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Oral Health Knowledge and perception Among Diabetes Mellitus Patients

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المعرفة والإدراك حول صحة الفم لدى مرضى السكري

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Abstract:
Diabetes mellitus (DM) represents a significant and escalating global health challenge, with its prevalence rising annually. DM is characterized as a metabolic disorder in which the body either fails to produce adequate insulin or improperly utilizes it, resulting in hyperglycemia in both fasting and postprandial states. Patients with diabetes are predisposed to a range of complications throughout the body, including those within the oral cavity. This study aimed to assess the level of oral health knowledge among male and female patients with diabetes. Conducted as a cross-sectional study, data collection took place at Souq Alkhamees and the General Medical Centre. A total of 120 patients participated, with data obtained through direct interviews using a structured questionnaire. Findings indicated that individuals with diabetes generally possess insufficient knowledge about oral health and have limited engagement with dental care services. While the majority reported brushing their teeth at least twice daily, most participants did not floss regularly. In response to a question regarding diabetes' impact on tooth decay, 74.2% of respondents acknowledged an increased risk, while 25.8% were unaware of the association. Similarly, when asked about the link between gum disease and oral health, 89.2% responded affirmatively, whereas 10.8% did not recognize this connection. The study highlights that diabetic patients demonstrate limited oral health knowledge and poor oral health practices. Consequently, there is an urgent need to educate diabetic patients on their heightened risk for oral health issues, encourage better oral hygiene practices, and improve their access to dental care services.

Keywords: Oral Health; Knowledge; Diabetes mellitus; SPSS analysis.

الملخص
يعد مرض السكري أحد أهم المشاكل الصحية المزمنة ويزداد انتشاره كل عام. مرض السكري هو اضطراب أيضي حيث لا ينتج جسم الإنسان الأنسولين أو يستخدمه بشكل صحيح أو يصاب بحالة ارتفاع سكر الدم سواء أثناء الصيام أو بعد الأكل. يمكن أن يصاب مريض السكري بمضاعفات مختلفة في الجسم وقد لوحظت مضاعفات في تجويف الفم لدى الأفراد الذين يعانون من مرض السكري. كان الهدف من هذه الدراسة هو مراقبة معرفة صحة الفم بين مرضى السكري من الذكور والإناث. أجريت هذه الدراسة المقطعية في سوق الخميس والمركز الطبي العام. تم جمع البيانات عن طريق المقابلة المباشرة مع المريض باستخدام نموذج استبيان. كان إجمالي العينة في هذه الدراسة 120 مريضًا. وجدت هذه الدراسة أن الأشخاص المصابين بداء السكري لديهم معرفة غير كافية بصحة الفم وزيارات أقل لطبيب الأسنان حيث ينظف الغالبية أسنانهم مرتين على الأقل في اليوم ومعظمهم لا يستخدمون خيط الأسنان. أثناء الإجابة على السؤال بأن مرض السكري يزيد من خطر تسوس الأسنان، أجاب حوالي 74.2٪ بنعم و25.8٪ أجابوا بلا، بينما أجاب 89.2٪ بنعم و10.8٪ لا عند الإجابة على السؤال المتعلق بأمراض اللثة وتأثيرها على صحة الفم. بشكل

عام، يعاني الأشخاص المصابون بداء السكري من معرفة محدودة بصحة الفم وسلوكيات سيئة في صحة الفم. لذلك من الضروري تثقيف المريض بشأن زيادة خطر إصابته بمشاكل صحة الفم وتحفيزه على سلوكيات صحة الفم الجيدة وتسهيل الوصول إلى رعاية الأسنان.

الكلمات المفتاحية: صحة الفم، المعرفة، مرض السكري، تحليل SPSS.

Introduction

Diabetes is among the most prevalent non-communicable diseases worldwide, posing a substantial public health challenge that impacts millions of individuals globally. According to the World Health Organization's 2019 report on diabetes, the global adult population with diabetes has nearly quadrupled since 1980, reaching 422 million, with projections indicating a further rise to 693 million by 2045. Diabetes is primarily characterized by elevated blood glucose levels, resulting from insufficient insulin activity due to dysfunction in the pancreas, the organ responsible for glucose regulation. Estimates from the International Diabetes Federation reported a diabetes prevalence of 381 million in 2013, with projections suggesting an increase to 592 million by 2035. These figures underscore the rising prevalence and incidence of diabetes globally.

In Libya, where this study was conducted, the WHO reported an estimated 8,000 diabetes cases in 2000, with an expected increase to 245,000 by 2030. Diabetes can induce irreversible damage across various bodily systems, leading to a spectrum of complications, both systemic and oral. Chronic manifestations most commonly involve macrovascular and microvascular complications, with macrovascular conditions—such as coronary artery disease, cerebrovascular disease, and peripheral vascular disease—constituting the primary sources of diabetes-related morbidity and mortality.

Oral manifestations are also common in diabetic patients. Insufficient saliva production reduces the natural cleansing of the oral cavity, accelerating plaque and debris buildup. Additionally, elevated blood glucose levels result in thicker saliva. This dry mouth condition, combined with increased salivary glucose, elevates the risk of dental caries. Inadequate oral health knowledge among diabetic patients may heighten the risk of further health issues; thus, this study aimed to assess the level of oral health awareness among individuals with diabetes.

Material and methods

This study was designed as a cross-sectional survey, targeting patients attending the Souq Alkamees Diabetes Clinic and Alkhoms Governmental Hospital during the study period from July to October 2022. A total of 120 patients constituted the sample size for this research. A self-developed questionnaire, adapted from previous studies employing similar designs [9, 10, 11], was utilized to collect data. Initially prepared in English, the questionnaire was translated into Arabic to ensure clarity and comprehensibility for the participants. Data analysis was conducted using IBM SPSS Statistics (version 26). Descriptive statistics, including frequencies and percentages, were used to summarize the data. Additionally, an independent samples t-test was employed to compare responses between male and female participants. Written permission for conducting the study was obtained from the Dean of the Faculty of Medical Technology, as well as from the heads of the Souq Alkamees Diabetes Center and Alkhoms Public Hospital.

Result

The diabetic patients participating in this study aged between 21-80 years (Table 1), of whom 76 (63.3%) were females and 44 (36.7%) were males.

Table1: Age distribution of respondents.

Group of age	n.	%
21-30	7	5.8
31-40	31	25.8
41-50	28	23.3
51-60	25	20.8
61-70	22	18.3
71-80	7	5.8
Total	120	100

Table 2 presents the oral health knowledge among diabetic patients. A significant majority (91.7%) acknowledged that diabetes has a general impact on oral health. Additionally, 82.5% of patients recognized gum disease as a prevalent oral health issue for individuals with diabetes, and an equal percentage (82.5%) understood that oral health problems could influence blood glucose control. Furthermore, 78.3% of respondents were aware that diabetes increases the likelihood of gingival bleeding, and 85% knew that it affects wound healing within the oral cavity. A substantial proportion of

patients (67.5%) agreed that diabetes exacerbates oral infections, and 90.8% identified that it contributes to tooth loss. Additionally, 74.2% reported experiencing dental caries, and 70.8% agreed that diabetic patients with digestive issues are at an elevated risk for gum disease. These findings underscore the awareness levels among diabetic patients regarding the interrelationship between diabetes and oral health complications.

Table 2: Oral health knowledge of diabetes patients.

	YES n. (%)	NO n. (%)
Gum disease and diabetes	99 (82.5)	21 (17.5)
Oral health and affecting of glucose level	99 (82.5)	21 (17.5)
Digestive problems and gum disease.	85 (70.8)	35 (29.2)
effect of diabetes on the oral health	110 (91.7)	10 (8.3)
Diabetes and gingival bleeding	94(78.3)	26 (21.7)
Diabetes and healing of wound	102 (85)	18 (15)
Diabetes and loosing teeth	109 (90.8)	11 (9.2)
Diabetes and oral disease infection	81(67.5)	39(32.5)
Diabetes and dental caries	89 (74.2)	31 (25.8)

Table 3 provides insights into the oral self-care practices of diabetic patients. According to the table, 39.2% of patients reported brushing their teeth after meals, and 41.7% brush twice daily. In terms of dental floss usage, 46.7% of patients reported that they never use it. The data also reveal that 46.7% of respondents visit the dentist only when they experience an oral health issue, while a significant majority (75%) seek dental care specifically when in pain. Additionally, 46.7% cited the high cost of treatment as a reason for not visiting the dentist regularly.

Table 3: Oral self-care of diabetes patients**.**

	Frequency N=	Percent (%)
Having oral problem		
Visit dentist	56	46.7
Visit doctor	48	40
Self-treat	14	11.7
Ignore it	2	1.7
Frequency of visiting dentist		
Every 3 months	7	5.8
Every 6 months	8	6.7
Having pain	90	75
Never	4	3.3
Reason of not visiting dentist		
High cost	56	46.7
No need	8	6.7
Transport problem	16	13.3
Other reasons	40	33.3
Frequency of using dental brush		
After eating	47	39.2
Twice a day	50	41.7
Once a day	15	12.5
Never brush	8	6.7
Frequency of using dental floss		
After eating	24	20
Twice a day	22	18.3
Once a day	18	15
Never use	56	46.7
Frequency of using of mouth wash		
Twice a day	62	51.7
Once a day	21	17.5
Once a week	10	8.3
Never use	27	22.5

Regarding mouthwash use, over half of the respondents use it twice daily, whereas 22.5% reported that they never use mouthwash. These findings indicate gaps in regular oral self-care and preventive dental visits among diabetic patients, influenced by factors such as treatment costs and pain-driven care-seeking behavior.

Table 4 illustrates the management strategies among diabetic patients. The majority (86.7%) reported having controlled diabetes. More than half of the patients (54.2%) use insulin injections to regulate blood sugar levels, while only 21.7% manage their condition through dietary adjustments. These findings reflect the prevalent reliance on medication, specifically injections, over lifestyle modifications such as diet, highlighting a potential area for educational interventions to promote holistic diabetes management.

Table 4: Status of diabetes and treatment used.

	Frequency=N.	**Percent %**
Status of diabetes		
Controlled	104	86.7
Uncontrolled	16	13.3
Treatment used		
Diet	26	21.7
Oral medication	18	15
Diabetes injection	65	54.2
Injections and oral medication	11	9.1

For evaluating knowledge of diabetic patients toward oral health, the results revealed (Table 5) that most of the patients (75%) have poor knowledge and 25% have good knowledge. In Table 6, the results for females show that the mean is equal to (1.84) and the value of the statistical signification of the test is equal to (0.00) which indicates that there is an awareness and knowledge toward oral health among diabetic female patients, while the results for males show that the mean is equal to (1.70) and the value of the statistical signification of the test is equal to (0.00) which indicate that there is an awareness and knowledge toward oral health among diabetic male patients. By comparing, the results show that female patients have awareness and knowledge toward oral health higher than males.

Table 5: Assessment of patients Knowledge toward oral health**.**

	n.	**%**
Good Knowledge	30	25.0
Poor knowledge	90	75.0
Total	120	100.0

Table 6: Compare between knowledge males and females' patients towards oral health.

	Mean	T test	Std. Deviation	Sig (p. value)
Females	1.84	0.370	-1.865	0.00
Males	1.70	0.462	-1.758	0.00

Discussion

Diabetes prevalence is rising globally, with the WHO projecting that 693 million people will be affected by 2045. The oral cavity can serve as a valuable indicator for various systemic diseases, with early detection of oral manifestations potentially facilitating the timely diagnosis and management of diabetes. This study aimed to assess diabetic patients' knowledge and perceptions regarding oral health. Findings indicated that patients were generally aware of diabetes-related oral complications: 82.5% recognized periodontal disease as a significant issue for diabetics, 91.7% understood diabetes' overall impact on oral health, 78.3% identified diabetes as a cause of gingival bleeding, 90.8% acknowledged that diabetes contributes to tooth loss, and 74.2% were aware of the increased risk of dental caries. These results align with previous studies evaluating diabetic patients' knowledge, attitudes toward oral health, and oral health-related quality of life, where approximately 60% of participants were aware of their increased risk for periodontal disease and 54% for dental caries [12]. The study further revealed that only 25% of patients possessed a good level of oral health knowledge—lower than reported in studies from Tanzania [13], Saudi Arabia [11], Iran [14], and Kuwait [10]. Differences in these findings may be due to variations in study populations and questionnaire structures. In terms of oral self-care and hygiene maintenance, the current study found that 12.5% of participants brushed once daily, 41.7% brushed twice daily, 39.3% brushed after meals, and 6.7% did not brush daily. Over half reported using

mouthwash, while 46.7% never used dental floss. A comparative study showed that 50% brushed once daily, 31% twice daily, 19% never brushed, and 66% never used dental floss [12]. The study also revealed that 46.7% of respondents visited a dentist for oral problems, 40% consulted a physician, 75% visited a dentist when experiencing toothache, 6.7% attended check-ups every six months, and 3.3% never visited. The primary barrier to regular dental visits was the high cost of dental treatment in the absence of medical insurance in Libya. These figures are lower than those reported in studies from the United Arab Emirates [12] and the United Kingdom [6, 15].

Conclusion

The findings indicate that individuals with diabetes generally exhibit insufficient oral health knowledge, a suboptimal attitude toward oral health, and low adherence to recommended oral hygiene practices. The data also reveal that male patients demonstrate a lower level of oral health knowledge compared to female patients. While most participants were aware of the association between diabetes and increased risks of dental caries and periodontal disease, a notably small proportion reported regular dental visits for routine checkups. Furthermore, diabetic patients appear to receive limited oral health information and preventive care advice from their diabetes care providers, underscoring a critical gap in comprehensive diabetes management.

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