

DENTAL PROFESSIONAL'S KNOWLEDGE REGARDING UPDATED PROTOCOLS IN PERIODONTICS, DIABETES MELLITUS, AND HYPERTENSION IN SAUDI ARABIA

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ABSTRACT

This study aimed to evaluate the awareness of dental professionals regarding new classifications in periodontics, diabetes mellitus, and hypertension. A descriptive cross-sectional study was conducted among dental professionals working in Saudi Arabia. One hundred eighty dental professionals responded to the structured, self-reported, and close-ended questionnaire. Results showed that 97.3% of the dental professionals agreed to stay updated with the current protocols in periodontics, diabetes mellitus, and hypertension. Nearly 33.9% of the respondents knew about the 4 Stages and 3 Grades of periodontitis based on the updated 2017 classification of periodontal and peri-implant diseases.

Only 14.4% of respondents knew that 240 mg/dl is the critical blood sugar level for any dental treatment. While 36.1% were aware that the cut-off fasting blood glucose level for emergency extraction is 180 mg/dl. Only 15% agreed that 234 mg/dl is the cut-off point of blood sugar level after 2 hours from the last meal. 40% considered systolic and diastolic blood pressures of 130-139 / 80-89 mmHg stage I hypertension. Nearly 30.6% agreed to seek a physician's consultation before proceeding if the patient's systolic and diastolic blood pressure is 180 mmHg or higher / 109 mmHg or higher. Most (71.7%) of the study participants knew that antihypertensive medications cause xerostomia. Majority of the dental practitioners participated in this study lacked knowledge regarding new guidelines for diabetes and hypertension. Therefore, dental practitioners are encouraged to attend additional conferences and lectures to remain updated on the latest guidelines of dental practice related to diabetes and hypertension.

Key words: Dental professionals, Diabetes, Hypertension, Knowledge, Updated protocol.

Introduction

Dentistry is an ever-changing science, and a practitioner must keep up to date in all aspects [1]. In 2017 during the World Workshop on the Classification of Periodontal and Peri-implant Diseases and conditions, which was co-sponsored by the American Academy of Periodontology (AAP) and the European Federation of Periodontology (EFP) and introduced a new periodontal classification having an enormous impact on the implant and periodontal specialties [2].

One of the significant updates was removing aggressive and chronic periodontitis terms and introducing a single category for periodontitis [2]. The new sorting of periodontal illnesses and cases also contains systemic diseases and conditions that affect periodontal supporting tissues [3]. Commonly known diseases and conditions that affect the course of periodontitis, such as diabetes mellitus, an essential modifying factors of periodontitis and should be included in periodontitis clinical diagnosis as a descriptor [4].

In 2014 a new guideline for diagnosing diabetes mellitus was introduced by the American diabetes association, and it

specified the parameters of diabetes mellitus diagnosis [5]. Meanwhile, low glycemia is present in about 74.9% of diabetes mellitus patients in Saudi Arabia [6]. However, there is insufficient information regarding the maximum acceptable blood glucose level for emergency tooth extraction in diabetic patients. Therefore, dentists must better understand glycemic control factors to improve diabetic patients' management at the dental clinic [7]. When faced with uncontrolled diabetic patients, a level of uncertainty arises among dentists, especially when they need an emergency tooth extraction. Their insufficient knowledge regarding the case and the safest blood glucose level for emergency tooth extraction needs to be well understood [8, 9].

In 2017 a new update on hypertension was released regarding its parameters and diagnosis [10]. "Silent killer" is a known name for hypertension as it affects 80 million adults older than 20 years in the USA alone [11] and just <1 billion people globally [11-13]. It is estimated that the number of hypertension-diagnosed patients will reach 1.56 billion by 2025 [13], and >7 million deaths annually are attributed to hypertension. As for cardiovascular mortality, hypertension is a forerunner risk factor [14]. The disease can be described

as systolic blood pressure (SBP) of 140 mmHg or diastolic blood pressure (DBP) \geq 90 mmHg in any person under the prescription of antihypertensive medication to manage hypertension [11, 12, 15].

Furthermore, hypertension can be described as elevated blood pressure readings on a minimum of two occasions without or with provocation. Hypertension is divided into two main categories: essential/primary hypertension and secondary hypertension [16]. Lack of apparent etiologic factors for blood pressure elevation is defined as essential or primary hypertension, which is observed in most hypertension cases, making up ~90%–95% of all cases. The presence of an identifiable cause is defined as secondary hypertension, affecting 5%–10% of USA adults diagnosed with hypertension [12, 16, 17]. Hence this study aimed to evaluate the awareness of dental practitioners regarding new classifications in periodontics, diabetes mellitus, and hypertension.

Materials and Methods

Study design

This was a descriptive cross-sectional study conducted amongst dental professionals working in Saudi Arabia.

Ethical approval and informed consent

The study proposal was submitted to Riyadh Elm University's research center, and ethical approval was obtained by the institutional review board (FUGRP/2020/197/289/170). Study participants indicated their agreement to participate by clicking the electronic link.

Study sample and sample size calculation

The study sample comprised final-year undergraduate students, interns, general dentists, specialists, and consultants in Saudi Arabia. A sample of 180 dental professionals was calculated based on the 5% acceptable margin of error, the confidence level of 82%, assuming 20000 dental professionals, and a response rate of 50% for

the questionnaire items.

Reliability and validity of the questionnaire

A pilot study was carried out by sending the questionnaire to 20 study participants to determine its reliability of the questionnaire. Chronbach's coefficient alpha was calculated (0.88). At the same time, the face validity of the questionnaire was established by sending the questionnaire to the periodontic experts.

Questionnaire contents and administration

This cross-sectional survey questionnaire consisted of 17 items related to demographic information and questions related to updates in periodontics, diabetes mellitus, and hypertension. The dental professionals administered the questionnaire through emails and social media platforms.

Statistical analysis

All the collected data were analyzed using the statistical package for social sciences version 25. Descriptive statistics of frequency distribution and percentages were calculated for the categorical variables. The relationship between demographic data and knowledge items on updated protocols in periodontics, diabetes mellitus, and hypertension was assessed using a chi-square test. A p-value of <0.05 was considered significant for all the statistical tests.

Results and Discussion

One hundred and eighty practitioners answered the questionnaire, 131 were males, and 49 were female, with the mean age of the participants being 27.6 ± 5.7 years old, and 60.6% of the practitioners were from the central region of Saudi Arabia. Most of the participants were undergraduate dental students and general dentists. The majority of the study participants had <4 years of experience. Almost 97.3% of the dental professionals agreed to stay updated with the current information on protocols in periodontics, diabetes mellitus, and hypertension (**Table 1**).

Table 1. Demographic characteristics of the study participants (N=180)

	Variables	n	%
Gender	Male	131	72.8%
	Female	49	27.2%
Region	Central Region	109	60.6%
	North Region	10	5.6%
	South Region	24	13.3%
	West Region	19	10.6%
	East Region	18	10.0%
Level of Education	Undergraduate	61	33.9
	Intern	29	16.1
	General Dentist	61	33.9

	Specialists and above	29	16.1
Years of Experience	<4 years	132	73.3
	5 to 10 Years	33	18.3
	More than 10 Years	15	8.3
Need to Stay Updated	Agree	175	97.3%
	Disagree	5	2.7%

Table 2 shows the questionnaire items and the correct responses provided by the study participants. One of the changes in the 2107 classification of periodontal and peri-implant diseases was 4 Stages and 3 Grades of Periodontitis, known to 33.9% of the respondents. Similarly, the change from plaque-induced gingivitis to dental biofilm-induced gingivitis was correctly answered by 74.4% of dental professionals. Tertiary Occlusal Trauma is not a type of traumatic occlusal force was reported by 37.8% of

respondents. Almost 38.9% attended lectures or conferences or read an article regarding the new classification of diabetes Mellitus. However, only 14.4% of respondents knew that 240 mgdl/ was the critical blood sugar level point for any dental treatment. In comparison, 36.1% were aware that the cut-off fasting blood glucose level for emergency extraction is 180 mgdl/. Contrarily, only 15% agreed that 234 mgdl/ is the cut-off point of blood sugar level after 2 hours from the last meal (**Table 2**).

Table 2. Questionnaire items and the correct responses

Items	Correct Responses	n	%
One of the changes in the new classification (2017) of periodontal and peri-implant diseases was periodontitis got divided into:	4 Stages and 3 Grades	61	33.9%
The diagnosis (Plaque-Induced Gingivitis) was changed to:	Dental Biofilm-Induced Gingivitis	134	74.4%
Traumatic Occlusal Forces are three types. Which of the following is Not one of the three types:	Tertiary Occlusal Trauma	68	37.8%
Have you attended any lectures or conferences or read an article regarding the new classification of Diabetes Mellitus?	Yes	70	38.9%
What is the critical blood sugar level point for any dental treatment:	240 mgdl/	26	14.4%
What is the cut-off fasting blood glucose level for emergency extraction?	180 mgdl/	65	36.1%
What is the cut-off point of blood sugar level after 2 hours from the last meal?	234 mgdl/	27	15.0%
Have you attended any lectures or conferences or read an article regarding the new classification of hypertension?	Yes	55	30.6%
If the blood pressure is _____, it will be considered Stage 1 in hypertension:	130-139 / 80-89 mmHg	72	40.0%
You need to seek consultation with a physician before proceeding if the patient's blood pressure is:	180 mmHg or higher / 109 mmHg or higher	55	30.6%
Most classes of antihypertensive medications can cause:	Xerostomia	128	71.1%

Almost 30.6% of the study participants attended lectures or conferences or read an article regarding the new classification of hypertension. However, 40% considered systolic and diastolic blood pressures of 130-139 / 80-89 mmHg stage I hypertension. Nearly 30.6% agreed to seek a

physician's consultation before proceeding if the patient's systolic and diastolic blood pressure is 180 mmHg or higher / 109 mmHg or higher. The majority (71.7%) of the study participants knew that almost all classes of antihypertensive medications cause xerostomia (**Table 2**).

Table 3. Comparison of responses across demographic variables (gender and level of education)

Items	Gender			Level of Education			
	Male	Female	p	Undergraduate	Intern	General Dentist	Specialist

		n	%	n	%		n	%	n	%	n	%	n	%	
Stages and grades of periodontitis according to the 2017 classification	Incorrect	106	80.9	36	73.5	0.276	43	70.5	25	86.2	47	77.0	27	93.1	0.067
	Correct	25	19.1	13	26.5		18	29.5	4	13.8	14	23.0	2	6.9	
The diagnosis of gingivitis	Incorrect	36	27.5	10	20.4	0.333	8	13.1	6	20.7	24	39.3	8	27.6	.009
	Correct	95	72.5	39	79.6		53	86.9	23	79.3	37	60.7	21	72.4	
Traumatic occlusal forces	Incorrect	78	59.5	34	69.4	0.225	32	52.5	21	72.4	41	67.2	18	62.1	0.221
	Correct	53	40.5	15	30.6		29	47.5	8	27.6	20	32.8	11	37.9	
Critical blood sugar level point for any dental treatment	Incorrect	112	85.5	42	85.7	0.970	58	95.1	20	69.0	54	88.5	22	75.9	.004
	Correct	19	14.5	7	14.3		3	4.9	9	31.0	7	11.5	7	24.1	
Cut-off fasting blood glucose level for emergency extraction	Incorrect	86	65.6	29	59.2	0.422	34	55.7	18	62.1	40	65.6	23	79.3	0.182
	Correct	45	34.4	20	40.8		27	44.3	11	37.9	21	34.4	6	20.7	
The cut-off point of blood sugar level after 2 hours from the last meal	Incorrect	108	82.4	45	91.8	0.116	54	88.5	25	86.2	51	83.6	23	79.3	.692
	Correct	23	17.6	4	8.2		7	11.5	4	13.8	10	16.4	6	20.7	
BP considered for Stage 1 in hypertension	Incorrect	78	59.5	30	61.2	0.838	45	73.8	16	55.2	36	59.0	11	37.9	.012
	Correct	53	40.5	19	38.8		16	26.2	13	44.8	25	41.0	18	62.1	
Consultation of a physician before proceeding if the patient's blood pressure	Incorrect	84	64.1	41	83.7	0.011	33	54.1	23	79.3	45	73.8	24	82.8	.011
	Correct	47	35.9	8	16.3		28	45.9	6	20.7	16	26.2	5	17.2	
Antihypertensive medications can cause	Incorrect	36	27.5	16	32.7	0.496	8	13.1	12	41.4	21	34.4	11	37.9	.009*
	Correct	95	72.5	33	67.3		53	86.9	17	58.6	40	65.6	18	62.1	

The questionnaire item responses did not differ significantly between the males and females except for the item consultation of a physician before proceeding if the patient's blood pressure is 180 mmHg or higher / 109 mmHg or higher, in which most of the male dental professionals correctly responded to the item than females (p=0.011). Similarly, a statistically significant difference was observed between educational categories and changed the diagnosis of plaque-Induced gingivitis to dental biofilm-Induced gingivitis (p=0.009), Critical blood sugar level point for any dental treatment (p=0.004), BP considered for Stage 1 in hypertension (p=0.012), consultation of a physician before proceeding if the patient's blood pressure 180 mmHg or higher / 109 mmHg or higher (p=0.011). In addition, antihypertensive medications can cause xerostomia (p=0.009), as shown in (Table 3).

This study mainly evaluated the awareness of dental practitioners regarding new classifications in periodontics, diabetes mellitus, and hypertension and compared their dental relevance. The findings indicated that most dental practitioners agreed to stay updated on the latest dental and medical protocols. Also, when asked about attending any conference or lectures on the new periodontal classification, most professionals responded positively, similar to that reported by Richards *et al.*, who emphasized 'Keeping up to date [1]. It shows the practitioner's willingness to update current protocols. However, as for diabetes mellitus and

hypertension, the majority did not attend any conferences or lectures.

Consequently, participants reported fewer correct answers on hypertension and diabetes mellitus. This finding is similar to the study of Albarrak *et al.* (2018). They found insufficient information regarding the maximum acceptable blood glucose level for emergency tooth extraction in diabetic patients [7].

The eastern region of Saudi Arabia is the 3rd highest percentage region with diabetes and hypertension-affected people, according to the last household health survey conducted by the General Authority for Statistics. Hence dental practitioners from this region may have relative higher knowledge of updated protocol. Moreover, there is a variation in understanding of updated protocols among different educational levels.

Unlike other studies, our study also has several limitations. First, the cross-sectional nature of the research and self-reported knowledge of updated protocols may not truly reflect the practice of updated protocols by dental professionals. Secondly, the low response rate of dental professionals may limit the generalizability of the study findings. Hence caution should be taken in generalizing the study results. Moreover, further studies with a larger sample size are required to confirm the current study findings.

Conclusion

The majority of dental professionals who participated in this study lack information regarding diabetes and hypertension updated protocols. Hence, dental professionals are advised to attend more conferences or lectures to keep updated regarding the new protocols on diabetes and hypertension applicable to dental practice. Nonetheless, further investigations are needed to confirm the valid reason for the lack of information to take appropriate measures to improve the awareness of the updated protocols among dental professionals in Saudi Arabia.

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