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ORIGINAL ARTICLE

Nursing Caries Prevalence Among Preschool Children of Piparia Village, Vadodara, Gujarat

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ABSTRACT

Nursing caries is a specific form of rampant caries affecting only primary dentition excluding mandibular incisors. Relative inaccessibility of the preschool children may be a practical reason for the concise research in this population.

Aim: To find out the nursing caries prevalence among the preschool children in Piparia Village, Vadodara , Gujarat.

Material and Methods: All the 80 pre school children attending anganwadi were examined with a pretested semistructured self designed closed ended questionnaire and by using dmft index.

Statistical analysis used: Chi square test & multiple logistic regression at 5% level of significance.

Results: Prevalence of nursing caries was 26.25% with mean caries experience of 1.54. Untreated decayed teeth dominated the dmft score. Statistically significant association was found between weaning at a later age, frequency of consuming snacks and development of nursing caries lesion.

Conclusion: Nursing caries is linked with various factors like educational qualification of mother, weaning age, oral hygiene measures, snacking frequency etc.

Keywords: Nursing caries, Pre school children, Prevalence

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INTRODUCTION

Nursing caries is a specific form of rampant caries affecting only primary dentition excluding mandibular incisors (1). Nursing Caries is a type of Early Childhood Caries (ECC), which is defined as "The presence of one or more decayed (non cavitated or cavitated lesion), missing (due to caries) or filled tooth surface in any primary teeth in a child 71 months of age or younger" (American Academy of Pediatric Dentistry) (2). It is considered as a multifactorial disease for which no single causative factor has been established. The suggested risk factors being weaning at a later age(3-6), nocturnal breast feeding(3,5,7,8-10), putting a child to sleep with a bottle in mouth (3), use of a honey-dipped pacifier (3), parental ignorance due to lack of awareness regarding oral hygiene measures (5,8,10-12), medically compromised condition (3), increased intake of cariogenic diet (3,6-8,12) and hypoplastic teeth (3). Nursing caries is a topic of concern not only due to its association with toothache, infection, early loss of tooth and interruption in permanent teeth eruption but also with the reduced height and weight of the child (3). It has received little attention from health professionals other than pediatric dentists due to lack of professional and public recognition of dental health for the general well being of the child. Relative inaccessibility of the preschool children in comparison to older school-children may be a practical reason for the concise research in this population (13). Exploration of literature has revealed that no such published data are available for Gujarat state. Keeping all these in view the present study has been attempted to find out prevalence of nursing caries and its associated risk factors among preschool children in Piparia Village, Vadodara district, Gujarat.

OBJECTIVES

- To asses the nursing caries prevalence by using dmft index.
- To determine age wise prevalence of nursing caries.
- To determine sex wise prevalence of nursing caries.
- To suggest the possible risk factors by using self designed pre tested questionnaire.

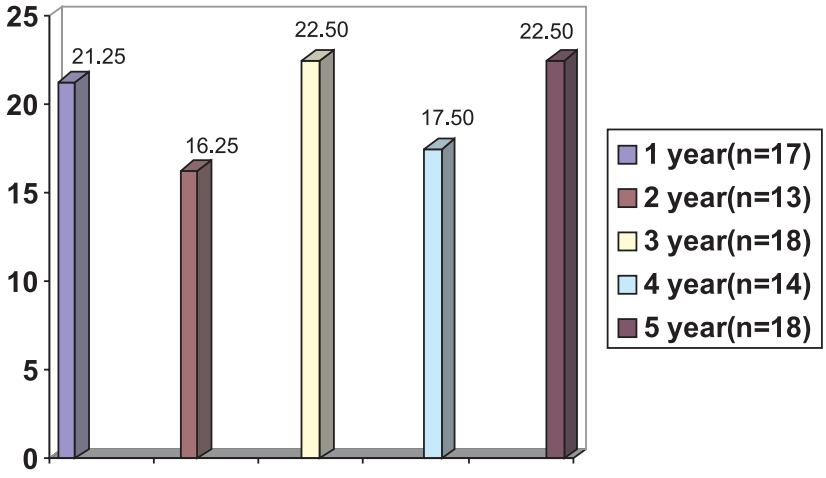

Fig. 1: Age wise distribution of study subjects

MATERIALS AND METHOD

A cross sectional survey was conducted in September 2007. Present survey was complete enumeration survey as all the 80 children in the age group of 1-5 years, enrolled in anganwadi at Piparia village of Vadodara district, were included in the study. Anganwadi, literally a courtyard play centre, is a childcare centre located within the village or the slum area itself. Each anganwadi is run by an anganwadi worker. It is the focal point for the delivery of services at community levels to children below six years of age, pregnant women, nursing mothers and adolescent girls. Prior to the study, an informed verbal consent was taken from the anganwadi workers and parents of the concerned study subjects. 20 children / day were examined clinically and the data were collected by a single examiner calibrated on the survey diagnostic criteria and recorded by a trained assistant. Data regarding risk factors for nursing caries was assessed by using a self designed, pre tested, semi structured, closed ended questionnaire consisting of 12 questions (Annexure I). The interviewer herself recorded the answers of the questionnaire in order to minimize misrepresentation of question & to ensure uniformity in data. To check reliability & validity, the questionnaire was again administered to same subjects at an interval of 1 week which had revealed similar responses on the questions. The caries experience of present primary teeth were recorded by using dmft index. Children having one or more decayed anterior teeth were considered as affected with nursing caries. Both co operative and uncooperative children with the help of their mother were included in the study. Children who were not present on the day of examination or unavoidable circumstances which deferred their clinical examination were excluded. A co operative child or mother with uncooperative child was asked to sit on a wooden chair with head rest and examined with the help of mouth mirror, explorer etc in the natural day light.

Table 1: Prevalence of nursing caries among the study subjects

Age in years	Males		Females		Total	
	Total males	Prevalencen (%)	Total females	Prevalencen (%)	Total	Prevalence n (%)
1	9	1 (11.11)	8	1 (12.50)	17	2 (11.76)
2	10	4 (40.00)	3	1 (33.33)	13	5 (38.46)
3	15	5 (33.33)	3	0 (00.00)	18	5 (27.78)
4	11	2 (18.18)	3	1 (33.33)	14	3 (21.43)
5	10	3 (30.00)	8	3 (37.50)	18	6 (33.33)
Total	**55**	**15(27.27)**	**25**	**6 (24.00)**	**80**	**21 (26.25)**

Statistical analysis

- Statistical analysis was done by using SPSS version 10. The collected data were coded and descriptive analysis was done. Inferential analysis was carried out by applying chi square test & multiple logistic regression. All the tests were carried out at 5% level of significance.
- The intra examiner variability was determined by randomly selecting 10% of the sample for re examination which showed good agreement (Cohen's kappa value = 0.9)

RESULTS

All the 80 enrolled children participated in the study of which 55 were males and 25 were females. Age wise distribution of the study subject is shown in Figure 1.

Caries lesion prevalence (Table 1)

It was observed that of the 26.25% of the study subjects who were affected with nursing caries, males showed higher prevalence (27.27%) than females (24%). ($c2 = 0.095$, $P>0.05$, d.f. = 1, Not Significant).

Mean caries experience among the study subjects (Table 2)

Mean caries experience among the study subjects was found to be 1.54 ± 3.10 with males showing higher mean dmft (1.47) than females (0.77). Untreated decayed teeth dominated the dmft score, with mean decayed teeth (dt) of 1.43 ± 2.87 and mean missing teeth (mt) of 0.11 ± 0.59. The carious lesion in none of the subjects was found to be treated.

Educational qualification of mother, feeding habits, oral hygiene habits and nursing caries prevalence

From the present study it was observed that the prevalence of nursing caries bears an inverse relationship with the educational qualification of mother. 14 out of 41 children (34.15%) of uneducated mother were affected with nursing caries. However the result was not statistically significant.

Table 2 Mean caries experience among the study subjects

Age in	dt			Mt			ft			dmft		
Years	M(n)	F(n)	Total(n)	M(n)	F(n)	Total(n)	M(n)	F(n)	Total(n)	M(n)	F(n)	Total(n)
1	0.3(3)	0.25(2)	0.29(5)	0.0(0)	0.0(0)	0.0(0)	0.0(0)	0.0(0)	0.0(0)	0.3(3)	0.25(2)	0.29(5)
2	1.8(18)	1.33(3)	1.69(22)	0.0(0)	0.0(0)	0.0(0)	0.0(0)	0.0(0)	0.0(0)	1.8(18)	1.33(3)	1.69(22)
3	1.33(20)	0.0(3)	0.86(20)	0.0(0)	0.0(0)	0.0(0)	0.0(0)	0.0(0)	0.0(0)	1.33(20)	0.0(3)	0.86(20)
4	0.91(10)	0.62(8)	1.29(18)	0.27(3)	0.0(0)	0.21(3)	0.0(0)	0.0(0)	0.0(0)	0.93(13)	0.62(8)	1.5(21)
5	2.1(21)	3.5(28)	2.72(49)	0.6(6)	0.0(0)	0.33(6)	0.0(0)	0.0(0)	0.0(0)	2.7(27)	3.5(28)	3.06(55)
Total	**1.31(72)**	**1.68(42)**	**1.43(114)**	**0.16(9)**	**0.0(0)**	**0.11(9)**	**0.0(0)**	**0.0(0)**	**0.0(0)**	**1.47(81)**	**0.77(42)**	**1.54(123)**

Compared to 2 out of 11 children (18.18%) who were both breast fed and bottle fed, 19 out of 69 children (27.54%) who were only breast fed were affected with caries. None of the children were completely bottle fed. Here, also the results were not statistically significant ($c^2 = 0.082$, $P>0.05$, d.f. = 1).

Nursing caries was higher among the subjects who had never cleaned their teeth (37.93%) compared to those who cleaned their teeth once daily. However, the result was not statistically significant ($c^2 = 3.206$, $P>0.05$, d.f. = 1). Higher amount of nursing caries lesion were present among the subjects who clean their teeth on their own (25%) than those in whom cleaning of teeth was assisted by parents (10.53%).

Weaning age and nursing caries prevalence (Table 3)

The subjects who were weaned after 2 years of age had more nursing caries lesion (63.64%) than those who were weaned at a younger age (20.29%). Result shows statistically highly significant association ($c^2 = 7.105$, $P < 0.01$, d.f. =1) between weaning age and development of nursing caries lesion.

Frequency of eating snacks/day and nursing caries lesion (Table 4)

Nursing caries was significantly higher among the subjects who were given snacks on demand (40.43%) than those who consumed snacks maximum upto 3 times a day (6.06%) ($c^2 = 10.118$, d.f. = 1, $P < 0.01$ H.S).

To minimize the effect of confounding variables, multiple logistic regression analysis was applied to the whole data which revealed that weaning at later age ($P = 0.01$) and snacking frequency ($P= 0.02$) was significantly related to nursing caries prevalence.

Table 3: Prevalence of nursing caries according to weaning age*

Weaning age	Unaffected n	(%)	Affected n	(%)	Total
Less than 2 yr	55	(79.71)	14	(20.29)	69
More than 2 yr	4	(36.36)	7	(63.64)	11
Total	**59**	**(73.75)**	**21**	**(26.25)**	**80**

*Statistically highly significant association between weaning age and nursing caries lesion in the child; $P < 0.01$

Table 4: Prevalence of nursing caries according to frequency of eating snacks/ day*

Frequency of eating snacks/day	Unaffected n	(%)	Affected n	(%)	Total
Upto 3 times in a day	31	(93.94)	2	(6.06)	33
On demand	28	(59.57)	19	(40.43)	47
Total	**59**	**(73.75)**	**21**	**(26.25)**	**80**

*Statistically highly significant association between frequency of eating snacks/day and nursing caries lesion; $P<0.01$

DISCUSSION

From this study it was found that, almost 26.25% of the study subjects were found to have nursing caries which is similar to the study conducted by Ramezani et al (4) and Rosenblatt et al (14). Studies conducted by Jose B et al (12), Carino KMG et al (7), Jin B et al (8) and Hallet KB et al (15) showed lower caries prevalence while on the contrary the study reported by Hattab FN et al (16), Sullivan D et al(17) showed a higher caries prevalence. This could be attributed to the difference in the literacy levels of the parents / guardian of the subjects in this area.

Highest prevalence was noted amongst 2 year old children followed by 5 year old children while the lowest prevalence was found amongst 1 year old children. This low prevalence could be due to less duration of exposure to cariogenic factor and due to protective nature of breast milk against development of caries up to 1 year. Higher prevalence of nursing caries amongst 2 year old children might be due late initiation of oral hygiene measures after the first year of life and decrease in protective element of human breast milk after 1 year of age (18). Untreated decayed teeth dominated the dmft score. The high rate of unmet treatment needs among the study subjects might be attributed to (a) a lack of awareness in the community regarding the early prevention and treatment of caries, and/or (b) parental indifference and belief that primary teeth

are replaceable by permanent teeth (7).

The prevalence of nursing caries was found to be higher in males than females in this study, the findings are in consistence with the studies conducted by Hallet KB et al (15), Hattab FN et al (16) while contradicted those of Ramezani et al (4), Robert J et al(10). The reason for the gender difference is unclear but it has been reported that male children who have the same genotype of their mother have 13 times greater risk of caries development than female children who acquire the same strain of bacteria from their mother (15).

The finding that nursing caries was associated with mother's education level is consistent with several other studies (5,6,10,12,13). Such results might be due to the fact that females with lower level of education are more loaded with myths and lack the basic awareness regarding the various modalities available for caries prevention.

Higher prevalence of nursing caries among the breast fed subjects than those who were both breast and bottle fed could be due to the demanded breast feeding at night, which in turn increases the colonization of streptococcus mutan bacteria; the major risk factor for development of nursing caries (19, 20). Since no child was completely bottle fed, its relationship with the development of nursing caries lesion is not investigated.

Children who were weaned after 2 years of age had significantly more nursing caries lesion. Findings are consistent with other recent reports (4-6,21,22). Such result might be attributed to the progressively diminished protection from the breast milk after 12 months of age with depletion of its protective elements.

In our study it was found that the nursing caries was higher among the subjects who had never cleaned their teeth. Similar observations have been reported by, Febres C et al (5), Carino KMG et al (7) ,Rosenblatt A et al (14), Declerk D et al (23) . Such results might be due to the lack of oral hygiene and concomitant lack of exposure to fluoride from the toothpaste in the early years (7). Higher amount of nursing caries lesion among the subjects who clean their teeth on their own can be correlated with the child's lack of manual dexterity coupled with a lack of proper understanding of good oral hygiene at such a young age. Similar results were reported in several other studies (7,8,12,15, 23).

Significantly higher amount of nursing caries among the subjects who were given snacks on demand is similar to the study reported by Olmez S et al (6), Carino KMG et al (7), Jin B et al (8), Jose B et al (12), Warren JJ et al (24) and Seow WK et al (25). The frequent intake of snacks along with improper oral hygiene measures can lead to an increase in the bacterial count (s. mutans), which is a major causative factor in the development of carious lesion.

Limitation in the study could be that the it was carried out in a small village and the children coming to anganwadi were only examined which may pose statistical challenges and may hinder the external validity of study findings but they can add an insight into the caries burden among preschool population at a low cost.

APPENDIX I
Questionnaire

I. Who is the main care taker for the child?
1. Mother
2. Others Specify.....

II. What is the education level of mother?
1. Didn't go to school
2. Upto high school
3. Completed highschool
4. Completed graduation
5. Don't know

III. What is/was the pattern of feeding the child?
1. Breast fed only
2. Mixed breast fed and bottle fed
3. Bottle fed only
4. Don't know

IV. Does the child sleep with bottle?
1. Yes
2. No
3. Don't know

V. Till what age was the child fed with mother's milk?
1. Less than 2 years old
2. More than 2 years old
3. Don't know

VI. Does the child have a habit of having milk at night?
1. Yes
2. No
3. Occasionally.

VI(A). If yes, which form of milk is given to the child?
1. Plain
2. With sugar
3. With honey
4. If others, specify

VII. Who cleans the teeth of the child?
1. Child himself
2. Mother
3. Other

VIII. What are the measures used for cleaning the teeth?
1. Finger
2. Toothbrush alone
3. Toothbrush with toothpaste
4. Others, specify

IX. At which age brushing was started?
1. Less than 1 year
2. 1.5 year
3. 2 year
4. 3 year
5. 4 year
6. Don't know

X. Does the child have the habit of having snacks between meal?
1. Yes
2. No

X(A). If yes, what is the frequency of having snacks per day?
1. Once
2. Twice
3. Thrice
4. On demand

Considering that this community is quite small, however, this survey gives a small glimpse into the oral health of preschoolers, which was a primary goal of this investigation. However more elaborative studies involving preschool children in more number of villages in Vadodara district is recommended to give more insight about nursing caries prevalence in Gujarat. It is concluded that the preschool children who are at high risk from development of nursing caries lesion include those with late weaning age, consuming more snacks, poor oral hygiene status and having mother with low educational qualification. Currently no specific oral health care programme is provided for the preschool children of Piparia village. It is also recommended to have dental health education programs at regular intervals to preschool children, parents and anganwadi workers; regular screening for oral diseases among preschool children and to improve the accessibility for the study group to preventive and curative dental services so as to meet the high rate of unmet treatment needs. Nutritional recommendation of limiting the frequency of intake of snacks among children and encouraging regular meals should be done to reduce the burden of nursing caries in the concerned population.

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REFERENCES

1. Mcdonald, Avery and Dean. Dentistry for the child and adolescent. 8th ed. St.Louis, Missouri: Mosby; 2004, 203.
2. American Academy of Pediatric Dentistry: Policy on early childhood caries(ECC): Unique challenges and treatment options. *Pediatr Dent* 2002;**24**(7 Suppl):24 -5. (special issue: Reference Manual 2002 – 2003).
3. Dilley GJ. Prolonged nursing habit: a profile of patients and their families. *J Dent Child* 1980;**47**:102-108.
4. Ramezani GH, Norozi A, Valael N. The prevalence of nursing caries in 18 to 60 months old children in Qazvin. *J Indian Soc Pedod Prev Dent* 2003;**21**(1):19 -26.
5. Febres C, Echeverri E, Harris J. Parental awareness, habits and social factors and their relationship to baby bottle tooth decay. *Pediatr Dent* 1997;**19**(1):22-27.
6. Olmez S, Uzami M, Erdem G. Association between ECC and clinical, microbiological, oral hygiene and dietary variables in rural Turkish children. *Turk J Pediatr* 2003;**45**:231-236.
7. Carino KMG, Shinanda K, Kawaguchi Y. Early childhood caries in northern Philippines. *Community Dent Oral Epidemiol* 2003;**31**:81-89.
8. Jin B, Ma D, Moon H , *et al.* Early childhood caries: prevalence and risk factors in Seoul, Korea. *J Public Health Dent Summer* 2003;**63**(3):183-188.
9. Riberio AG, De Oliveria AF, Rosenblatt A. Prevalence and risk factors of ECC in 4 year old children in Joao, Pessoa, Brazil. *Cad Saude Publica* 2005;**21**(6):1695-1700.
10. Robert J, Michael EK. Determinants of early childhood caries in a rural Manitoba community: a pilot study. Pediatr Dent 2005;**27**(2):114-120.
11. Al Hosani E, Rugg Gunn A. Combination of low parental education attainment and high parental income related to high caries experience in pre school children in Abu Dhabi. *Community Dent Oral Epidemiol* 1998;**26**:31-36.
12. Jose B, King N. Early childhood caries lesion in preschool children in Kerala, India. *Pediatr Dent* 2003;**25**(6):594-600.
13. Holm AK. Caries in preschool child: international trends. *J Dent* 1990;**18**:291-295.
14. Rossenblatt A, Zarzar P. The prevalence of early childhood caries in 12 to 36 month old children in Recife, Brazil. *J Dent Child* 2002;**69**(3):319-24.
15. Hallet KB, O' Rourke PK. Pattern and severity of early childhood caries. *Community Dent Oral Epidemiol* 2006;**34**:25-35.
16. Hattab FN, Al-Omari MA, Angmar-Mansson B et al. The prevalence of nursing caries in one to four year old children in Jordan. *J Dent Child* 1999; **66**(1):53-58.
17. Sullivan D, Champany R, Eberling S, *et al.* Dental caries prevalence and treatment among Navajo preschool children. *J Public Health Dent* 1994;**54**(3):139 -144.
18. Hallet KB, O' Rourke PK. Social and Behavioral determinants of ECC. *Aust Dent J* 2003;**48**(1):27-33.
19. Vadiakas G. Case definition, aetiology and risk assessment of early childhood caries (ECC): a revisited review. *Eur Arch Paediatr Dent* 2008;**9**(3):114-125.
20. Poureslami HR, Van Amerongen WE. Early Childhood Caries (ECC): an infectious transmissible oral disease. *Indian J Pediatr* 2009;**76**(2):191-194.
21. S Sunitha, GN Chandu, K Pushpanjali, *et al.* Feeding habits and Early Childhood Caries among the pre school children of Davangere City, Karnataka. *Journal Of The Indian Association Of Public Health Dentistry* 2006;(7):39-42.
22. Mohamed N, Barnes J. Characteristics of children under 6 years of age treated for early chidhood caries in South Africa. *J Clin Pediatr Dent* 2008;**32**(3):247-252.
23. Declerck D, Leroy R, Martens L, *et al.* Factors associated with prevalence and severity of caries experience in preschool children. *Community Dent Oral Epidemiol* 2008;**36**(2):168-178.
24. Warren JJ , Weber-Gasparoni K, Marshall TA, *et al.* A longitudinal study of dental caries risk among very young low SES children. *Community Dent Oral Epidemiol* 2009;**37**(2):116-122.
25. Seow WK, Clifford H, Battistutta D, *et al.* Case-control study of early childhood caries in Australia. *Caries Res* 2009;**43**(1):25-35.