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## RESEARCH ARTICLE

### ORAL HYGEINE MAINTENANCE OF SCHOOL GOING CHILDREN IN WEST BENGAL - A SURVEY STUDY

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#### ABSTRACT

**Background:** Dental caries is the single most prevalent chronic childhood disease worldwide. It affects 60-90% of school going children in most developed countries and in several developing countries the prevalence rates are increasing. Dental caries is a multi factorial disease. Some socio-demographic and behavioural indicators that prone an individual to increased caries experience include: presence of plaque, poor oral hygiene, increasing age, gender, inadequate tooth-brushing habits.

**Objective:** This study was carried out to measure the caries prevalence in school going children of 6-16 year old residing in West Bengal in relation to oral hygiene maintenance.

**Materials and Methods:** A total of 1000 children of 6-16 years age group, in standard one to senior secondary classes were examined over a 2 months period (camp frequency 1-2 times/wk) using World Health Organization criteria (1997) to record the prevalence of dental caries along with their history of oral hygiene. The treatment needs were also calculated according to that given criteria.

**Results:** 2.3% students were using tooth brush only, 97.9% students were using tooth brush with toothpaste, 0.2% students were using only finger, 0.4% students were using finger with toothpaste, 0.2% students were using finger with tooth powder, 0.1% students were using neem datum, 49.6% students using rinse mouth after snacking and 82.1% students were rinse mouth after meals.

**Conclusion:** Child oral health is always a matter of concern for a developing country so further research is required to explore actual causes.

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## INTRODUCTION

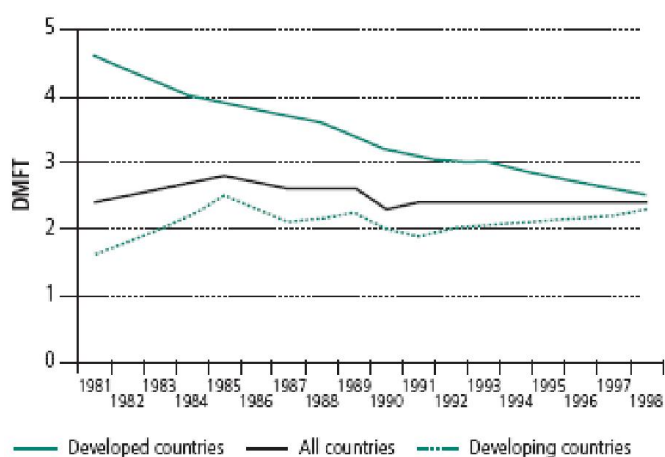
The history of diagnosing dental caries began in 1883 by W.D. Miller who found bacterial involvement in caries development. Though centuries have passed and advancements in medical techniques and technology have evolved mankind is yet to achieve a significant reduction in prevention of dental caries. Shafer (1993) defined dental caries as an irreversible microbial disease of the calcified tissues of the teeth, characterized by demineralization of the inorganic portion and destruction of the organic substance of the tooth, which often leads to cavitation. (Ramachandran Karunakaran *et al.*, 2014) Dental caries is a major health problem with high prevalence, globally involving

the people of all regions and society. The prevalence of these diseases is continuously increasing with negligence of oral maintenance habits. This disease not only causes damage to the tooth, but is also responsible for several morbid conditions of the oral cavity and other systems of the body. (Faizal C. Peedikayil *et al.*, 2013) Among oral diseases, the dental caries is an important dental public problem in India and is predominantly a disease of childhood. Pain due to dental caries can affect normal food intake and daily curriculum and sports activities in the children. (Ramachandran Karunakaran *et al.*, 2014) Various environmental factors affect dental caries prevalence among them improper brushing habits is one of the most important factor. (Raj Kumar Yadav *et al.*, 2001) Tooth loss in adult life may also be attributable to poor periodontal health. Severe periodontitis, which may result in tooth loss, is found in 5–20% of most adult populations worldwide. (Poul Erik Petersen *et al.*, 2005) WHO illustrates the periodontal

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health status of 35–44-year-olds by using the so-called Community Periodontal Index. The data available from the WHO Global Oral Health Data Bank indicate that symptoms of periodontal disease are highly prevalent among adults in all regions. Furthermore, most children and adolescents worldwide have signs of gingivitis. Aggressive periodontitis, a severe periodontal condition affecting individuals during puberty and which may lead to premature tooth loss, affects about 2% of youth. (Poul Erik Petersen *et al.*, 2005) Children and adolescents form the backbone of future generation and many serious diseases in adulthood have their roots in adolescence, for example brushing habits. Dental caries can be largely prevented by highly efficient removal of plaque by tooth brushing and flossing. Additionally, plaque on primary incisors at 1 year of age and infrequent tooth brushing at 3 years of age were associated with a high caries experience at 15 years. Good oral hygiene habits including the use of fluoride toothpaste, established in early childhood, provide a foundation for good dental health in adolescence. (Andlaw, 1978) The prevalence rates and experience of dental caries are tending to increase in developing countries with a decline in caries in most industrialized countries. Dental caries is commonly measured by the sum of decayed, missing, and filled number of teeth (DMFT index) (WHO, 2000). This value has been widely applied to assess the dental caries status at the population level for public health planning and policy-making purposes (Jakobsen and Hunt, 1990). The DMFT index, first introduced by (Klein *et al.*, 1938), is a cumulative caries measure, which indicates caries occurrence, including past and present dental caries. (Mohammed Al-Darwish *et al.*, 2014) So it is better to assess the occurrence of caries epidemiologically in terms of prevalence. The distribution and severity of dental caries vary in different parts of the world and within the same region or country. Dental caries experience in children is relatively high in the Americas (DMFT = 3.0) and in the European Region (DMFT = 2.6) whereas the index is lower in most African countries (DMFT = 1.7) (1–3). Fig. 1 illustrates the time trends in dental caries experience of 12-year-old children in developing and developed countries.



Source: refs. 1–3.

WHO 05.11.4

**Fig.1. Changing levels of dental caries experience (Decayed, Missing and Filled Teeth (DMFT) index) among 12-year-olds in developed and developing countries**

In most developing countries, the levels of dental caries were low until recent years but prevalence rates of dental caries and dental caries experience are now tending to increase. (Poul Erik Petersen *et al.*, 2005) The scenario in India is no different from other developing countries. Available literature about the prevalence of dental caries in India shows a varied picture, i.e., caries being very high in some areas and low in other areas. Oral health surveys help to detect the population's oral health status providing baseline information. (Faizal C. Peedikayil *et al.*, 2013) According to National Oral Health Survey, 2002–2003, caries prevalence in India was 51.9% (mean dmft=2), 53.8% (mean DMFT=1.8) and 63.1% (mean DMFT=2.4) at ages 5, 12 and 15 years. (Andlaw, 1978) In India where the birth rate is still high and there is less spacing between two births, mothers often are not capable of giving proper care to all the children which leads to unhealthy oral hygiene practice ultimately incidence of dental caries. (Dulal Das *et al.*, 2013) More than 40% of Indian children are found to be afflicted with dental caries. A large number of those children are residing in the West Bengal. In 1939 Sarkar examined 18,445 school children up to 16 years of age in West Bengal. He reported that 13.3% children had defective teeth. furthermore in 1931 he examined 2,000 children and found 14.4% had defective teeth. (Sajjad Ul Hasan *et al.*, 2015) Thus, this study was undertaken in the West Bengal with the objective to identify the relation between age, sex, oral hygiene maintenance with school going children.

## MATERIALS AND METHODS

The source of data was primary. The data were collected using the following instruments: the state of West Bengal has been divided into 5 zones: East, West, Central, North and South. About 1000 children with equal gender distribution from schools in the age group of 6 to 16 years studying in standard one to senior secondary classes were examined over a 2 months period (camp frequency 1–2 times/wk). The project was cleared by the IEC. WHO Oral Health Assessment Form (1997) was used to assess the dentition status and treatment needs. The examiners were instructed on the importance of thorough clinical examination and were not put under many time constraints in order to get a meaningful data. Examination was done under natural daylight using plain mouth mirror and CPITN “C” probe. The dentition status was assessed using dentition status and treatment needs. The first instrument, a semi closed ended questionnaire which was distributed among the volunteer students one day before examination and asked to fill with the help of their parents. This form also addressed data on oral habits (i.e. frequency, pattern and time of cleaning, rinsing of mouth, frequency of brushing).

### Inclusion criteria:

1. Subjects were selected randomly
2. Only whose questionnaires were complete were taken into consideration.

### Exclusion criteria:

1. Subjects who suffered from systemic illness.
2. Those who unwilling to participate were excluded from the study.

**RESULTS**

**Distribution of oral habits (Table-1) (Fig.2.)**

85(2.3%) students were using tooth brush only, 3662 (97.9%) students were using tooth brush with toothpaste, 7(0.2%) students were using only finger, 14(0.4%) students were using finger with toothpaste, 9(0.2%) students were using finger with tooth powder, 4(0.1%) students were using neem datum, 1857 (49.6%) students using rinse mouth after snacking and 3073 (82.1%) students were rinse mouth after meals.

**Table 1. Distribution of oral habits**

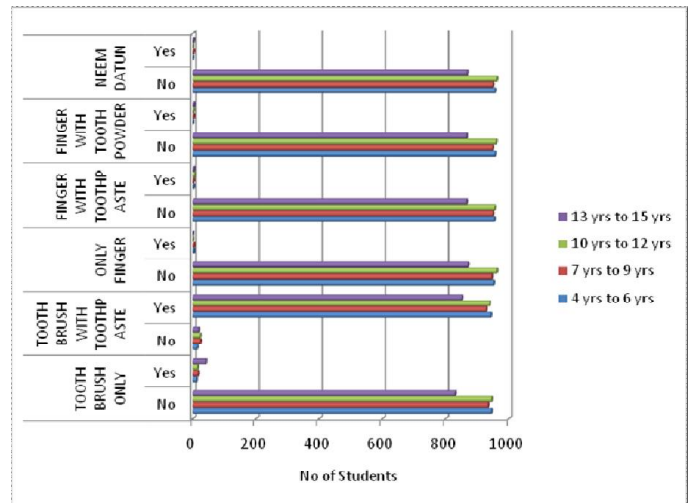
Oral habits	Group	Number	Percentage	Z-value	p-value
Tooth brush only	NO	3655	97.7%	82.5337	<0.0001*
	YES	85	2.3%		
Tooth brush with toothpaste	NO	80	2.1%	82.8111	<0.0001*
	YES	3662	97.9%		
Only finger	NO	3732	99.8%	86.1171	<0.0001*
	YES	7	0.2%		
Finger with toothpaste	NO	3728	99.6%	85.8628	<0.0001*
	YES	14	0.4%		
Finger with tooth powder	NO	3733	99.8%	86.094	<0.0001*
	YES	9	0.2%		
Neem datum	NO	3738	99.9%	86.3252	<0.0001*
	YES	4	0.1%		
Rinse mouth after snacking	NO	1885	50.4%	0.0462	0.96012
	YES	1857	49.6%		
Rinse mouth after meals	NO	669	17.9%	55.5773	<0.0001*
	YES	3073	82.1%		

**Table 2. Distribution of number of brush**

Oral habits	Group	Number	Percentage	Z-value	p-value
Number of Brush	1	2417	64.6%	26.4271	<0.0001*
	2	1274	34.0%		
	3	42	1.1%		
	4	9	0.2%		

**Distribution of oral habits (Table-2) (Fig.3.)**

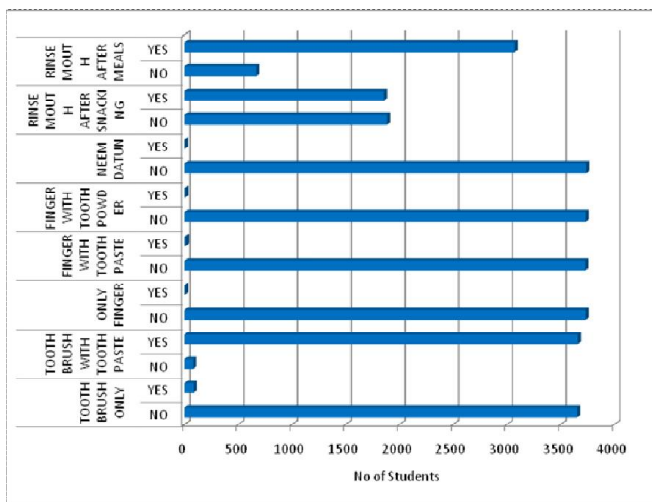
2417(64.6%) students were using one time brush only, 1274(34.0%) students were using two times brush, 42(1.1%) students were using three times brush and 9(0.2%) students were using four times brush



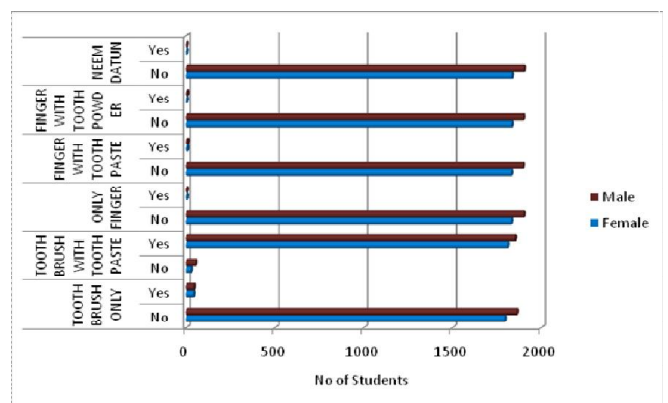
**Fig.4. Association between oral habits and age**

**Association between oral habits and age (Table-3) (Fig.4.)**

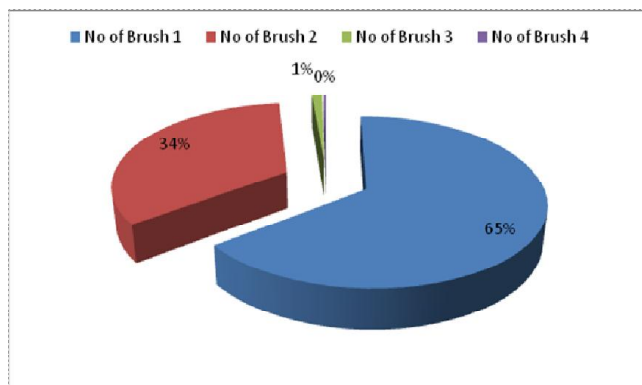
Association between use of tooth brush only and age was statistically significant ( $p < 0.0001$ ). Relationship between use of tooth brush with toothpaste and age was not statistically significant ( $p = 0.3834$ ). Association between use of only finger and age was not statistically significant ( $p = 0.0708$ ). Association between use of finger with toothpaste and age was not statistically significant ( $p = 0.3670$ ). Association between use of finger with tooth powder and age was not statistically significant ( $p = 0.2301$ ). Association between use of neemdatum and age was not statistically significant ( $p = 0.2375$ ).



**Fig.2. Distribution of oral habits**



**Fig.5. Association between oral habits and sex**



**Fig.3. Distribution of number of brush**

Table 3. Association between oral habits and age

Oral habits	Age in Years	4-6	7-9	10-12	13-15	Chi-square value	p-value
		Number %	Number %	Number %	Number %		
Tooth brush only	No	945	934	946	830	30.9147	<0.0001*
	Row %	25.9	25.6	25.9	22.7		
	Col %	98.7	98.2	98.4	95.3		
	Yes	12	17	15	41		
Tooth brush with toothpaste	No	14	24	23	19	3.0540	0.3834
	Row %	17.5	30.0	28.8	23.8		
	Col %	1.5	2.5	2.4	2.2		
	Yes	943	928	939	852		
Only finger	No	952	947	962	871	7.0336	0.0708
	Row %	25.5	25.4	25.8	23.3		
	Col %	99.7	99.6	100.0	100.0		
	Yes	3	4	0	0		
Finger with toothpaste	No	955	950	956	867	3.1644	0.3670
	Row %	25.6	25.5	25.6	23.3		
	Col %	99.8	99.8	99.4	99.5		
	Yes	2	2	6	4		
Finger with tooth powder	No	957	949	960	867	4.3075	0.2301
	Row %	25.6	25.4	25.7	23.2		
	Col %	100.0	99.7	99.8	99.5		
	Yes	0	3	2	4		
Neem datun	No	957	950	962	869	4.2314	0.2375
	Row %	25.6	25.4	25.7	23.2		
	Col %	100.0	99.8	100.0	99.8		
	Yes	0	2	0	2		
	Row %	0.0	50.0	0.0	50.0		
	Col %	0.0	0.2	0.0	0.2		

Table 4. Association between Oral Habits and age

Oral habits	Age in Years	4-6	7-9	10-12	13-15	Chi-square value	p-value
		Number %	Number %	Number %	Number %		
No of brush	1	875	611	439	492	488.0212	<0.0001*
	Row %	36.2	25.3	18.2	20.4		
	Col %	91.4	64.2	45.6	56.5		
	2	81	331	500	362		
	Row %	6.4	26.0	39.2	28.4		
	Col %	8.5	34.8	52.0	41.6		
	3	1	7	17	17		
	Row %	2.4	16.7	40.5	40.5		
	Col %	0.1	0.7	1.8	2.0		
	4	0	3	6	0		
	Row %	0.0	33.3	66.7	0.0		
	Col %	0.0	0.3	0.6	0.0		
Rinse mouth after meals	No	206	122	143	198	45.2226	<0.0001*
	Row %	30.8	18.2	21.4	29.6		
	Col %	21.5	12.8	14.9	22.7		
	Yes	751	830	819	673		
Rinse mouth after snacking	No	507	388	484	506	58.5895	<0.0001*
	Row %	26.9	20.6	25.7	26.8		
	Col %	53.0	40.8	50.3	58.1		
	Yes	450	564	478	365		
	Row %	24.2	30.4	25.7	19.7		
	Col %	47.0	59.2	49.7	41.9		

Table 5. Association between oral habits and sex

Oral habits	Gender	Female		Male		Chi-square value	p-value
		Number	%	Number	%		
Tooth brush only	No	1794		1861		0.0239	0.8771
	Row %	49.1		50.9			
	Col %	97.8		97.7			
	Yes	41		44			
	Row %	48.2		51.8			
	Col %	2.2		2.3			
Tooth brush with toothpaste	No	27		53		7.6985	0.0055*
	Row %	33.8		66.3			
	Col %	1.5		2.8			
	Yes	1810		1852			
	Row %	49.4		50.6			
	Col %	98.5		97.2			
Only finger	No	1831		1901		0.1826	0.6691
	Row %	49.1		50.9			
	Col %	99.8		99.8			
	Yes	4		3			
	Row %	57.1		42.9			
	Col %	0.2		0.2			
Finger with toothpaste	No	1831		1897		0.2185	0.6401
	Row %	49.1		50.9			
	Col %	99.7		99.6			
	Yes	6		8			
	Row %	42.9		57.1			
	Col %	0.3		0.4			
Finger with tooth powder	No	1834		1899		0.8964	0.3437
	Row %	49.1		50.9			
	Col %	99.8		99.7			
	Yes	3		6			
	Row %	33.3		66.7			
	Col %	0.2		0.3			
Neem datun	No	1835		1903		0.0013	0.9709
	Row %	49.1		50.9			
	Col %	99.9		99.9			
	Yes	2		2			
	Row %	50.0		50.0			
	Col %	0.1		0.1			

Table 6. Association between oral habits and sex

Oral habits	Gender	Female		Male		Chi-square value	p-value
		Number	%	Number	%		
No of brush	1	1291		1126		52.1262	<0.0001*
	Row %	53.4		46.6			
	Col %	70.3		59.1			
	2	528		746			
	Row %	41.4		58.6			
	Col %	28.7		39.2			
	3	14		28			
	Row %	33.3		66.7			
	Col %	0.8		1.5			
	4	4		5			
	Row %	44.4		55.6			
	Col %	0.2		0.3			
Rinse mouth after meals	No	327		342		0.0147	0.9034
	Row %	48.9		51.1			
	Col %	17.8		18.0			
	Yes	1510		1563			
	Row %	49.1		50.9			
	Col %	82.2		82.0			
Rinse mouth after snacking	No	929		956		0.0563	0.8124
	Row %	49.3		50.7			
	Col %	50.6		50.2			
	Yes	908		949			
	Row %	48.9		51.1			
	Col %	49.4		49.8			

#### Association between Oral Habits and age (Table-4)

Association between use of number of tooth brush and age was statistically significant ( $p < 0.0001$ ). Association between rinse mouth after meals and age was statistically significant ( $p < 0.0001$ ). Association between rinse mouth after snacking and age was statistically significant ( $p < 0.0001$ ).

#### Association between oral habits and sex (Table-5) (Fig.5)

Association between use of tooth brush only and sex was not statistically significant ( $p = 0.8771$ ). Relationship between use of tooth brush with toothpaste and sex was statistically significant ( $p = 0.0055$ ). Association between use of only finger and sex was not statistically significant ( $p = 0.6691$ ). Association between use of finger with toothpaste and sex was not statistically significant ( $p = 0.6401$ ). Association between use of finger with tooth powder and sex was not statistically significant ( $p = 0.3437$ ). Association between use of neemdatum and sex was not statistically significant ( $p = 0.9709$ ).

#### Association between Oral Habits and sex (Table-6)

Association between use of number of tooth brush and sex was statistically significant ( $p < 0.0001$ ). Association between rinse mouth after meals and sex was not statistically significant ( $p = 0.9034$ ). Association between rinse mouth after snacking and sex was not statistically significant ( $p = 0.8124$ ).

### DISCUSSION

Numerous studies have related dental caries experience of children with the frequency of their tooth brushing or with their oral cleanliness at the time of examination. Conflicting results were obtained and, therefore, no conclusions may be drawn from these studies. In other studies, the incidence of new carious lesions over a number of years was related to oral cleanliness during the same period of time. These studies showed that children with good oral hygiene had a lower caries incidence than those with poor oral hygiene, but the differences were small. Flossing can remove plaque from proximal tooth surfaces, and there is some evidence that it can reduce caries incidence. Dental caries can be largely prevented by highly efficient removal of plaque by tooth brushing and flossing. However, the available evidence suggests that regular prophylaxis by dental personnel is essential to maintain the necessary high level of efficiency. It is not known to what extent individuals are capable of removing their own plaque to the same high level of efficiency. It is probable that only highly motivated individuals can maintain such a high standard of plaque control. So, it is important to do a survey on oral hygiene maintenance of school going children in West Bengal. In this study 2.3% students were using tooth brush only, 97.9% students were using tooth brush with toothpaste, 0.2% students were using only finger, 0.4% students were using finger with toothpaste, 0.2% students were using finger with tooth powder,

0.1% students were using neem datum, 49.6% students using rinse mouth after snacking and 82.1% students were rinse mouth after meals. So lion part is using tooth brush with toothpaste which is appreciable. But 64.6% students were using one time brush only, 34.0% students were using two times brush, 1.1% students were using three times brush and 0.2% students were using four times brush which needs more awareness among school going children along with their parents. Relationship between use of tooth brush with toothpaste and age was not statistically significant ( $p = 0.3834$ ) which again require awareness.

### Conclusion

When oral hygiene maintenance is considered, parents should advise the children on the ill effects of poor oral hygiene maintenance on their dental health. Teachers in school also can contribute in educating the children on this. Health education on oral hygiene maintenance habits can bring about behaviour changes among these school going children that they would take forward into their adult life.

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