

# Oral Health Behavior and Dental Caries status: A comparative study between rural and urban school-going children in Dhaka Division

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## ABSTRACT:

**Introduction:** The importance of oral health in children is paramount. Proper techniques of brushing and the influence of fermentable carbohydrates in dental caries should be taught at the early childhood stage. **Objective:** To estimate the mean deft, DMFT, Oral health-related behavior, and practice among the selected rural and urban school-going children in Bangladesh. **Materials and Methods:** This was a comparative descriptive cross-sectional study carried out among 593 (152 rural and 441 urban children) school children using the purposive sampling technique. Data were collected from 3 urban schools and 1 rural school, using an interview-based structured questionnaire and oral examination. Consent was taken both from the college authority and participants before data collection. Descriptive analysis was performed. **Results and Discussion:** The study was carried out among 593 school children with an age range between below 5 years to above 15 years old. The majority of the students at urban schools brush their teeth twice daily while most rural school children brush their teeth once daily. Most of the students use toothbrushes and toothpaste as cleaning aids, however, the majority of them usually brush before meals. In addition, the majority of the students at rural and urban schools do not brush their teeth after taking sweet foods. Mean deft in deciduous teeth is high among rural school children (2.07) while mean DMFT in permanent teeth is high among urban schools. **Conclusion:** Organized and systemic community oral health promotion should be strengthened and a prevention-oriented oral health system is needed for promoting future oral self-care practices among school children.

**KEYWORDS:** school children, dental caries, oral hygiene, dietary practice

## INTRODUCTION:

Oral health means more than teeth and the absence of disease. According to World Health Organization (WHO)-“Oral health is a state of being free from chronic mouth and facial pain, oral and throat cancer, oral sores, birth defects such as cleft lip and palate, periodontal (gum) disease, tooth decay and tooth loss and other diseases and disorders that affect the oral cavity.”<sup>1</sup>

Oral diseases have been a persistent public health problem around the world. Almost everybody has experienced of poor oral health at least single time in their whole life. Oral diseases cause difficulties with chewing, swallowing, speech and can disrupt sleep and productivity. Dental caries and periodontal disease are the main common oral disease, which has different geographic variation, socio-economic patterns and frequency of distribution all over the world.<sup>2</sup>

Dental caries are the localized destruction of the tissues of the tooth by bacterial action. Destruction of tooth due to caries results in cavity formation and can progress into the dentin part of teeth and afterward spread into the pulp chamber which leads to necrosis and resulting peri-apical abscess.<sup>3</sup> Acid produces in dental caries caused by bacterial fermentation of food debris attached on the tooth surface. In the world, about 2.43 billion people experience dental caries in their permanent teeth.<sup>4</sup> In WHO report; dental caries persist as a major public health problem in most developed countries, attacking 60-90% of school children and the large number of adults. Dental

caries is the most prevalent oral disease in some of the Asian and Latin American countries too. In Bangladesh, dental caries is a common problem. The prevalence of dental caries is most common in childhood. Various studies showed that about 74.7% of children less than 12 year were affected by dental caries and 55.5% of people aged between 23-40 years suffered from dental caries. About 88.0% in the age group 13-22 years had missed one or more teeth by dental caries or by its complication.<sup>5</sup> The World Health Organization calculated that almost all adults have dental caries at some point in time. The availability of treatment is often poor in the developing world.<sup>6</sup> WHO and FDI established the first global oral health goal, as follows: by the year 2000, children reaching the age of 12 will not possess an average of more than three decayed, missing, and filled permanent teeth (DMFT) (Agreed in 1983). During the following decades, most high-income countries reached or even exceeded these goals, but for many low-income countries, this remains a remote aspiration.<sup>7</sup>

Dental caries prevention can be enhanced by regular tooth cleaning, low sugar diet and required amount of fluoride adding in water, salt or toothpaste. Brushing teeth two times in a day and flossing daily is recommended too. Treatment of the carious tooth of mother lowers the risk in children by decreasing the loading of certain bacteria.<sup>8</sup>

The WHO carried out several surveys to evaluate the prevalence of tooth decay and indices. The most common index was DMFT index which denotes the frequency, prevalence of dental caries in an individual's mouth and is calculated the number of decayed (D), missing (M), filled (F), teeth(T). In this way WHO goal indicates a maximum number of three teeth in average maybe affected by caries at the age of 12.<sup>9</sup>

Children who have dental caries in their deciduous tooth are in high risk to develop dental caries in permanent tooth. Therefore, children need required guidance for healthy growth up and ideal hygiene maintenance of their Oral Cavity.<sup>10-12</sup> Permanent teeth first erupt in the school going ages. Proper dental hygiene and regular checkup and follow up regarding dental caries are very important component of school health supervision during this time tenure. Ideal and correct tooth brushing techniques and education about influence of fermentable carbohydrates that is essential for development of caries should be informed periodically to school children is mandatory.

In this study, we have estimated the mean deft, DMFT, oral health related behavior and practice among the selected rural and urban school going children in Bangladesh. The results and conclusion will be helpful to explore the prevalence of dental caries in children in that particular age, compared the oral health with other countries. These might give an idea to the

health policymakers to plan for a better oral health policy for all to improve the oral health care among children of Bangladesh.

#### MATERIALS AND METHODS:

These surveys were organized among the school children in three urban schools (Urban School-1 named as "Premier School", Uttara, Dhaka which is an English Medium School; Urban School-2 and Urban School-3 named as - "Milestone School and College"- Girls' Section, "Milestone School and College"- Boys' Section, Uttara, Dhaka, both of which are under National Curriculum) and one Rural School (You and ME International school located in Bagherbazar, Gazipur, which is situated in a village outside the Gazipur City Corporation) were surveyed for their deft, DEFT and oral health-related behavior and practice.

Pretesting was performed among limited students in each school prior to conduct the surveys.

Both male and female school children were chosen from three urban schools and one Rural School for our survey.

In this This Comparative descriptive cross sectional study the expected sample size,

$$n = \frac{z^2 P(1-P)}{d^2} \quad \text{[Here, } z = \text{level of confidence 95\%,} \\ \text{P= Prevalence (50\%), } d = \text{precision(0.05)]}$$

n= 384.

We invited all the students in between 5 to 15 years old of individual schools to participate in the study. Those who were present during data collection were included in the study.

This Comparative descriptive cross sectional study had the total sample size of 593 students. 1 Rural School had the sample size of 152 and 3 other urban schools had the sample size of 441.

Purposive sampling method was used in this Comparative descriptive cross sectional study. A simple close ended questionnaires along with some open-ended components and an intraoral examination form (check list) were used to collect information by interview and oral examination (observation) on oral health status like deft, DMFT, oral health related behavior and practice of the students of both deciduous and permanent dentition. The interview parts were completed by the students of second year of Sapporo Dental College and Hospital, under the direction of the head of the Department of Dental Public Health. The oral checkup parts were examined by the faculty members of department, which were assisted by the students of second years.

Students were trained both practically and theoretically about the successful data collection method before going to the survey places. The training included recording of data related deft, DMFT, oral hygiene and dental condition of participants. Survey proposals were submitted to the Principals of all of the

schools to avail permission for the surveys. Verbal consent was collected from the students and their teachers prior to obtain data. The objectives of survey were explained to them clearly earlier. In addition, subjects were assured about the confidentiality of collecting data.

For these survey techniques, sterilized dental mirrors, caries probes, torch light, cotton, WHO recommended sterilization kits, mask and hand gloves were used.

The used instruments were taken in a container and carried into the sterilization room by volunteer group. WHO recommended portable autoclave kits were used to sterile the instruments. After that, that these instruments were taken in another sterile container. Then these were distributed in examination room for separate tables.

After taking consent from the students, detailed questions were asked, intra oral examination were done and data were collected regarding deft, DMFT, oral health related behavior and practice. Descriptive analysis was performed by using Microsoft Excel 2010.

**RESULT:**

A total of 593 both male and female students from one rural school and three urban schools were surveyed for their deft, DMFT & oral health related behavior & practice.

**Figure-1 Gender Distribution**

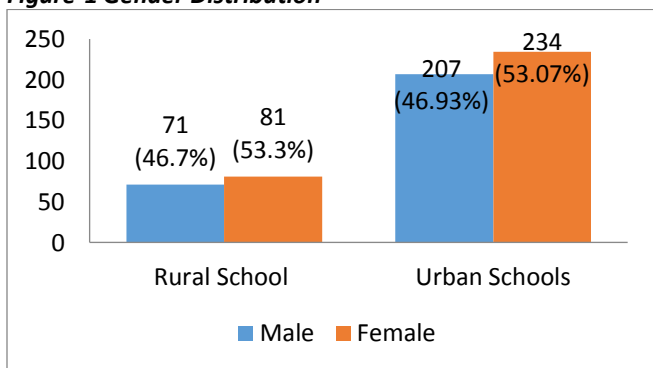


Figure-1 shows: according to gender distribution, in rural school out of 152 students 71 (46.7%) was male and 81(53.3%) were female students whereas in the combine data of 3 urban schools, 207 (46.93%) students were male and 234 (53.07%) students were female.

**Table-1 Age Distribution**

Age (Year)	Percentage of the Students (%)	
	Rural School	Combine data of 3 Urban schools
Below 5	6.15	6.22%
5-10	21.1	21.44%
11	18.75	14.33%
12	17	41.33%
13	19	14.33%
Above 13	18	2.33%

Table-1 shows that out of the 593 both male and female students where 152

students from rural school and 441 students were from 3 urban schools. In the rural school, majority of the students 21.1% are 5-10 years old and only 6.15% students are below 5 years of old. In combine data of three urban schools, majority of the students 41.33% are 12 years old and only 2.33% students were above 13 years old.

**Table-2 Oral Hygiene Maintenance Related Behavior:**

Variables		Rural School	Combine data of 3 Urban schools
Frequency of brushing in a day	Once daily	55.3%	34.44%
	Twice daily	42.8%	62.88%
	Do not brush	2%	2.89%
Schedule time of brushing teeth	Before meal	69.7%	39.23%
	After meal	9.9%	38.78%
	Both before & after meal	20.4%	22.80%
Cleaning Aids	Tooth Brush	88.2%	98.77%
	Fingers	8.6%	0.55%
	Meshwak	0%	0.33%
	Others as Mouthwash	3.4%	1.22%
Materials used along with Cleaning aids	Toothpaste	74.3%	99.04%
	Tooth powder	21.7%	0.003%
	Charcoal	2.6%	0%
	Salt	0%	0.33%
	Others as Floss, Ash	1.3%	0.92%
Brushing after taking chocolates, juice and other sweet foods	Do not Brush	73.7%	70.16%
	Do Brush	15.1%	16.05%
	Do not take sweet food at all	8.6%	4.94%
	Irregularity	2.6%	8.6%

Table-2 shows: majority of the students at urban school brush their teeth twice daily whereas most of the students of rural school brush their teeth once daily. Most of the students in both rural and urban school usually brush tooth before meal. Maximum students use toothbrush as cleaning aids, however this tendency is higher among urban school. Most of the students in both rural and urban school use toothpaste for cleaning tooth while a significant proportion of students at rural school use toothpowder for cleaning tooth. Majority of the students at rural and urban school do not brush their tooth after taking chocolates, juice, and other sweet foods.

**Table-3 Pattern of Sugar Consumption:**

Variables		Rural School	Combine data of 3 Urban schools
Taking chocolates, juice & other sweet food in a day	Do not take such food or drinks at all	23%	13.55%
	Occasionally	7%	31.89%
	Once in a day	29%	31.44%
	Several times in a day	40%	22.11%
	All through the day	1%	1.37%

Table-3 shows: frequency of taking chocolates, juice and other sweet food in a day is higher among rural school students in comparison with urban school students. However, majority of the students in rural school also do not take such food or drinks at all.

**Table-4 Distribution of deft/DMFT in Deciduous & Permanent Teeth:**

Variables		Rural School	Combine data of 3 Urban schools
(A) Mean deft in deciduous tooth	d(decayed)	1.97	0.58
	e(extracted)	0.10	0.60
	f(filled)	0.00	0.09
	mean(deft)	2.07	0.74
(B) Mean DMFT in permanent tooth	D(Decayed)	0.54	0.75
	M(Missing)	0.04	0.01
	F(Filled)	0.00	0.06
	Mean (DMFT)	0.58	0.84

Table-4 shows

- (A) Mean deft in the deciduous tooth is higher in rural school in comparison with urban school whereas  
 (B) Mean DMFT in permanent tooth is higher in urban school in comparison with rural school.

### DISCUSSION:

Oral health is the integral part of general health. Good oral hygiene is important for the health of our mouth, which can assist us in eradicating infection. Correct brushing techniques and the role of fermentable carbohydrates that play in production of dental caries should be taught or reinforced at early childhood stage. The importance of oral health in children is paramount. Children who have dental caries in their primary dentition are more likely to have dental caries in permanent dentition.<sup>10,11,12</sup> Therefore; at this stage school children should be properly equipped with good oral hygiene and dietary practice.

Current study was conducted among 593 Bangladeshi school children both from rural and urban areas in order to estimate the mean deft, DMFT and Oral health related behavior and practice. Majority of the participants were female. Our study identified that most of the urban school children have good oral hygiene practice in compare to that of rural school as majority of the urban school children (62.88%) brush twice a day and (38.78%) brush after meal, while opposite were observed in the studies among urban school children of Tamil Nadu, India and of Lahore, Pakistan in which only 10.8% of children had good oral hygiene practice.<sup>13</sup> Furthermore, in Lahore studies 48.3% school children brush twice a day<sup>14</sup> which is comparatively less than the findings of our study.

Nevertheless, in our study, we found that, use of tooth powder is relatively high among the children of rural area than that of the urban area which is similar with the findings of the study in Lohore, Pakistan.<sup>14</sup> Perhaps this could be due to low cost of tooth powder available in the market of rural area.

Though in our study, children from both rural and urban school brush their teeth, a significant numbers of students brush their teeth before meal indicating improper oral hygiene practice among these children. Similar finding was found in another study conducted among the primary school children in the

rural area of Bangladesh, where about 88.7% students brush before meal while only 4% students brush after meal.<sup>15</sup> Again in our study, we revealed that, 55.3% of rural school children brushes once daily, while 80.7% children brush once daily in that above mentioned study conducted in rural Bangladesh<sup>15</sup>, which is higher than our findings.

Furthermore, our study identified that frequency of chocolates, juice and sweet food intake is higher among rural school children in comparison to urban school while majorities from both areas do not brush after taking such foods which is similar to another study, conducted in Mumbai school children, India.<sup>16</sup>

This emphasizes the need for introduction of proper oral health education among these children. The WHO oral health report also noted that dental caries could be controlled by the joint action of communities, professionals and individuals aimed at reducing the impact of sugar consumption and emphasizing the beneficial impact of fluorides.<sup>17</sup>

However, in our study, mean deft in deciduous teeth in rural school children is higher (2.07) and mean DMFT in permanent tooth is higher (0.84) in urban school children. This is opposite with another study conducted in Southern Thailand in both urban and rural area where mean deft was 5.7 and mean DMFT was 1.6 which is comparatively higher than our study.<sup>18</sup>

Regarding filled (F) component in case of both deciduous and permanent dentition among rural school children identified zero (0), reflecting the fact that there are lack of primary prevention and treatment facilities in those areas. Furthermore, another study conducted in Jyamrung (a rural school of Nepal) showed that a total of 61% of the children had dental caries. Mean DMFT of the school children was 1.78 (SD 2.04) with the filled (F) component score of zero (0). Almost 92% of them have never received oral health education in their school<sup>19</sup> which reflects the similar trend where dental treatment facilities are almost not existent.

### CONCLUSION:

This study identifies that mean deft and DMFT is considerably high among school children both in rural and urban areas. Sugar consumption is significantly higher among rural children. Urban school children have better oral hygiene practice than rural school children. Although most of the school children brush their teeth using tooth brush and tooth paste, majority of children from both rural and urban areas do not brush their teeth following sugar meal.

### RECOMMENDATION:

Organized and systemic community oral health promotion should be strengthened and prevention oriented oral health system is need for promoting future oral self-care practices among school children.

### CONFLICT OF INTEREST:

There are no conflicts of interest.

Website: <https://www.banglajol.info/index.php/UpDCJ>

**ETHICS APPROVAL:**

Ethical Permission was taken from Sapporo Dental College authority and consent was taken from participants.

**FUNDING:**

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**AUTHORS' CONTRIBUTION:**

Conceptualization- MTHC, SKN; Writing manuscript- MTHC, SKN, AEN; Data collection and analysis- MTHC, SKN, AEN, CPP; Supervision, review and editing- MTHC. All authors have read and agreed to the published version of the manuscript.

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