

## Knowledge and Oral Health Awareness about Diabetes among College Population in United Arab Emirates: A Pilot Study

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**Abstract:** Diabetes Mellitus has emerged as an epidemic problem in the Gulf countries, due to their rapid socio-economic development and changes in lifestyle. This study aims to evaluate the level of knowledge and overall awareness of diabetes and its general and oral complications among university students. Two hundred and thirty six subjects aged over 18 years old agreed to participate in this study. Amongst those who have family history of diabetes, about 17% of males and 27% of females undergo routine medical checkups and only 8% of males and 21% of females undergo routine dental checkups. Over 91% claimed that they are not at risk of diabetes or pre-diabetes. More females than males with a family history of diabetes had knowledge of diabetic symptoms and effects. It is worthy to note that these educated adults had lack of information related to diabetes and its associated effects on general and oral health. Public education about diabetes prevention and its general and oral complications is thus a worthy public health goal in UAE and Gulf region.

**Key words:** Diabetes · Oral health · Knowledge · Awareness · United Arab Emirates

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### INTRODUCTION

Diabetes Mellitus (DM) is one of the most prevalent and a costly chronic disease which affects over 246 million people worldwide [1]. The five countries with the highest diabetes prevalence in 2003 were Nauru (30.2%), United Arab Emirates (20.1%), Qatar (16%), Bahrain (14.9%) and Kuwait (12.8%). The number of diabetics is expected to double in Africa, the Eastern Mediterranean and South-East Asia regions By 2025 [1]. The global increase in the prevalence of DM is attributed to many factors, including the ageing population, unhealthy diets and inactive lifestyles. In the western industrial countries, diabetes is common among the elderly, whereas in the developing countries diabetes most frequently affects people between the ages of 35 and 64 [2]. Appallingly, DM onset is increasing among youth in some countries [3]. DM has emerged as an epidemic problem in the Gulf countries, due to their rapid socio-economic development and changes in lifestyle [4-6].

The incidence and impact of diabetes-related complications on public health is alarming. Common complications include microvascular conditions such as neuropathy, retinopathy, nephropathy and macrovascular disease resulting in an increased incidence of stroke and heart disease. These complications further contribute to reduced quality of life [7]. A number of oral complications have also been associated with diabetes mellitus [8]. These complications may cause early tooth loss and edentulism, salivary glands dysfunction, taste and other neurosensory disorders, oral mucosal diseases associated with delayed healing and infections such as oral candidiasis. The association of DM and periodontal diseases is well-established and periodontitis is considered the "sixth complication of diabetes" [9]. Diabetes related complications can be prevented or significantly delayed with early diagnosis, improved diabetes management and public awareness of diabetes risk factors and complications [10-12]. However, little is known about how the public generally perceive diabetes

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and its general and oral complications. This study aims to evaluate the level of knowledge and overall awareness of diabetes and its general and oral complications among University of Sharjah (UoS) students. To the best of our knowledge, no such study has been conducted previously in the UAE.

### MATERIALS AND METHODS

This pilot cross sectional study was conducted in different colleges (Engineering, Media, Law and Shariaa) of the University of Sharjah. Students enrolled in different programs in year 1 through year 4 were invited to participate. A convenience sample of 236 subjects aged over 18 years old agreed to participate in this survey. Participants were provided with an information sheet that explained the aims and objectives of the study, as well as a consent form. The sample included 118 Males (50 percent) and 118 Females (50 percent).

A questionnaire was prepared by modifying the English version of the questionnaire developed by Stanford University Patient Education Research Center [13]. Participation in the study was voluntary and the answers were anonymous. The questionnaire consisted of sections that contained questions concerning the subjects' self-reported general health, information related to diabetic parents and siblings, routine diabetes tests, knowledge about pre-diabetes, symptoms of diabetes and awareness about diabetic effect on different parts of the body and on dental health. Information on the socio-economic status of the participants such as the participant's birth place, family size and composition was collected from the questionnaire.

The data was entered into SPSS version 14.0 and used for statistical analysis by chi-square tests for categorical data. The significance level was set at  $P \leq 0.05$ .

### RESULTS

Of the 236 subjects, 36% were Emiratis and 64% of the study population was from other nationalities, corresponding to the University's distribution of Emirati and non-Emirati students. Almost 95% of the participants rated their overall health as good to excellent. The majority of participants (91%) reported no incidence of any chronic disease like hypertension, high cholesterol, heart disease and/or lung diseases. A small proportion of participants, about 2%, reported having Type 1 (0.8%) and Type 2 (1.7%) diabetes and the remaining 6% of the study population reported other types of chronic diseases e.g., hypertension, high cholesterol and lung diseases.

Over 60% of the study participants reported that either their parents or their siblings or both had been diagnosed with diabetes. Among those reported family history of diabetes, we found statistically significant difference ( $P=0.04$ ) between Emirati (71%) and non-Emirati (58%) students. Interestingly, we also found significant difference ( $P=0.03$ ) between Emiratis (approximately 64%) and non-Emirati (around 49%) participants and their dental visit frequency (Table 1).

Amongst those who have family history of diabetes, about 23% of male participant and 31% of female participants believe that they are at high risk of contracting diabetes because of their family history. Few numbers of respondents, 17% of males and 27% of females, undergo routine medical checkups and only 8%

Table 1: Knowledge and attitude among Emirati and non-Emirati students in relation to diabetes

Diabetes related knowledge and attitude	Diabetic knowledge among Emirati students N (%)	Diabetic knowledge among Non-Emirati students N (%)	P value
<b>Diabetic family history</b>			
Yes	71.1	58	0.04*
No	28.9	42	
<b>Risk of diabetes</b>			
Yes	31.7	25.9	0.42
No	68.3	74.1	
<b>Medical history of diabetes</b>			
Yes	4.9	3.9	0.55
No	95.1	96.6	
<b>Screening for diabetes</b>			
Yes	53.6	43.3	0.13
No	46.4	56.8	
<b>Dental visit</b>			
Yes	63.9	49.3	0.03*
No	36.1	50.7	

\*  $P < 0.05$

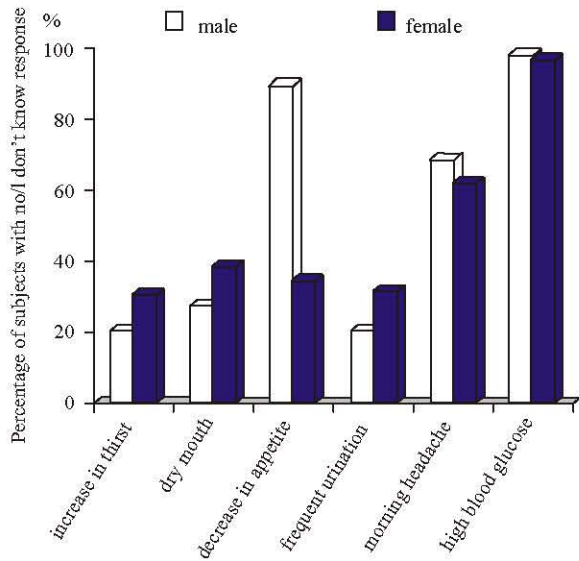


Fig. 1: Level of knowledge about diabetes symptoms by gender

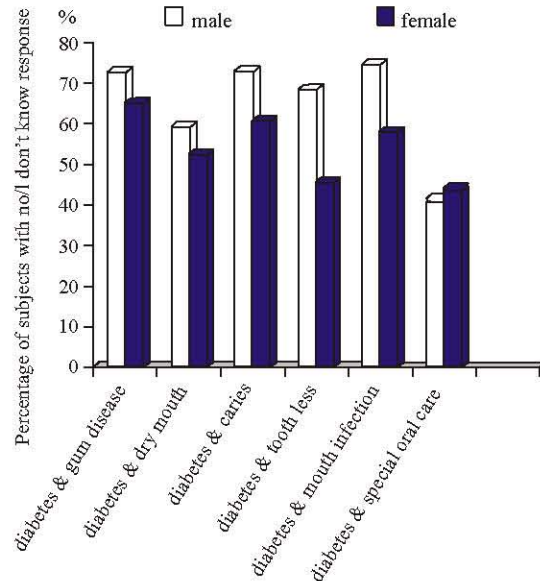


Fig. 3: Level of knowledge about diabetes and its oral affects by gender

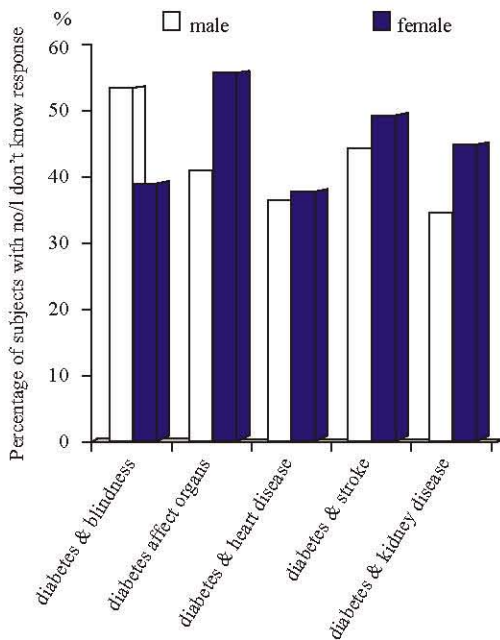


Fig. 2: Level of knowledge about diabetes and its systemic affects by gender

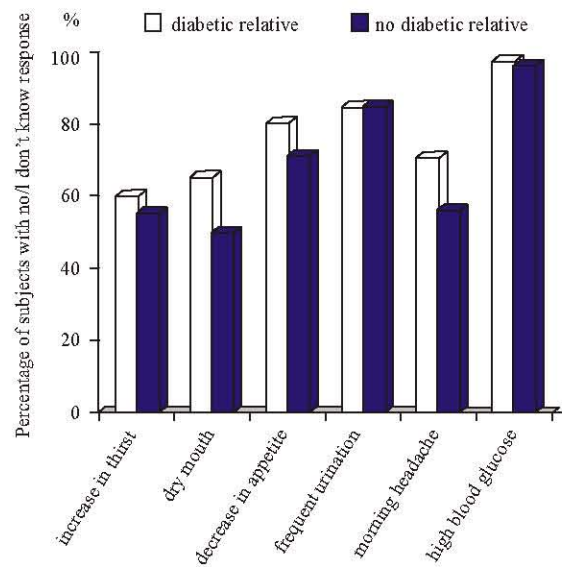


Fig. 4: Level of knowledge about diabetes symptoms by diabetic family history

of males and 21% of females undergo routine dental checkups. About 45% of males and of 49% females had been screened for diabetes only once in their lives. Over 91% claimed that they are not at risk of diabetes or pre-diabetes and approximately 9% of the participants with diabetic family history reported that they “don’t know” (Figs. 1-3).

More female than male patients with a family history of diabetes had knowledge of diabetic symptoms and health-related medical and dental effects (Figs. 4-6).

### DISCUSSION

This study shows that the level of knowledge about diabetes and its associated effects on oral and general health was low in general among participants. However,

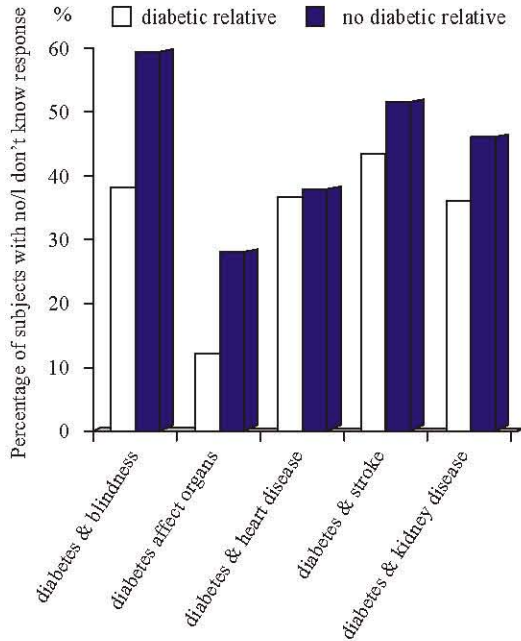


Fig. 5: Level of knowledge about diabetes and its systemic affects by diabetic family history

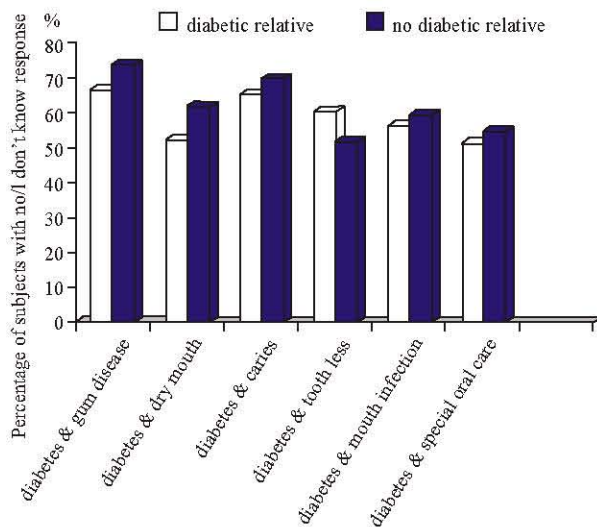


Fig. 6: Level of knowledge about diabetes and its oral affects by diabetic family history

these subjects have less awareness related to the impact of diabetes on oral health as compared to its systemic effects. The majority (60%) of the study participants have a family history of diabetes. Those respondents with a family history of diabetes demonstrated relatively better understanding of the affects of diabetes on general and oral health. In addition, Emiratis participants showed more awareness about diabetes (71%) compared to non-

Emiratis subjects (58%). More female than male respondents had knowledge of diabetic symptoms and health-related medical and dental effects.

Type 1 and 2 Diabetes, which have devastating consequences on life expectancy, morbidity and quality of life, impose large economic costs [1]. According to World Health Organization reports, the UAE has the second highest prevalence of diabetes in the world. About 25% of the UAE population is affected by either diabetes Type 1 or diabetes Type 2. In spite of that, our survey of these young educated adults, demonstrates lack of awareness about the seriousness of this global and national problem, on which the UAE government is spending about Dh 1.6 billion annually for diabetes related treatment [14]. Interestingly, our results show that more Emiratis visit dentists for regular check up compared to non-Emiratis ( $P=0.03$ ) participants. This could be due to their free access to government dental services.

Genetic disposition is one of the risk factors for diabetes. There is a risk of developing either type 1 or type 2 diabetes if a blood relative has type 2 diabetes. Genetic risk factors for diabetes are especially strong if a close blood relative, such as a parent or sibling, has type 2 diabetes [15].

It is worth noting that those participants with a family history of diabetes never gone for routine screening for diabetes. Moreover, they lack information related to diabetic symptoms and the associated effects on the heart, nerve, vision, limbs and kidneys. Similarly, they lack awareness of diabetic effects on oral health. These findings are in agreement with similar studies in gulf and eastern Mediterranean regions [4, 16, 17] and other countries in the world [12, 18, 19].

The lack of knowledge and public awareness of diabetes symptoms may explain the failure of early diagnosis and prevention of diabetes complications. Increasing public awareness regarding diabetes symptoms and the importance of diabetic screening for high risk group can decrease the incidence of diabetes complications.

Routine diabetic screening is essential in order to detect pre-diabetic condition and also initiate life style advice. Like type 1 and 2 diabetes, pre-diabetes can be a "hidden" disease, so being aware of one's risks and being tested are important. Several long-term damages to the body, especially the heart and circulatory system, may already be occurring during pre-diabetes. It is also important to increase the public awareness regarding modification of diabetes risk factors, such as unhealthy life style, high sugar intake and obesity [20].

Results of this pilot study demonstrate that public education about diabetes prevention and its general and oral complications is a worthy public health goal in UAE and Gulf region especially because the diabetes pandemic is linked to this region contemporary lifestyle.

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