

# Pattern and Severity of Early Childhood Caries and its Association with Feeding Habits in Children

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## ABSTRACT

**Introduction:** Early childhood caries, seen in infants and young children, is an infectious, multifactorial disease that is also caused by feeding practices like: bedtime bottle feeding, “at will” breastfeeding, and frequent intake of sugary snacks and drinks. It has impact on quality of life, increases the risk of caries in the permanent dentition, and promotes inequalities in oral health.

**Objective:** To assess pattern and severity of early childhood caries and its association with feeding habits in children in Nepal.

**Materials and Method:** An analytical cross-sectional study was conducted from May to October 2021 using a structured questionnaire to determine the feeding habits of 200 children between two to six years of age. The WHO criteria were used to calculate dental caries and severity was established from the criteria given by American Academy of Pediatric Dentistry.

**Result:** Mean dmft was  $6 \pm 4.33$  and 110 (55%) children had severe early childhood caries. The caries severity increased significantly with age of child. Upper anterior teeth were the most affected while the lower anterior were least affected regions depicting a nursing caries pattern. The children who were breast-fed for more than one year (157, 78.5%) had a significantly higher mean dmft in the upper anterior region which suggests a nursing bottle type pattern.

**Conclusion:** The present study revealed that more than half children under six years of age had S-ECC, and a positive significant association was noted in the duration of breastfeeding beyond one year of age to ECC in the upper anterior teeth region.

**Keywords:** Early childhood caries; feeding habits; pattern; primary teeth; severe early childhood caries.

## INTRODUCTION

Early childhood caries (ECC) remains significant public health problem. It was formerly referred as nursing bottle caries and baby bottle tooth decay indicating importance of feeding practices like bedtime feeding, “at will” breast feeding, and

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frequent and in-between meal snacking as important risk factor. Typical pattern of nursing bottle caries shows dental caries in maxillary anterior, posterior, and mandibular posterior teeth while sparing mandibular anterior teeth.<sup>1,2</sup> ECC is presence of  $\geq 1$  decayed (noncavitated or cavitated), missing (due to caries), or filled tooth surfaces in any primary tooth under six years.<sup>3</sup> Severe early childhood caries (S-ECC) is smooth-surface caries in  $< 3$  years child, and from ages 3-5 years,  $\geq 1$  cavitated, missing (due to caries), or filled smooth surfaces in primary maxillary anterior teeth or decayed, missing, or filled score of  $\geq 4$  (age three),  $\geq 5$  (age four), or  $\geq 6$  (age five).<sup>3</sup>

Globally, 41% of children have ECC with prevalence up to 85% reported in developing countries, improper breastfeeding and bottle-feeding habits being major risk factors for ECC and S-ECC.<sup>4,5</sup>

There is paucity of studies in pre-school children regarding ECC and S-ECC in Nepal. Therefore present study aimed to assess pattern and severity of ECC and its association with feeding habits in children.

## **MATERIALS AND METHOD**

An analytical cross-sectional study was conducted on children aged between two to six years visiting the Department of Paediatric Dentistry, Kantipur Dental College, Kathmandu, Nepal for routine dental check up from May to October 2021. Ethical clearance was obtained from the institutional review committee (Ref. 28/020) of Kantipur Dental College before starting the study.

All healthy children between two to six years on their regular dental visit were included in the study. The exclusion criteria were children with missing teeth (due to dental caries/ traumatic injuries or physiologic exfoliation), craniofacial anomalies or syndromic children and those with systemic disorders such as respiratory disorders, neuromuscular, and cardiac disorders. Children with erupted permanent teeth or supernumerary teeth were also excluded. The sample size was calculated using the formula:  $n = z^2pq/d^2$  where  $z = 1.96$ ;  $d = 0.05$ ; and  $p = 0.85$ .<sup>4</sup> Hence,  $n = 1.96 \times 1.96 \times 0.85 \times 0.15 / (0.05 \times 0.05) = 195.9 \approx 200$ .

A letter of consent was obtained from the parents for the participation in the study. A structured questionnaire in English containing demographic information and data on feeding practices, adapted from the research of Barjatya et al.<sup>5</sup> was filled by the parents with assistance from the investigators when required. The questions included were - type, duration, and timing of feeding, introduction of solid food, regular meals, and snacking.

For the assessment of Early Childhood Caries and its Severity, the “dmft” index according to the WHO 1997 criteria was used. All primary teeth were examined by calibrated dentists and caries experience was recorded using the decayed, missing filled teeth (dmft) index where d indicates decayed tooth/surface, e indicates extraction, and f indicates filled tooth. S-ECC was marked according to the definition of American Academy of Paediatric Dentistry (AAPD)<sup>3</sup>- any sign of smooth-surface caries in a child younger than three years of age, and from ages three to up to six years, a dmft score  $\geq 4$  (age three years),  $\geq 5$  (age four years), or  $\geq 6$  (age five to six years). The children were categorised into the following groups: two to three years, three to four years, four to five years, and five to six years.

The data collected was coded, entered, and analysed using IBM SPSS Statistics for Windows, version 20 (IBM Corp., Armonk, N.Y., USA). Descriptive statistics - frequencies, percentages, mean and standard deviations were derived. Chi-square test and Pearson’s correlation with level of significance set at  $P < 0.05$  and  $P = 0.01$  respectively were used to analyse the recorded data.

## **RESULT**

A total of 200 children participated in the study who were distributed into four groups according to their age (Table 1). Most children were between the age of five to six years – 110 (55%) and very few children belonged to less than three years category. The male female ratio was 1.02:1 and the girls showed slightly more S-ECC as well as mean dmft compared to the boys, which was not statistically significant (Table 1). The mean dmft in the present study was  $6 \pm 4.33$  and 110 (55%) children presented with S-ECC, both increased significantly with the

age of the child. ( $P \leq 0.05$ ) (Table 1).

Table 2 depicts the distribution of dental caries in different teeth based on the age of the child. The highest score of 133 (11.07%) was seen in five- to six-year-old children in the lower second molars while lower scores of dmft between zero to three were observed in all the teeth of two- to three-year-old children.

Nursing bottle type of pattern was noticed where the most severely affected teeth were the upper anterior teeth (426, 35.47%) followed by lower (411, 34.22%) and upper posterior teeth (333, 27.72%) respectively. The lower anterior teeth were the least involved with only 31 (2.58%) and the highest dmft score was observed in the mandibular right second molar (116, 9.66%) (Table 3, Figure 1). On comparing the regions with each other, not much difference was observed between the same teeth on the right and left side. While a highly significant difference was seen in the distribution between the upper anterior, upper posterior, lower anterior and lower posterior region. ( $P \leq 0.01$ ) (Table 3, Figure 1). There was a highly significant difference in dmft

between the upper (759, 63.19%) and lower arch (442, 36.8%).

Of the 200 children, 104 (52%) had been exclusively breast-fed, 89 (44.5%) were fed by combination feeding while only 7 (3.5%) were exclusively bottle-fed. There was no statistically significant difference in the mean dmft or the severity between the three groups (Table 1). When the duration of feeding was compared with dmft and severity it was found that children who were breastfed for more than one year had higher mean dmft in the upper anterior region while it was less in children who were fed between six months to one year and this was statistically significant. A significant relationship was also noted in the duration of bottle feeding and the lower anterior teeth caries score. However, the relationship of breast feeding, and bottle-feeding duration was not significant when it was compared to S-ECC as well as dental caries in other tooth regions (Table 4).

The children who were fed at night beyond one year as well as those who were introduced to cup after one year of age showed a higher severity of

**Table 1: Distribution of ECC and S-ECC based on age, gender, and feeding type.**

Variable	n (%)	No ECC n (%)	ECC n (%)	S- ECC n (%)	P value	dmft	P value
						Mean±SD	
ECC	71 (35.5)	-	-	-	-	2.89±1.44	-
S-ECC	110 (55)	-	-	-	-	9.05±3.31	-
<b>Age (years)</b>							
2-3	5 (2.5)	3 (60)	-	2 (40)	0.002	0.8±1.30	0.009
3-4	34 (17)	4 (11.76)	9 (26.47)	21 (61.76)		5.26±4.68	
4-5	51 (25.5)	6 (11.76)	15 (29.41)	30 (58.82)		6.47±4.72	
5-6	110 (55)	6 (5.45)	47 (42.72)	57 (51.81)		6.25±3.97	
<b>Total</b>	200 (100)	19 (9.5)	71 (35.5)	110 (55)		6±4.33	
<b>Gender</b>							
Male	101 (50.5)	11 (10.89)	37 (33.63)	53 (52.47)	0.69	5.86±4.21	0.68
Female	99 (49.5)	8 (8.08)	34 (34.34)	57 (57.57)		6.15±4.47	
<b>Total</b>	200 (100)	19 (9.5)	71 (35.5)	110 (55)		6±4.33	
<b>Type of feeding</b>							
Only breast-fed	104 (52)	12 (11.53)	36 (34.61)	56 (53.84)	0.22	5.63±4.4	0.35
Only bottle-fed	7 (3.5)	2 (28.57)	1 (14.28)	4 (57.14)		6.42±5.44	
Combination	89 (44.5)	5 (5.61)	34 (38.2)	50 (48.07)		6.4±4.18	
<b>Total</b>	200 (100)	19 (9.5)	71 (35.5)	110 (55)		6±4.33	
Chi-square test							

**Table 2: Distribution of dental caries based on age and teeth region involved, n (%).**

Age (years)	Tooth region involved										Total
	Upper central incisors	Lower central incisors	Upper lateral incisor	Lower lateral incisor	Upper canine	Lower canine	Upper first molar	Lower first molar	Upper second molar	Lower second molar	
2-3	3 (0.25)	-	1 (0.08)	-	-	-	-	-	-	-	4 (0.33)
3-4	43 (3.58)	2 (0.17)	34 (2.83)	2 (0.17)	14 (1.67)	4 (0.33)	31 (2.58)	21 (1.75)	5 (0.42)	23 (1.91)	179 (14.9)
4-5	45 (3.75)	5 (0.42)	41 (3.41)	3 (0.25)	21 (1.75)	1 (0.08)	55 (4.58)	58 (4.83)	42 (3.5)	59 (4.91)	330 (27.48)
5-6	110 (9.16)	2 (0.17)	80 (15.82)	4 (0.33)	34 (2.83)	8 (0.67)	108 (8.99)	117 (9.74)	92 (7.66)	133 (11.07)	688 (57.29)
<b>Total</b>	201 (16.74)	9 (0.75)	156 (12.99)	9 (0.75)	69 (5.75)	13 (1.08)	194 (16.15)	196 (16.32)	139 (11.57)	215 (17.90)	1201 (100)

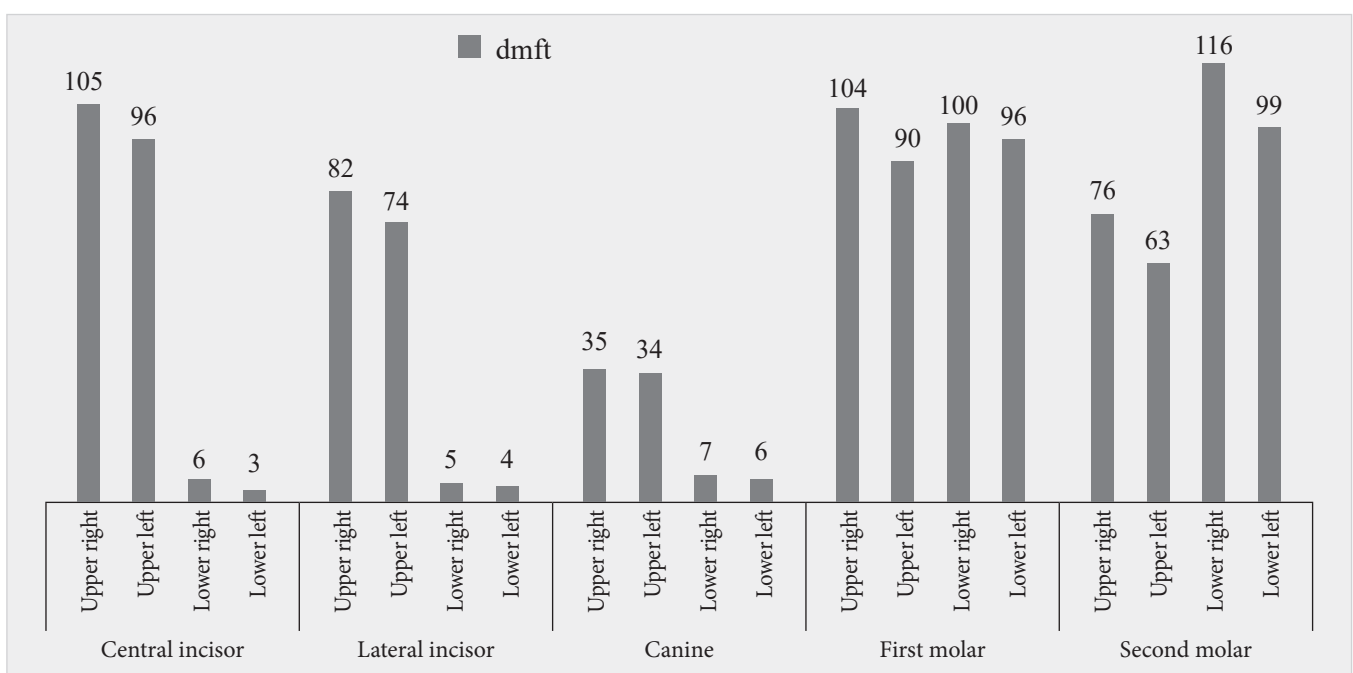
**Table 3: Comparison of dmft in different tooth regions and upper and lower arch.**

Tooth region	Upper anterior	Lower anterior	Upper posterior	Lower posterior
dmft (n%)	426 (35.47)	31 (2.58)	333 (27.72)	411 (34.22)
Mean±SD (dmft)	2.13±2.09	0.15±0.71	1.66±1.46	2.05±1.57

Tooth region	P value	P value	P value	P value
Upper anterior	1	<0.001	<0.001	<0.001
Lower anterior	1	<0.001	0.007	0.005
Upper posterior	<0.001	0.007	1	<0.001
Lower posterior	<0.001	0.005	<0.001	1
<b>Total</b>	200	200	200	200

dmft n (%)	Upper arch dmft n (%)	Lower arch dmft n (%)
1201 (100)	759 (63.19)	442 (36.8)
<b>Upper arch vs Lower arch</b>		P value <0.001

Pearson's Correlation is significant at the 0.01 level (2-tailed).



**Figure 1: Distribution of dmft score in individual primary teeth.**

50 (33.33%) and 66 (55.46%); and mean dmft scores of 6.14±4.21 and 6.31±4.67 respectively. However, these comparisons were not significant statistically. Most of the children (116, 58%), had been weaned before they reached the age of one year, but this had no significant association with S-ECC or ECC.

A higher number of parents (178, 89%) stated that their children were fed regularly and 97 (48.5%) and 86 (43%) had the habit of snacking more than once a day. The dental caries was less severe in children who snacked less than once, but the correlation was not significant statistically (Table 5).

**Table 4: Association of duration of breast and bottle feeding with the dmft in various tooth regions.**

Breastfeeding duration	n (%)	Upper anterior	P value	Lower anterior	P value	Upper posterior	P value	Lower posterior	P value
		dmft Mean±SD		dmft Mean±SD		dmft Mean±SD		dmft Mean±SD	
<b>Not breast-fed</b>	7 (3.5)	1.71±2.36	0.04	0.28±0.48	0.13	1.28±1.49	0.54	2.14±1.95	0.83
<b>1-3 months</b>	5 (2.5)	4.21±2.48		-		2.4±1.81		2.4±1.51	
<b>6 months</b>	7 (3.5)	1.28±1.7		-		2.57±1.71		1.85±1.77	
<b>1 year</b>	24 (12)	1.25±1.56		-		1.29±1.39		2.04±1.54	
<b>&gt;1 year</b>	157 (78.5)	2.25±2.10		0.18±0.79		1.67±1.44		2.05±1.57	
<b>Total</b>	200 (100)	2.13±2.09		0.15±0.71		1.66±1.46		2.05±1.57	
<b>Bottle feeding duration</b>									
<b>Not fed</b>	105 (52.5)	2.05±2.13	0.09	0.12±0.66	0.04	1.61±1.54	0.5	1.83±1.61	0.17
<b>1 year</b>	45 (22.5)	2.36±2.10		0.13±0.61		1.86±1.35		2.34±1.38	
<b>1.5 years</b>	13 (6.5)	3.30±1.75		0.69±1.65		2±1.68		2.76±1.58	
<b>2 years</b>	13 (6.5)	1.15±1.40		0.07±0.27		1.69±1.37		2.23±1.3	
<b>&gt;2 years</b>	24 (12)	1.85±2.19		0.08±0.28		1.29±1.23		1.95±1.75	
<b>Total</b>	200 (100)	2.13±2.09		0.15±0.71		1.66±1.46		2.05±1.57	

Chi-square test.

**Table 5: Association of ECC and S-ECC with feeding practices.**

Feeding practice	n (%)	No ECC n (%)	ECC n (%)	S- ECC n (%)	P value	dmft	P value
						Mean±SD	
<b>Breastfeeding duration</b>							
<b>Not breast-fed</b>	7 (3.5)	2 (28.57)	1 (14.2)	4 (57.14)	0.18	6.42±5.44	0.09
<b>1-3 months</b>	5 (2.5)	-	1 (20)	4 (80)		10.2±3.89	
<b>6 months</b>	7 (3.5)	2 (28.57)	4 (57.14)	1 (14.28)		3.42±3.59	
<b>1 year</b>	24 (12)	2 (8.33)	10 (41.66)	12 (50)		5.12±3.62	
<b>&gt;1 year</b>	157 (78.5)	13 (8.28)	55 (35.08)	89 (56.68)		6.10±4.36	
<b>Total</b>	200 (100)	19 (9.5)	71 (35.5)	110 (55)		6±4.33	
<b>Bottle feeding duration</b>							
<b>Not fed</b>	105 (52.5)	12 (11.42)	36 (34.28)	57 (54.28)	0.36	5.63±4.4	0.082
<b>1 year</b>	45 (22.5)	2 (4.44)	15 (33.33)	28 (62.22)		6.71±3.94	
<b>1.5 years</b>	13 (6.5)	1 (7.69)	2 (15.38)	10 (76.92)		8.76±4.98	
<b>2 years</b>	13 (6.5)	1 (7.69)	7 (53.86)	5 (38.46)		5.15±3.15	
<b>&gt;2 years</b>	24 (12)	3 (12.5)	11 (45.83)	10 (41.66)		5.2±4.52	
<b>Total</b>	200 (100)	19 (9.5)	71 (35.5)	110 (55)		6±4.33	
<b>Nighttime feeding beyond one year</b>							
<b>Yes</b>	150 (75)	12 (8)	50 (33.33)	88 (58.66)	0.15	6.14±4.21	0.31
<b>No</b>	50 (25)	7 (14)	21 (42)	22 (44)		5.6±4.7	
<b>Total</b>	200 (100)	19 (9.5)	71 (35.5)	110 (55)		6±4.33	

Feeding practice	n (%)	No ECC n (%)	ECC n (%)	S- ECC n (%)	P value	dmft	P value
						Mean±SD	
<b>Introduction of feeding cup</b>							
<1 year	81 (40.5)	7 (8.64)	30 (37.03)	44 (54.32)	0.90	5.55±3.76	0.36
≥1 year	119 (59.5)	12 (10.08)	41 (35.29)	66 (55.46)		6.31±4.67	
Total	200 (100)	19 (9.5)	71 (35.5)	110 (55)		6±4.33	
<b>Weaning</b>							
<1 year	116 (58)	8 (6.89)	42 (36.2)	66 (56.89)	0.33	5.93±3.94	0.78
≥1 year	84 (42)	11 (13.09)	29 (34.52)	44 (52.38)		6.08±4.85	
Total	200 (100)	19 (9.5)	71 (35.5)	110 (55)		6±4.33	
<b>Regular meals</b>							
Yes	178 (89)	18 (10.11)	64 (35.95)	96 (53.93)	0.56	5.94±3.94	0.32
No	22 (11)	1 (4.54)	7 (31.81)	14 (63.66)		6.08±4.85	
Total	200 (100)	19 (9.5)	71 (35.5)	110 (55)		6±4.33	
<b>Frequency of in between snacking</b>							
Less than once	17 (8.5)	2 (11.76)	8 (47)	7 (41.17)	0.77	5.05±4.73	0.77
1-2 times	97 (48.5)	10 (10.30)	34 (35.05)	53 (54.63)		5.82±4.03	
3 or more	86 (43)	7 (8.13)	29 (33.72)	50 (58.13)		6.39±4.58	
Total	200 (100)	19 (9.5)	71 (35.5)	110 (55)		6±4.33	

Chi-square test.

## DISCUSSION

Early childhood caries is a global disease significantly affecting young children in both well-developed as well as developing nations. It affects the quality of life of a child due to infection, swelling, pain, and other symptoms often leading to sleep problems, missed days in school, high treatment costs and even emergency room visits and hospitalisation.<sup>3</sup> The AAPD<sup>3</sup> recognises early childhood caries as a significant chronic disease resulting from an imbalance of multiple risk and protective factors over time. The ECC affects children after eruption of primary teeth until age of 71 months and it is also a strong predictor of caries in permanent dentition. Feeding habits are of prime importance in the aetiology of dental caries at any age, but more importantly, in preschool children. The present study assessed the pattern of early childhood caries, its severity and association with feeding habits of children in Nepal.

In this study the findings showed no significant difference between the males and females which contrasted with the findings of Shrutha et al.<sup>7</sup> where the boys more affected than the girls.

Severe early childhood caries (S-ECC) is a progressive and acute pattern of dental caries seen affecting the primary teeth of young children. The children with S-ECC are more likely to report with pain, chewing difficulties, speech problems and even psychological problems.<sup>8</sup> The prevalence of ECC in this study population was 71 (35.5%) while that of S-ECC was 110 (55%) this finding was almost similar to that of Sundas et al.<sup>9</sup> who found 60% S-ECC in their study whereas Azevedo<sup>10</sup> have reported a prevalence of 36%. Authors have reported a varied range in the prevalence globally. The USA shows a higher prevalence of 40% in pre-school children compared to European countries. In the UK only 12% of three-year-old children had visible caries. A high prevalence of 36–85% has also been recorded in Asia, 38-45% in Africa, and 22-61% in the Middle East.<sup>11,12</sup> In the disadvantaged groups in developing countries the prevalence is shown to peak to reach 85%.<sup>13,14</sup> In Nepal limited studies have been conducted regarding ECC in children. The prevalence reported range from 52% to 69% among 5-6-year-old Nepali school children. However, a higher prevalence of up to 85.2% have been reported among children attending dental

clinics in a teaching institute as well those examined in health facility.<sup>4,10</sup> The higher prevalence in the present study maybe due to the fact that it was conducted in a teaching institution. The one reason for this hike maybe because people in this region are known to visit a dentist only once they have encountered a dental problem.<sup>4,14,15</sup>

A systematic review by Chen et al.<sup>16</sup> included studies published in the recent five years, showed a wide variation of ECC prevalence across countries and the mean dmft score varied from 0.9 to 7.5.<sup>16</sup> The mean dmft in the current study was  $6\pm 4.33$ , a similar mean value of 6.2 has been reported by Fauzia et al.<sup>1</sup> It was  $2.89\pm 1.44$  in the ECC group while it peaked at  $9.05\pm 3.31$  in the S-ECC group. In research by Nobile et al.<sup>17</sup> the mean dmft in ECC and S-ECC subjects was found to be 2.68 and 6.86. The mean dmft here showed an increasing trend with the age of the child ( $0.8\pm 1.30$ ,  $5.26\pm 4.68$ ,  $6.47\pm 4.72$  and  $6.25\pm 3.97$  among group 1, 2, 3, and 4 respectively). The severity also shows a similar trend to increase with age: 2-3 years: 5 (2.5%), 3-4 years: 34 (17 %), 4-5 years: 51 (25.5 %), 5-6 years: 110 (55 %). This was in accordance with the findings of many other authors.<sup>12, 18</sup>

The most affected teeth were the mandibular right second molars 116 (9.66%) followed by maxillary right central incisor 105 (8.76%), maxillary right first molars 104 (8.66%) and mandibular right first molars 100 (8.33%). However the overall difference between the right and left side was not significant statistically. Maxillary arch was affected significantly more 759 (63.19%) than the mandibular arch 442 (36.8%) and this was in accordance to the findings of Agrawal et al.<sup>19</sup> The dental caries in anterior teeth region is known to be more prevalent than posterior regions. It was found that the upper anterior teeth were most severely affected 426 (35.47%) with mean  $2.13\pm 2.09$  followed by the lower posterior region-411 (34.22%);  $2.05\pm 1.5$  and upper posterior 333 (27.72%);  $1.66\pm 1.46$  region. Although the lower anterior teeth erupt before their upper counterparts, yet they were the least involved with only 31 (2.58%) and mean  $0.15\pm 0.71$ . The lower anterior teeth are subjected to the protective mechanism of the tongue and by saliva from submandibular and

sublingual glands.<sup>19-21</sup> The findings of the pattern of ECC were in accordance with many authors.<sup>19-23</sup> The difference seen in the distribution between the upper anterior, upper posterior, lower anterior and lower posterior region was highly significant. Maxillary anterior caries is known to develop as early as 10-12 months of age. The caries pattern in the present study with a high percentage of carious maxillary incisors and minimal involvement of mandibular incisors, is suggestive of the nursing bottle caries pattern.<sup>21,22</sup>

The World Health Organisation advocates and recommends initiation of breastfeeding within one hour of birth and exclusive breastfeeding up to six months of age. In research conducted in Nepal it was found that 23.2% of infants were exclusively breastfed until six months, with 28.2% predominantly breastfed and 48.6% partially breastfed.<sup>24</sup> Breast feeding is the most accepted practice even in Western countries.<sup>25</sup> Similar result was found in this study where 104 (52%) were exclusively breast-fed or had combination feeding 89 (44.5%) whereas only seven (3.5%) had been exclusively bottle-fed. However, there was no significant relation between ECC and S-ECC and the type of feeding which agreed with findings of Almushayt et al.<sup>25</sup>

The literature suggests that prolonged natural breast-feeding after 12 months was a risk factor for the occurrence of early childhood caries in infants.<sup>5,25</sup> Maximum children 157 (78.5%) in the present study had been breastfed for more than a year. On comparing the duration of feeding with dmft and severity it was found that children breastfed for more than one year had a higher mean dmft in the upper anterior region indicating a nursing bottle type pattern. It has been suggested that breastfeeding in infancy may protect against dental caries up to 12 months, but the risk increases on breast feeding beyond 12 months.<sup>5</sup> The human milk contains caries protective elements like maternal immunoglobulins, enzymes, leukocytes, and antibacterial agents, which show a depletion after one year of age.<sup>6</sup>

Baby bottles are known to predispose to S-ECC as the feeding nipple blocks the access of saliva

to the upper incisors. Infant feeding formulas even those without sucrose have proven to be cariogenic.<sup>6,19</sup> Several infant feeding practices are associated with the pattern and severity of dental caries, depending on the duration of feeding. In the present study it was found that children who were bottle-fed for more than one and half years had significantly more caries in the lower anterior region, which is otherwise considered to be immune to decay. Shrestha et al.<sup>5</sup> in their review on ECC have reported a higher caries prevalence among exclusively bottle-fed (33.3%) children. A study in Kosovo found that among most of the children with ECC represented those who were bottle-fed up to the age of two.<sup>5</sup>

There were more children who were fed at night and their mean dmft ( $6.14 \pm 4.21$ ) was higher than those who were not fed at night ( $5.6 \pm 4.7$ ). Night-time feeding leads to prolonged exposure to fermentable carbohydrates that lead to a detrimental oral environment. Research by Barjatya et al.<sup>6</sup> have found prominent impact of night-time feeding to ECC. These findings suggest that relationships between ECC and S-ECC are not clearly related to the type of feeding but rather with the duration of it.

Children introduced to cup after one year of age showed a higher severity 66 (55.46%). Many parents 178 (89%) stated that their children were fed regularly but children also had had the habit of snacking more than once a day. The dental caries was less severe in children who snacked less than

once although the correlation was not significant statistically and is like that reported by Barjatya et al.<sup>6</sup> However, it has been found that consumption of cariogenic snacks is a major factor in occurrence of ECC in developed nations.<sup>6</sup>

The current study was conducted among the patients visiting Kantipur Dental College which cannot represent the wider population group.

## CONCLUSION

Results of the present study demonstrated a nursing bottle pattern of ECC with more than half children having severe early childhood caries. A significant relation was also noted in the duration of feeding beyond one year with caries in upper anterior teeth. The authors support the view that oral counselling of parents should begin at the earliest even before the eruption of first primary tooth and therefore advocate the need for early caries examinations and initiation of prevention programs in Nepal.

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