19.30%)	3(2.22%)	3(2.22%)
Total	542	466(85.98%)	76(14.02%)	58(10.7%)	10(1.85%)	7(1.30%)

\*PDI: - Periodontal disease index.

### 4. Discussion

Studies on gingivitis have been conducted in many parts of the world on different ethical and cultural background, but periodic evaluation of data is very much required [5]. Majority of the students examined in our study used tooth brush and paste to clean their teeth, some used finger or neem stick as a method of cleansing. School children were selected in this study as they were available easily as a group [6]. The gingival index, given by Loe and Silness [2] was used to assess the severity of gingivitis. The prevalence of gingivitis and periodontitis percentage ratio varies world wide in different places but overall gingivitis was 77.52% with increase with age observed Jose et al [7] in 2003. Kumar et al [8] in 2005 and Dhar et al [9] in 2007. The prevalence of gingivitis and periodontitis was 57.01% and 14.02% seen in our study but this prevalence ratio is similar to other studies only percentage ratio varies. The overall incidence of gingivitis and periodontitis is increased with age. In case of children and adolescents gingivitis was seen in pubertal age group of 11 – 13 years mainly in the girls because of the hormonal changes. Juvenile periodontitis was also seen in this age group.

School dental health programs and dental camps at school level are necessary in this region. Dental Camps should be conducted at regular intervals, because children in this region especially from rural area do not have access to standard dental care and treatment. School children do not know much about dental diseases, methods of dental care and prevention and to maintain proper oral hygiene. Therefore education and motivation of children is of paramount important in this region. Teachers and parents should be taught and encourage to emulate healthy life style habits in children. The more important aspect is management of dental fear which acts as a barrier to oral health care services. The behavioral child management technique along with preventive dentistry should be a fundamental part of school dental health programs.

### 5. Conclusion

The overall prevalence of gingivitis and periodontitis were 57.01% and 14.02%, respectively among schools children of 5 to 16 years of age in Kaski district of Nepal. The older age group children had comparatively higher percentage of gingivitis and periodontitis than younger age group children. Prevalence of gingivitis and periodontitis needs immediate attention in the children.

Suitable oral health awareness program is required to improve oral hygiene status in rural areas of Nepal.

## Declaration of Conflicting Interests

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