

## PATIENTS WITH DIABETES; THEIR PERCEPTION AND PRACTICES TOWARDS ORAL HEALTH

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### ABSTRACT

**Objectives:** The study aimed at assessing the knowledge, attitudes and practices regarding oral health among patients attending the clinic for diabetes patients at a Tertiary Care Teaching Hospital, Sri Lanka.

**Methods:** A descriptive cross-sectional, questionnaire based study among 427 patients was carried out. The questionnaire consisted of 14 questions to assess knowledge, 16 questions for practices and 16 statements for attitudes regarding oral health. A total score of  $\geq 75\%$  was considered as a 'good', 50%-74% was considered as a 'moderate' and  $< 50\%$  as a 'poor' level of the aspect assessed. **Results:** Majority (74%) were females aged above 50 years. Of the patients 56% recognized an association between diabetes and oral health. Only 15%

knew that they were more prone to oral fungal infections though 89% knew that diabetes resulted in delayed wound healing. Oral cancer (72%) was mainly recognized as a complication of poor oral hygiene. Regarding attitudes, 98% believed that they should be vigilant regarding their oral hygiene. While 29% believed that a dentist should be visited at least twice a year, only one patient practiced this. A majority (93%) believed that brushing teeth twice a day is important for good oral hygiene and 92% claimed to practice this. **Conclusions:** Overall oral health knowledge and practices among patients were 'moderate' and the level of attitudes was 'good'. Patients expect the clinic to provide regular oral health education and oral examinations.

**KEYWORDS:** diabetes, oral health, knowledge, attitudes, practices.

## 1. INTRODUCTION

Diabetes Mellitus (DM) is a major Non-Communicable Disease (NCD) prevalent in almost all countries in the world. It is a leading NCD in Sri Lanka where the prevalence is known to be 14.2% among males and 13.5% among females.<sup>[1]</sup>

Poorly controlled or uncontrolled DM can result in compromised oral health resulting in various complications such as periodontitis,<sup>[2]</sup> burning mouth syndrome,<sup>[3]</sup> gingivitis<sup>[4]</sup>, candidiasis,<sup>[5]</sup> dental caries,<sup>[6]</sup> and xerostomia.<sup>[7]</sup>

A bidirectional association between diabetes and periodontal disease has been suggested by many groups.<sup>[3,8]</sup> Prevalence of severe periodontitis was significantly higher in people with poorly controlled DM than in counterparts without diabetes.<sup>[9,10]</sup> Hence oral health is particularly important for people with DM. However research has demonstrated that knowledge and awareness were deficient in patients with diabetes.<sup>[11,12]</sup> Therefore patient education regarding the association between DM and oral complications and importance of good oral self-care practices should be considered a priority.

In Sri Lanka the knowledge related to the importance of oral health in diabetes among the patients has not been investigated. It is therefore vital to assess their knowledge, attitudes and practices (KAP) in order to implement measures to improve their oral health.

## 2. MATERIALS AND METHODS

### 2.1. Study design, setting and population

This study was a descriptive cross sectional study of 427 patients attending a clinic in a teaching hospital in Sri Lanka. Patients over 18 years of age, having at least a 6 month history of Diabetes Mellitus and at least one natural tooth were included in the study. Informed written consent was taken from those who volunteered to take part in the study. Ethical clearance for the study was obtained from the Ethical Review Committee of the University of Sri Jayewardenepura, Sri Lanka (B. Pharm 2014/07).

### 2.2. Development of the interviewer administered questionnaire

The interviewer administered questionnaire which was used to collect data was pretested among 25 volunteers in the community using convenience sampling. The volunteers were

requested to fill the questionnaire and based on their responses, the questions were refined or eliminated to improve clarity.

The questionnaire consisted of five parts; demographic information, knowledge, Attitudes, practices and patients' expectations from health care providers regarding oral hygiene. Knowledge was assessed using 14 questions which covered areas such as food habits, good oral hygiene practices, importance of regular dental visits and oral complications aggravated by DM. attitudes were assessed using 16 statements and the respondents were given the option to select on a 1 to 5 point scale between 'strongly agree' and 'strongly disagree', out of which the first two responses were taken as positive responses and the rest were taken as negative responses.

### **2.3. Data Analysis**

Collected data was entered to EXCEL software and the percentages were calculated. Overall levels of KAP were assessed for each individual and total score for each category (KAP) was calculated as a percentage. A percentage of  $\geq 75\%$  was considered as 'good', 50%-74% was considered as a 'moderate' and  $< 50\%$  as a 'poor' level of the aspect assessed.<sup>[13]</sup>

## **3. RESULTS**

### **3.1. Socio-demographic characteristics of the study participants**

The study group comprised of 314 females (73.54%) and 113 males (26.46%) presenting a female: male ratio of 1:2.78. Amongst the 427 participants, majority (99.3%) were diagnosed with type 2 DM, whereas only 0.7% was diagnosed with type 1. As far as the age distribution is considered, 354(82.9%) were above and 73(17.1%) were below the age of 50. A majority (48%) had an education below G.C.E ordinary level and only 16% had an education above G.C.E ordinary level. 36% have studied up to G.C.E ordinary level. A majority (40.98%) had a history of diabetes for less than 5 years and a considerably lower fraction (17.33%) had a diabetes history of more than 15 years.

### **3.2. Knowledge of participants regarding oral health**

In this study, 55.5% were aware that patients with diabetes are more prone to oral diseases. A higher proportion (88.52%) knew that DM causes delayed wound healing. A comparatively high percentage (93.21%) knew about gingivitis and a lower percentage (14.75%) knew about oral thrush as conditions aggravated by DM. Most of the patients knew that soreness of throat and gums (90.16%), gum bleeding (93.21%), redness and swelling of gums (92.74%)

are symptoms of gum diseases. Almost all the participants (99.3%), knew that brushing teeth at least twice daily is a practice to maintain good oral hygiene. Of the patients, majority knew that brushing teeth only at night before sleep and in brushing only in the morning on waking up are not adequate for good oral health (99.53% and 98.83% respectively). A percentage of 85.95% knew that brushing after each meal is the best. Table 1 illustrates the questions used to assess patient's knowledge with regards to oral hygiene practices.

**Table 1: Patients' responses to questions used to assess knowledge with regard to oral hygiene practices.**

Question	Answers	Number of correct responses	Percentage of correct responses
What is the best tool to brush your teeth with?	*Toothbrush Finger Toothpick	421	98.60%
What is the best agent to clean your teeth?	*Toothpaste Powdered dentifrices Charcoal	420	98.36%
Will consumption of sugar and sugary products increase your dental problems?	*Yes No Don't know	427	100%
Will consumption of fruits lead to oral diseases?	Yes *No Don't know	83	19.44%
Do you know that consumption of very hot and cold water/drinks lead to oral diseases?	*Yes No Don't know	353	82.67%
Will consumption of excess salt or salty food cause oral diseases?	Yes *No Don't know	11	2.58%
Which of the following habits lead to poor oral health?			
Smoking	*Yes No Don't know	413	96.42%
Chewing betel	*Yes No Don't know	416	97.42%
Consumption of alcohol	*Yes No Don't know	372	87.12%

Eating toffees and other candies	*Yes No Don't know	424	99.30%
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***\*Correct response***

Knowledge of patients regarding the sources of information on oral health was assessed. Most of the patients knew that dentist (97.9%) and physician (97.66%) are the best sources of information regarding oral health. They were not relying on other health care professionals such as pharmacist (2.6%), nurse (11%) and mid wife (7%). A considerable number of participants believed that printed media (52.22%) and radio and television (63.94%) would be reliable sources to gain information. A percentage of 22% relied on the internet as an information source.

### **3.3. Attitudes of participants regarding oral hygiene**

Several statements were used to assess the attitudes of patients regarding oral health. Those are shown in Table 2.

**Table 2: Responses of patients to statements used to assess attitudes regarding oral health.**

<b>Attitude assessed</b>	<b>Percentage of positive attitude</b>
*I believe that it's very important to be concerned about my oral health as a patient with diabetes	98.36%
My anti-diabetes drugs are powerful enough to improve my oral health; therefore it's not necessary to worry about my oral health	66.28%
If there is no significant oral problem, it is a waste of money and time to visit a dentist	28.57%
There is no need of mentioning about diabetes during each visit to a dentist	71.19%
If there is no significant oral problem, it is a waste of money and time to visit a dentist	28.57%
*I am comfortable to talk with a dentist regarding oral health	96.72%
Brushing teeth should be stopped if bleeding gums occur	46.60%
*I believe that fluoride based toothpaste is more effective than non-fluoride containing toothpaste	58.78%
*I believe that I should always use a tooth brush to brush my teeth	95.55%

***\*Correct positive attitude***

### 3.3. Practices of the participants regarding oral hygiene

A majority of the study group (92.27%) claimed to practice brushing teeth at least twice daily. Tooth brush was the most commonly used tool (95.55%) and 4.45% of the patients used the finger to clean their teeth with. Most of the patients (96.25%) used toothpaste while powdered dentifrices and charcoal are the other agents used (2.58% and 1.17% respectively). Among the participants, 17.33% uses salt water, 3.04% uses Listerine mouth wash and 0.7% uses Clogard mouth wash to rinse their mouth. Of the study group, 83.37% changed their toothbrush once in less than three months. Only one patient follow dental visits on a regular basis (Once in every six months). Smoking was seen among 6.75% of the study group; all of them being males and among them 75.86% use to smoke more than three times a day.

Of the patients, 13.35% had the habit of betel chewing. Amongst the betel chewers, 98.25% used arecanut and 43.86% used tobacco. A minor percentage 11.71% used home remedies to cure oral problems. Most commonly used were clove (62%) and cinnamon (12%). Amongst the patients, 25.76% were denture users. Almost all of them (97.27%) used to wash the palate after meals and 63.64% use to remove them at night before sleep.

### 3.4. Assessment of improvements expected by the patients regarding oral health care services by the Clinic for Diabetes patients

A majority (98.13%) claimed that they were not advised regarding oral hygiene at the clinic and 82.44% believed that oral health awareness should be provided by the clinic. All patients were willing to receive education tools like leaflets and a majority (90.16%) expected regular dental examinations and referrals.

Overall scores for oral health knowledge, attitudes and practices of participants regarding oral health are shown in table 3.

**Table 3: Knowledge, attitudes and practices score of the participants regarding oral health.**

	Good (%)	Moderate (%)	Poor (%)
<b>Knowledge</b>	9.73	81.73	8.90
<b>Attitudes</b>	62.06	34.43	3.51
<b>Practices</b>	55.74	40.05	4.21

#### 4. DISCUSSION

The overall levels of knowledge and practices of all patients in the study were 'moderate' with a mean score of 64% and 73% respectively. However the mean of the attitudes score of these patients was 77% which is considered 'good'. According to a similar study carried out in Iran by Moghadam FA *et al* to evaluate the knowledge, attitudes and practices between periodontal disease and diabetes, the overall levels of knowledge and attitudes were 'moderate' but the level of practices was 'poor'.<sup>[12]</sup>

A considerable proportion (44.5%) of the study group didn't know that patients with diabetes were more prone to oral complications. In the study carried out in Egypt by Ismaeil FM *et al*, more than half of the study group (52.3%) was unaware of the link.<sup>[11]</sup> Patients were more aware of other systemic effects of diabetes e.g. delayed wound healing (88.52%) than oral complications. The study of Ismaeil FM *et al* showed similar results where 84.8% knew that diabetes result in foot complications.<sup>[11]</sup> In comparison to the awareness of impact of diabetes on gingiva (93.21%), a very low fraction was aware that diabetes aggravates oral thrush.

As far as oral hygiene practices are concerned, a majority (92.27%) brushed teeth twice daily. But the practice of regular dental visits was very poor (0.23%). Contradictorily, 85.1% of Sandberg GE *et al*'s study group, followed regular dental visits.<sup>[14]</sup> Cost of dental visits was one of the major reasons for the patients not to follow routine dental checkups. Work of Moore PA *et al*<sup>[15]</sup> had come up with a similar finding. Participants have also claimed that they refrained from dental visits unless they are forced to by an acute dental problem.

Our study showed that 11.17% used home-remedies to cure dental problems. In the study results of Mirza KM *et al*, 28% used self-remedies.<sup>[16]</sup> This figure is comparatively higher than that of our results. Amongst the self-remedies used, clove (62%) and cinnamon (12%) are the most common ones. Interestingly, patients claimed to use several numbers of other self-remedies namely fruits of *Garcinia cambogia*, roots of *Areca catechu* and leaves of *Sesbania grandiflora*.

According to studies reported in literature, patients feel that they would be more careful about oral hygiene if they were informed. Further, they found an association between counselling by physicians and positive practices towards oral health by patients.<sup>[16]</sup> Adequate knowledge regarding oral health among participants was associated with oral health information they received from health professionals (dental and/or medical).<sup>[17]</sup> In our study, we found that



patients expect oral health awareness to be provided by the clinic (82.44%), and all wish to receive education tools like leaflets containing information on impact of diabetes on oral health. In addition, this study emphasized the fact that oral examinations at the clinic is of vital importance as no patients claimed to have been examined for oral disorders in the clinic. Studies in literature have mentioned this oral examination as a clinical implication.<sup>[18]</sup> Further, 90.15% thought that they should be referred to regular dental examinations by the clinic.

These findings suggest that patient education regarding impact of diabetes on oral health, proper oral examinations and dental referrals in necessary conditions should be considered a priority of all health professionals.

## 5. CONCLUSION

Overall study population had moderate knowledge (64%), good attitudes (77%) and moderate practices (73%) with regard to their oral health. It's important for the treating physician to convey the association between diabetes and oral manifestations to the patients and recommend regular dental visits in order to avoid possible oral complications. Patients with diabetes expect appropriate oral health education, regular oral examinations and dental referrals to be provided by the clinic.

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