

## Knowledge, Attitude and Practice of Oral Hygiene in Children of Eastern Nepal

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**Abstract:** Objectives: The objectives of the study were to study knowledge, attitude and practice of oral hygiene in the school children of eastern region of Nepal of age group 6-13 years. Methods and materials: The study was undertaken in the eastern region of Nepal with a sample population of 2,500 children in the age group of 6-13 years. A questionnaire which was formulated to assess knowledge, attitude and practices of oral hygiene was used. Silness and Loe Plaque index was used to record plaque scores. Results: It was found that 62.3% of the 10-13 years age group had plaque score of 3 (fair) and 37.7% had a plaque score of 4 (poor) as compared to 59.7% and 40.3% in the 6-9 years age group. The children aged 10-13 years had higher percentage of good oral hygiene compared to 6-9 years children. Conclusion: The present study concludes that in spite of good oral hygiene practices in children, their overall oral hygiene status was found to be poor. Upon investigating about the knowledge of how to maintain good oral hygiene, maximum number of children responded by brushing twice daily. This implicates that knowledge without proper practice is lacking in children of eastern Nepal.

**Keywords:** Knowledge, Attitude, Oral hygiene, Plaque, Eastern Nepal.

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### I. Introduction

The oral cavity is a known reservoir for pathogens to grow and thrive. Oral diseases such as gingivitis, halitosis and plaque formation are some of the consequences of poor oral hygiene. Determinants of the diseases have as the complex chain of environmental and behavioral events<sup>1</sup> such as, oral health behavior, oral hygiene level, dietary habits<sup>2</sup>, and are shaped by broader socioeconomic and socio-demographic condition.<sup>1</sup> The most of the common dental disease can be controlled only if the individual patient exercises a considerable measure of initiative and responsibility.

Dental caries prevalence is directly proportional to habits and habitat of the population that is multi-factorial in nature, in the hands of the individuals to eradicate with a healthy dietary and oral hygiene practices. It is also influenced by the socio-economic status and affected by the cultural variation.<sup>3</sup> Mutans streptococcus multiplies more in the fermented carbohydrate substrate<sup>4</sup>.

It is well established fact that diet and oral hygiene habits are inter-related and influenced by income, education and social environment. Hunt (1990)<sup>5</sup> had shown convincingly that in westernized industrialized countries people whose socio-economic status is low tend to have more carious lesion than do people with high socio-economic status.

Children comprises of 38% of the total population of Nepal. Negligence of the oral health leads to the impairment of esthetics and functional discrepancies. The burning problem of the nation regarding health concern, priority wise infectious diseases, malnutrition and maternal and child mortality is followed by oral diseases.<sup>6</sup>

Scanty information is available concerning oral hygiene status of children on a national & district level in the eastern development region. This prompted us to undertake present study with an aim of establishing the data for knowledge, attitude, and practice of oral health habits in children of eastern development region.

#### Subjects and Methods:

Eastern development region of Nepal comprises of sixteen districts of which seven districts are in the foothills of the Himalayas and comprises of >80% of the population and nine in the hill region<sup>7</sup>. Due to presence of larger population in the Terai region, four districts from Terai and one district from hill region was selected randomly. Proportionate stratified simple random sampling technique was used to select children.

A total of 2500 children aged 6-13 years comprised of the study population. The children were selected from one government school and one private school from each of the five districts selected for the study. Before the study started, no school based oral health education existed.

The sample size was calculated using the formula  $N = z^2 p * q / d^2$

Where,

N=sample size

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Z= tabulated value

P= prevalence of disease in Eastern Developmental Region according to previous study (25%= 0.25)

Therefore Q= 1-p= 0.75

L<sup>2</sup> = estimating error.

Before the commencement of the study, an informed consent from the principal of the school as well as the parents of the students participating in the study was obtained.

A questionnaire survey was conducted for children aged 6-13 years to evaluate oral hygiene practices. Oral hygiene status was recorded using plaque index. All examinations were carried out in the school courtyard or in a well-lit classroom. Recording of data was done by a trained person who assisted throughout the study. Prior to the examination for plaque, a questionnaire was filled by the subject to find out the personal data and oral hygiene habits. The children were examined by a single examiner who was trained to record the WHO oral health assessment form to avoid inter-examiner variations.

Plaque was assessed using Silness and Loe Plaque index. Plaque index was graded on a numeric scale from 0 to 3, depending on the severity and extent of the deposits. The Plaque index values are categorized as follows:-

0	EXCELLENT	1	
0.1-0.9	GOOD	2	
1.0-1.9	FAIR		3
2.0-3.0	POOR		4

The six surfaces selected for assessment are as follows:-

1. Buccal of maxillary right first permanent molar (i.e. 16)
2. Labial of maxillary right lateral incisor (primary or permanent) (i.e. 52/12)
3. Buccal of maxillary left first premolar or first primary molar (i.e. 24/64)
4. Lingual of mandibular left first permanent molar (i.e. 36)
5. Lingual of mandibular left lateral incisor (primary or permanent) (i.e. 72/32)
6. Lingual of mandibular right first premolar or first primary molar (i.e. 44/84)

Missing teeth are not substituted. The surface of the tooth is given a score of 0 to 3 and scores from selected surfaces of the teeth are added and divided by the number of teeth examined to derive the plaque index for the individual.

### Results

A study of knowledge, attitude and practice of oral hygiene in 2,500 children aged 6-13 years was conducted in the Eastern Developmental Region of Nepal. The data was analyzed using the statistical package SPSS version 11.5. The Pearson  $\chi^2$  test was used for statistical analysis of data.

Table 1 illustrates the oral hygiene status indicated through plaque score of 2,500 children in the age group of 6-9 and 10-13 years respectively and was found that 62.3% of the 10-13 years age group had plaque score of 3 (fair) and 37.7% had a plaque score of 4 (poor) as compared to 59.7% and 40.3% in the 6-9 years age group.

Question enquiry had been made to evaluate the knowledge regarding oral hygiene practices, knowledge of fluorides and use of mouth washes, food habits and dental visit.

### Frequency of tooth brushing, time of tooth brushing and material used for brushing.

Tables 2, 3 and 4 highlights frequency of brushing once/twice/thrice; timing of tooth brushing i.e. before meals/after meals/at morning and night; material used for brushing in male and female distribution and was found that 68.1% in the 6-9 years age group and 58.75% in the 10-13 years age group brushed twice daily of which 59.6% and 54.5% brushed in the morning and at night of which 84.7% and 84.1% used paste in the age groups of 6-9 and 10-13 years respectively.

### Knowledge about fluoride and use of mouthwashes.

Tables 5 and 6 depicts the children's knowledge about fluorides yes/no and whether they have used mouth washes sometimes/never in male and female distribution in the age groups of 6-9 and 10-13 years age group respectively. Around 1108 (100%) in the age group of 6-9 years age group had no knowledge of fluoride and 1382 (99.3%) in the age group of 10-13 years did not know about fluoride whereas only 10 (.7%) knew about fluoride and around 83.4% in the age group of 6-9 years and 83.8% in the age group of 10-13 years did not use mouthwashes.

### Frequency of food intake, mouth rinsing habit after meals, frequency of snacking and type of snacks consumed.

Tables 7, 8, 9 & 10 illustrate the frequency of food intake (once/twice/thrice/four times), mouth rinsing habits (yes/no/sometimes), frequency of snacking (once/twice/thrice/four times) by the children in the age group of 6-9

and 10-13 years respectively. The most frequently used snacks was bread/chips (including biscuits) which was consumed by 539 males and 424 females, pre-cooked noodles was consumed by 494 males and 409 females, whereas sweets (including chocolates) was consumed by 199 males and 218 females and only 44 males and 71 females consumed other type of snacks like beaten rice etc.

#### **Dental visit and reason for visit to dentist.**

Out of 2,500 children assessed, 385 males and 331 females had visited dentist whereas 953 males and 385 females had never been to a dentist. [Table 11] 716 children had visited dentist for various reasons like extraction (297 males, 288 females), scaling (19 males, 14 females), restorations (49 males, 15 females) and others like consultation (20 males, 14 females). [Table 12]

#### **How to maintain good oral health.**

Out of 2,500 children assessed, 2,478 (1325 males, 1153 females) responded that to maintain good oral health they would brush twice daily, only 8 (5 males, 3 females) children said that they would visit dentist regularly and 14 (8 males, 6 females) said that they would reduce the intake of food. [Table 13]

## **II. Discussion**

The Silness and Løe plaque index has been widely used to evaluate the level of oral cleanliness in epidemiological studies<sup>8</sup>. Silness and Løe plaque index is easy to use since the criteria are objective, the examinations can be carried out quickly and a high level of reproducibility is possible with minimum training. For these reasons Silness and Løe plaque index was chosen for this study.

With the trend towards increasing prevalence and severity of dental caries and a concern for the periodontal health of young adults, information concerning the oral hygiene status of young children would assist in the development of oral health policies, strategic plans, monitoring and surveillance systems for oral health.<sup>9</sup> The overall oral hygiene status of 2,500 children examined was poor which was in concurrence with the findings of Almedia et al<sup>10</sup>.

In both the age group of 6-9 and 10-13 years, oral hygiene status was evaluated by plaque score. In the present study, plaque score of 3 in 6-9 years is 59.7% and 40.3% had plaque score of 4 whereas in 10-13 years age group 62.3% had plaque score of 3 and 37.7% had plaque score of 4 shows that 10-13 years had higher percentage of good oral hygiene compared to 6-9 years children. These findings concur with the study by Kumar P et al.<sup>11</sup> where 80% of children had good oral hygiene and only 20% had poor oral hygiene. Rao<sup>12</sup> found that oral health status of children in the urban school was better than those in rural school and these observations made, coincides with the present study. Thomas et al<sup>13</sup> found that the plaque scores were high in children before dental health education which was similar to the findings of this study. Al-Banyan et al<sup>14</sup> found prevalence of gingivitis in 100% of the children which indicated presence of poor oral hygiene in children. Babu, MS Minor et al<sup>15</sup> also found that oral hygiene status was poor among rural school children than urban school children.

In 6-9 years age group majority of children i.e. 68.1% brushed twice daily whereas in 10-13 years age group 58.7% brushed twice daily showing good oral hygiene practices in children. These findings are in accordance with the findings of Kerstin Westbacke<sup>16</sup>.

The time of tooth brushing as followed by 6-9 years age group mainly consisted of 59.6% children who brushed in the morning and night before sleeping was compared to 54.5% of children of 10-13 years age group and these findings concur with the findings of Kerstin Westbacke<sup>16</sup> and Kuriakose and Joseph<sup>17</sup>.

In the age group of 6-9 years majority of children i.e. 47.6% had snacks once daily whereas in 10-13 years age group 36.3% had snacks once daily and 36.1% had snacks twice daily. The most frequently used snacks for the 6-9 years old was pre-cooked noodles (42%) followed by bread/chips (35.2%), sweets (15.3%) and home-made snacks (7.8%) whereas in 10-13 years old 41.2% consumed bread/chips followed by pre-cooked noodles (31.5%), sweets (17.8%) and rest had home-made snacks (9.5%). These results concur with the study by Kerstin Westbacke<sup>16</sup>.

In the present study only 27.6% had visited dentist and 72.4% had not visited any dentist in 6-9 years age group as compared to 29.5% who visited dentist and 70.5% who did not in the 10-13 years age group. In concurrence with the present study, Addo-Yobo et al.,<sup>18</sup> reported 90% of children who had not visited the dentist. In contrast to these observations, Weirzbicka et al.,<sup>19</sup> found that in 6 and 12 years children examined, 71% of children had seen a dentist within one year, 20% had seen a dentist 1-2 years ago, 3% had visited a dentist more than 2 years ago and 8% had never visited a dentist.

**Table 1. Oral Hygiene Status according to Plaque Score.**

Age group	Plaque score	
	3	4
6-9	662 59.7%	446 40.3%
10-13	867 62.3%	525 37.7%

**Table 2. Frequency of tooth brushing.**

	Q1				Total
	a	b	c	d	
6-9	318 28.7%	754 68.1%	24 2.2%	12 1.1%	1108 100.0%
10-13	516 37.1%	817 58.7%	29 2.1%	30 2.2%	1392 100.0%
Total	834 33.4%	1571 62.8%	53 2.1%	42 1.7%	2500 100.0%

**Table 3. Time of tooth brushing.**

	Q2					Total
		after each meal	After meals	BEFORE MEALS	in the morning & night	
group age 6-9	12 1.1%	118 10.6%	7 .6%	311 28.1%	660 59.6%	1108 100.0%
10-13	30 2.2%	88 6.3%	42 3.0%	474 34.1%	758 54.5%	1392 100.0%
Total	42 1.7%	206 8.2%	49 2.0%	785 31.4%	1418 56.7%	2500 100.0%

**Table 4. Material used for brushing.**

	Q3					Total	
		neem stick	others	paste	tooth powder		
group age 6-9	Count	9	39	3	938	119	1108
	% within group age	.8%	3.5%	.3%	84.7%	10.7%	100.0%
10-13	Count	27	27	5	1171	162	1392
	% within group age	1.9%	1.9%	.4%	84.1%	11.6%	100.0%
Total	Count	36	66	8	2109	281	2500
	% within group age	1.4%	2.6%	.3%	84.4%	11.2%	100.0%

**Table 5. Knowledge of fluoride.**

	Q5		Total	
	No	Yes		
group age 6-9	Count	1108	0	1108
	% within group age	100.0%	.0%	100.0%
10-13	Count	1382	10	1392
	% within group age	99.3%	.7%	100.0%
Total	Count	2490	10	2500
	% within group age	99.6%	.4%	100.0%

**Table 6. Use of mouthwashes**

			Q9			Total
			never	No	Yes	
group age	6-9	Count	176	924	8	1108
		% within group age	15.9%	83.4%	.7%	100.0%
	10-13	Count	224	1166	2	1392
		% within group age	16.1%	83.8%	.1%	100.0%
Total		Count	400	2090	10	2500
		% within group age	16.0%	83.6%	.4%	100.0%

**Table 7. Frequency of food intake.**

			Q7			Total
			f our times	thrice	twice	
group age	6-9	Count	110	946	52	1108
		% within group age	9.9%	85.4%	4.7%	100.0%
	10-13	Count	178	998	216	1392
		% within group age	12.8%	71.7%	15.5%	100.0%
Total		Count	288	1944	268	2500
		% within group age	11.5%	77.8%	10.7%	100.0%

**Table 8. Mouth rinsing after meals.**

			Q8			Total
			no	sometimes	yes	
group age	6-9	Count	106	63	939	1108
		% within group age	9.6%	5.7%	84.7%	100.0%
	10-13	Count	85	70	1237	1392
		% within group age	6.1%	5.0%	88.9%	100.0%
Total		Count	191	133	2176	2500
		% within group age	7.6%	5.3%	87.0%	100.0%

**Table 9. Frequency of snacking.**

			Q10				Total
			f our times	once	thrice	twice	
group age	6-9	Count	29	322	230	527	1108
		% within group age	2.6%	29.1%	20.8%	47.6%	100.0%
	10-13	Count	38	505	346	503	1392
		% within group age	2.7%	36.3%	24.9%	36.1%	100.0%
Total		Count	67	827	576	1030	2500
		% within group age	2.7%	33.1%	23.0%	41.2%	100.0%

**Table 10. Type of snacks consumed.**

			Q11					Total
			bread/chips	noodles	others	pre cook noodles	sweets	
group age	6-9	Count	390	50	34	465	169	1108
		% within group age	35.2%	4.5%	3.1%	42.0%	15.3%	100.0%
	10-13	Count	573	52	81	438	248	1392
		% within group age	41.2%	3.7%	5.8%	31.5%	17.8%	100.0%
Total		Count	963	102	115	903	417	2500
		% within group age	38.5%	4.1%	4.6%	36.1%	16.7%	100.0%

**Table 11. Dental visit.**

			Q12		Total
			No	Yes	
group age	6-9	Count	802	306	1108
		% within group age	72.4%	27.6%	100.0%
	10-13	Count	982	410	1392
		% within group age	70.5%	29.5%	100.0%
Total		Count	1784	716	2500
		% within group age	71.4%	28.6%	100.0%

**Table 12. Reason for visit to dentist.**

			Q13				Total	
			extraction	filling	others	scaling		
group age	6-9	Count	802	248	29	9	20	1108
		% within group age	72.4%	22.4%	2.6%	.8%	1.8%	100.0%
	10-13	Count	982	337	35	25	13	1392
		% within group age	70.5%	24.2%	2.5%	1.8%	.9%	100.0%
Total		Count	1784	585	64	34	33	2500
		% within group age	71.4%	23.4%	2.6%	1.4%	1.3%	100.0%

**Table 13. What would you do to keep good oral health?**

			Q18			Total
			brush twice daily	eat less	visit dentist	
group age	6-9	Count	1093	7	8	1108
		% within group age	98.6%	.6%	.7%	100.0%
	10-13	Count	1385	7	0	1392
		% within group age	99.5%	.5%	.0%	100.0%
Total		Count	2478	14	8	2500
		% within group age	99.1%	.6%	.3%	100.0%

### III. Conclusion

Nepal today is faced with a series of problems regarding the oral health of the population. An attempt was made to evaluate the knowledge, attitude and practice of oral hygiene in 2500 children by recording plaque scores and questionnaire. When asked about how to maintain good oral health, majority of children responded that they would brush twice daily to maintain good oral health. The present study concludes that in spite of good oral hygiene practices in children, their overall oral hygiene status was found to be poor indicating a need for community based oral health intervention programs.

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