Original Article

Oral Hygiene Education and Tobacco Cessation Counseling for Patients Attending in the Dental Outpatient Department of a Selected Private Dental College

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Abstract

Aim: The study aimed to assess the sociodemographic characteristics, systemic diseases, consumption of tobacco products and oral hygiene practices among patients attending in the dental outpatient department (OPD) of the University Dental College and Hospital (UDC&H), followed by oral hygiene education, demonstration, and tobacco cessation counselling (TCC).

Methods: A convenience sampling method was used to recruit 478 patient who attended in the dental OPD of UDC&H from February 2024 to August 2024. Permission and informed consent were taken from hospital director of UDC&H and patients respectively. The study was done in two phases. Firstly, a descriptive cross-sectional study was undertaken employing a pretested, standardized, semi-structured interview administered questionnaire through Google Forms to acquire information regarding sociodemographic characteristics, oral hygiene practices, systemic diseases and consumption of tobacco products. After that, in second phase, based on the findings, relevant oral hygiene education (instruction and demonstration) and TCC were offered and documented. Data obtained from Google Forms, were converted to a Microsoft Excel spreadsheet and later analyzed using IBM Statistical Package for Social Sciences (SPSS) Version 27 and statistics, including frequency, percentage, mean ±standard deviation, were presented in both tabular and figure formats.

Results: Majority of the participants in our study were male 244 (51.0%). The mean age was 33.97±16.38 years, with young adults aged 18-32 years (34.7%), followed by 33-47 (25.7%). Most of them were married (69.0%) and had finished graduation (31.4%). The largest category participants were housewives (31.2%), followed by students (28.2%). Most reported (80.3%) no systemic health difficulties, and just 7.2% used any form of tobacco products. Dental hygiene practices vary, with only 44.1% tooth brushing twice daily and 33.4% brushing after breakfast. A mere 2.3% did interdental cleaning regularly, only 5.0% consistently rinsed after-meal, and only 5.2% did tongue clean regularly. Oral hygiene instruction, tooth brushing, and dental flossing demonstrations were employed for all the participants, whereas TCC was given only 7.2% participants.

Conclusion: The study highlights the need for comprehensive oral health education, addressing systemic diseases and oral hygiene practices, and tobacco cessation counseling. It suggests prioritizing research and oral health educational programs to improve adherence to recommended practices in dental OPD during intern rotation.

Keywords: Oral Hygiene Education, Tobacco Cessation Counseling, Dental OPD, Dental College

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Introduction

Oral diseases, identified as the most widespread non-communicable diseases (NCDs), include problems such as dental caries and periodontal disease, posing substantial public health issues worldwide. Besides, these oral health problems impact over 3.5 billion people in both developed and developing countries. Moreover, the consequences of these illnesses affect everyday living and general well-being, leading to pain, deformity, discomfort, and, in extreme instances, death. Whereas, the cost obligation of dental care is expensive, and such services are frequently excluded from universal health coverage (UD). Moreover, low- and middle-income nations often lack adequate resources to properly prevent and manage oral health diseases. Consequently, the pathogenesis of these disorders is mostly ascribed to modifiable risk factors, such as sugar intake, tobacco use, alcohol use, and insufficient oral hygiene practices [1]. World Health Organization (WHO) Global Oral Health Status Report 2022 reveals that Bangladesh has a significant prevalence of untreated dental caries in children aged 1-9 years (43.5%) and in individuals aged 5 years and older (30.4%), as well as severe periodontal disease in those aged 15 years and older (23.4%). The frequency of edentulism in adults aged 20 and older is 1.2%, whereas the incidence of oral cancer is 9.5 per 100,000 individuals, and the prevalence of current tobacco usage among those aged 15 and older is 35.2% [2]. The prevention of oral and dental illnesses, including gingivitis, periodontal disorders, and dental caries, is of essential significance. Furthermore, advocating for effective oral hygiene habits is crucial for educating a favorable self-image, averting oral illnesses, and improving quality of life [3,4]. Inadequate oral hygiene is a key contributor various oral disorders [5]. and it is connected with several comorbidities, such as halitosis, cardiovascular diseases, respiratory diseases, renal diseases, and oral malignancies [6]. Consumption of different form of tobacco is the important risk factor for oral diseases and related conditions, halitosis, tooth discoloration, diminished taste sense, periodontal disease, alterations in oral soft tissues, excessive tooth wear, including tooth loss, failure of dental implant, oropharyngeal cancer, and dental caries [7]. Public health interventions aim at reducing the incidence of oral diseases and other non-communicable diseases can be effective by addressing factors such as tobacco cessation through the implementation of the evidence based 5As and 5Rs framework, promoting a balanced diet, and encouraging proper oral hygiene practices, including two times toothbrushing, interdental cleaning, moth rinsing, and tongue cleaning [1,8-12]. Despite the seriousness of these concerns, there is a lack of research concentrating on oral hygiene instruction and TCC within dental outpatient department (OPD). Consequently, this study aimed to assess the sociodemographic characteristics, systemic diseases, consumption of tobacco products and oral hygiene practices among patients attending in the dental OPD of the University Dental College and Hospital (UDC&H), followed by oral hygiene education, demonstration, and tobacco cessation counselling.

Methods

A total of 478 patients were recruited using a convenience sample approach, with ages ranging from 3 to 77 years, who attended the dental OPD at the UDC&H from February 2024 to august 2024. Approval for the study was permitted by the hospital director of the UDC&H, and verbal & written informed consent was collected from all participants. Additionally, informed permission was sought from their legal parents or guardians in case of minors. The study was done in two parts. Initially, a descriptive cross-sectional study was undertaken employing a pretested, standardized, semi-structured interview

driven questionnaire via Google Forms to acquire information regarding sociodemographic factors, oral hygiene practices, history of systemic diseases and consumption of different types of tobacco**.** The questionnaire encompassed sociodemographic information such as age, sex, level of education, marital status, and occupation, as well as five items related to oral hygiene practices, including the frequency of tooth brushing, morning tooth brushing, interdental cleaning, mouth rinsing, and tongue cleaning**.** Data obtained through Google form, were converted to a Microsoft Excel spreadsheet and later analyzed using IBM Statistical Package for Social Sciences Version 27 **(**SPSS, Inc**.**, Chicago, IL, USA**).** Descriptive statistics, including frequency, percentage, mean±standard deviation, were provided in both tabular and graphical formats**.** In the second phase, based on the findings, relevant oral hygiene education **(**oral hygiene instruction, tooth brushing and dental flossing demonstration and TCC were offered and documented**.**

Results

In the present study, table 1 illustrated that patient cohort consisted of 244 males (51.0%) and 234 females (49.0%), reflecting a relatively equitable sex distribution within the sample. Whereas the age demographics indicated that the predominant group of participants were young adults aged 18-32 years (34.7%), followed by individuals aged 33-47 years (25.7%). A smaller segment of the population included children and adolescents aged 3-17 years (15.7%), while 20.3% were aged 48-62 years. The oldest demographic, comprising individuals aged 63-77 years, constituted only 3.6% of the sample. In addition, the mean age of participants was calculated to be 33.97 years±16.38 (mean±SD). Whereas, a majority of participants were married (69.0%), whereas 31.0% were unmarried. In terms of educational attainment, the majority of participants (31.4%) were graduated and 19.0% completed higher secondary education (HSC). Notably, 4.8% of participants held a Master's or Ph.D. degree, while 5.6% reported having no formal education. This distribution indicates a spectrum of educational exposure among the participants. The occupational analysis revealed that housewives constituted the largest demographic (31.2%), followed by students (28.2%). Businesspersons represented 15.9% of the sample, while only 1.0% identified as doctors. A small proportion of participants were classified as minors (1.9%) or retired (1.7%).

Furthermore, as illustrated in figure 1, among the total number of participants, 94 individuals (19.7%) reported the presence of one or more systemic diseases, whereas the majority, comprising 384 participants (80.3%), indicated that they did not suffer from any systemic conditions. Moreover, Table 2 demonstrated that a minor proportion of participants consumed different form tobacco products. Specifically, 26 individuals (5.4%) reported smoking tobacco, while 5 participants (1.0%) indicated the use of smokeless tobacco. Additionally, 4 participants (0.8%) reported utilizing both smoked and smokeless tobacco products. In contrast majority of participants, totaling 443 (92.7%), reported abstaining from all forms of tobacco use.

Table 3 further revealed that a majority of participants reported brushing their teeth once daily (55.9%), while 44.1% indicated they brushed twice a day. Among the 401 participants who reported brushing in the morning, 66.6% stated they brushed before breakfast, whereas 33.4% brushed afterward.

Table 1: Distribution of Sociodemographic characteristics of participants (n=478)

Attributes	f (%)
Sex	
Male	244 (51.0%)
Female	234 (49.0%)
Age group (In years)	
3-17	75 (15.7%)
18-32	166 (34.7%)
33-47	123 (25.7%)
48-62	97 (20.3%)
63-77	17 (3.6%)
Mean Age ± SD	33.97±16.38
Marital Status	
Married	330 (69.0%)
Unmarried	148 (31.0%)
Highest level of Education	
Masters/Ph.D.	23 (4.8 %)
Graduation	150 (31.4 %)
HSC	91 (19.0 %)
SSC384	75 (15.7 %)
Secondary	50 (10.5 %)
Primary	62 (13.0 %)
No formal education	27 (5.6 %)
Occupation	
Businessperson	76 (15.9%)
Doctor	5 (1.0%)
Job	96 (20.1%)
Student	135 (28.2%)
House wife	149 (31.2%)
Minor	9 (1.9%)
Retired	8 (1.7%)

The practice of interdental cleaning was reported infrequently, with 74.5% of participants indicating that they never clean between their teeth. Only 23.2% engaged in interdental cleaning sometimes,

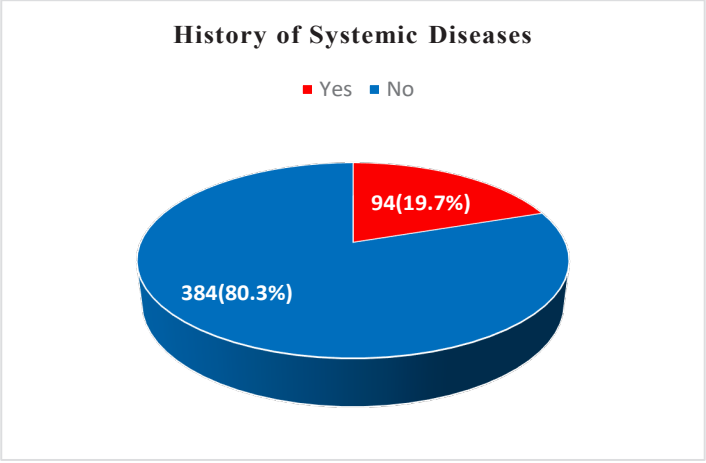

Figure 1: Distribution of systemic diseases among participants (n=478)

Table 2: Distribution of consumption of tobacco products among participants (n=478)

Age Group	Consumption of Tobacco Products			
	Not such habit	Smoke tobacco	Smokeless tobacco	Smoke -less tobacco & Smoke tobacco
3-17 years	75 (15.7%)	0 (0.0%)	0 (0.0%)	0 (0.0%)
18-32 years	146 (30.5%)	16 (3.3%)	2 (0.4%)	2 (0.4%)
33-47 years	114 (23.8%)	6 (1.3%)	3 (0.6%)	0 (0.0%)
48-62 years	91 (19.0%)	4 (0.8%)	0 (0.0%)	2 (0.4%)
63-77 years	17 (3.6%)	0 (0.0%)	0 (0.0%)	0 (0.0%)
Total	443 (92.7%)	26 (5.4%)	5 (1.0%)	4 (0.8%)

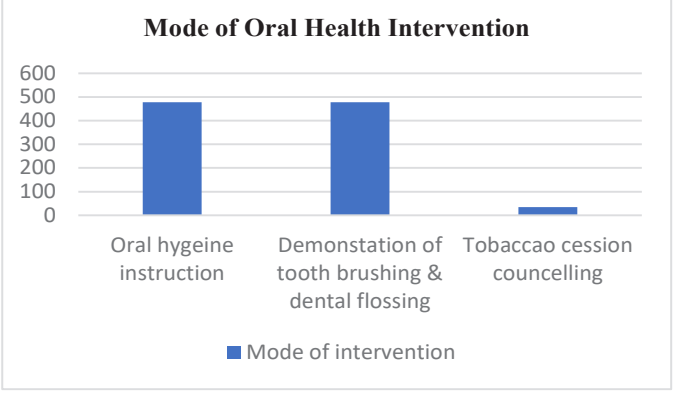

Figure 2: Distribution of mode of oral health intervention among participants (n=478)

and a mere 2.3% did so regularly, highlighting a considerable deficiency in comprehensive oral hygiene practices. Regarding mouth rinsing, 42.7% of participants reported never rinsing their mouths after meals, while 52.3% rinsed sometimes, and only 5.0% consistently rinsed post-meal. Additionally, tongue cleaning was notably under-practiced, with 78.0% of participants stating they never cleaned their tongues. Only 16.7% reported occasionally cleaning their tongues, and just 5.2% did so regularly.

Additionally, the figure 2 showed that oral hygiene instruction, tooth brushing and dental flossing demonstration were the most frequently employed interventions to all of the 478 (100%) patients at dental OPD whereas TCC was given among 35(7.2%) patients according to tobacco users.

Table 3: Distribution of self-reported oral hygiene practice of participants

Attributes	f (%)
Frequency of tooth brushing (n=478)	
One time	267 (55.9%)
Two times	211 (44.1%)
Tooth brushing at Morning(n=401)	
Before Breakfast	267 (66.6%)
After Breakfast	134 (33.4%)
Interdental cleaning (n=478)	
Never	356 (74.5%)
Sometimes	111 (23.2%)
Always	11 (2.3%)
Mouth rinsing after meal (n=478)	
Never	204 (42.7%)
Sometimes	250 (52.3%)
Always	24 (5.0%)
Tongue Cleaning (n=478)	
Never	373 (78.0%)
Sometimes	80 (16.7%)
Always	25 (5.2%)

Discussion

The relationship between tobacco uses and oral health remains a significant concern in dental practice and public health. While some studies indicated promising trends in reduced tobacco consumption, others highlight the persistent challenges and varied prevalence rates across different populations. The consumption of tobacco significantly contributes to the risk of periodontal diseases, oral malignancies, and several other oral health issues [13-15]. Recent studies reported low proportion, with approximately 7.2% of participants indicating any form of tobacco consumption. This figure was notably lower than the global and Bangladesh tobacco usage prevalence, estimated at 22.3% in 2020 and 27.5% respectively in 2018 [16,17]. However, other studies presented a contrasting picture, with prevalence rates ranging from 24.78% to 35.69% among dental outpatients [18-19]. These discrepancies highlight the potential for noteworthy regional and demographic variations in tobacco use patterns. Dental practitioners play a pivotal role in tobacco cessation efforts and managing tobacco-

induced periodontal damage [20], thereby reduce the economic and social burden of tobacco-related health issues [11].

Numerous research highlights the bidirectional relationship between oral health and systemic diseases. Oral health issues have been associated with various systemic conditions, including diabetes, cardiovascular disease, and pregnancy-related ailments [21]. Conversely, systemic diseases can manifest in the oral cavity, impacting oral health and potentially serving as early indicators of undiagnosed conditions [22-24]. In our study, 19.7% of participants reported one or more systemic disorders. This proportion was lower than that reported in certain dental patients about 45% [24] but higher (7.9%) from another study [25]. This subset of patients may demand particular consideration in oral health care measures, necessitating targeted interventions to promote both oral and systemic health.

The findings regarding tooth brushing frequency across various studies presented a complex picture of oral hygiene practices and their implications for dental health. While some research indicated that a majority of people brush twice daily, as recommended by different organizations [1, 26, 27] and whereas, other studies revealed a concerning trend of less frequent brushing habits. A study found that 76.1% of individuals brushed only once daily, with just 23.9% adhering to the recommended twice-daily routine [28]. This aligned with our study that only 44.1% of participants did brush twice daily, underscoring a significant gap between recommended and actual oral hygiene practices. The observed discrepancy between recommended and actual brushing practices across various studies signals a critical public health concern. Individuals who brush less frequently are at higher risk of oral health issues, including increased plaque formation and a higher incidence of caries [29]. The discrepancy in these percentages across studies may reflect variations in population demographics, cultural factors, or methodological differences.

The study of oral hygiene practices reveals complex relationships between brushing habits, interdental cleaning, and overall dental health. The frequency of brushing also plays a crucial role in oral health outcomes. A study found that increased brushing frequency correlates with lower DMFT scores, indicating reduced caries incidence [30]. However, this benefit must be balanced against the potential risk of dental abrasions, particularly in older individuals [31]. These findings underscore the importance of proper brushing techniques and education about optimal brushing practices. Among the 401 individuals surveyed, a plurality (66.6%) reported brushing before breakfast, while 33.4% brushed after. Whereas, another recent research suggests post-breakfast brushing may be more effective in reducing Streptococcus mutans counts compared to pre-breakfast brushing. This finding introduces an interesting counterpoint to the prevalent practice observed in our study. The same research indicates that post-breakfast brushing, with or without a pre-breakfast rinse, significantly reduces S. mutans counts but does not significantly affect DMFT (Decayed, Missing, and Filled Teeth) values in the short term [32].

Studies on interdental cleaning practices among dental patients revealed consistently low adoption rates and awareness across various populations globally. The low incidence of interdental cleaning is problematic, as it is crucial for eliminating plaque and food debris from regions that toothbrushes cannot reach [33]. Interdental cleaning devices, such as dental floss and interdental brushes, had been found to dramatically lower the incidence of interproximal caries and periodontal disease [34]. More alarmingly, in our study revealed that 74.5% of individuals reported never participating in interdental cleaning, with only 23.2% doing so sometimes and a mere 2.3% routinely. Whereas, only 23.2% of patients practiced regular interdental cleaning in other study, with dental floss being the most common aid [35]. A more recent study in the same country found an even lower rate, with just 13.1% of patients using dental floss [36]. Similarly, in India, very few patients reported using floss or other interdental aids [37].

Frequent mouth rinsing was found to be beneficial in maintaining oral health [38]. In our study, the data suggested that a considerable proportion of individuals neglect crucial aspects of oral hygiene. For instance, 42.7% of participants reported never rinsing their mouths after meals, while only 5.0% routinely engage in this practice. This low frequency of post-meal rinsing indicates a lack of understanding regarding the benefits of this simple yet effective habit. Mouth rinsing can aid in eliminating food particles and reducing oral acidity after eating, thereby contributing to overall dental health [39]. Even plain water rinsing had a beneficial effect on salivary pH comparable to chlorhexidine mouthwash [40].

The practice of tongue cleaning, an essential aspect of oral hygiene, exhibits significant variability across populations and presents a notable area for improvement in public health education [41]. Our study noted a striking under-practice of tongue cleaning, with 78.0% of individuals reporting never engaging in this crucial habit. This finding is particularly concerning given that tongue cleaning is vital for eliminating bacteria and food particles that can lead to halitosis and other oral health issues [42]. However, the prevalence of tongue cleaning varies considerably across different populations and studies. In a research found that 53.8% of dental patients practiced tongue cleaning [43] and 52.5% of participants

cleaned their tongues at least occasionally [44]. Whereas in other study noted nearly 47% do not consider using a tongue cleaner [45]. These disparities highlight the need for standardized assessment methods and suggest that cultural and regional factors may play a role in tongue cleaning practices.

While our study highlighted the focus on basic oral hygiene instruction and demonstration, the integration of tobacco cessation counselling (TCC) presents an opportunity for enhancing comprehensive oral healthcare in dental OPD setting. Our study revealed that oral hygiene instruction, toothbrushing, and dental flossing demonstrations were the most frequently employed interventions for all 478 patients at the dental OPD, while TCC was only provided to 35 patients identified as tobacco users. Studies showed that dental patients are generally open to TCC, with a high percentage of tobacco users planning to quit and believing that dentists should routinely offer quit assistance. In a study found that 88.9% of tobacco users planned to quit, and 82% believed dentists should routinely offer quit assistance [46]. Similarly, another reported that 83% of tobacco users agreed dentists should inquire about tobacco use, and 79.4% agreed they should advise quitting [47-48]. These interventions have demonstrated potential to reduce dental caries, enhance periodontal conditions, and improve oral health behaviors [49]. However, the effectiveness of interventions can vary based on delivery methods and target population characteristics, highlighting the need for further research in diverse socioeconomic settings [50].

Limitations

The study faced several limitations including sample taken from specific geographical area; it may also show self-reporting bias because its heavily reliant on cross-sectional design. In addition, quasi-experimental study is also required to determine the effectiveness of intervention regarding oral hygiene instruction and TCC, longitudinal studies are needed to identify causal relationship between demographic factors and oral health behaviors for a more complete picture of oral health practices and policy development.

Conclusion

Oral hygiene practices such as frequency and timing of tooth brushing, interdental dental cleansing, mouth rinsing, and tongue cleaning, with concerns about compliance with recommended guidelines. It highlights the necessity for comprehensive oral health education, addressing the relationship between systemic diseases and oral hygiene practices. Moreover, TCC provides an opportunity to promote healthy lifestyle choices. Furthermore, Institutional-based research, oral health promotion and education should be prioritized for patients in dental OPD settings during internship rotation.

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Ethical Declarations

The study was conducted following the World Medical Association Declaration of Helsinki and approved by review board of dept. of Dental Public Health, University Dental College (Ref. 2024/UDCDPHIRB/027). Written & verbal informed consent was taken from all participants. In the case of involving an illiterate population, informed consent was obtained from their respective legal guardians.

Competing interests

The authors declare no competing interests

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