

Food Behavior, Oral Hygiene and Dental Problems among the Children (6-11 Years) at Dhaka City in Bangladesh

Md. Tazul Islam¹, S.M. Rezaul Hoque^{1*}, Jubaida Gulshan Ara² and M A H Bhuyan²

1. Department of Food Technology and Nutrition Science, Noakhali Science and Technology University
2. Institute of Nutrition and Food Science, University of Dhaka, Dhaka-1000.

Abstract

A descriptive type of cross sectional study was carried out to assess the prevalence of dental diseases and to find out the relationship between dental diseases and the regular food intake pattern of children aged 6-11 years in Dhaka city. Oral examination was done to identify dental diseases for a sample of 123 children. A structured questionnaire was used for collecting relevant information. Result shows that the most prevalent dental disease among this age group was dental caries (52.8%) which was found to be decreased with the increase of age (P value= 0.005). Any type of dental disease was significantly related to consumption of excessive carbohydrate intake in daily meal (P value= 0.03). Those, who consume more than 300g of carbohydrate and sticky food, became more susceptible to dental disease and it was found to be 78.9%. The prevalence rate of dental disease was found to be high (95.1%) in higher economic group whose family income (monthly) is more than 18000tk. Bottle feeding, the major cause of teeth decay among children, were found to be significantly related with dental diseases (P value= 0.01). Only 13.8% used paste or powder containing Ca and/or F had less diseases percentage (P value= 0.002). Following the correct manner of tooth brushing (right way), brushing frequency (two or more) and gargling (regularly) reduced the probability of dental problems. The study also revealed that children had less dental problems (33.3%) whose parents had little preventive knowledge of dental diseases.

Key Words: Food behavior, oral hygiene, dental disease, 6-11 years aged children.

Introduction

Childhood is the most important period that deals with several dental problems, on average, mainly from 6th to 12th years of age. In these years, patients experience dental caries, pulpitis, gingivitis and some other dental problems also. The underlying factors responsible in children may be due to their indiscriminate eating of particularly sugary and sticky foods such as crackers, pre-sweetened cereals, breads, muffins, dried fruits, cookies, potato chips, sweetened dairy products, candies, lollipops, ice-creams which ultimately results prolonged sugar exposure in mouth and make favorable environment for microorganisms that producing acids cause a

drop in salivary pH to less than 5.5 to initiate the demineralization process if no oral hygiene measures are introduced within 2 hours. Others factors are the lower rate of saliva flow, greater the stagnation of food on tooth surface, poor oral hygiene, frequent eating and sucking habit, crowding that is irregularities of teeth pattern. In children, bottle feeding is one of the most important factors associated with high rate of dental caries or tooth decay. Breastfed infants who fall asleep during breastfeeding period are also at risk of dental caries.

Dental caries is the most common oral disease and the average individual has his first experience with it. According to the Surgeon General's 2000 Report on Oral Health, caries is seven times more common than hay fever and five times more common than asthma¹. In adults, caries usually progresses slowly and a small cavity may take several months to develop. By contrast, childhood caries, particularly of deciduous teeth, may be so rapid that the pulp becomes exposed long before the tooth is due to be shed². The ultimate effect of caries is to break down enamel and dentine thus open a path for bacteria to reach the pulp. The consequences are inflammation of the pulp and later of the peripheral tissues. As inflammation progresses pain becomes more persistent and there may be prolonged attacks of toothache³.

The prevalence of dental diseases is high in Bangladesh and is being rising with time. In a study the prevalence of dental plaque, calculus, dental caries and periodontitis were found 99.1, 61.3, 44.1 and 8.6 percent of the high school girls respectively. Another study found that about 100 percent of the subjects had dental plaque⁴. Bangladesh is still among the 33 percent countries of the world with the worst periodontal conditions. There are only 3,500 qualified dental surgeons in Bangladesh, a country with a population of 150 million. That means there is one dental surgeon for every forty two thousand people. Oral health and overall health is related. As the mouth is connected with rest of the body, it is important to maintain proper dental hygiene.

Methodology

Study design: A cross sectional study was conducted among 6 to 11 years aged children in Dhaka city.

Study population: The study population was the children of 6 to 11 years of age from different location of Dhaka city having any dental problem.

Selection of study location: Different locations were selected purposively in Dhaka city for expected homogeneity of socio-economic status and availability & co-operation of the participants in the study. The selected school was Silver Shine School, Dhaka and the required information was collected from Eminent Dental, Pioneer Dental Collage, Endo Dental and Dhaka Dental College.

Questionnaire: In order to obtain relevant clinical, socio-economic and dietary data, personal characteristics and general health information, a standard questionnaire was developed. The questionnaire was pre-tested, modified where necessary and standardized for data collection.

Determination of dental diseases: Every selected child was recorded as per the report of a dentist, using various dental apparatus such as mirror, tongue depressor, caries probe and twiser. The oral problems were observed and the findings were recorded on the questionnaire. Soft deposit, bad breath and cavity in the tooth were noted carefully. During examination, the investigator was present in the dental clinic and school.

Dietary information: The dietary consumption pattern of various common foods such as rice, bread, fried rice (muri), fish, meat, pulse, vegetables, candy chocolate, chewing gum, ice-cream chips, sweets, milk with sugar, fruit juice, soft drinks, several deserts, chanachur and so on was collected. Food intake of the child during last 24 hours (recall method) was collected to be informed about their regular dietary pattern. The data were collected by probing both the mother and children using the questionnaire. Weight of different states of food items were recorded carefully and then converted in gram using weighing scale. Standard spoon, cup, bowl, plate were used and weight of edible portion of the foods were estimated by using conversion factors. The calorie and nutrient content of foods were calculated by using appropriate software.

Data analysis: Before finalization of the data for computer entry, each questionnaire was cross checked for final editing. After completion of necessary coding and editing, the analysis was undertaken using SPSS 16.0 software package. The output was then presented in figures and tabular forms on the basis of frequency distribution.

Results

A total of 123 urban children were studied to find out the prevalence of the common dental problems and their relationship with their regular food intake pattern and oral hygiene practices. The prevalence rate of dental caries among children was 52.8%, which was highest than any other dental disease (Figure-1). In contrast, the prevalence rate of gingivitis was found to be 8.9 percent, 18.7 percent was of pulpitis whereas it was 19.5 percent in other cases such as fluoridation, hereditary anomalies and oral mucosal lesion and so on. Dental caries was most prevalent in children of below 8 years (38.2%) and it decreased with the increase of age (Figure-2). Again 61.7% of the study subjects had dental problems who were bottle fed (Figure-3) and 78.9% of children consumed more than 300g of carbohydrate daily (Figure-4) and for that reason they were more prone to dental caries.

Only 13.8% children took more than 40g of protein daily (Figure-5) and they were less susceptible to dental disease. Chips, milk with sugar, sweetmeat, chocolate, soft drinks all are the cariogenic foods which were consumed by 50.4%, 48.8%, 10.6%, 52.9% and 30.9% children respectively among the total 123 study subjects (Table-1). Regarding cleaning of tooth majority of the subjects (79.6%) had dental problems who brush only one time or irregularly in a day (Table-2). Brushing is a routine activity but most of the people do not know the chemistry behind the cleansing of teeth. Study showed that children who followed the right brushing pattern (up-down) had less dental problems (5.7%) than those who did not (94.3%). The study also showed that majority group who did not gargle after each meal (65.9%) had the highest susceptibility of having dental caries (36.6%). Children using paste/powder that contains Calcium (Ca) and/or Fluoride (F) had only 13.8% dental problems comparing with others (86.2%) who did not use such paste/powder (Table-2). According to the study result, only 33.4% parents had disease prevention knowledge and of course their children were less prone to disease. The study showed that 49.6% population who had family income more then 18,000tk had higher percentage of dental problems (95.1%).

Tables and charts

Figure 1: Percent distribution of dental problems among children (n=123)

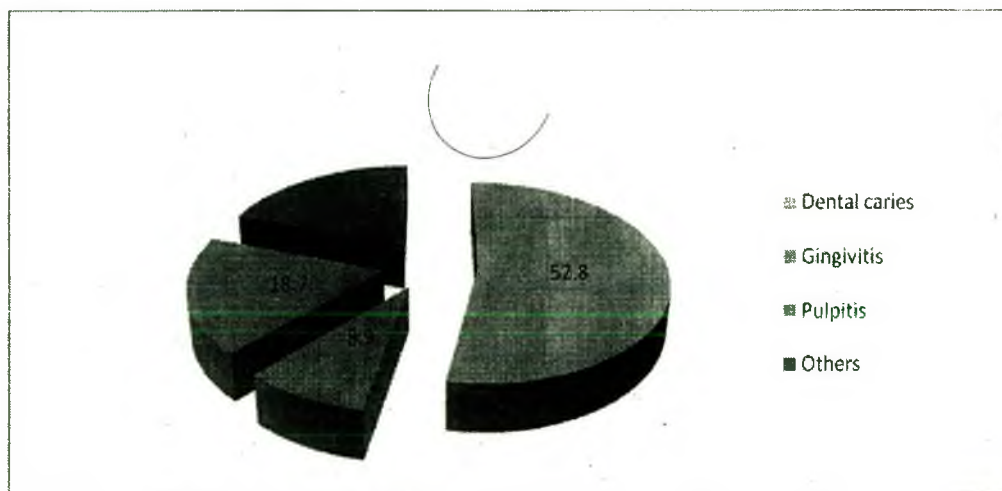
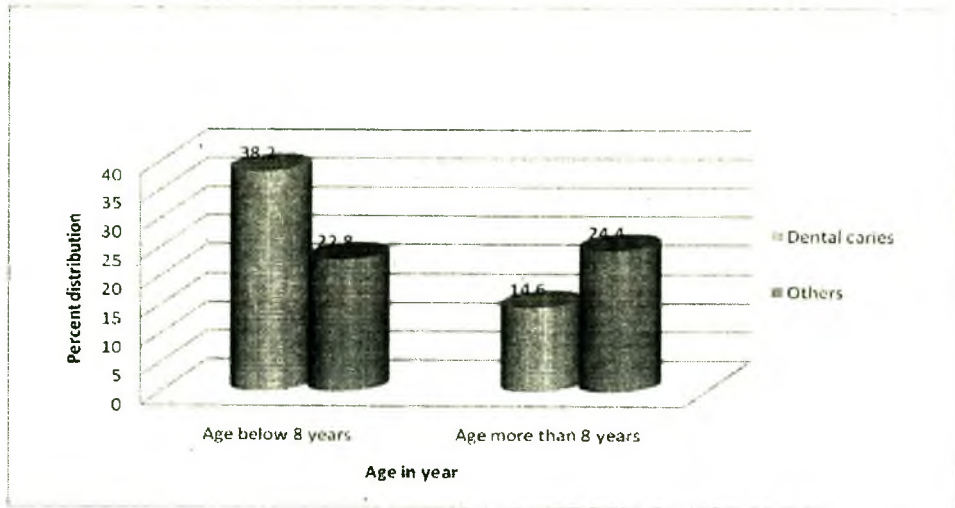
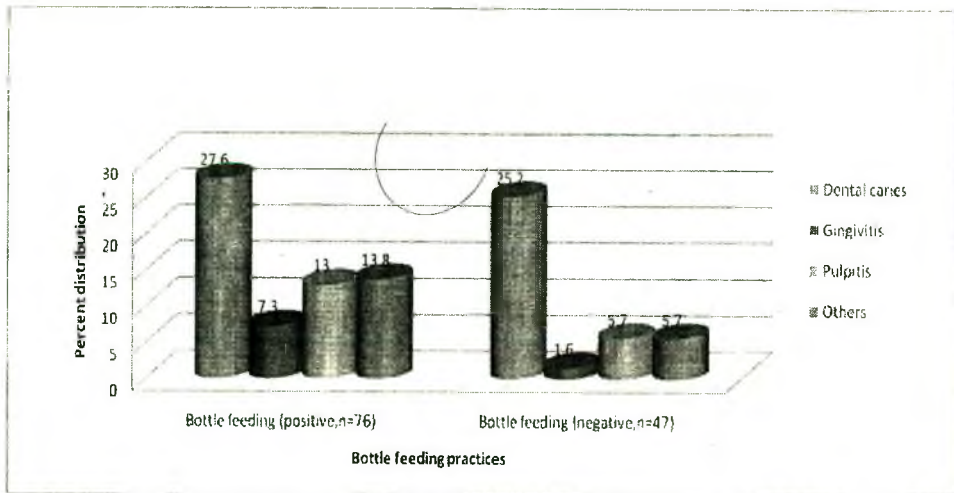


Figure-2: Percent distribution of dental problems according to the age of children (n=123)



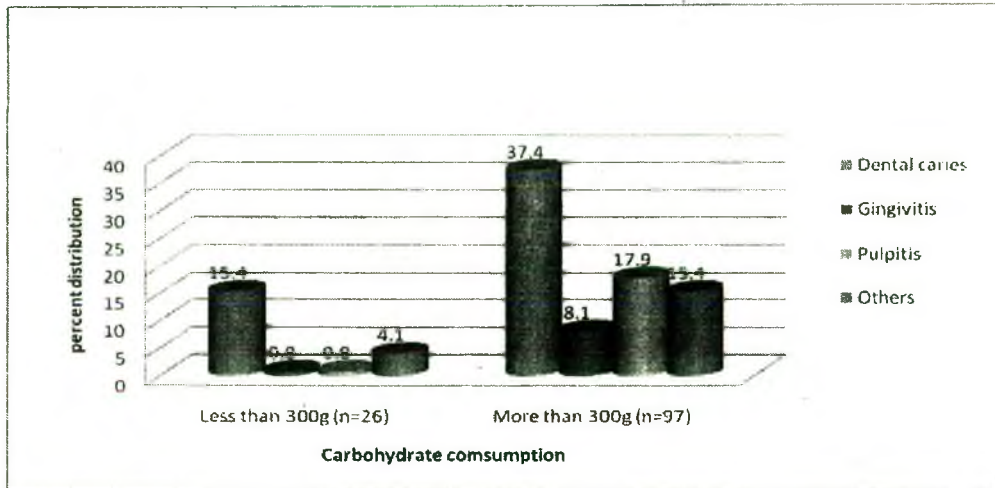
P value = 0.005

Figure 3: Relation between dental problems and bottle feeding practice among children (n=123)



P value = 0.01

Figure 4: Daily consumption of carbohydrate and dental problems among children (n=123)



P value = 0.03

Figure 5: Relation between protein consumption and dental problems among children (n=123)

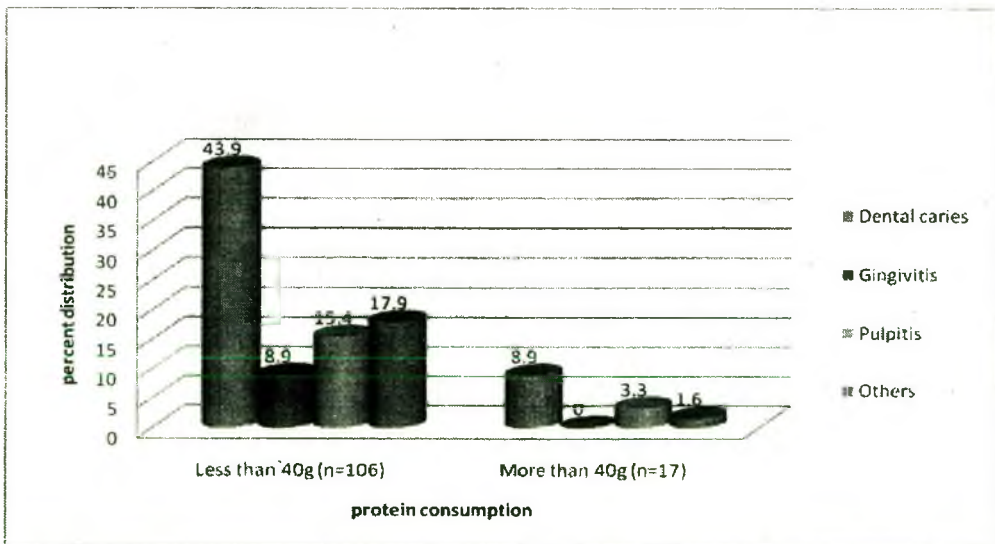


Table 1: Consumption frequency of selected food items with percentage distribution of dental caries.

Intake of food items	Problem type			
	Dental caries		Others	
	Yes	No	Yes	No
Chips	62(50.4%)	3(2.5%)	57(46.3%)	1(0.8%)
Milk with sugar	60(48.8%)	5(4.1%)	54(43.9%)	4(3.2%)
Sweet	13(10.6%)	51(41.5%)	10(8.1%)	49(39.8%)
Chocolate	65(52.9%)	0	58(47.1%)	0
Soft drinks	38(30.9%)	27(22.0%)	40(32.5%)	18(14.6%)

Table 2: Tooth cleaning practices among study children (n=123)

Tooth cleaning practices	Dental caries (%)	
Gargling	No	36.6
	Irregular	16.3
	One time or irregular	46.3
Brushing frequency	Two times or more	6.5
	Right way	4.1
Brushing style	Wrong way	48.8
	With Ca/F	12.2
Tooth paste/powder content	Without Ca/F	40.7

Figure 6: Association between dental problems and prevention knowledge of parents

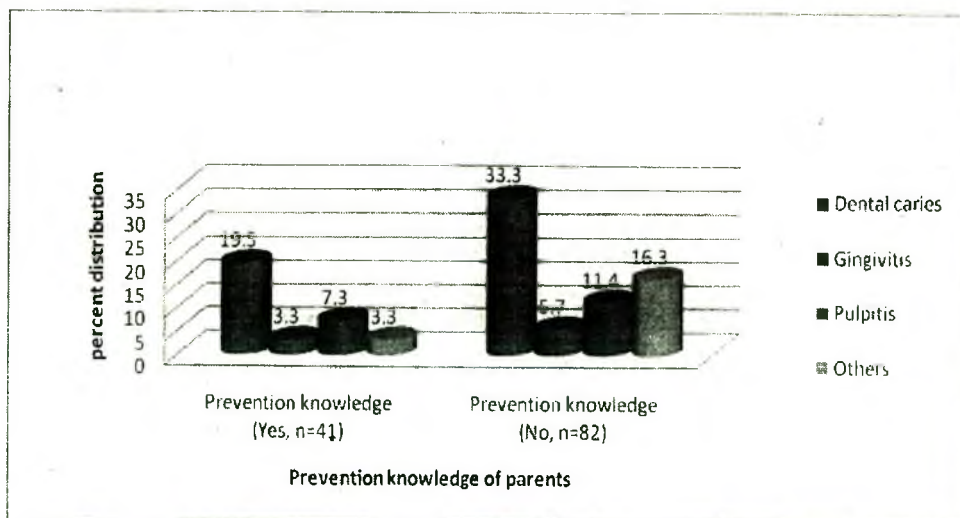
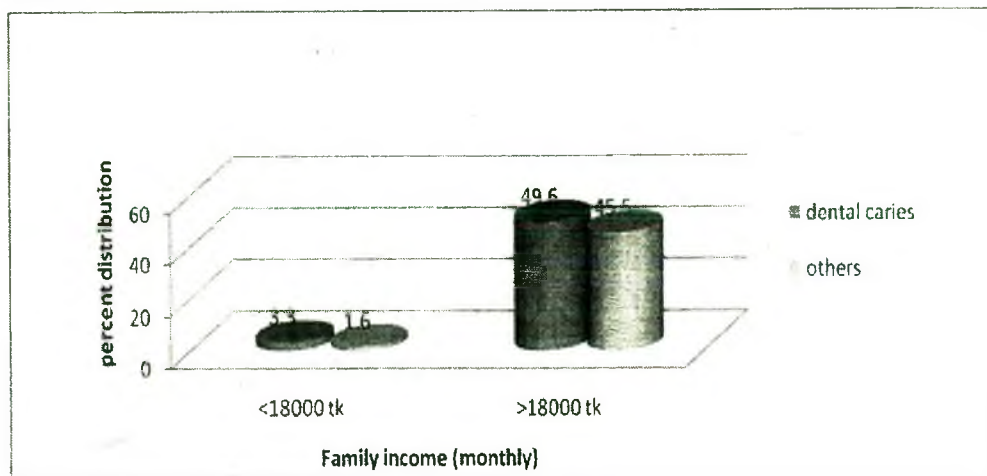


Figure 7: Relation of monthly family income with dental problems



Discussion

In Bangladesh a study found the prevalence rate of dental caries was 37.8 percent in 7 to 12 years of age children of an urban school in Dhaka city⁵. The present prevalence rate was found to be 52.8 (Figure-1) which were 1.4 times higher than the rate found in the previous study. It may be due to changes of food habit and increased consumption of the convenient, cheap & tasty sticky and fermentable carbohydrates like chocolate, ice- cream and so on. Dental caries is the most common of all oral diseases and average individual has his first experience with this disease in childhood⁶. In a study of Singapore dental caries were found in 1088 out of 2052 children from 56 kindergartens⁷. The total number of decayed teeth was 4487 with a prevalence of 53.02%. Another study found about 40% children (26%, 37%, and 49% for 3-4, 4-5 and 5-6 year-olds, respectively) were affected by caries. The attitude of mothers towards their children's oral health and its relation with caries prevalence was noted among 200 subjects. The prevalence of dental caries was 54.1%⁸, which is almost similar to the present study result. There is a significant relationship (p value=0.005) exists between increasing age of children and dental caries. According to the study, children aged more than 8 years had less percentage of dental caries (39%) and vice versa (Figure-2). A study found that prevalence of dental caries is gradually decreased as the age increased⁹. Study revealed that babies those are bottle-fed suffer more dental problems (Figure-3). Infant formula typically contains more sugar than breast milk and many parents are feeling guilty of putting baby to sleep with the bottle left in child's mouth¹⁰. In this study, 61.7% children had dental problems those are bottle fed (p value=0.01). The prevalence of baby bottle tooth decay is about three times more among poor urban children, even in communities with a fluoridated water supply¹¹. The children who were given either breast or bottle feeding for a longer duration are more prone to dental caries¹²

Breastfed infants are usually not at risk of baby bottle tooth decay unless they feed for extended period. To prevent baby bottle tooth decay, let not the children sleep with milk since it is known to cause maximum damage and the bottle should be taken away as soon as mealtime is over¹³. Fermentable carbohydrates are creating the environment for decay. Food form determines the duration of exposure or retention time of a food in the mouth which in turn affects how long the decrease in pH or the acid producing activity will last¹⁴. Figure- 4 shows that who consumed carbohydrate more than 300g become the victim of dental caries (37.4%). Oral bacteria cannot utilize dietary protein and can not produce acid and hence it acts as a buffer against demineralization¹⁵. The study also shows that children who consumed more than 40g of protein, only few of them (13.8%) had suffered from dental problems compare to those children (86.2%) who consumed less than 40g of protein. Regarding cleaning of tooth 79.6% children have dental problems who brush only one time or irregularly in a day (Table-2). Brushing is a routine activity but most of the people do not know the chemistry behind the cleaning of teeth. This study shows that children who followed the right brushing pattern (up-down) had less dental problems (5.7%) than those who did not (94.3%). Children whose are not gargle after each meal (65.8%) have the highest susceptibility of dental caries (36.6%). Fluoride helps to replace hydroxypatite of tooth with fluoropatite which is much stronger as well as resistant to caries and calcium prevent demineralization. Children using paste/powder that contain Ca and/ or F had only 13.8% dental problems comparing with others (86.2%) who did not use such paste/powder (Table-2). The prevalence of dental problems is highest (52.8%) among those whose family income is more than 18,000Tk (Figure-7). Only 33.4% children suffer in dental problems whose parents have some prevention knowledge. Parental literacy, particularly maternal literacy is influencing dental caries prevalence in children¹⁶. Family is the first school and mother is the first tutor for children. Parent may help to prevent such dental problems of children by allowing them the correct manner to keep their tooth healthy.

References

1. Andrew M Sicklick. Dental health and children. December 11, 2006:12.
2. R.A.Cawson and E.W. Odell. Oral Pathology and Oral Medicine. Dental Caries. 2002: 7:36-52.
3. R.A.Cawson and E.W. Odell. Oral Pathology and Oral Medicine. Pulpitis, apical periodontitis, resorption and hypercementosis. 2002: 7:54.
4. Bhuiyan A.M. Prevalence of dental disease in Bangladesh. Bangladesh Dental Journal. 1988-89: 5(49): 2.
5. Karamat Ali S.M. Healthy survey of student of a primary school. Bangladesh Medical Research Council Bulletin. 1977: 3(2):124-129.
6. Khan M.H. Dental Wise. December 2009: 5:3.

7. SHANG Xiao- hong, LI Da-lu, HUANG Yi, SUN Ruo- peng. Prevalence of dental caries among preschool children in Shanghe County of Shandong. Chinese Medical Journal 2008:121(22).
8. R.Mahejabeen, P. Sudha, S.Kulkarni, R.Anegundi .Dental caries prevalence among preschool children of Hubli, Dharwad city. January 2006.
9. Alam M.M. Epidemiology of dental caries among the primary school children at a school of semi-urban area of Bangladesh. National Institute of Preventive and Social medicine.1984.
10. Robin O Brien. Why are Dental problems More Prevalent in Babies that are Bottle-fed? Bottle feeding tooth decay.2006.
11. Von Burg MM et al. Baby Bottle Tooth Decay: A Concern for All Mother. Pediatric Nursing. 1995: 21:515-519.
12. Haque M.E., Shahidullah. Prevalence of dental caries in urban children and its relation to feeding pattern. Bangladesh Medical Research Council Bulletin. December 1985: 11(2):55-62.
13. Johnsen, D. and Nowjack-Raymer, R. "Baby Bottle Tooth Decay (BBTD): Issues, Assessment, and an Opportunity for the Nutritionist." Journal of the American Dietetic Association. 1989: 89:1112-1116.
14. Dr. Garbe Markin. Nutrition for health and fitness. Nutrition for oral and dental health. 2009:405.
15. Olojugba OO, Lennon MA. sugar consumption in 5 and 12 year old school children in Ondo State, Nigeria in 1985. Community dental health. September 1990: 7(3):259-265.
16. Chestnutt I G, Schäfer F, Jacobson A P, Stephen K W. The influence of tooth brushing frequency and post-brushing rinsing on caries experience in a caries clinical trial. Community dentistry and oral Epidemiology. February 1998: 26(6):406-411.