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# ASSESSMENT OF PERCEPTION AND EXTENT OF ORAL HYGIENE PRACTICE AMONG COMILLA UNIVERSITY STUDENTS BY A DESCRIPTIVE CROSS-SECTIONAL STUDY

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**ABSTRACT**

Knowledge of oral health is a fundamental prerequisite for healthy behavior, allowing individuals to take measures to protect their overall health. To examine the perception and extent of oral hygiene behavior, this study was conducted among current 227 Students of Comilla University within age range of 18-27 years irrespective of gender, religion, and customs. IBM SPSS Statistics version 26.0, the Statistical Package for Social Sciences, was used for the analysis with a 95% CI, and the significance level was set at $p< 0.05$. Among the participants of this study, the majority were female (61.9%). Dental visits were significantly influenced by age ($p<0.05$) where the students whose ages were 18-22 years had 0.242 times [AOR=0.242; 95% CI: 0.070-0.826] less dental visit history than those of more than 25 years. Respondents having dental problems ($p<0.05$) including, dental cavities, dental caries, and toothache were more likely to visit dentists compared to the students who didn't have any dental problems (AOR=11.026; 95% CI: 3.747-32.440, AOR= 8.768; 95% CI: 1.501-51.191, and AOR=7.132; 95% CI: 2.021-25.163 respectively). More than half (55.9%) of the students had gum bleeding while brushing and are 2 times more likely to visit a dentist than those who didn't. Regarding oral hygiene practices, including type of toothbrush, brushing frequency, and using oral aids, there was no significant difference ($p>0.05$) in dental visits except for using toothpicks [AOR=0.283; 95% CI: 0.121-0.654]. Future studies are needed to determine whether this framework is supported by empirical data and leads to improvements in oral health.

***Keywords:*** Oral health**;** Students**;** Dental caries**;** Dental visit**;** Oral hygiene

## 1. INTRODUCTION

The total lack of pain, discomfort, or illnesses pertaining to the mouth cavity and its associated structures, including the teeth, tongue, jaws, and oral soft and hard tissues, is known as oral health [1]. An individual's oral health has a direct impact on their oral functions and social relationships. It is also intimately related to their general health and quality of life [2,3]. Keeping the mouth and teeth clean is the practice of oral hygiene, which aims to prevent dental issues such as cavities, gingivitis, periodontal disorders, and bad breath [4].

Frequent dental checkups, flossing, and twice-daily tooth brushing are all examples of good oral hygiene habits that dramatically lower the incidence of oral diseases [5]. Furthermore,

following these guidelines has been connected to a higher socioeconomic level [5] and education level [6]. Maintaining good dental health starts with good oral cleanliness, which also prevents 80% of dental issues [7]. Keeping your mouth healthy starts with practicing basic dental hygiene [8]. Ensuring good dental health is crucial to one's overall health, happiness, and quality of life [9,10]. Throughout the world, oral illnesses represent a significant public health issue. In particular, people from lower socioeconomic classes are more likely to suffer from oral disorders [11]. Due to their high incidence and detrimental consequences on a person's quality of life, oral illnesses are a serious public health concern [12].

One of the most common oral disorders in children is dental caries, which is brought on by tooth plaque and is closely linked to inadequate oral hygiene habits [13-16]. Approximately 3.9 billion individuals worldwide are impacted by dental caries, periodontal disease, and oropharyngeal malignancies, which collectively contribute significantly to the disease burden [17,18]. In addition, bad dental health can lead to discomfort, pain, or dysfunction and has a detrimental effect on day-to-day activities, performance at work and in school, and quality of life [6,19].

Among all medical specialties, oral health receives very little attention globally. The prevalence of periodontitis alone is thought to be 45% in South Asians between the ages of 35 and 44 [18]. According to a prior study, dental caries was more common in children in Bangladesh than in adults between the ages of 18 and 35, and 45 across all socioeconomic levels [20].Previous studies show that due to cultural, religious, and belief-based conventions, a large number of people in South Asian nations lack basic knowledge about oral health and use antiquated or traditional oral hygiene practices [18], [21], [22]. Understanding oral health is a basic requirement for good behavior, which enables a person to take preventative action for their health. Several studies have demonstrated connections between improved oral hygiene and health-related behaviors and a greater understanding of oral health [23], [24].

While research on university students' oral health has gained importance worldwide, there is still a need for specific studies in regions like Cumilla to understand the particular difficulties and influencing factors that increase dental visits. The study aims to investigate the prevalence of dental visits among students of Comilla University. Moreover, this study determines the influential factors that may increase a student's dental visits. The study's findings will be useful for stakeholders in oral health care and policymakers in understanding Bangladesh's dental health prospects and developing appropriate policies for enhancing field-level services.

## 2. MATERIALS AND METHOD

**Study design:** A cross-sectional type of study was conducted to assess the level of knowledge about oral hygiene and the extent of oral hygiene practice among the students of Comilla University. In this three months long survey work, we gathered data from current students studying in different departments of Comilla University, Cumilla, Bangladesh. Students within age range of 18-27 years irrespective of gender, religion, and customs were included in this purposive sampling technique.

**Human participants:** Students were approached to share their knowledge if they would agree to. Participants were provided with clear and comprehensive information about the study, including potential risks and benefits, before giving their consent to participate. As required, this survey work was approved by the Biosafety, Biosecurity and Ethical Committee, Faculty of Biological Sciences, Jahangirnagar University, Savar, Dhaka, Bangladesh with the **Ref No.: BBEC, JU/M 2024/08 (128).**

**Statistical Analysis:** A Microsoft Excel data sheet was used to record and evaluate the collected data, and IBM SPSS Statistics version 26.0, the Statistical Package for Social Sciences, was used for the analysis with a 95% confidence interval, and the significance level was set at $p< 0.05$.

Categorical variables are expressed as frequencies and percentages. Chi-square tests were used to identify significant connections between dependent and independent variables. The significant influencing factors of the dependent variables were used in the binary logistics regression model with the outcomes reported as odds ratios (OR) to assess the impact of selected factors.

## 2. RESULTS AND DISCUSSION

Table 1 shows the frequency and association of dependent and independent variables. A total of 227 students participated in this study where most of the respondent students were female (61.9%) and the rest 33.9% of respondent students were male. More than half (54%) of female respondents visited a dentist which is higher than male respondents (51.9%). The 18-22 year-old students (56.4%) were the maximum in number whereas only 10.1% of respondents were more than 25 years old. Around 43% of respondents who were 18-22 years aged visited a dentist and more than 65% of respondents who were greater than 25 years aged visited a dentist. Most of the students (62.6%) were students of the science faculty and more than half of the respondent students (55.5%) were from residence halls.

The non-science faculty respondents had a higher dental visit percentage (62.4%) and 58.4% of homestay respondent students visited a dentist. Only 4.8% of respondent students used hard-type toothbrushes and 52.5% used medium-type toothbrushes. The hard-type toothbrush users had a higher proportion (90.9%) of dental visits. More than half (52.4%) of the respondent brushes once a day and 62.6% of respondent students changed their toothbrushes in less than or equal to 4 months. The respondents who changed their brush more than 4 months interval had a higher percentage (56.5%) of dental visits. The maximum of students used mouthwash or toothpicks. The respondents who use mouthwash had a higher proportion (67.1%) of dental visits. Most of the respondents (60.8%) didn't forget to brush their teeth out of laziness whereas only 25.1% forgot to brush their teeth out of laziness. The respondents who forgot to brush out of laziness had a maximum of visits to a dentist.

The maximum of the students (34.4%) had tooth sensitivity dental problems, and only 4.4% had dental caries. The highest dental visits proportion of respondents had dental cavities, tooth sensitivity, and toothache dental problems. Over half 56% of respondents had gum bleeding while brushing and only 30% expressed fear in the dentist's chamber where 12.9% fear for toothache**.** Most of the respondents visited a dentist who had gum bleeding problems (59.8%) while brushing and didn't fear the dentist's chamber (57.9%). Only 19.8% of respondents believed that they had enough knowledge about taking care of their teeth and 55.1% had little knowledge. Most respondents (87.2%) didn't take care of their teeth before sleeping. Nearly two out of three students (69.2%) sometimes like to eat sweets. The respondents who always ate sweets had a high proportion (64.3%) of visiting a dentist. Only 24.5% of respondent students had some bad habits such as Biting nails (9.7%), Bruxism (5.7%), and Grinding (7.1%). Over half (52.4%) of respondent's students advise others to brush their teeth regularly and 18.5% had no advice to others. From the chi-square test, we found dental visits had a significant influence on age of the respondent, faculty, types of toothbrushes, the items the respondent used, dental problems, gum bleeding, fear of the dentist's chamber, like eating sweets, respondent advice for others to take care their teeth. We take those significant influencing variables in the binary logistic regression model.

**Table 1. The frequency distribution and association between Socio-demographic factors and dental visiting history.**

| Variables | Overall N (%) | Dental Visit | | P-value |
|---|---|---|---|---|
| | | No (%) | Yes (%) | |
| **Gender** | | | | |
| Female | 150 (66.1%) | 69 (46%) | 81 (54%) | 0.769 |
| Male | 77 (33.9%) | 37 (48.1%) | 40 (51.9%) | |
| **Age of respondent** | | | | |
| 18-22 | 128 (56.4%) | 73 (57%) | 55 (43%) | **<0.05** |
| 23-25 | 76 (33.5%) | 25 (32.9%) | 51 (67.1%) | |
| >25 | 23 (10.1%) | 8 (34.8%) | 15 (65.2%) | |
| **Faculty** | | | | |
| Non-science | 85 (37.4%) | 32 (37.6%) | 53 (62.4%) | **<0.05** |
| Science | 142 (62.6%) | 74 (52.1%) | 68 (47.9%) | |
| **Residence Type** | | | | |
| Homestay | 101 (44.5%) | 42 (41.6%) | 59 (58.4%) | 0.167 |
| Residence Hall | 126 (55.5%) | 64 (50.8%) | 62 (49.2%) | |
| **Which type of toothbrush do you use?** | | | | |
| Hard | 11 (4.8%) | 1 (9.1%) | 10 (90.9%) | **<0.05** |
| Medium | 120 (52.9%) | 61 (50.8%) | 59 (49.2%) | |
| Soft | 96 (42.3%) | 44 (45.8%) | 52 (54.2%) | |
| **Brush frequency** | | | | |
| Once | 119 (52.4%) | 61 (51.3%) | 58 (48.7%) | 0.148 |
| Twice or More | 108 (47.6%) | 45 (41.7%) | 63 (58.3%) | |
| **How often do you change your toothbrush?** | | | | |
| ≤ 4 months | 142 (62.6%) | 69 (48.6%) | 73 (51.4%) | 0.459 |
| > 4 months | 85 (37.4%) | 37 (43.5%) | 48 (56.5%) | |
| **Which of the items mentioned below do you use?** | | | | |
| Dental floss | 17 (7.5%) | 7 (41.2%) | 10 (58.8%) | **<0.05** |
| Miswak | 57 (25.1%) | 28 (49.1%) | 29 (50.9%) | |
| Mouthwash | 76 (33.5%) | 25 (32.9%) | 51 (67.1%) | |
| Toothpick | 77 (33.9%) | 46 (59.7%) | 31 (40.3%) | |

| | | | | |
|---|---|---|---|---|
| **Do you forget to brush your teeth out of laziness?** | | | | |
| No | 138 (60.8%) | 63 (45.7%) | 75 (54.3%) | 0.900 |
| Sometimes | 32 (14.1%) | 16 (50%) | 16 (50%) | |
| Yes | 57 (25.1%) | 27 (47.4%) | 30 (52.6%) | |
| **Dental problem** | | | | |
| None of them | 56 (24.7%) | 42 (75%) | 14 (25%) | |
| Dental Cavity | 42 (18.5%) | 11 (26.2%) | 31 (73.8%) | **<0.05** |
| Dental Caries | 10 (4.4%) | 3 (30%) | 7 (70%) | |
| Tooth Sensitivity | 78 (34.4%) | 38 (48.7%) | 40 (51.3%) | |
| Toothache | 41 (18.1%) | 12 (29.3%) | 29 (70.7%) | |
| **Do you have gum bleeding while brushing?** | | | | |
| No | 100 (41.1%) | 55 (55%) | 45 (45%) | **<0.05** |
| Yes | 127 (55.9%) | 51 (40.2%) | 76 (59.8%) | |
| **Do you fear the dentist's chamber?** | | | | |
| No | 159 (70.0%) | 67 (42.1%) | 92(57.9%) | **<0.05** |
| Yes | 68 (30.0%) | 39 (57.4%) | 29 (42.6%) | |
| **Reason of fear** | | | | |
| Have no fear | 159 (70.0%) | 67 (42.1%) | 92(57.9%) | 0.050 |
| Fear of dental instruments | 17 (7.5%) | 12 (70.6%) | 5 (29.4%) | |
| Fear of injection | 22 (9.7%) | 14 (63.6%) | 8 (36.4%) | |
| Fear of toothache | 29 (12.8%) | 13 (44.8%) | 16 (53.3%) | |
| **Do you believe you have enough knowledge about taking care of your teeth?** | | | | |
| A little | 125 (55.1%) | 60 (48%) | 65 (52%) | 0.874 |
| No | 57 (25.1%) | 25 (43.9%) | 32 (56.1%) | |
| Yes | 45 (19.8%) | 21 (46.7%) | 24 (53.3%) | |
| **What do you do to take care of your teeth before sleeping?** | | | | |
| No | 198 (87.2%) | 95 (48%) | 103 (52%) | 0.311 |
| Yes | 29 (12.8%) | 11 (37.9%) | 18 (62.1%) | |
| **Do you like eating sweets?** | | | | |
| Always | 70 (30.8%) | 25 (35.7%) | 45 (64.3%) | **<0.05** |
| Sometimes | 157 (69.2%) | 81 (51.6%) | 76 (48.4%) | |
| **Which of the bad habits listed below do you have?** | | | | |
| Biting nails | 22 (9.7%) | 7 (31.8%) | 15 (68.2%) | |
| Bruxism | 13 (5.7%) | 8 (61.5%) | 5 (38.5%) | 0.356 |
| Grinding | 16 (7.1%) | 7 (43.8%) | 9 (56.3%) | |
| Nothing | 176 (75.5%) | 84 (47.7%) | 92 (52.3%) | |
| **How would you advise others to take care of your teeth?** | | | | |
| Brush your teeth regularly | 119 (52.4%) | 50 (42%) | 69 (58%) | |
| Don't consume too much sweets | 20 (8.8%) | 13 (65%) | 7 (35%) | |
| Go for regular dental visit | 17 (7.5%) | 9 (52.9%) | 8(47.1%) | **<0.05** |
| Gurgling with salty warm water | 29 (12.8%) | 19(65.5%) | 10 (34.5%) | |
| No advice | 42 (18.5%) | 15(35.7%) | 27 (64.3%) | |

Table 2 presents the influencing factors of respondent student's dental visits. The binary logistic regression variable namely age of the respondent, dental problem, gum bleeding, and the items the respondent used were found to influence the respondent student's dental visits where the p-value was less than 0.05.

From the binary logistic regression analysis, the students whose ages were 18-22 years had 0.242 times [AOR=0.242; 95% CI: 0.070-0.826] less dental visit history than the students whose ages were more than 25 years.

In cases where students who had dental cavities, dental caries, dental sensitivity, and toothache problems were still found to be 11.026 times [AOR=11.026; 95% CI: 3.747-32.440], 8.768 times [AOR= 8.768; 95% CI: 1.501-51.191], 3.615 times [AOR=3.615; 95% CI: 1.5-8.708], and 7.132 times [AOR=7.132; 95% CI: 2.021-25.163] more dental visits history compared to the students who didn't have any dental problems.

The students who had a gum bleeding problem while brushing had two times [AOR=2.133; 95% CI: 1.097-4.147] more likely to visit a dentist than the students who didn't have gum bleeding dental problems. The students who used toothpicks had 0.283 times [AOR=0.283; 95% CI: 0.121-0.654] fewer visits to a dentist than the students who used mouthwash.

**Table 2: Binary logistic regression analysis for dental visiting history among students of Comilla University.**

| Variables | Adj. OR | 95% CI for Adj. OR | | P-value |
|---|---|---|---|---|
| | | Lower | Upper | |
| **Age of respondent** | | | | |
| 18-22 | 0.242 | 0.070 | 0.826 | **0.024*** |
| 23-25 | 0.569 | 0.174 | 1.865 | 0.352 |
| >25 | Ref. | | | |
| **Faculty** | | | | |
| Science | 0.980 | 0.437 | 2.198 | 0.962 |
| Non-science | Ref. | | | |
| **Which type of toothbrush do you use?** | | | | |
| Soft | 0.167 | 0.017 | 1.660 | 0.127 |
| Medium | 0.194 | 0.019 | 1.972 | 0.166 |
| Hard | Ref. | | | |
| **Dental problem** | | | | |
| Dental Cavity | 11.026 | 3.747 | 32.440 | **<0.001**** |
| Dental Caries | 8.768 | 1.501 | 51.191 | **0.016*** |
| Tooth Sensitivity | 3.615 | 1.500 | 8.708 | **0.004*** |
| Toothache | 7.132 | 2.021 | 25.163 | **0.002*** |
| None of them | Ref. | | | |
| **Do you have gum bleeding while brushing?** | | | | |
| Yes | 2.133 | 1.097 | 4.147 | **0.026*** |
| No | Ref. | | | |
| **Do you like eating sweets?** | | | | |
| Always | 1.345 | 0.588 | 3.074 | 0.483 |
| Sometimes | Ref. | | | |
| **Do you fear the dentist's chamber?** | | | | |
| Yes | 0.711 | 0.321 | 1.574 | 0.400 |
| No | Ref. | | | |
| **Which of the items mentioned below do you use?** | | | | |
| Dental floss | 0.701 | 0.169 | 2.894 | 0.624 |
| Miswak | 0.426 | 0.177 | 1.021 | 0.056 |
| Toothpick | 0.283 | 0.121 | 0.654 | **0.003*** |
| Mouthwash | Ref. | | | |
| **How would you advise others to take care of your teeth?** | | | | |
| Brush your teeth regularly | 1.081 | 0.450 | 2.601 | 0.861 |
| Don't consume too much sweets | 0.944 | 0.224 | 3.976 | 0.938 |
| Go for a regular dental visit | 0.637 | 0.160 | 2.540 | 0.523 |
| Gurgling with salty warm water | 0.556 | 0.151 | 2.056 | 0.379 |
| No advice | Ref. | | | |

## DISCUSSION

In our study, we find that 53.3% of university students have visited the dentist chamber for any reason, slightly higher than the European average of 50% [25]. Our research finding demonstrated that respondents did not show a significant relation between dental visits and gender ($p = 0.769$), which agrees with findings from studies on Indian postgraduate students [26]. On the other hand, a study carried out in Saudi Arabia indicated that compared to their male students, female students had considerably superior oral health-related knowledge, attitudes, and habits. The study's findings on the good oral health practices and attitudes of women may be explained by the fact that women tend to be more self-conscious about their looks. Women are therefore more likely to become knowledgeable about oral health and to visit a dentist [23]. A positive correlation has also been seen between dental visits and age [23]. Our research at the Comilla University demonstrated this relationship, with younger students seeing the dentist 0.242 times less often than older students. This suggests that older students have more oral health awareness than younger ones. A study performed at the University of Barcelona found a statistically significant association between the faculty and dental visits which shows that this variable had a relationship with the knowledge that the respondents have about oral hygiene [27]. A comparison of the respondents' oral health knowledge concerning toothbrush hardness ($p < 0.05$), and the interval between toothbrush replacements ($p < 0.05$) revealed no significant variations in this regard. When asked how often they brush their teeth, the majority of respondents (52.9%) said they only brush once a day (52.4%) and use a medium toothbrush. This is in contrast to a survey done at a military college in Bucharest, which revealed that 78.3% of respondents brushed their teeth twice a day (morning and evening) [28].

Research conducted by Peltzer and Pengpid [29] across 26 countries in Asia, Africa, and America involving 19,560 undergraduate students revealed that 67.2% of students brushed their teeth twice a day, 28.8% about once a day, and 4.0% never did. Studies in low- and middle-income nations (e.g., 52.2% in India, 35% in Lebanon, and 32% in Turkey) seem to have greater rates of students cleaning their teeth fewer than twice a day than children in high-income nations (7.9% in Italy or 25% in the United States). A study conducted on Zagreb's student body revealed that 83% of students, all of whom were Faculty of Dentistry students, brushed their teeth two to three times a day, and 17% stated they did so more than three times [30]. Students from Bjelovar, Croatia, presented an opposite statement [31].Over half (62.6%) of the participants swapped out their toothbrushes every four months. In a Military College in Bucharest poll, 53.8 percent of participants changed their brush every three months, and 34.3 percent once a month [28].In Zagreb, on the other hand, 48.3% of students use the same brush for fewer than three months [32].

According to numerous studies [9], [33], [34] the majority of students did not use dental floss. However, this is in contradiction with a study by Grewal and Kaur [35], which revealed that over half of American children regularly flossed their teeth. Furthermore, in contrast to some research, the majority of university students used mouthwash [9], [34], [36]. Additionally, we observe that students who use toothpicks have 0.284 times fewer visits than those who use mouthwash. Because miswak is used by Muslim students for cultural and religious reasons, university students should be instructed on how to use it properly and should be encouraged to practice excellent oral hygiene by brushing, using dental floss, and using toothpicks as preventative measures [33].

According to over half of university students,

individuals with gum disease attended dental chambers 2.133 times more often than students without gum disease. This result is in contradiction with the previous [36]-[38] carried out globally, which suggested using a toothbrush as a preventative care for gum disorders. One effective strategy to remove plaque and maintain healthy gums is to teach and encourage university students to wash their teeth regularly [33]. Eating sweets and fear of the dentist's chamber are significantly associated with dental visits. In our study, the students who consume sweets regularly face more dental problems and also visit the dentist's chamber more frequently. Besides, most of the students do not fear visiting a dentist's chamber. Dental visits are also significantly associated with dental problems, in our study, most of the students face tooth sensitivity problems, students who face dental cavities 11.024 times, dental caries 8.768 times, tooth sensitivity 3.615 times, toothache 7.132 times have more dental visits than none of them dental problem. Finally, we also find a significant association between advice and dental visits.

Our study revealed that the students advised to avoid too much sweet consumption, showed fewer dental visits. Diet provides sugars and other fermentable carbohydrates, which are metabolized to acids by plaque bacteria, resultant low pH favors the growth of the acidogenic and aciduric bacteria (*Mutans streptococci*) which subsequently produce dental caries. In terms of gargling with warm salty water, we find that respondents showed a significant reduction in dentist chamber visits. A similar correlation was reported by Karmawati *et al.*, highlighting that gargling with salt water, creates an alkaline environment that will inhibit the growth/proliferation of bacteria, and reduce toothache.

## 3.CONCLUSION

Oral hygiene is strongly correlated with an individual's attitude, behavior, and level of knowledge towards it. Acquiring adequate oral hygiene knowledge is essential for implementing effective oral hygiene practices. Even with education, a person's dental hygiene may still be inadequate if they do not exercise the right habits and attitude. Higher education students have a greater understanding of the significance of keeping good dental hygiene.

The data acquired from this research may be used by educational institutions to get a deeper understanding of student knowledge. As a result, they can enhance student education by offering a range of lectures or workshops. Conducting a study on student demographics across Bangladesh is highly recommended. In addition, a dental examination simultaneously is required to objectively evaluate the oral hygiene status on a regular basis.

## DECLARATIONS

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**Consent for publication**

Informed consent was obtained from every participant for documentation and examination.

**Competing interests**

The authors declare no competing interests.

**Ethical approval**

Ethical approval was granted by the Institutional Human Ethical Committee

**Informed patient consent**

All patients' clinical records were obtained with informed consent.

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