

## Diabetic patient's knowledge level on oral health and habits (questionnaire)

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### Summary

**Objective.** It is well known that oral health and general health are inseparable. Therefore the aim of this study is to clarify what the diabetic patients know about diabetes as a disease and what they know about its effects on oral health, and to assess their oral health behaviors, access to dental care and need for improved health education.

**Methods.** 100 diabetic patients, aged 15-89 years, completed a questionnaire, which consisted of 20 questions regarding their oral health attitudes, behaviors and knowledge.

**Results.** It was found that 60% of diabetic patients had dry mouth complaint, 26% had teeth brushing habit once a day and 13% had usually gum bleeding during brushing. In addition, patients appeared to lack important knowledge about the oral health complications of their disease. But they were eager to learn and get education about oral health and diabetes.

**Conclusion.** We believe that the oral health education of people with or without diabetes is very important and necessary to reduce the risk of oral complications.

**Key words:** diabetics, oral health behaviors, questionnaire.

### Introduction

Diabetes mellitus is a chronic and metabolic disorder that affects more than 100 million people worldwide [1-3]. Medical complications commonly associated with diabetes include retinopathy, neuropathy, renal disease, peripheral vascular disease and coronary heart disease [1, 2]. The oral complications reportedly associated with diabetes include tooth loss, gingivitis, periodontitis, reduced salivary flow, increased saliva glucose, oral soft tissue pathologies. [1-7]. Soft tissue pathologies, particularly lesions associated with delayed healing and candidal infections, have been observed more frequently in diabetic populations [3, 4, 8]. The consequences of periodontal disease and subsequent tooth loss not only are important considerations for the quality of life of patients with diabetes, but they may also affect significantly overall health by compromising patients' ability to maintain healthy diets and proper glycemic control [1, 3, 9-11].

Because patients with diabetes are at an increased risk of developing oral diseases, reliable and up-to-date information regarding oral health behaviors and perceptions in diabetic populations is needed to develop effective prevention strategies.

Prevention of these oral health sequelae - tooth loss, periodontal disease and soft tissue disease - depends on education and health promotion strategies such as early diagnosis, proper oral hygiene and diet, rigorous glycemic control measures and smoking cessation counseling. To promote proper oral health behaviors that limit the oral complications, education of diabetic patients is very important. Before education it is necessary to assess diabetic patients' oral health behaviors. Questionnaire studies are very valuable tools for this purpose

The goal of this study was to assess the patient's oral health behaviors, attitudes, habits and knowledge.

## Material and methods

This study was performed on 55 females and 45 males, a total of 100 diabetic patients aged between 15-89 years who attended Diabetes Association for routine control. The patients had different social, economic and cultural background. They were asked to complete a questionnaire with 20 questions regarding their oral health attitudes, behaviors and knowledge. The questionnaire included demographic, dental and diabetic items and cigarette and alcohol habits. Demographic data included age, gender and education; diabetic items included type of diabetes, duration of diabetes, treatment of diabetes; dental items included taste alterations, dry mouth, frequencies of tooth brushing, bleeding while brushing, general knowledge about oral health and diabetes. The data were presented as percentage of the total.

## Results

The results of demographic, diabetic and dental items are shown in *Table 1*.

## Discussion

The mouth can function as an "early warning" system for some diseases. The early identification of oral disease may contribute to the early diagnosis and treatment of diabetes.

Diabetes is a risk factor for impaired oral health. It is known that diabetic patients have higher rates of tooth loss, periodontal disease and soft tissue disease than non-diabetic patients [9,12,13].

Oral complications include periodontitis, salivary dysfunction, mucosal infections and neurological problems of taste and smell [3,14,15]. The prevention, diagnosis and treatment of these infections are central responsibilities of oral health practitioners in the overall management of diabetes mellitus.

To promote proper oral health behaviors that limit the oral complications, education of diabetic patients is very important. Before education it is necessary to assess diabetic patients' oral health behaviors. Questionnaire studies are very valuable for this purpose.

**Table 1.** General characteristics of diabetic patients and percentages of responses to the items

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<i>Sex:</i> male 45%, female 55%
<i>Age:</i> 15-89 years
<i>Education:</i> primary school 55%, high school 21%, university 11%, not educated 13%
<i>Occupation:</i> student 1%, professional 54%, homemaker 45%
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<i>Cigarette smoking:</i> yes 29%, no 60%, have never smoked 11%
<i>Alcohol consumption:</i> yes 16%, no 84%
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<i>Type of diabetes:</i> Type I: 10%, Type II: 25%, doesn't know: 65%
<i>Diabetic age:</i> year $\leq$ 1: 10%, 1 < years $\leq$ 11: 57%, 11 < years $\leq$ 20: 28%, 20 > years: 5%
<i>Heredity:</i> yes: 62%, no: 29%, doesn't know: 9%
<i>Diabetic treatment:</i> diet: 11%, OAD: 38%, diet + OAD: 12%, insulin: 25%, insulin + OAD: 3%, diet + insulin: 2%, doesn't know: 9%
<i>Do you know the effect of diabetes on general health?</i> Yes: 53%, no: 22%, maybe: 25%
<i>Do you know the effect of diabetes on oral health?</i> Yes: 20%, no: 59%, maybe: 21%
<i>Does diabetes cause dental caries?</i> Yes: 28%, no: 46%, maybe: 26%
<i>Does diabetes affect gingiva?</i> Yes: 45%, no: 55%
<i>Did you learn about the diabetes from any source?</i> Yes: 78%, no: 22%
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<i>Do you have dry mouth sensation?</i> Yes: 60%, no: 40%
<i>Do you have burning mouth sensation?</i> Yes: 12%, no: 88%
<i>Do you have taste alteration?</i> Yes: 26%, no: 74%
<i>Do you brush your teeth?</i> Yes: 89%, no: 11%
<i>The frequency of tooth brushing:</i> once a day: 38%, two times a day: 38%, once a week: 3%, 2-3 times a week: 21%
<i>Bleeding during brushing?</i> Yes: 46%, no: 54%
<i>Do you want to get any education about oral health and diabetes?</i> Yes: 60%, no: 27%, not sure: 13%.

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In our study, patients had four different education categories. 13% of diabetic patients were not educated and 55% of them had passed through basic education, 21% high school, and 11% university. This shows that our research group education level was very low and parallel with professions.

The prevalence and severity of medical and oral health complications may depend on the specific type of diabetes assessed. 10% of the diabetic patients had type I diabetes whereas 25% had type II. 65% of diabetics did not know their diabetic type. This is a normal result of low-level education.

There is close relationship between oral complications and diabetic age. For this reason, to educate newly diagnosed diabetics about oral health is very important for reducing the risk of oral complications. 10% of the diabetics had diabetes for less than 1 year and 26% had diabetes for 1-5 years.

62% of diabetics had diabetic relatives, 9% of diabetics did not know whether they had diabetic relatives. For taking precautions it is important to know the familial history.

Diabetic treatment consists of diet, oral antidiabetics (OAD), insulin or combination of these two or three. In this study only 11% of diabetics were under diet treatment; 9% of them did not know their treatment.

Dry mouth syndrome - Xerostomia - is a result of some medication, of Sjögren syndrome, radiation, renal dialysis, diabetes, mouth breathing, caffeine or alcohol consumption, etc [6, 12, 16]. Dry mouth causes bad mouth smell, burning sensation of tongue, speaking, eating and swallowing difficulties, dry lips, taste alterations, increased caries formation [14, 15, 17]. In our study 60% of diabetics had dry mouth sensation that meant they were under the risk of caries.

In some systemic diseases such as diabetes, patients may have burning mouth sensation [4, 14-16]. In our group the rate was 12%. It was less than the patients with dry mouth sensation.

More than two hundred reasons have been reported for taste alteration. Diabetes is one of them [14, 17]. Some patients cannot eat and they loose weight because of taste alterations. In our study 26% of diabetics had taste alteration.

Cigarette smoking and alcohol consumption have been known to affect the oral microflora adversely. Smoking is an established risk fac-

tor for developing periodontal disease in both healthy people and diabetic patients. *Moore et al.* reported the prevalence of smoking among diabetics as 19% [1]. In our study 29% of the patients were smoking and 16% were drinking alcohol.

53% of diabetic patients explained that they knew how diabetes affects general health. When considering that most of the patients were not well educated, this was a very good result. However the rate of knowledge on relationship between oral health and diabetes was only 20%.

Dental caries and periodontal diseases are major factors, which cause tooth loss. Diabetes also sometimes causes tooth loss without caries formation because of insufficient blood supply of gingiva and disturbance of gingival health [3]. When diabetes is not controlled properly, high glucose levels in saliva may help bacteria thrive causing repeated acid attacks, which can lead to dental caries and periodontal disease. Both diseases can adversely affect quality of life and result in health problems.

The most effective method for the prevention of dental caries and periodontal disease is to brush teeth regularly, at least twice a day. In our study, 89% of the patients were brushing their teeth, however the number of those having effective brushing frequency was not high enough - only 38% of them.

Education of diabetic patients on oral health and oral diseases is important for the prevention of early tooth loss. The first sign of periodontal disease is gum bleeding. Healthy gum never bleeds. 43% of the diabetics were having gum bleeding during tooth brushing. This showed that they were under risk of serious periodontal disease. 27% of the patients were edentulous. They were wearing dental prostheses.

78% of our study group was learning mostly from newspapers than books, Internet, medical personnel, ear to ear, about their disease.

In conclusion, diabetic patients appear to lack important knowledge about the oral health complications of their disease and need for proper preventive care. They were eager to get information about oral health and diabetes. However, 10% of them were not sure to attend seminars about oral health, and 3% stated that they could not attend to the seminars because of the difficulties living in a big city.

We believe that the oral health education of people with or without diabetes is very important

and necessary to reduce the risk of oral complications.

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