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Prevalence of Common Dental Problems and Oral Hygiene Behaviors Among Adults in Bangladesh- A Cross-Sectional Study

Dr. Shakur Mahmud[1*], Dr. Khandokar Emanuzzaman Emon[2], Dr. Shahela Sarmin[3], Dr. Md. Immam Hossin[4], Dr. Musfiqur Rahman[5], Dr. Abdullah al Faruk[6], Dr. Md. Rasel Ahmad[7]

[1]Assistant Professor, Department of Dentistry, Mymensingh Medical College, Mymensingh, Bangladesh
[2]Junior Consultant, Department of Dentistry (OSD), Directorate General of Health Services (DGHS), Mohakhali, Dhaka, Bangladesh
[3]Assistant Professor, Department of Dentistry, Dhaka Dental College, Dhaka, Bangladesh
[4]PhD Fellow, Bangladesh Medical University (BMU), Dhaka, Bangladesh
[5]Lecturer, Department of Dental Anatomy, Sapporo Dental College, Dhaka, Bangladesh
[6]Assistant Professor, Department of Periodontology, Dental Unit, Rajshahi Medical College, Rajshahi, Bangladesh
[7]Assistant Professor (Medical Education), Department of Public Health and Informatics, Bangladesh Medical University (BMU), Dhaka, Bangladesh

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***Corresponding author**: Dr. Shakur Mahmud
Assistant Professor, Department of Dentistry, Mymensingh Medical College, Mymensingh, Bangladesh

Abstract **Original Research Article**

Background: Oral health is a key component of general well-being, yet it remains a neglected area of public health in many developing countries, including Bangladesh. Understanding the prevalence of common dental problems and oral hygiene behaviors is essential for planning effective preventive and educational interventions. Therefore, this study aimed to assess the prevalence of common dental problems and oral hygiene practices among adults in Bangladesh. ***Methods:*** This cross-sectional study was conducted at the Department of Dentistry, Shaheed Syed Nazrul Islam Medical College Hospital, Kishoreganj, and Sadar Hospital, Sunamganj, Bangladesh. A total of 300 adult participants with dental problems from various age groups, ranging from under 20 to over 60 years, were included. ***Results:*** The most common age group among participants was 30–39 years (27.67%), and the majority were female (62.0%), with a female-to-male ratio of 1.63:1. Gingivitis (41.0%) and dental caries (27.0%) were the most frequently reported dental problems. While 65.4% used toothbrushes for cleaning teeth, a considerable portion relied on fingers, neem sticks, or meshwak. Among toothbrush users (n=196), 81.6% brushed once daily, and 51.0% used a mixed brushing technique. Only 40.7% reported rinsing their mouth after meals, and a significant proportion did not engage in flossing (62.0%) or tongue cleaning (85.3%). Regarding dental visits, only 21.3% had sought routine dental checkups, and most (68.8%) of them visited only when experiencing a problem. ***Conclusion:*** The findings indicate a high prevalence of dental problems and inadequate oral hygiene practices among adults in Bangladesh. Public health initiatives focusing on oral health education and promotion of regular dental checkups are urgently needed to address these gaps.

Keywords: Oral Health Bangladesh, Dental Health Study, Cross-sectional Study, Adult Oral Health, Oral Hygiene Practices.

INTRODUCTION

Dental health is a vital aspect of overall health, well-being, and quality of life. It plays an essential role in enabling individuals to speak, eat, and socialize confidently. Good oral health is characterized by the absence of chronic orofacial pain and diseases such as dental caries and periodontal disease [1]. Dental diseases are widespread, affecting individuals across all age groups, children, adults, and the elderly, and can lead to significant discomfort, social embarrassment, disruption of daily life, and economic burden. While dental caries is largely under control in most high-income countries, a substantial portion of cases remain untreated in low- and middle-income populations. Across both developed and developing nations, the burden of oral disease disproportionately affects disadvantaged groups, including those with low levels of education, low income, the unemployed, the elderly, and people with disabilities [2].

Over the past two decades, several industrialized countries have witnessed a remarkable decline in dental disease prevalence. This positive trend

has been attributed to the widespread use of fluoride, participation in preventive dental health programs, and improvements in oral hygiene practices and dietary habits [3]. In contrast, many developing countries are experiencing a rise in dental caries due to a shift toward unhealthy diets, poor oral hygiene, limited fluoride use, and inadequate access to dental services. Urbanization, westernization, and the lack of public oral health programs further exacerbate the problem [4]. Notably, the key risk factors for poor dental health, such as poor diet, tobacco use, excessive alcohol consumption, and physical inactivity, are similar to those responsible for other chronic diseases [4]. A study conducted in 2002 at Dhaka Dental College and Hospital identified several key contributors to dental caries among patients, including ignorance, illiteracy, low family income, poor oral hygiene practices, and high consumption of sugary foods [5]. In this context, oral health literacy has emerged as a critical determinant of oral health. Inadequate education, traditional beliefs, and cultural myths can lead to misconceptions about dental care, which are often passed down through generations, creating barriers to accepting scientific and evidence-based dental treatments [6].

Maintaining proper oral hygiene is considered the cornerstone of preventing up to 80% of oral health issues [7]. Effective plaque control and regular oral hygiene practices are crucial for preventing periodontal disease, as dental plaque is the primary etiological factor in its development [8]. Periodontal diseases comprise a spectrum of inflammatory conditions affecting the gums, supporting bone, and periodontal ligaments, and may lead to tooth loss and systemic inflammation [9]. Gingivitis is a reversible, early stage of periodontal disease that can progress to the more severe and irreversible condition of periodontitis if not treated promptly [10]. Globally, approximately one-third of the population is affected by periodontitis, with its prevalence increasing significantly with age [11]. Thus, addressing periodontitis in the elderly population is essential. However, there is a lack of comprehensive data on the oral health status of adults in Bangladesh.

Therefore, the present study aimed to assess the prevalence of common dental problems and oral hygiene practices among adults in Bangladesh.

METHODOLOGY & MATERIALS

This cross-sectional study was conducted in the Department of Dentistry at Shaheed Syed Nazrul Islam Medical College Hospital, Kishoreganj, and Sadar Hospital, Sunamganj, Bangladesh, from January 2022 to June 2022. In this study, we included 300 adults with dental problems aged 18 years and above who voluntarily participated and provided informed consent. Participants were selected from both urban and semi-urban communities through convenient sampling. These were the following criteria for eligibility as study participants:

Inclusion Criteria

- Adults aged 18 years and above
- Individuals who gave informed verbal or written consent
- Participants residing in Bangladesh for at least 6 months
- Those able to understand and respond to the questionnaire

Exclusion Criteria

- Individuals below 18 years of age
- Medically compromised or critically ill patients unable to participate
- Individuals with cognitive impairments or psychiatric disorders that hinder response accuracy
- Respondents who refused to participate or withdrew consent

Data Collection Tool and Procedure:

Informed written consent was taken from each of the patients by using a consent form in English. Data were collected using a pretested, semi-structured questionnaire designed by the research team based on existing literature and expert consultation. The questionnaire was divided into several sections including demographic details (age, gender), types of self-reported dental problems, methods and frequency of oral hygiene practices (such as brushing frequency, tools used, techniques, mouth rinsing, flossing, and tongue cleaning), and dental service utilization (such as frequency of dental visits and reasons for seeking care). The tool was developed in English, then translated into Bengali, and back-translated to ensure consistency. The interviews were conducted in person by trained health workers or dental students who had received orientation to maintain consistency and reduce interviewer bias.

Data Analysis:

Descriptive statistics, including frequencies and percentages, were used to summarize categorical variables such as age groups, gender distribution, types of dental problems, and oral hygiene practices. Results were presented in the form of tables, pie charts, and bar graphs. The gender ratio was calculated, and age distributions were categorized to reflect trends in oral health across different age groups. The data were analyzed using SPSS 20 (Statistical Package for Social Sciences) for Windows version 10. This study was ethically approved by the Institutional Review Committee of Shaheed Syed Nazrul Islam Medical College Hospital, Kishoreganj, Bangladesh.

RESULTS

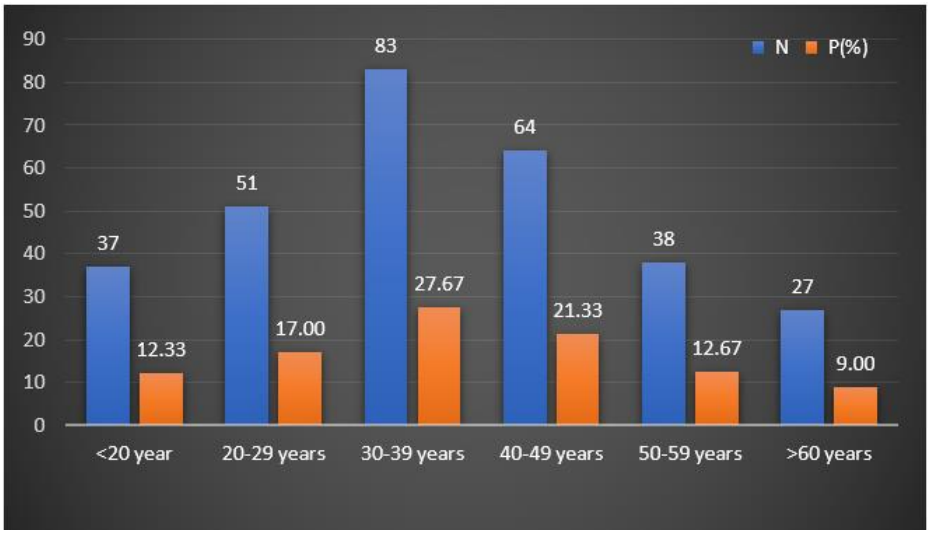

Figure 1: Age Distribution of the Respondents (N=300)

Figure 1 illustrates that the age of the participants ranged from 18 years to over 60 years. The highest proportion of participants (27.67%) belonged to the 30–39 years age group, followed by 21.33% in the 40–49 years age group. Participants aged 20–29 years accounted for 17.0%, while the 50–59 years group represented 12.7%. About 12.3% were under 20 years of age, and 9.0% of respondents were aged 60 years or older.

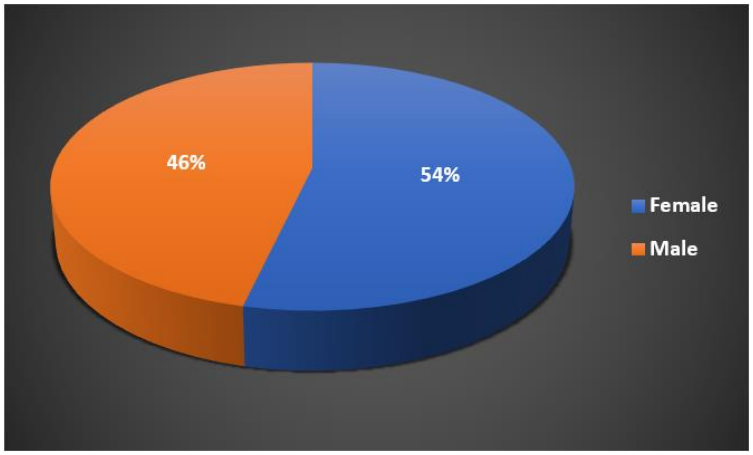

Figure 2: Gender Distribution of the Respondents (N=300)

The pie chart illustrates that out of the total 300 participants, 186 (62.0%) were females, and 114 (38.0%) were males. The female-to-male ratio was approximately 1.63:1 in this study.

Table 1: Types of Dental Problems (N=300)

Dental Problems	N	P(%)
Gingivitis	123	41.0
Dental caries	81	27.0
Multiple problems	57	19.0
Fractured tooth	21	7.0
Other problems	18	6.0

Table 1 presents the distribution of various dental problems reported among the study participants (N=300). The most common issue was gingivitis, affecting 123 (41.0%) of individuals, followed by dental caries at 27.0%. A significant proportion, 57 (19.0%), had multiple dental problems. Fractured teeth were reported by 7.0%, while other miscellaneous dental issues accounted for 6.0%.

Table 2: **Use of Toothbrush or Other Alternatives for Cleaning Teeth among Participants (N=300)**

Using of toothbrush or other alternatives	N	P (%)
Toothbrush	196	65.33
Finger	56	18.67
Neem stick	22	7.33
Meshwak	19	6.33
Others	7	2.33

Table 2 outlines the methods used for cleaning teeth by the participants. The majority of individuals (65.4%) used a toothbrush for maintaining oral hygiene. Alternative methods included the use of fingers (18.7%), neem sticks (7.3%), and meshwak (6.3%). A small fraction (2.3%) reported using other means for dental cleaning.

Table 3: Brushing Practices Among Toothbrush Users (N = 196)

Brushing frequency	N=196	P(%)
Once daily	160	81.6
Twice daily	36	18.4
Brushing time		
Brushing in the Morning before meal	160	81.6
Brushing in the morning after meal	06	3.1
Brushing at night after meal	30	15.3
Brushing technique		
Horizontal stroke	40	20.4
Vertical stroke	40	20.4
Circular stroke	16	8.2
Mixed stroke	100	51.0

Table 3 describes the brushing frequency, time, and techniques among the 196 participants who reported using a toothbrush. Most participants brushed once daily (81.6%, n=160), while only 18.4% (n=36) brushed twice daily. A majority of users (81.6%, n=160) brushed in the morning before meals, followed by 15.3% (n=30) who brushed at night after meals, and 3.1% (n=6) who brushed in the morning after meals. The most common technique was the mixed stroke method (51.0%, n=100). Equal proportions used either horizontal or vertical strokes (20.4%, n=40 each), while only 8.2% (n=16) used the circular stroke technique.

Table 4: Oral Hygiene Practices Among Study Participants (N = 300)

Mouth rinsing after meal	N=300	P(%)
Yes	122	40.7
No	178	59.3
Inter-dental cleaning/Flossing		
Yes	114	38.0
No	186	62.0
Tongue cleaning		
Yes	44	14.7
No	256	85.3

Table 4 shows that only 122 (40.7%) reported rinsing their mouth after meals, whereas 178 (59.3%) did not. Among all respondents, 38.0% practiced flossing or interdental cleaning; however, a larger group (62.0%) did not. Only 14.7% reported cleaning their tongue regularly, while a significant 85.3% neglected this aspect of oral hygiene.

Table 5: Dental Visit Behavior Among Respondents (N = 300)

Dental Visits for Checkups	N=300	P (%)
Yes	64	21.3
No	236	78.7
How often		
6 monthly	10	15.6
Yearly	10	15.6
On, if any problem	44	68.8

Table 5 shows that only 21.3% of the participants reported visiting a dentist for routine checkups, while a large majority (78.7%) had never visited unless faced with a dental issue. Among those who did visit the dentist, 44 (68.8%) did so only when a problem occurred, whereas 10 (15.6%) visited yearly, and another 10 (15.6%) went for six-monthly checkups.

DISCUSSION

In this study, the largest proportion of participants (27.67%) were aged 30–39 years, followed by 21.33% were aged 40–49 years. This age distribution reflects a relatively younger adult population compared to studies focusing specifically on the elderly. For instance, Kanta *et al.,* conducted a study among 227 elderly patients attending dental outpatient departments in three hospitals in Dhaka, where the majority of participants (48.5%) were aged between 46 and 55 years [12]. This finding differs from another study among older adults in Dhaka, which reported that the highest proportion of respondents (49.10%) fell within the 60–69-year age group [13].

In terms of gender distribution, females made up a larger portion of the sample in our study (62%), whereas males accounted for 38%. This contrasts with the findings of Akter et al., who conducted a cross-sectional study among 100 patients and reported a higher proportion of male participants (55%) compared to females (45%) [14].

The most frequently reported dental issue was gingivitis, affecting 41.0% of participants, followed by dental caries (27.0%). Additionally, 19.0% of respondents experienced multiple dental problems, 7.0% had fractured teeth, and 6.0% reported other dental conditions. These findings align closely with a cross-sectional study conducted by Akter *et al.,* who found gingivitis and dental caries to be the most common dental problems, affecting 48% and 42% of patients, respectively [14].

In our study, 65.4% of participants used a toothbrush for cleaning their teeth, whereas others relied on traditional methods such as fingers (18.7%), neem sticks (7.3%), and meshwak (6.3%). These findings are comparable to those of Kanta *et al.,* who reported that 70.5% of elderly participants used toothbrushes and toothpaste for cleaning their teeth [12]. Similarly, Chahar *et al.,* found 48.2% used toothbrushes and toothpaste, which is lower than our results [15]. The preference for modern dental hygiene tools appears to be increasing, though traditional methods remain in use, particularly in rural and older populations.

Brushing habits in this study showed that most participants (81.6%) brushed once daily, while only 18.4% brushed twice. The most common brushing technique reported was the mixed stroke method (51.0%), followed by horizontal and vertical strokes (20.4% each), and circular strokes (8.2%). These findings are consistent with previous literature suggesting that once-daily brushing remains common in South Asia, although evidence supports twice-daily brushing as more effective in preventing dental diseases [16].

Regarding oral hygiene behaviors, this study showed that only 40.7% of participants rinsed their mouths after meals, and just 38.0% practiced flossing or interdental cleaning. Tongue cleaning was notably neglected, with only 14.7% practicing it. These practices are consistent with those reported by Kanta *et al.,* who observed that only 2.2% used interdental aids and 11.9% cleaned their tongues [12]. Similar trends were noted in Indian populations, where low awareness of interdental cleaning and tongue hygiene is common [17,18].

Dental visits were infrequent among the study population. Only 21.3% had ever visited a dentist for routine checkups, and most (78.7%) reported seeking care only when experiencing dental issues. This finding is aligned with Kanta *et al.,* who found that 97.8% of participants visited the dentist only when a problem occurred [12], and with previous data from other South Asian studies showing that pain is the primary motivator for seeking dental care [19].

International comparisons provide further insight. A study conducted in Rawalpindi revealed that 87% of respondents brushed twice daily, but only 4% knew the proper brushing technique, and just 43% regularly visited the dentist [20]. Similarly, Mahmud *et al.,* [6] found that while 32% brushed twice daily and 58% visited the dentist, a substantial portion relied on unqualified dental technicians or quacks. They also identified strong associations between oral health literacy and factors such as age, education, and income (P=0.000), indicating that socioeconomic factors play a critical role in oral health behaviors [6,21].

The present findings further highlight the gap between knowledge and practice. Although the majority of respondents used a toothbrush, their brushing frequency and technique were suboptimal. Furthermore, preventive practices such as flossing, tongue cleaning, and regular dental visits were low. This pattern is consistent with the 2003 National Adult Assessment of Literacy, which found that 22% of adults had only basic literacy skills and 14% had below-basic abilities [22]. Such limited literacy contributes to poor oral hygiene practices and misconceptions about dental care, as shown by a study in which 24.47% of respondents believed that substances like charcoal, salt, rice husk, or tobacco were better than toothpaste for cleaning teeth [23].

Findings from other studies support this trend. In Delhi, India, 71.1% of older adults had periodontal pockets of 6 mm or more, compared to 28.19% in the study by Kanta *et al.,* [12] This suggests that periodontal

disease is a major concern among elderly populations in South Asia, particularly among those with inadequate oral hygiene and limited access to dental care [24]. Kanta *et al.,* [12] also found a significant correlation between non-use of toothbrushes and higher risk of periodontitis, with those not using a toothbrush and toothpaste being 5.077 times more likely to develop the condition [15].

Limitations of the study

This study has several limitations. First, the cross-sectional design limits the ability to establish causal relationships between oral hygiene behaviors and dental problems. Second, the data were self-reported, which introduces the possibility of recall bias or social desirability bias, particularly in responses regarding hygiene practices. Third, the sample was limited to a specific geographic region, which may not fully represent the diversity of oral health behaviors across the entire Bangladeshi population.

CONCLUSION AND RECOMMENDATIONS

The findings of this study highlight a notable prevalence of common dental problems, particularly gingivitis and dental caries, among Bangladeshi adults. Oral hygiene behaviors were found to be suboptimal, with a majority brushing only once daily, low use of proper brushing techniques, and limited practices of mouth rinsing, flossing, and tongue cleaning. Additionally, dental visits were infrequent, with most participants seeking professional care only when problems arose. These results underscore the need for increased oral health education, promotion of preventive practices, and accessible dental care services. Public health interventions focusing on awareness, behavior change, and routine dental check-ups could play a critical role in improving oral health outcomes in this population.

Further studies incorporating oral health education and awareness programs are needed to validate and expand upon the findings of this study.

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Conflict of interest: None declared

Ethical approval: This study was ethically approved

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