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A Cross-sectional Study on the Knowledge, Attitudes, and Performance of Iranian Endodontists Regarding Diabetic Patients

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Introduction: The high prevalence of diabetes mellitus and related consequences in all populations of the world makes their management an important challenge in endodontic practice. This study aimed to evaluate the knowledge, attitudes, and performance of Iranian endodontists regarding the management of diabetic patients. **Materials and Methods**: Questionnaires with 18 items were distributed to Iranian endodontists from different geographical provinces of Iran using social media. Responses to each question used a five-point Likert scale. Data for responses were analyzed using Chi-square or Fisher's exact tests. **Results**: A total of 101 valid responses were returned for analysis (50 men and 51 women). None of the respondents had aggregated scores that were rated as unfavorable on 3 domains. Knowledge was rated as favorable for 81% and acceptable for the remaining 19%. Attitude was rated as favorable for 63%, and acceptable for 37%, while performance was rated as favorable for 98% and acceptable for the remaining 2%. Also, none of the 3 variables under evaluation were influenced by demographic factors or by work experience. The most common areas of uncertainty for respondents were monitoring blood for glucose or glycated hemoglobin concentration, and decisions regarding when to prescribe antibiotics. **Conclusions**: Overall, this cohort of endodontists displayed a high level of knowledge of the major issues involved in diabetic patient care and were confident in providing clinical care. Future programs for continuing professional development for endodontists should consider current methods used for monitoring blood glucose and glycated hemoglobin, both as point-of-care or personal devices. In addition, further education is needed on antibiotic stewardship.

Keywords: Attitude; Diabetes Mellitus; Endodontists; Knowledge; Performance

Introduction

In specialist endodontic practice, diabetes mellitus (DM) is one of the most common medical conditions that patients may deal with [1]. This condition accounts for many cases of hospitalization and death. Its reported prevalence in most parts of the world is increasing, especially for type 2 DM, which accounts for about 85% of all cases of diabetes [2-6]. Moreover, similar to other medical disorders, the prevalence of DM increases significantly with age among patients seeking dental treatment [7]. During the past decades, medical management/care of diabetic patients has changed significantly to minimize the debilitating complications associated with DM [8]. This is a complex chronic disease that affects many systems in the body, especially the cardiovascular and renal systems, and this necessitates several alterations to dental treatment protocols [9, 10].

Through the production of inflammatory cytokines, such as interleukin-1, endodontic infections can worsen the severity of DM by impairing the regulation of blood glucose levels. On the other hand, poorly controlled DM causes alterations in the microvasculature and impaired neutrophil function, and these make the spread of endodontic infections beyond the periapical region far more likely [10, 11].

For patients with insulin-dependent type I DM, careful monitoring of glycated hemoglobin (HbA1c) levels is needed. As well, dental appointments should be scheduled in the morning, to reduce the likelihood of a hypoglycaemic episode that can cause the patient to collapse [13 ,12]. A further consideration is that patients with poorly managed DM frequently suffer from salivary gland hypofunction, causing an elevated risk for coronal and root surface caries. Carious attacks on tooth structure can cause the loss of the coronal seal and thus failure of endodontic treatment. Patients with DM have poor wound healing and reduced defenses against bacterial infections. The presence of uncontrolled DM also alters decision-making regarding the use of antibiotics [14, 15].

To provide safe and efficient clinical care, clinicians must be aware of both the acute complications of DM as well as its long-term chronic health impacts. They must be able to recognize the early signs and symptoms of hypoglycemia *versus* hyperglycemia, and be able to manage both conditions properly [16]. They must also be able to recognize the risk of diabetic ketoacidosis (DKA) in patients who have had a reduced oral intake, have an active endodontic infection, are dehydrated, or have recently undergone a surgical procedure (including tooth extraction and oral surgery) [17].

Given these considerations, the present study was undertaken to investigate the knowledge, attitudes, and performance of Iranian endodontists in relation to managing patients with DM.

Materials and Methods

A survey was conducted using a customized questionnaire (Table 1). The questionnaires were distributed among endodontists from different geographical provinces of Iran during 2021-2022. The primary method of distribution was online, *via* the Instagram website page of the Iranian Society of Endodontists, although hard copy questionnaires were given to colleagues who participated, where that was possible and convenient. The survey collected demographic information about the respondents (age, work experience, university faculty status, workplace status, type of workplace (private office or public dental clinic), and working hours per week). No personal data were collected, and all responses were anonymized.

The 18 questions in the survey are shown in Table 1. The first cluster had 6 items and explored knowledge. Each of the provided statements was correct. This allowed the extent of agreement with known key facts about diabetes mellitus to be assessed. The second cluster of items explored attitudes. This had 5 items, of which 2 relied upon a proper appreciation of risk assessment based on medical considerations, namely for the use of local anesthesia with epinephrine, and point-of-care testing using a glucometer. One item, regarding prophylactic antibiotics, was designed to test whether or not clinicians were following appropriate prescribing practices, including antimicrobial stewardship.

Table 1. Questionnaire items used in the study

Knowledge items	
1	Stable high blood glucose levels lead to vascular and metabolic complications and various degrees of neuropathy.
2	Observing frequent periapical lesions in radiographs is a sign of diabetes.
3	In diabetic patients, both the blood circulatory system and defensive responses to eliminate microbes are disrupted.
4	Patients' vital signs, such as pulse rate, heart rhythm, and blood pressure, are guides to the treatment of these patients.
5	If fasting blood glucose concentration increases, the risk of infection rises.
6	Blood glucose test results lower than 100, between 100 and 126, and higher than 126 are normal, prediabetic, and diabetic, respectively.
Attitude items	
7	I consider prescribing prophylactic antibiotics a necessity for these patients.
8	I think the treatment of these patients is troublesome.
9	I think consulting a medical specialist before treatment is necessary.
10	I think regular use of local anesthesia with epinephrine is risk-free for most diabetic patients.
11	I consider using a glucometer as a proper method for monitoring blood glucose in the endodontic clinic.
Performance items	
12	Before beginning root canal therapy, I take the patient's full medical history and family background and refer them to specialists if they have signs of diabetes
13	I order an HbA1c test for all these patients.
14	I ask about the amount and number of times they take insulin per day.
15	I see these patients in the morning.
16	I make sure they have taken insulin and had breakfast.
17	I have food containing sugar, such as orange juice, cakes, and non-diet drinks, in my office to give to the patient in case of hypoglycemia.
18	If the patient goes unconscious and I cannot distinguish between hypoglycemia and hyperglycemia, I take measures to treat hypoglycemia.

The final cluster of 7 items was around performance in the clinic when managing issues relating to blood glucose, including protocols to avoid hypoglycemia and to manage it appropriately. These items relied upon survey participants having a proper appreciation of the protocols to follow. As with the knowledge items, correct statements were made, and the extent of agreement with these assessed. In total, 15 of the 18 items related to known standard protocols to safely manage patients with diabetes mellitus who are undergoing dental treatment. As such, the questionnaire items are statements of mainstream clinical practice. If a participant was well-versed in these known protocols, then they would indicate full agreement with each of them.

Before its use with participants, the questionnaire was tested in a pilot study with a separate cohort of 15 endodontists. Information from that pilot study was used in a power analysis to determine that the sample size for the main study should be 100.

The study was approved by the institutional research ethics committee (approval number IR.KMU.REC.1399.079). The study was conducted in parallel with investigations of knowledge, attitudes, and performance relating to patients with cardiovascular diseases and renal diseases, which have been reported separately [18, 19].

Responses to the questions were graded using a 5-point Likert scale (with 1 the least and 5 the highest degree of agreement among respondents). The mean score within each relevant variable (knowledge, attitude, and performance) was calculated, and then classified as follows: favorable (optimal) (3.51-5.00), acceptable (2.51-3.50), and unfavorable (inadequate) (1.00-2.50). Categorical data were analyzed by SPSS software (SPSS version 22; IBM, Armonk, NY, USA) using Chi-square tests and Fisher's exact tests, to assess whether demographic variables and response patterns affecting performance, attitude, and knowledge were significantly associated with age, gender, workplace type, years of clinical experience, or working hours per month as a specialist in endodontics. The *P*-value, defined as the probability of obtaining data equal to or more extreme than the data (results) observed, given that the null hypothesis is true, was set at <0.05 for all tests.

To determine major trends in response patterns, data sets for 5-point Likert scale responses were consolidated from five categories into three (agree/unsure/disagree) by bringing together agree plus strongly agree, and disagree plus strongly disagree. Then, for each category of agree, unsure, and disagree, the three most prominent items in the category were identified.

Table 2. Characteristics of the respondents

Variable	Parameter	Number	Percentage
Gender	Male	41	40.6
	Female	60	59.4
Faculty member	Yes	65	64.4
	No	36	35.6
Workplace	Private Office	61	60.4
	Public clinic	40	39.6
Age (year)	45 and less	75	74.3
	46 and above	26	25.7
Working experience (year)	15 and less	80	79.2
	16 and above	21	20.8
Working hours per month	20 and less	54	53.5
	More than 20	47	46.5

Results

Respondents

A total of 101 valid responses were returned, meeting the sample size threshold determined from the power analysis. Details of the respondents are summarized in Table 2. Most respondents were female (59.4%), less than 45 years of age (74.3%), served as faculty members at Iranian dental schools (64.4%), and were employed in private dental offices (60.4%). Most respondents had less than 16 years of working experience (79.2%) and worked in clinical practice for 20 h or less per month (53.5%).

Overall performance

Data for overall ratings across the 101 respondents are summarized in Table 3, and these data are shown as percentages in Figure 1. Knowledge was rated as favorable for 81.2% of respondents and as acceptable for the remaining 18.8%, while attitudes were rated as favorable for 63.4% and acceptable for 36.6%. Performance was rated as favorable for 98% and acceptable for the remaining 2%. As shown in Table 4, none of these parameters was significantly associated with age, gender, workplace type, years of clinical experience, or working hours per month as a specialist in endodontics. The number and percentage of the endodontists' responses to the questions on three domains are summarized in Table 5.

Table 3. Overall data on knowledge, attitude, and performance for respondents

Category	Unfavorable	Acceptable	Favorable
Score range	(1.0-2.5)	(2.51-3.5)	(3.51-5.)
Knowledge	0	19	82
Attitude	0	37	64
Performance	0	2	99

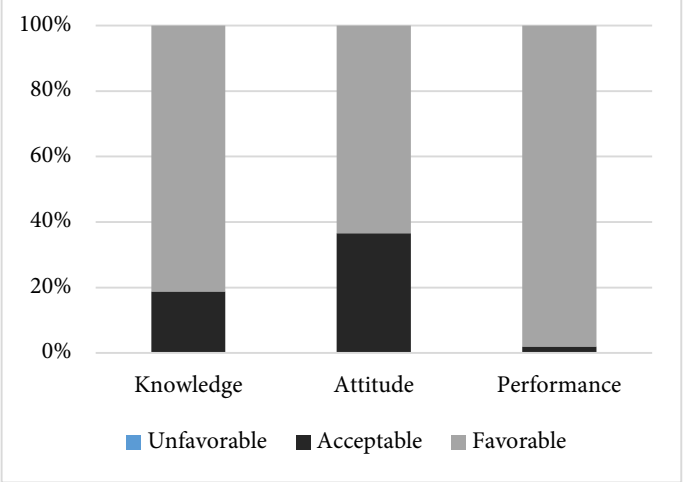

Figure 1. Respondent performance, shown in percentages, for knowledge, attitude, and performance. Across all 3 domains, the proportion of respondents that were rated as "unfavorable" was zero

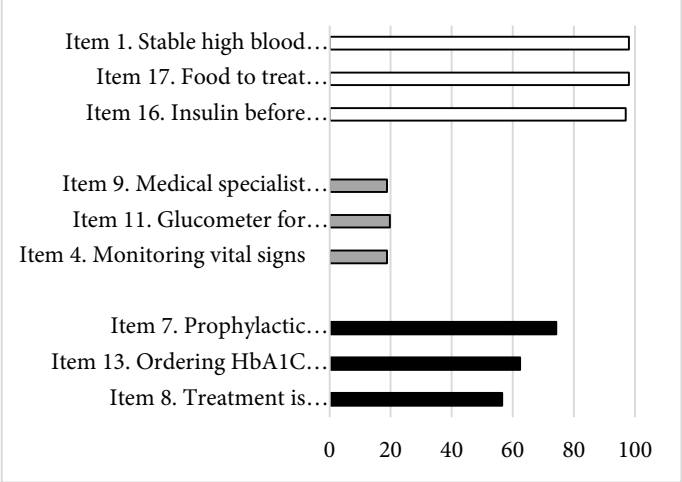

Figure 2. A plot of respondent proportions in percentages, arranged in three separate logical clusters. The top section shows the three items with the greatest agreement amongst respondents (white bars). The middle section shows the 3 most prominent items where the respondents were unsure (grey bars), while the lowest section shows the 3 most prominent items of disagreement (black bars)

Looking more closely at responses to the 18 individual items, the three items with the greatest agreement, uncertainty, and disagreement were identified (Figure 2). The items with the strongest agreement were the importance of insulin before breakfast (item 16), having suitable food to treat hypoglycemia available in the clinic (item 17), and awareness that sustained high blood glucose levels led to vascular and metabolic complications as well as neuropathy (item 1).

There were three items where more than a majority expressed disagreement. These related to the routine use of prophylactic antibiotics (item 7), a belief that the provision of treatment to diabetic patients was troublesome (item 8), and the need to request an HbA1c test (item 13).

The three items with the highest levels of uncertainty for the respondents related to monitoring vital signs (item 4), consulting a medical specialist (item 9), and the value of using a glucometer (item 11).

Discussion

The results of this study show that this particular cohort of endodontists was generally very familiar with the concepts of safe clinical management for patients with DM. All endodontists recognized the inherent dangers of sustained high blood glucose concentrations, and most respondents scored very well for core points of knowledge about diabetes. The present study adds to the literature by evaluating the attitudes and performance of endodontists.

Almost 57% of endodontists did not believe that treating patients with DM was particularly troublesome for them, which indicates that they felt confident in their ability to properly assess the patient's situation and make necessary modifications to scheduling appointments and delivering endodontic treatment. Around one in five endodontists were unsure about the value of tests for measuring blood glucose concentration, and almost two-thirds did not believe that it was necessary to refer the patient to obtain a current value for their HbA1c levels. Together, these findings indicate that continuing professional education programs on the topic of diabetic patient management for endodontists should address the topic of patient monitoring and the interpretation of results for blood glucose and glycated hemoglobin.

In line with modern principles of antimicrobial stewardship, it was interesting to note that almost three-quarters of the endodontists did not support following a rule-based approach regarding when to prescribe prophylactic antibiotics for diabetic patients. On the other hand, some 17.9% of endodontists were likely to prescribe prophylactic antibiotics. In a previous study, only 20% of general practitioners had full knowledge of antibiotic prescription for pulpal and periapical diseases [20]. The decision to prescribe antibiotics should always be considered based on the patient's clinical situation as well as their medical status, and whether there are systemic signs and symptoms of infection, such as fever.

There is now a large range of medicines that are used to support patients with different forms of DM, and this area of medical prescribing has advanced considerably over the past decade. Having an awareness of what medicines are being

prescribed to treat DM, along with their specific complications and probable consequences, is an important professional responsibility [21]. In the situation where a clinician encounters a patient taking a medicine that they do not recognize, consultation with the patient's treating medical practitioner is essential. Some 83.1% of respondents were taking a comprehensive medical history before commencing endodontic treatment. This cohort of endodontists did not unanimously believe that it was necessary to consult with the patient's medical doctor in every case. This indicates that a risk-based approach was being followed, with patients being profiled according to their complexity. This stratification according to risk is important in DM, as multiple body systems become involved over time if the disease process is not being managed well by lifestyle modifications and prescribed medicines [22, 23]. Overall, the results for this cohort of endodontists show they are familiar with many of the issues about providing safe care for diabetic patients, and their performance is superior to past studies on general dentists and dental hygienists working in a range of locations overseas [24-33]. However, one cannot make a direct comparison between all the published studies because of variations in clinician types and models of health care delivery. Specialist training imparts a greater awareness of the management of patients with medical complexity, so one would expect specialists to have better knowledge of health conditions, including DM. This could explain why the overall performance for the management of diabetic patients was better for the cohort of endodontists in this study than the earlier studies on general dentists [24-30] or involving dental hygienists [31, 32]. There are no past studies of endodontists, and so it is unclear whether the

Table 4. *P*-values for demographic variables affecting performance, attitude, and knowledge

Demographic variables	Performance	Attitude	Knowledge
Gender	0.495	0.838	0.726
Age (46 years and above)	1.00	0.603	0.641
Years of working (16 years and above)	1.00	0.879	0.677
Working hours per month (21 and above)	0.497	0.117	0.667
Being a faculty member	0.499	0.634	0.738
Type of clinical workplace	1.00	0.117	0.936

All P-values are non-significant

Table 5. Responses to particular topics in percentages

Survey items	Strongly agree 5	Agree 4	Unsure 3	Disagree 2	Strongly disagree 1
Knowledge items					
1 -Blood glucose and complications	50.5	47.5	2.0	0	0
2 -Periapical lesions	19.8	50.5	15.8	12.9	1.0
3 -Disrupted host defenses	36.6	52.5	4.0	6.9	0
4 -Monitoring vital signs	17.8	46.6	18.8	16.8	2.0
5 -Risk of infection	22.8	56.4	11.9	7.9	1.0
6 -Blood glucose test results	45.5	48.5	4.0	2.0	0
Attitude items					
7 -Prophylactic antibiotics	3.0	14.9	7.9	55.4	18.8
8 -Troublesome treatment	4.0	15.7	23.8	33.7	22.8
9 -Specialist medical review	15.8	42.6	18.8	20.8	2.0
10 -Local anaesthesia with epinephrine	29.7	58.4	2.0	7.9	2.0
11 -In-office glucometer	16.8	44.6	19.8	17.8	1.0
Performance items					
12 -Full medical history	37.6	45.5	11.9	4.0	1.0
13 -HBA1c testing	7.9	17.8	11.9	47.4	15
14 -Insulin doses per day	55.4	33.7	8.9	2.0	0
15 -Morning appointments	40.6	38.6	17.8	2.0	1
16 -Insulin before breakfast	72.3	24.7	1.0	0	2
17 -Glucose or sugar available	64.4	33.6	1.0	1.0	0
18 -Treat hypoglycemia	46.5	47.5	1.0	5.0	0

Data shows the distribution of responses in percentages for Likert scale items. The sequence of items is the same as the full questions shown in Table 1. The most prominent items for agreement, uncertainty and disagreement are highlighted in Figure 2

results of this study can be extrapolated to endodontists in other countries, or to other types of dental specialists in the same country. It is likely that dentists and dental specialists who work in regions of the world where there is a very high prevalence of diabetes may be more familiar with the condition and its dental implications. Thus, future work needs to explore the knowledge of dental clinicians in other jurisdictions and take into account the known national health issues of diabetes in the local population that these clinicians are serving.

Finally, additional work is needed to explore the enablers and barriers around chairside screening for diabetes mellitus, including training, reimbursement, and use of point-of-care diagnostic devices. Past work on screening at the chairside has shown that clinician time, patient out-of-pocket expenses for screening, and lack of training and equipment may all be barriers to the wider use of dental clinicians for diabetes screening activities [32, 33]. This can create a gap between the willingness of dental clinicians and the opportunities they have, with the practicalities of undertaking such screening [34, 35]. Sharing examples of best practice and suitable models that work in different contexts could help widen diabetes screening in dental clinics.

Conclusions

Overall, the results show that this cohort of endodontists have a good level of knowledge on the major issues related to diabetic patient care, and are confident in providing optimal treatment for them. Future programs of continuing professional development for endodontists on this topic should address current methods used for monitoring blood glucose and HbA1c, including body-worn devices and point-of-care devices, as well as pathology laboratories. These programs could also ensure that endodontists have up-to-date knowledge regarding how diabetic patients are managed medically. Finally, further education could also strengthen clinician antibiotic prescribing practices, to conform to antimicrobial stewardship principles and align with relevant local guidelines.

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Conflict of interest

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Authors' contributions

Methodology: MN/AA/FZ; Formal analysis and investigation: MN/FZ; Writing-original draft preparation: AA/FZ; Writing-review and editing: MN/AA; Supervision: MN/AA. All authors read and approved the final manuscript.

References

1. Segura-Egea JJ, Castellanos-Cosano L, Machuca G, López-López J, Martín-González J, Velasco-Ortega E, Sánchez-Domínguez B, López-Frías FJ. Diabetes mellitus, periapical inflammation and endodontic treatment outcome. Med Oral Patol Oral Cir Bucal. 2012;17(2):e356-61.
2. Milech A, Angelucci AP, Golbert A, Matheus A, Carrilho AJF, Ramalho A. Diretrizes da sociedade brasileira de diabetes (2015-2016). São Paulo: AC Farmacêutica. 2016;13.
3. da Rocha Fernandes J, Ogurtsova K, Linnenkamp U, Guariguata L, Seuring T, Zhang P, Cavan D, Makaroff LE. IDF Diabetes Atlas estimates of 2014 global health expenditures on diabetes. Diabetes Res Clin Pract. 2016;117:48-54.
4. Guariguata L, Whiting DR, Hambleton I, Beagley J, Linnenkamp U, Shaw JE. Global estimates of diabetes prevalence for 2013 and projections for 2035. Diabetes Res Clin Pract. 2014;103(2):137-49.
5. Organization WH. Global diffusion of eHealth: making universal health coverage achievable: report of the third global survey on eHealth: World Health Organization; 2017.
6. Beagley J, Guariguata L, Weil C, Motala AA. Global estimates of undiagnosed diabetes in adults. Diabetes Res Clin Pract. 2014;103(2):150-60.
7. Parirokh M, Eghbal MJ, Ghoddusi J, Kakoei S, Haghdoost AA, Kakooei S. The frequency of medically compromised patients in endodontic offices in iran. Iran Endod J. 2013;8(2):48-51.
8. Kadkhodazadeh M, Mollaverdi F, Abdolsamadi HR, Azar R, Ghasemian Pour M, Ahmadpour S. Histologic effects of demineralized bone matrix on regeneration of alveolar socket in diabetic rats. Iran Endod J. 2009;4(1):20-4.
9. Nazir MA, AlGhamdi L, AlKadi M, AlBeajan N, AlRashoudi L, AlHussan M. The burden of Diabetes, Its Oral Complications and Their Prevention and Management. Open Access Maced J Med Sci. 2018;6(8):1545-53.
10. Ford PJ, Gamonal J, Seymour GJ. Immunological differences and similarities between chronic periodontitis and aggressive periodontitis. Periodontol 2000. 2010;53:111-23.
11. Andrukhov O, Ulm C, Reischl H, Nguyen PQ, Matejka M, Rausch-Fan X. Serum cytokine levels in periodontitis patients in relation to the bacterial load. J Periodontol. 2011;82(6):885-92.
12. Malik S, Singh G. Dental management of diabetic patients: a clinical review. Dental management. 2014;2:12-2014.
13. Miller A, Ouanounou A. Diagnosis, Management, and Dental Considerations for the Diabetic Patient. J Can Dent Assoc. 2020;86:k8.

14. Lalla RV, D'Ambrosio JA. Dental management considerations for the patient with diabetes mellitus. J Am Dent Assoc. 2001;132(10):1425-32.
15. Imran SA, Agarwal G, Bajaj HS, Ross S. Targets for Glycemic Control. Can J Diabetes. 2018;42 Suppl 1:S42-s6.
16. Shafiee G, Mohajeri-Tehrani M, Pajouhi M, Larijani B. The importance of hypoglycemia in diabetic patients. J Diabetes Metab Disord. 2012;11(1):17.
17. Alotaibi A, Aldoukhi A, Albdah B, Alonazi JA, Alseraya AS, Alrasheed N. Diabetic Ketoacidosis Treatment Outcome and Associated Factors Among Adult Patients Admitted to the Emergency Department and Medical Wards at King Abdulaziz Medical City, Riyadh, Saudi Arabia. Cureus. 2020;12(8):e10067.
18. Arabpour F, Kuzekanani M, Walsh LJ, Mirzaei M. Knowledge, Attitudes and Performance of Iranian Endodontists to Patients with Kidney Diseases. Eur Endod J. 2023;8(1):90-5.
19. Ahmadi N, Kuzekanani M, Walsh LJ, Mirzaee M. Knowledge, attitudes, and performance of Iranian endodontists regarding patients with cardiovascular disorders: A cross sectional study. Saudi Endod J. 2023;13(2):177-82.
20. Nabavizadeh MR, Sahebi S, Nadian I. Antibiotic prescription for endodontic treatment: general dentist knowledge + practice in shiraz. Iran Endod J. 2011;6(2):54-9.
21. Stewart D, Jebara T, Cunningham S, Awaisu A, Pallivalapila A, MacLure K. Future perspectives on nonmedical prescribing. Ther Adv Drug Saf. 2017;8(6):183-97.
22. Megari K. Quality of Life in Chronic Disease Patients. Health Psychol Res. 2013;1(3):e27.
23. Shrivastava SR, Shrivastava PS, Ramasamy J. Role of self-care in management of diabetes mellitus. J Diabetes Metab Disord. 2013;12(1):14.
24. MossananMozafari P, Pakfetrat A, Amirchaghmaghi M, FarkhondehAghideh N. Evaluation of awareness of general dentists and dental specialists about dental management of pregnant and diabetic patients. Journal of Mashhad Dental School. 2012;36(4):317-26.
25. Ziebolz D, Reiss L, Schmalz G, Krause F, Haak R, Mausberg RF. Different views of dentists and general medical practitioners on dental care for patients with diabetes mellitus and coronary heart diseases: results of a questionnaire-based survey in a district of Germany. Int Dent J. 2018;68(3):197-203.
26. Lin H, Zhang H, Yan Y, Liu D, Zhang R, Liu Y, Chen P, Zhang J, Xuan D. Knowledge, awareness, and behaviors of endocrinologists and dentists for the relationship between diabetes and periodontitis. Diabetes Res Clin Pract. 2014;106(3):428-34.
27. Al-Khabbaz AK, Al-Shammari KF, Al-Saleh NA. Knowledge about the association between periodontal diseases and diabetes mellitus: contrasting dentists and physicians. J Periodontol. 2011;82(3):360-6.
28. Forbes K, Thomson WM, Kunzel C, Lalla E, Lamster IB. Management of patients with diabetes by general dentists in New Zealand. J Periodontol. 2008;79(8):1401-8.
29. Saad MA, Saleh SM, Essam Eldin W. Knowledge, attitude, and reported practices of a group of ministry of health dentists towards patients with diabetes mellitus in Alexandria, Egypt. Alexandria Dent J. 2019;44(1):24-31.
30. Esmeili T, Ellison J, Walsh MM. Dentists' attitudes and practices related to diabetes in the dental setting. J Public Health Dent. 2010;70(2):108-14.
31. DeBiase C, Giblin-Scanlon L, Boyd LD, Vineyard J. Knowledge, Attitudes and Practices of Dental Hygienists Regarding Diabetes Risk Assessments and Screenings. J Dent Hyg. 2020;94(2):37-44.
32. Boyd LD, Hartman-Cunningham ML. Survey of diabetes knowledge and practices of dental hygienists. J Dent Hyg. 2008;82(5):43.
33. Greenberg BL, Kantor ML, Bednarsh H. American dental hygienists' attitudes towards chairside medical screening in a dental setting. Int J Dent Hyg. 2017;15(4):e61-e8.
34. Estrich CG, Araujo MWB, Lipman RD. Prediabetes and Diabetes Screening in Dental Care Settings: NHANES 2013 to 2016. JDR Clin Trans Res. 2019;4(1):76-85.
35. Tantipoj C, Sirichanyaphong T, Nuntachurat J, Ruetaijetjaroen K, Hiransuthikul N, Pujarern P, Fuangtharnthip P, Khovidhunkit SP. Dentists' Attitudes toward Diabetes Mellitus Screening in Thai Dental Clinics. Int J Environ Res Public Health. 2022;19(6).

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