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Research Article

**THE AWARENESS OF THE RELATIONSHIP BETWEEN
PERIODONTAL HEALTH AND DIABETES AMONG PATIENTS
IN HAIL REGION.**

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Abstract:

Introduction: The importance of periodontal health maintenance and promotion in patients with diabetes mellitus has been supported. Evidence reveals that many diabetic patients are unaware about effects of their condition on oral health and periodontal diseases. The aim of this study is to evaluate awareness, attitudes and practices of diabetic patients concerning the risk of periodontal disease and prevention.

Materials and Methods: In this cross-sectional study, 186 diabetic patients attending one of the three outpatient clinics at King Khalid Hospital, Hail Hospital, and Salamat Hospital in Hail City, Saudi Arabia, were recruited. Patients completed questionnaires, which was divided into six parts about their knowledge, attitude and practice of oral health in diabetes mellitus. Informed consent was taken from all participants. The data of completed questionnaire were scored and analyzed.

Results: A majority of diabetic patients visit dentists only if needed (62%), however, a minority visit dentists on a regular basis. Forty-three percent brush their teeth once daily. Only 52.7% of patients were aware of the bidirectional relationship between diabetes and periodontal health problems. Relatives were the main source of diabetes-related information in our population (17%).

Conclusion: This study demonstrated the poor awareness and practices as regards the relationship between diabetes and periodontal health.

Keywords: Periodontal diseases; Diabetes; DM; Awareness; Knowledge.

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INTRODUCTION:

Periodontitis, which is a common chronic disease of the tooth-supporting structures, is caused by bacterial deposits accumulating on the surface of the tooth, [1,2] leading to local oral inflammation. Local oral inflammatory process may induce systemic inflammation which could also aggravate systemic diseases including cardiovascular diseases, pulmonary diseases, rheumatoid arthritis and diabetes mellitus. [3] Diabetes mellitus (DM), a metabolic disorder characterized by hyperglycemia, is a complex disease with various systemic and oral complications. [4] Periodontal diseases take the sixth position in the most common complications of DM. [5-7] Several research studies demonstrated the bidirectional relationship between DM and periodontal diseases, which could aggravate periodontitis. Subsequently, periodontitis could negatively impact the control of the diabetic state. [8] Such relationship has become a recent focus of attention among healthcare providers due to the substantial evidence supporting the two-way relationship between DM and periodontal diseases; DM increases the risk of periodontitis while periodontitis negatively affect glycemic control. [9]

The recent rise in patients being diagnosed with diabetes is not solely a genetic shift, but also an environmental one as a result of certain lifestyle habits. The international Diabetes Federation plans on preventing type II diabetes based on controlling and enhancing those modifiable risk factors. They can be divided into two groups: individuals at high risk of developing type II DM and the entire population similarly with the periodontal diseases. [10] For proper management of DM as well as periodontitis, patients themselves are the most determining factor. Lack of information of the bidirectional relationship between DM and periodontal diseases is one of the main reasons for non-compliance to healthy lifestyle modifications. Better compliance comes with informing and positively reinforcing those patients. In that instance, individuals who have the knowledge and awareness of such relationship and are highly susceptible to periodontal diseases tend to go to dentists on a regular basis. [11] Adequate health education attempts to modify behaviors by altering individuals' knowledge, beliefs, and attitudes about health matter.

Awareness of diabetic patients of the bidirectional relationship between DM and periodontal diseases is very limited in Sweden, where 83% of patients with diabetes were unaware of such link. [12] Another study conducted in Jordan revealed that 48% of diabetic patients were aware that diabetes increases

the susceptibility to develop periodontal diseases and oral health complications. [13] Recently, a study conducted in Abha, Saudi Arabia, pointed out the deficient awareness of dental health knowledge among diabetic patients were 52.3% of patients were unaware of the existence of such two-way relationship. [14] Therefore, we conducted this survey study to gather baseline information on awareness, practices, and source of diabetes-related information of patients with DM at three outpatient clinics in Saudi Arabia as regards periodontal and oral health in order to enhance dental health education for the targeted population.

METHODS:

This study is a cross-sectional descriptive survey study. We recruited individuals with confirmed diagnosis of diabetes who were receiving the regular care at the outpatient diabetes clinics of three healthcare settings: King Khalid Hospital, Hail Hospital, and Salamat Hospital in Hail City, Saudi Arabia. The majority of patients attending these outpatient clinics are Saudis from a mixture of urban and rural communities. The study was conducted from August to December 2018. Patients with diabetes were required to fulfill the following conditions in order to be eligible for inclusion into the study: the presence of at least one natural tooth in the patient's mouth and a period of at least six months have passed since the diagnosis of diabetes. Diabetic patients with obvious physical or mental health problems were excluded from this study. Eligible participants of all age groups and both genders were included. The study protocol was reviewed and approved by the ethics committee, Institutional Review Board (IRB), of each corresponding study center.

Patients who were willing to participate in the study were instructed to write an informed consent. Afterwards, they were asked to complete a self-reported questionnaire during waiting for their appointments at the outpatient clinic. Oral and written instructions were provided to each participants with assurances of confidentiality. Completed questionnaires were collected from participants prior to leaving the clinic.

We thoroughly reviewed the literature of the association between DM and periodontal diseases in order to design a well-structured questionnaire. The development of the questionnaire was based on the previously published study of Allen et al. [15] The questionnaire was subdivided into six categories. The first category of the survey evaluated participants' sociodemographic characteristics. The second one assessed patients' medical history including type of

diabetes. The third category aimed to assess patients' general health and practices followed to maintain oral hygiene as well as the frequency to visit dentists, and brushing frequency. The fourth category addressed awareness of participants about diabetes and its types. The fifth part assessed the two-way relationship between periodontal health problems and diabetes. On the last part of the questionnaire, the six part, participants were questioned about the sources of diabetes information. There was a complete anonymity of all of the data gathered in the study.

Statistical Analysis

Data were collected and entered into Microsoft Excel Sheet. Data analysis was performed using Statistical Package of Social Science (SPSS-Version 22). Categorical variables were expressed as numbers and percentages.

RESULTS:

Sociodemographic characteristics of the study participants

A total of 186 registered diabetic patients agreed to participate in this survey study, completed the self-administered questionnaire and were eligible for inclusion into the final analysis. Of those, 81 patients were males while 105 patients were females. The

highest percentage of respondent were in age group of fifth to sixth decade of life (43.6%).

Medical history

Most of the study participants were diagnosed with type I diabetes mellitus (39%) and 34% had a diagnosis of type II diabetes. On the other hand, 27% of participants did not know their type of diabetes mellitus. Data regarding the time since diagnosis of diabetes, family history of diabetes, and the type of hypoglycemic medication taken, were not available to be investigated.

General and oral health-related awareness and practices

The analysis reveals that participants' responses indicated inadequate health-related practices in our surveyed population. The majority of the respondents (62%) visit the dentist only if needed followed by those who never visited a dentist. On the other hand, a very limited percentage of respondents visit dentists on a regular basis. and not on a regular basis (Figure 1). Furthermore, upon assessing oral hygiene practices performed by participants to maintain the healthiness of their teeth, we found that 43% brushed their teeth once a day.

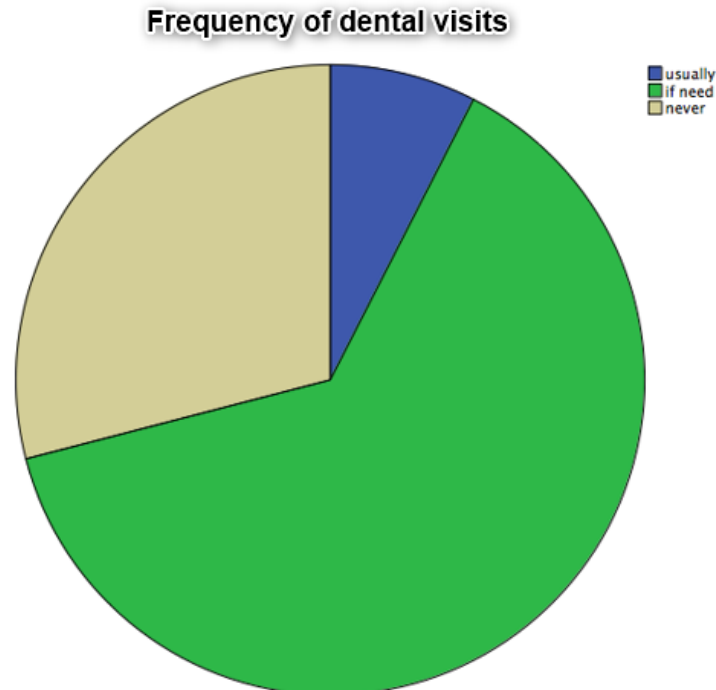


Figure 1. Frequency of visiting dentists in patients with diabetes mellitus

participants' awareness of the association between periodontal diseases and diabetes

The majority of respondents were familiar with the oral problems associated with the high blood sugar level due to diabetic state, as 52.7% reported that they know that a relation between diabetes and gum diseases exist. However, 42% of study population did not know about the existence of such relation.

Sources of diabetes-related information

All of the 186 participants, who finished the diabetes awareness assessment questionnaire, completed the

data regarding the sources they had their information from. As shown in Figure 2, The majority of participants reported that they 'do not know' about the association between diabetes and periodontal health problems in the first place. On the other hand, only 17% reported that they knew about the association from relatives. Following relatives in order, equal percentage of participants gained their information from newspaper, schools, and services from ministry of health (MOH), respectively. Television, Internet and experience was reported the least.

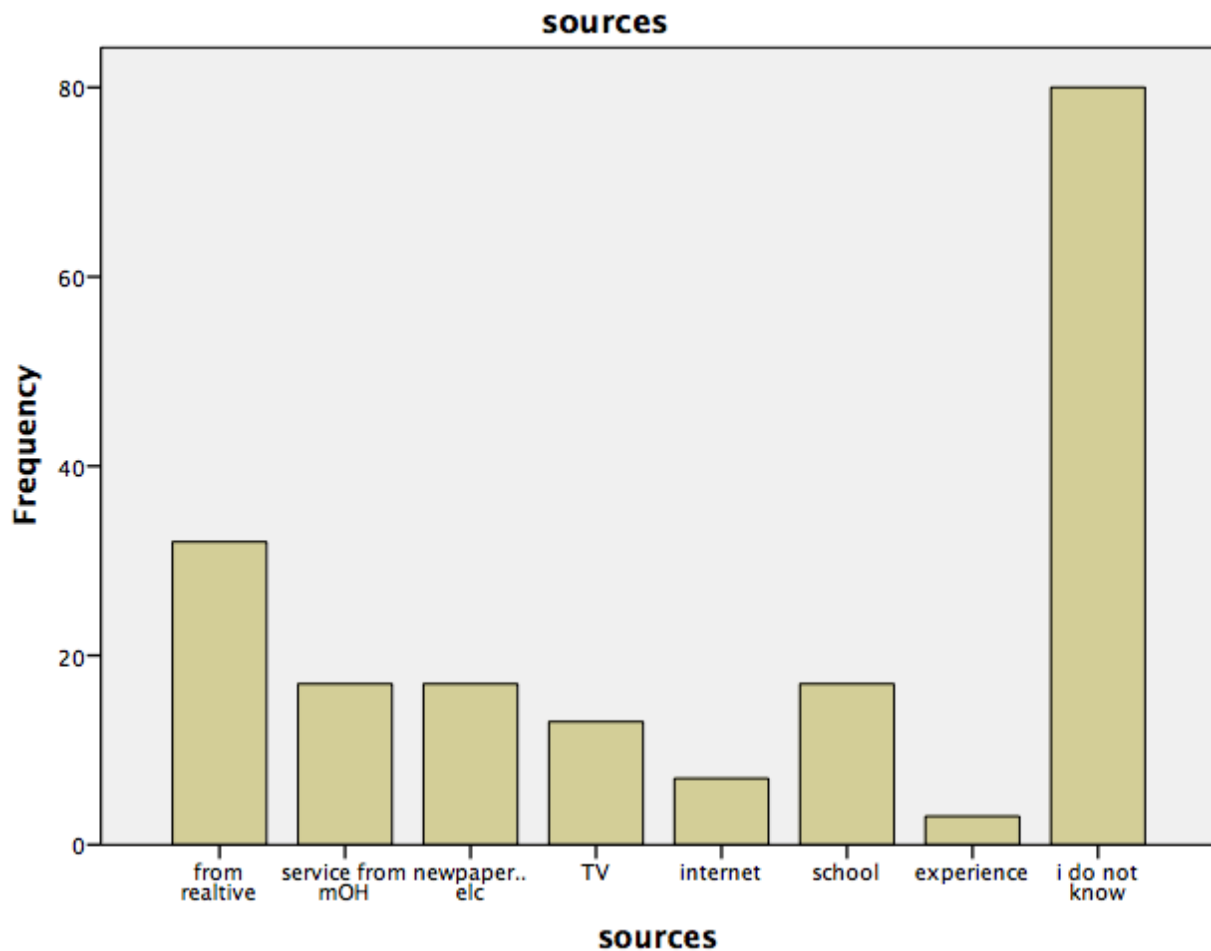


Figure 2. Sources of diabetes-related information in our population

DISCUSSION:

Periodontal diseases are considered the six main complication of DM, which proves that patients with diabetes are more susceptible to such diseases. [5-7] Adequate knowledge and information about the association between periodontal diseases and diabetes is essential. [15] Patients with diabetes should have regular recall program visits due to the insufficient

care provided to those patients. Therefore, consultation with a dentist is crucial to enhance oral health promotion. [13] It is clear that the knowledge and attitude of each individual in healthcare is important in order to provide information about health promotion and practices to prevent periodontal diseases.

The results of the present study show that most of the

respondents did not care about their dental healthiness, as only a minority of the population went to dentists on a regular basis. On the other hand, more than half of them went to dentists only when his help was required. The low compliance with regular dental visits shown in this study goes in line with other studies. A study conducted in Jeddah in 2015 reported that only 12.6% of their survey population visited their dentists regularly. [16] Another previous research conducted on female Saudi adults showed that only 8% of female patients with diabetes visited their dentists on a regular basis. [17] Similarly, a study conducted in Jordan reached the same conclusion about this findings. [13] On the other hand, our results regarding dental visit compliance is much lower than that reported in other research conducted in Western countries [12,15] (39% and 43%, respectively). Such differences between our results could be attributed to the difference in the examined population. Moreover, age could play a role in such difference, as most of our population was between the 5th and 6th decade of life; thus, visiting dentists on a regular basis would not be a possible option for them. Based on the above observations, diabetic patients should visit dentists regularly to reinforce and promote dental health in those populations and to inform them about the best health practices to prevent periodontal diseases.

Upon assessing dental care practices in the present study, we found that 43% brushed their teeth once daily, which indicates that oral hygiene measures are not adequately followed in this population. Similar findings of inadequacy of maintaining oral hygiene measures in diabetic populations were reported in the literature. [13,16,18,19] Even though brushing once a day has shown to be linked with better oral health-related quality of life (OHRQL) in comparison with less frequent brushing, [20] we recommend following proper oral hygiene methods in addition to proper education of these measures in order to enhance periodontal health and prevent gingival diseases in this high-risk population.

Individuals continue to neglect dental health, however, seek medical care whenever required. However, it is not realized that often poor periodontal health can be an underlying cause for a deteriorating systemic health of those individuals. In such instances, physicians and medical professionals' knowledge of the relationship between periodontal health and general health comes to the rescue of the patients.

As for awareness of the relationship between diabetes and periodontal diseases, only 53% were aware that diabetes would be associated with gum problems.

This finding indicates that our population was less aware as regards the connection between diabetes and gum problems. Multiple studies conducted in Saudi Arabia and other countries reported similar findings, showing that the knowledge of such association is still lacking. [15-17,21,22] This could be the results of the low educational level of those patients. In this study, a considerable percentage of respondents did not even know what type of diabetes they had, reflecting the low educational background and knowledge of those patients.

Going in line with the findings of Bahammam et al, [16] relatives were the most common source of information about the association of diabetes and periodontal health, followed by services from MOH, school programs, newspaper, TV, and internet respectively. These results indicate that information obtained by patients with diabetes came from informal sources lacking a scientific basis. Therefore, we suggest that dental health education containing accurate and updated information is required to be available through educational program for diabetic patients. That being said, regardless of the sources of information, limited knowledge and awareness of the two-way relationship between diabetes and periodontal health problems was evident in our study.

Research in the area of diabetes health education in Saudi Arabia remains limited. Therefore, our findings point out the importance of conducting further research to identify barriers to awareness and compliance of diabetic patients in maintaining regular dentist visits as well as the background knowledge of healthcare providers and dentists as regards the association between diabetes and periodontal diseases.

This study has several limitations. The findings obtained from the self-administered questionnaire is not supported due to the lack of objective clinical data for assessment. The fact that our population was based on patients presenting at the outpatient clinics make our study liable for bias and not representative of the whole diabetic population. Finally, the fact that our study is based on self-administered questionnaires increases the risk of recall bias due to the possibility that participants would give socially acceptable responses to questions pertaining to oral health behavior.

CONCLUSION:

Almost half of our population lack the knowledge of the relationship between periodontal health problems and diabetes. They also follow inadequate health practices in terms of oral healthiness in addition to neglecting the regular visits to dentists. These

findings conclude that awareness of the burden of diabetes on periodontal health remains neglected in Saudi Arabia and that further investigations are warranted.

Conflict of Interest: None

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