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CAN ORAL HEALTH KNOWLEDGE CHANGE ATTITUDE TOWARDS ORAL HEALTH PRACTICE BETWEEN DIABETIC AND NON-DIABETIC PATIENTS? A CROSS SECTIONAL STUDY AMONG PATIENTS VISITING DIABETIC CENTER AND TAIBAH UNIVERSITY COLLEGE OF DENTISTRY CLINIC, MADINAH, SAUDI ARABIA.

Dental Science

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ABSTRACT

Background: Diabetes mellitus is a chronic disease characterized by an impaired production of insulin and has been associated with oral disorders. Risk of developing oral health problem in diabetic patients is more as compared to non-diabetic patients. Common oral diseases are mostly related to oral hygiene and especially in diabetes patient chances of development of oral diseases increase if oral hygiene is not maintained properly. Oral hygiene is closely related with the oral health knowledge of the person.

Aim and objectives: Aim of this study is to find out oral health knowledge and practice among both diabetes and non-diabetes patient in Madinah, KSA.

Methods: This is a cross-sectional study carried out on over a period of 6 months from October 2016 until April 2017. A total of 416 diabetic and non-diabetic adults age ranging from 18 to 90 years were selected for the study. A questionnaire was designed to obtain the necessary information. It consisted of two parts oral health practice and oral health knowledge including demographic data. The questions were asked directly from the subjects directly by an interviewer. The data were analyzed using IBM SPSS version 22 software package. The statistically significant level was set at $P < 0.05$, and it is measured by Chi Squire. Ethical permission was obtained from the Ethical society of Taibah University College of Dentistry.

Results: Demographic data of diabetes and non-diabetes patients are mentioned in table 1. Majority of diabetic patients were less qualified as compared to non-diabetic patients. The results showed not much difference in smoking among diabetes and non-diabetic patients; smokers were 36 (15.9%) among diabetes and 32 (16.8%) among non-diabetes and it has the non-significant relation (P=0.442). Out of total 29(12.8%) never cleaned their teeth as compared to the non-diabetic patient who was only 3.7 percent. Percentage of diabetic patients having poor oral health knowledge was higher 53(23.5%) as compare to non-diabetic patient 29 (15.3%). But there is no significant relation ($P = 0.095$) between diabetic and non-diabetic patient in relation with oral health knowledge.

Conclusion: It was concluded that diabetic patients have less knowledge as compare to non-diabetic patients. Numbers of diabetic patients, who did not clean their teeth, was more as compared to non-diabetic patients.

KEYWORDS

Diabetic, health knowledge, Insulin, smoking

INTRODUCTION:

Diabetes mellitus (DM) is a chronic disease, which is characterized by an impaired production or utilization of insulin, leading to high amounts of blood glucose.[1] It is a chronic endocrinal disorder affecting more than 200 million people worldwide.[2] This number is expected to double by the year 2030. In Saudi Arabia, there are 23.9% people are suffering from diabetes, making the country on a global scale among the top ten with the highest prevalence of disease. [1] This figure is expected more than double by 2040.[3]

Diabetes has long been associated with oral disorders as dental caries and periodontal conditions. The risks for oral conditions in relation to diabetes have presented conflicting results by the researchers.[4-9] Xerostomia (dry mouth) has been reported to be a common complaint among diabetic patients. Xerostomia leads to damage both hard and soft tissues of the mouth, which leads to be more susceptible to infection.[10] Xerostomia is an uncomfortable condition, which may lead to dental caries, changes in oral mucosa like candida infection and impairment of taste and burning mouth.[10] Some studies reported, the way of DM in the pathogenesis of xerostomia is not specific as many studies reported.[11]

Dental caries and periodontal diseases are mostly related to oral hygiene and especially in diabetic the chances of oral diseases development increases if oral hygiene is not maintained properly.[12] Different studies have demonstrated that oral hygiene is closely associated with the oral health knowledge of the person. So it is important to determine the current level of oral health knowledge and practices of these adult diabetic patients in order to present a proper oral health program to increase their awareness and educate them about the relation between the diabetes and its effect on the oral cavity. Therefore knowledge about susceptibility to oral diseases like dental caries, periodontal diseases, dry mouth condition and prevention of these oral complications as well as effective management of oral health care is essential for diabetes patients.

Only a few studies are known to have conducted in Saudi Arabia. There is no study pertaining to diabetics, and their oral health knowledge and practice has been conducted in the area of Madinah.

The aim of this study is to find out the oral health knowledge and practice among both diabetics and non-diabetics in Madinah, KSA.

MATERIALS AND METHODS:

A cross−sectional study was carried out on over a period of 6 months from October 2016 until April 2017. The sample is collected by convenient method, the Saudi or non-Saudi patients visited the dental clinics of Taibah University College of Dentistry and Prince Abdulaziz Bin Majad Diabetic Center at King Fahad Hospital from Madinah, KSA. A total of 416 adults age ranging from 18 to 90 years were selected for the study. Among them, 226 were diabetes patients and 190 were non-diabetes. Among diabetic 133 were male and 93 were female. Among non-diabetic 105 were male and 85 were female.

A questionnaire consisting of twenty questions regarding oral health knowledge and practice was designed to obtain the necessary information. It consisted of two parts. Part I pertaining to oral health practice and part II pertaining to oral health knowledge including demographic data like gender, age and social status.

The questionnaire was first piloted amongst 20 people to identify any possible problems in its structure or misinterpretations of questions. There were seven questions related to oral health knowledge, each positive answer was coded with one point while negative or do not know answers were coded as a zero. The maximum number of points that could be obtained was seven. Participants who scored 0-2 points were considered to have “poor knowledge” those scoring 3-5 points recorded as having “average knowledge” and those who recorded 6-7 were considered to have “good knowledge”.

The questionnaire was in Arabic and was completed in an interview type format with the principal investigator asking the questions to the participants. The questionnaires were collected on the same day by the interviewers when they completed the answer. The data were analyzed using IBM SPSS version 22 software package. The statistically significant level was set at P< 0.05, and it is measured by Chi Squire. Ethical approval was obtained from the College of Dentistry, Ethical Committee, Taibah University College.

RESULTS:

A total of 416 adults between the age of 18 to 90 years were selected for study by convenient sampling method from dental clinics of Taibah University College of Dentistry and Prince Abdulaziz Bin Majed Diabetic Center at King Fahad Hospital from Madinah, Kingdom of Saudi Arabia who came in for the dental treatment and routine checkup in the diabetic center. Among them, 226 (54.3%) were diabetic and 190(46%) were non-diabetics. Among the diabetic participants 133 (58.8%) were male and 93 (41.2%) were female. Among non-diabetic participants 105 (55.3%) were male and 85 (44.7%) were female.

Demographic data of the diabetics and non-diabetics participants is shown in table1.

Table 1: Demographic Data of the diabetic and Non-Diabetic patient:

Participants	Diabetic (N = 226)		Non-diabetic (N = 190)	
	N	%	N	%
Age group				
18-30 years	87	38.5	141	74.2
31-50 years	78	34.5	44	23.2
51-70 years	55	24.3	5	2.6
71-90 years	6	2.7	0	0
Gender				
Male	133	58.8	105	55.3
Female	93	41.2	85	44.7
Nationality				
Saudi	196	86.7	165	86.8
Non-Saudi	30	13.3	25	13.2
Marital Status				
Married	143	63.3	69	36.3
Unmarried	78	34.5	117	61.6
Divorced	5	2.2	4	2.1
Employment status				
Unemployed	26	11.5	15	7.9
Manual worker	27	11.9	13	6.8
School teacher	35	15.5	10	5.3
House wife	24	10.6	12	6.3
University Teacher	3	1.3	6	3.2
Doctor	2	0.9	5	2.6
Student	50	22.1	98	51.6
Retired	30	13.3	6	3.2
Others	29	12.8	25	13.2
Level of education				
Illiterate	18	8.0	0	0
Primary	12	5.3	3	1.6
Elementary	29	12.8	3	1.6
High school	60	26.5	37	19.5
Graduate and Above	107	47.3	147	77.4

In this study, participants had five different educational categories. Eight percent of diabetic participants were illiterate, 5.3% had primary school education, 12.8% had an elementary school education, 26.5% had high school education and 47.3% of them were graduate and above. However 77.4% non-diabetic participants were graduate and above and 19.5% had high school education. Table 1

There was not much difference in the number of smokers between the diabetic and non-diabetic participants. Smokers among diabetics compared of 36 (15.9%) participants and 32 (16.8%) among non-diabetics. Table 2

Table 2: Relation with smoking

Participants	Smokers		Non-Smokers		Total
	N	%	N	%	
Diabetic	36	15.9	190	84.1	226
Non-Diabetic	32	16.8	158	83.2	190

Not significant P = 0.442

Among the diabetic participants 29 (12.8%) said they never cleaned their teeth as compared to the non-diabetic patient who was only 7 (3.7%). There was not the significant difference between diabetic and non-diabetic patient in relation to the time of cleaning. More than 50% diabetic and non-diabetic patient were cleaning their mouth both morning and evening. Table 3 and 4

Table 3: Time of cleaning teeth

Subject	One time		Two time		Three-time		Never		Total
	N	%	N	%	N	%	N	%	
Diabetic	75	33.2	78	34.5	44	19.5	29	12.8	226
Non-Diabetic	74	39.0	67	35.2	42	22.1	7	3.7	190

P = 0.02

Table 4: Period of cleaning

Subject	Morning only		Evening only		Morning & evening		Never		Total
	N	%	N	%	N	%	N	%	
Diabetic	57	25.2	23	10.2	116	51.3	30	13.3	226
Non-Diabetic	45	23.7	35	18.4	101	53.2	9	4.7	190

P = 0.001

When the participants were asked about using which tools for cleaning the teeth, a majority of participants from both diabetic and non-diabetic patient told that they were using a toothbrush and it was 141(62.4%) and 146 (76.8%) respectively. Table 5

Table 5: Tools of cleaning

Subject	Toothbrush and Toothpaste		Miswak only		Toothbrush and Miswak both		Nothing		Total
	N	%	N	%	N	%	N	%	
Diabetic	141	62.4	16	7.1	41	18.1	28	12.4	226
Non-Diabetic	146	76.8	4	2.1	33	17.4	7	3.7	190

P = 0.000

Regarding changing of a toothbrush, 79 (35%) diabetic participants were changing toothbrush in every three months and 46 (25.2%) were changing when completely distorted whereas non-diabetic patient 33.2% were changing after every three months and 30% when the toothbrush completely distorted. Table 6

Table 6: Changing toothbrush

Subject	Every three months		Every six months		As long as Last		Do not remember		Total
	N	%	N	%	N	%	N	%	
Diabetic	79	35.0	44	19.5	57	25.2	46	20.3	226
Non-Diabetic	63	33.2	53	27.9	57	30.0	17	8.9	190

P = 0.002

On asking about using interdental cleaner, 52(23%) diabetic participants said that they did not use any interdental cleaner as compared to the non-diabetic patient who was only 15.3 percent. Table 7

Table 7: Interdental tool of cleaning

Subject	Dental floss		Brushing		Toothpick		Nothing		Total
	N	%	N	%	N	%	N	%	
Diabetic	53	23.5	66	29.2	55	24.3	52	23.0	226
Non-Diabetic	64	33.7	55	28.9	42	22.1	29	15.3	190

P = 0.064

Percentage of diabetic participants having poor oral health knowledge was higher 53(23.5%) as compare to non-diabetic patient 29 (15.3%). But there is no significant relation (P = 0.095) between diabetic and non-diabetic patient in relation with oral health knowledge Table 8

Table 8: Oral Health knowledge among diabetes and non-diabetes participants

Subject	Poor		Average		Good		Total
	N	%	N	%	N	%	
Diabetic	53	23.5	54	23.9	119	52.7	226
Non-Diabetic	29	15.3	55	28.9	106	55.8	190

P = 0.095

DISCUSSION:

This was the first study conducted to compare oral health knowledge and practice among diabetic and non-diabetic participants in the region of Madinah, Saudi Arabia.

The mouth is a mirror of some systemic diseases. The early identification of oral diseases may contribute to the early diagnosis and treatment of diabetes. It is known from studies that diabetics are more likely to have chances of tooth loss, periodontal diseases and soft tissue diseases as compared to non-diabetics.[12-14]

Oral complications may include periodontitis, neurological problem, mucosal infection, salivary dysfunction and problems of taste. Prevention, diagnosis, and treatment of these diseases are the responsibilities of oral health practitioners.[15, 16] To promote oral health behaviors, which limit the complications, oral health knowledge is very important for diabetic patients. Before education, it is necessary to know the level of oral health knowledge and practice as compared to non-diabetic patients are important. So questionnaire studies are very important and valuable for improvement of oral health among diabetic patients.[17,18]

In our study, 38.5% of the diabetic participants were aged between 18-30 years and most of them (47%) were graduates and above and high school pass comprised (26.5%). There is close relation ship between oral health and diabetic age.[15] In the non-diabetic group 74.2% of participants were aged between 18-30 years and among them, 77.4% were graduate and above and 19.5% high school passed. This shows that our research participants were educated and young. The reason might be increasing tension among young and educated people. Another reason might be the eating habits among the young participants are mostly dependent on junk food, which is very commonly found on every street corner. The majority of the diabetic and non-diabetic participants were non-smokers that were 84.1% and 83.2% respectively. Nowadays anti-smoking campaign is one of the parts of treatment in most of the hospitals and clinics as well as health worker doing an anti-smoking campaign in an oral health program. [19]

Table 3 shows that 12.8% of diabetic participants never brush their teeth as compared to non-diabetic participants that were only 3.7%. It has significant relation with the brushing (P = 0.02). Majority of diabetic and non-diabetic participants were cleaning their mouth morning and evening both. Out of all 62.4%, diabetic patient used a toothbrush as tools for cleaning teeth as compare to non-diabetic patients who used 76.8% and more than 50% of patients from diabetic and non-diabetic were changing toothbrush after every three months and 6 months. Table 4, 5 and 6. The different studies show similarity with our study.[20-23]

Table 7 shows the tools for using interdental cleaning and it was observed that 23% of diabetic participants did not use any interdental cleaning tools as compared to 15.3% non-diabetic participants. Our study is similar to the study of Al Amassi and Al Dakheel[14] who did from Riyadh in 2017.

In our study, nearly one-fourth of diabetic participants had poor oral health knowledge as compare to the non-diabetic patient as in table 8. Similar findings documented by Hawthorne and Tomlinson regarding Pakistani Muslims attending the Manchester Diabetic center.[24-27] The key theme emerged from this study were that participant felt the need for more information and advice about the links between oral health and diabetes and that dentist was seen as the main person to managing oral health needs among diabetes and provide general advice about oral health and diabetes. Oral hygiene behavior and seeking oral health care depends upon a number of factors. Participants comply better with oral health care regimens when informed and positively reinforced. Lack of information is among the reasons for non-adherence with oral hygiene practices. Further, oral health attitudes and beliefs are significant for oral health behavior.[17,27]

Health education attempts to change behaviors by altering an individual's knowledge, attitudes, and beliefs about health matters.[17] The present study aimed to gather baseline information on knowledge, and practices of diabetic patients regarding their oral health with the view of enhancing dental health education program for this population, which would upgrade their knowledge and understanding. This is believed to improve the oral health status of the diabetic patients, in turn, control of diabetes and ultimately their quality of life.

CONCLUSION: It was concluded that diabetic participants have less knowledge as compare to non-diabetic participants. A number of diabetic participants, who did not clean their teeth, were more as compared to non-diabetic. Further educational programs should be established for diabetic patients in order to improve their oral health knowledge and behavior. Dentists and hygienists should be entrusted with more responsibility in this task. It is also recommended to conduct such studies on diabetic patients visiting primary health care centers and hospitals in different areas of Saudi Arabia.

Recommendation: In future oral health advice should be given for improving oral hygiene among diabetes people to prevent from oral diseases that are in more in danger of oral diseases.

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Conflict of interest: There is no conflict of interest among the authors.

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