

Tooth Brushing Practices Among Bangladeshi Rural Adolescents

Miah MNA¹, Mia MAQ², Haque MM³, Singha RK⁴.

Abstract

The aims and objectives of the study was to document and monitor the tooth brushing practices, type of tooth paste or tooth powder used, previous exposure to oral hygiene instruction and impacts on daily life due to oral diseases. The study was a cross sectional survey of the students in class six to ten of a secondary school. A two stage cluster sample design was used to produce representative data. 350 students took part in the survey. The response rate was 93.3%. Overall 69.14% students were brush their teeth twice or more a day. About one third of the respondents (30.00%) were brushed their teeth once a day. Only 0.86% of the students seldom or no brushed their teeth. Most of the students (72.00%) brushed their teeth with toothbrush and toothpaste. About one tenth of the student (12.57%) brushed their teeth with toothbrush and powder, and about same number of students (10.00%) brushed with miswak. Very few students cleaned their teeth with finger and powder (4.00%) and other measures (1.43%). More than half of the students (56.75%) used fluoridated toothpaste to clean their teeth whilst 19.44% of the students used toothpaste without fluoride. About one fourth of the students (23.81%) were unaware about fluoride. About six in every ten of all students (59.14%) reported that they had taught to clean the teeth and had got instruction from guardian or others to clean their teeth. About one fourth of the students reported that tooth and oral diseases caused many impact on their daily life. Oral diseases are suggested to have their roots in a complex chain of environmental and behavioral events that are shaped by broader socio-economic determinants. We can prevent most of the oral diseases by proper cleaning and brushing of our teeth.

Introduction

A variety of oral hygiene measures have been used since before recorded history. The tooth brush is an oral hygiene instrument used to clean the teeth and gums. It consists of a

head of tightly clustered bristles mounted on a handle, which facilitates the cleansing of hard-to-reach areas of the mouth¹. Various forms of tooth brush have been used. Indian Ayurvedic Medicine used the twigs of the neem or banyan tree to make tooth brushes and other oral hygiene related products. The end of neem twigs is chewed until it is soft and splayed; and it is then used to brush the teeth. In the Muslim world, chewing miswak, the roots or twigs of the Arak tree is common practice¹. The first tooth brush recorded in history was made in 3000 BC, a twig of a frayed end called chewstick¹. For the origin of modern tooth brush, the Chinese have used the bristle tooth brush since 1498. It is thought that Chinese version of tooth brush spread to Europe by travelers². Dental flossing and tooth brushing are the most commonly performed oral self-care behaviour³. Tooth brushing is the practice of keeping the mouth clean and healthy. Brushing and flossing prevent tooth decay and gum disease. The purposes of tooth brushing are to prevent the buildup of plaque, the sticky film of bacteria and food that forms on the teeth. Plaque adheres to the crevices and fissures of the teeth and generates acids that, when not removed on a regular basis, decay the protective enamel surface of the teeth causing dental caries. Plaque also irritates gums and can lead to gum disease, periodontal disease, and tooth loss. Brushing and flossing removes plaque from teeth⁴. Oral diseases are clearly related to behavior. The prevalence of dental caries and periodontal diseases has decreased with improvement in oral hygiene⁵. To avoid oral diseases, individual should brush and floss at least once a day and visit a dentist regularly⁶.

Dental caries is a major health problem affecting an estimated 90% of school children worldwide⁷. Adolescence can be a time of heightened caries activity and periodontal disease due to an increased intake of cariogenic substances and inattention to oral hygiene procedures⁸. Tooth brushing with a fluoridated toothpaste and flossing can provide benefit through the topical effect of the fluoride and plaque removal from tooth surfaces⁹.

During the past two decades, many industrialized countries have experienced a dramatic decline in dental caries prevalence of children and adolescents^{10,11}. The reasons for the improvement of oral health are complex but may involve a more sensible approach to sugar consumption, improved oral hygiene practices, fluorides in tooth paste, topical fluoride application, effective use of oral health services and establishment of school based preventive programmes^{12,13}.

The aims and objectives of the study was to document and monitor the tooth brushing practices, type of tooth paste or tooth powder used, previous exposure to oral hygiene instruction and impacts on daily life due to teeth and oral diseases.

Materials and Methods

The study population included all students of class six to

1. Corresponding Author: Dr Md Nurul Amin Miah BDS, MSc
Assistant Professor
Department of Dentistry
Sylhet MAG Osmani Medical College
2. Dr Md Abul Quashem Mia BDS, DDS
Assistant Professor
Department of Dentistry
Sylhet MAG Osmani Medical College
3. Dr Md Muminul Haque BDS, DDS
Assistant Professor
Department of Dentistry
Sylhet MAG Osmani Medical College
4. Dr Ramendra Kumar Singha MBBS, M Phil
Assistant Professor
Department of Psychiatry
Sylhet MAG Osmani Medical College

ten of all secondary school at Shariatpur district in Bangladesh and the sample included 350 students of that district. A two-stage cluster sampling design was used to produce a representative sample of students. The first stage sample frame consists of all Secondary school of Shariatpur district. The list of secondary school was taken from District Education Office. All regular public and private schools were included and only those with total students less than 100 were excluded. There were 112 secondary schools in Shariatpur district within which only two were public and 110 were private. Within these 112 schools, 10 schools were excluded because in those schools, the number of total students was less than 100. The remaining 102 schools were listed and one school was selected from the list by lottery. The second stage sample frame consists of all students of the selected one school. The study used a standardized questionnaire based on OHIP (Oral Health Impact Profile). The questionnaire includes items on the topics- tooth brushing practice, types of tooth paste or tooth powder, previous exposure to oral hygiene instruction, impacts on daily life due to oral diseases. The questionnaire was translated into Bengali language. The study administration procedures were designed to protect students' privacy by assuring that the student participation was anonymous and voluntary. The self administered questionnaire was distributed to all the students in the class room and the students recorded their responses on the answer sheet. After completing the answer sheets, those took for analysis. Data analysis was conducted by SPSS 15.0 software package. Statistical differences were determined by comparing the range of the 95% confidence intervals.

Results

Total number of students of the selected school was 375 of whom 350 students responded. The response rate was 93.3%. Among those 350 students, 160 were boys and 190 were girls.

Overall 69.14% (95% CI 64.30% - 73.98%) students were brush their teeth twice or more a day (Table 1).

Table 1: Percentage (95% CI) of respondents according to the frequency of tooth brushing (N= 350)

| Cate gory | Seldom or no brushing | Brushing once a day | Brushing twice or more a day |
|-----------|-----------------------|--------------------------|------------------------------|
| Boys | 1.25 (0.37 – 2.13) | 27.50 (20.5 – 34.50) | 71.25 (63.99 – 78.51) |
| Girls | 0.53 (0.07 – 1.57) | 32.10 (25.46 – 38.74) | 67.37 (60.70 – 74.04) |
| Total | 0.86 (0.10 – 1.82) | 30.00 (25.20 – 34.80) | 69.14 (64.30 – 73.98) |

Among them boys (71.25%, 95% CI 63.99% - 78.51%) were significantly higher than that of girls (67.37%, 95% CI 60.70% - 74.04%). About one-fourth of boys (27.50%, 95% CI 20.50% - 34.50%) and one third of the girls (32.10%, 95% CI 25.46% - 38.75%) were brushed their teeth once a day. Only 1.25% (95% CI 0.37% - 2.13%) boys and 0.53% (95% CI 0.07% - 1.57%) girls were seldom or no brushed their teeth. Most of the boys (65.63%, 95% CI 58.27% - 72.98%) and girls (77.37%, 95% CI 72.42% - 83.32%) brushed their teeth with toothbrush and toothpaste (Table 2). About one tenth of the student (12.57%, 95% CI 9.10% - 16.04%) brushed their teeth with toothbrush and powder, and about

same number of students (10.00%, 95% CI 6.68% - 13.14%) brushed with miswak. Very few students cleaned their teeth with finger and powder (4.00%) and other measures (1.43%).

Table 2: Percentage (95% CI) of respondents about tooth cleaning practice (N = 350)

| Category | Boys | Girls | Total |
|-------------------------|------------------------|------------------------|------------------------|
| Toothbrush & toothpaste | 65.63 (58.27–72.98) | 77.37 (72.42–83.32) | 72.00 (67.30–76.70) |
| Toothbrush and Powder | 11.88 (6.87–16.89) | 13.16 (8.35–17.97) | 12.57 (9.10–16.04) |
| Finger and Powder | 4.37 (1.21–7.54) | 3.68 (1.00–6.36) | 4.00 (1.95–6.05) |
| Miswak | 16.25 (10.53–21.97) | 4.74 (1.72–7.76) | 10.00 (6.68–13.14) |
| Others | 1.87 (0.23 – 3.97) | 1.05 (0.39 – 2.50) | 1.43 (0.19 – 2.67) |

More than half of the boys (57.14%, 95% CI 47.67% - 66.61%) and girls (56.46%, 95% CI 48.44% - 64.48%) used fluoridated toothpaste to clean their teeth whilst about one-tenth of the boys (11.43%) and one fourth of the girls (25.17%) used toothpaste without fluoride. About one fourth of the students (23.81%) were unaware about fluoride (Table 3).

Table 3: Percentage (95% CI) of respondents used toothpaste with or without fluoride (N= 252)

| Cate gory | Toothpaste with Fluoride | Toothpaste without Fluoride | Don't know |
|-----------|--------------------------|-----------------------------|--------------------------|
| Boys | 57.14 (47.67 – 66.61) | 11.43 (5.34 – 17.52) | 31.43 (22.55 – 40.31) |
| Girls | 56.46 (48.44 – 64.48) | 25.17 (18.15 – 32.19) | 18.37 (12.11 – 24.63) |
| Total | 56.75 (50.63 – 62.87) | 19.44 (14.55 – 24.33) | 23.81 (18.55 – 29.07) |

About six in every ten of all students (boys 61.25% and girls 57.37%) reported that they had taught to clean the teeth, and about three fourths of them (boys 78.13% and girls 72.63%) reported that they had got instruction from guardian or others to clean their teeth (Table 4).

Table 4: Percentage (95% CI) of respondents pre- viously exposure to oral hygiene instruction (N= 350)

| Cate gory | Taught to clean teeth | Instruction from guardian or others to clean teeth |
|-----------|------------------------|--|
| Boys | 61.25 53.70 – 68.80 | 78.13 71.72 – 84.54 |
| Girls | 57.37 50.34 – 64.40 | 72.63 66.29 – 78.97 |
| Total | 59.14 53.99 – 64.29 | 75.14 70.61 – 79.67 |

Many students reported that tooth and oral diseases caused many impact on their daily life for example experienced difficulty for chewing any food (26.11%), difficulty in pronouncing words (17.50%), avoided eating certain foods (21.94%), avoided smiling (14.44%), avoided going out (8.89%), experienced discomfort during eating any food (23.89%), sleep disturbed (19.17%) etc (Table 5).

Table 5: Percentage (95% CI) of responses by boys and girls to impacts on daily life due to oral diseases content questions (N= 350)

| Particulars of the Items | Boys | Girls | Total |
|---|--------------------------|--------------------------|--------------------------|
| Experienced difficulty for chewing any food | 31.25 (24.07 – 38.43) | 23.16 (17.16 – 29.16) | 26.11 (21.52 – 30.70) |
| Experienced difficulty in pronouncing words | 23.13 (16.60 – 29.66) | 13.68 (8.79 – 18.57) | 17.50 (11.02 – 21.48) |
| Felt that your facial appearance was affected | 18.75 (12.70 – 24.80) | 17.37 (11.98 – 22.76) | 17.50 (11.02 – 21.48) |
| Felt shy because of problem with your teeth | 13.13 (7.90 – 18.36) | 13.16 (8.35 – 17.97) | 12.78 (9.28 – 16.28) |
| Avoided eating certain foods | 24.38 (17.73 – 31.03) | 21.05 (15.70 – 26.85) | 21.94 (17.60 – 26.28) |
| Avoided smiling because of problems with your teeth | 16.88 (11.08 – 22.68) | 13.16 (8.35 – 17.97) | 14.44 (10.76 – 18.12) |
| Concentration been disturbed by problems with your teeth | 17.50 (11.6 – 23.39) | 17.89 (12.44 – 23.34) | 17.22 (13.26 – 21.18) |
| Avoided going out because of problems with your teeth | 8.13 (3.90 – 12.36) | 10.00 (5.73 – 14.27) | 8.89 (5.91 – 11.87) |
| Experienced problems in carrying out your daily activities | 17.50 (11.61 – 23.39) | 17.89 (12.44 – 23.34) | 17.22 (13.26 – 21.18) |
| Experienced discomfort during eating any food because of problems | 28.75 (21.74 – 35.76) | 21.05 (15.70 – 26.85) | 23.89 (19.42 – 28.36) |
| Felt problems because of bad breath | 23.75 (17.16 – 30.34) | 8.95 (4.89 – 13.01) | 15.28 (11.51 – 19.05) |
| Sleep disturbed because of problems with your teeth | 21.88 (15.47 – 28.29) | 17.89 (12.44 – 23.34) | 19.17 (15.05 – 23.29) |

Discussion

Evidence had showed that strong knowledge of oral health demonstrates better oral care practice¹⁴. Similarly for those with more positive attitude towards oral health are influenced by better knowledge in taking care of their teeth. Tooth brushing practice is a good measure to take care of teeth. In this study, we found that 69.14% of the students brushed their teeth twice or more a day which was very higher than the figure (44.4%) reported by WHO¹⁵ but lower than the figure (95.7%) showed in a study in Sarwak, Malaysia¹⁶. Toothbrush and toothpaste were the most commonly used oral hygiene aids. In this study, we found that 72.00% of the students clean their teeth with toothbrush and toothpaste. Girls were found to use toothbrush and toothpaste to clean their teeth more frequently (77.37%), as compared to boys (65.63%). Now-a-days, adolescents are more conscious about the appearance of their teeth and mouth odour. They use not only the toothpaste but toothpaste with fluoride (56.75%) which is more appreciable. This is because of availability of toothbrushes and fluoridated toothpastes in all area of Bangladesh. Besides this, increased health education and awareness make the students more careful about their teeth and oral cavity. About 60% of the students reported that they had taught to clean their teeth and about 75% of them had got instruction to clean their teeth from their guardian and others. This was also influenced them to brush their teeth. Miswak, a traditional chewing stick, is also a popular method for cleaning the teeth. Large number of students (10.00%) used miswak to clean their teeth. Boys were significantly higher (16.25%) than girls (4.74%) to use miswak. Miswak is preferred for religious and cultural reasons. It has its origin in antiquity. It was used by the Arab in the pre-Islamic era to make their teeth white and shiny. In a study based on 3117 people, 15 years and older, in 10 regions of Saudi Arab, 50% were reported to use miswak¹⁷.

Many students reported that tooth and oral diseases caused many impact on their daily life. In this study, about one fourth of the students reported that oral diseases experienced difficulties for eating and chewing foods. Below one fifth of the respondents said that oral diseases caused them difficulties in pronouncing words, affected facial appearance, avoided smiling, disturbed concentration, disturbed sleeping, avoided going out etc. Oral health affects general health by causing considerable pain and suffering and by changing what people eat, their speech and their quality of life and well-being. Oral health affects people physically and psychologically and influences how they grow, enjoy life, look, speak, chew, taste food and socialize, as well as their feelings of social well-being¹⁸.

Oral diseases are suggested to have their roots in a complex chain of environmental and behavioral events that are shaped by broader socio-economic determinants. Dental diseases are most often used as a measure to describe adolescents' oral health. The biggest prevention against dental diseases is brushing teeth twice a day and even better, after every meal with fluoride toothpaste and soft bristle toothbrush.

The survey was conducted in only one secondary school and among students aged 11-15 years. In Bangladesh, many adolescents do not go to school. As the survey represents only school going youth, it does not report the true picture of tooth brushing practice in the community as a whole. The sample

size of 350 was not sufficient for all kinds of sub-group analysis and statistical tests.

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