Asian Journal of Periodontics and Orthodontics
2023, Volume 3, Page No: 6-11

Available online at: www.tsdp.net

ISSN: 3062-3499

Original Article

Dental Professionals' Adherence to Updated Guidelines on Periodontics and Systemic Conditions

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Received: 20 February 2023; **Revised:** 26 April 2023; **Accepted:** 05 May 2023

ABSTRACT

This study aimed to assess the understanding of dental professionals about the new classifications in diabetes mellitus, hypertension, and periodontics. Dental practitioners employed in Saudi Arabia participated in a descriptive cross-sectional survey. 180 dental practitioners completed the structured, self-reported, closed-ended questionnaire. According to the findings, 97.3% of the dentists agreed to keep up with the latest guidelines for diabetes, hypertension, and periodontics. More than 33.9% of respondents knew about the four phases and three grades of periodontitis, as per the 2017 revision of the grouping of periodontal and peri-implant illnesses. Only 14.4% of those surveyed were aware that the essential blood sugar level for any dental procedure is 240 mg/dl. The cut-off fasting blood glucose level for emergency extraction is 180 mg/dl, as 36.1% of respondents knew. According to 15% of respondents, the cut-off level of blood sugar two hours after the previous meal is 234 mg/dl. A systolic and diastolic blood pressure of 130–139/80–89 mmHg is considered stage I hypertension in 40% of cases. If the patient's systolic and diastolic blood pressures are 180 mmHg or higher or 109 mmHg or higher, over 30.6% of respondents agreed to visit a doctor first. The majority (71.7%) of the survey participants were aware that antihypertensive medicines induce xerostomia. Most of the dental practitioners who participated in the present investigation were unaware of the new diabetes and hypertension recommendations. Therefore, dental professionals are urged to attend more seminars and lectures to stay up to date with the latest dental standards regarding diabetes and hypertension.

Keywords: Dental professionals, Diabetes, Hypertension, Knowledge, Updated protocol

How to Cite This Article: Shaheen RS, AlQadhibi AF, Qrba AMB, AlQublan YE, Neyaz AA. Dental Professionals' Adherence to Updated Guidelines on Periodontics and Systemic Conditions. Asian J Periodontics Orthod. 2023;3:6-11. https://doi.org/10.51847/Cytd0xfgrr

Introduction

Since dentistry is a constantly evolving field, a practitioner needs to stay current in every way [1-3]. The American Academy of Periodontology (AAP) and the European Federation of Periodontology (EFP) co-sponsored the World Workshop on the Classification of Periodontal and Peri-implant Diseases and Conditions in 2017, which introduced a new periodontal classification that has a significant effect on the implant and periodontal specialties [4].

Eliminating the terminology for aggressive and chronic periodontitis and creating a single category for the condition was one of the major revisions [4]. Systemic disorders and conditions affecting periodontal supporting tissues are also included in the revised classification of periodontal diseases and cases [5, 6]. Well-known illnesses and ailments that impact the progression of periodontitis, including diabetes mellitus, are crucial modifying elements of the disease and need to be included as a descriptor in the clinical diagnosis of periodontitis [7-10].

The American Diabetes Association released updated guidelines for diagnosing diabetes mellitus in 2014, specifying the criteria for making that diagnosis [11]. In Saudi Arabia, about 74.9% of people with diabetes mellitus have low glycemia [12]. The highest blood glucose level that diabetic people can have before needing an emergency tooth extraction is not well understood yet. To properly treat diabetes patients in the dental clinic, dentists need to get a better understanding of glycemic control variables [13-15]. Dentists have some degree of concern when dealing with patients who have uncontrolled diabetes, particularly when they require an emergency tooth extraction [16-19]. It is necessary to fully comprehend their inadequate understanding of the problem and the safest blood glucose level for emergency tooth extraction [20, 21].

A fresh update on hypertension's diagnosis and parameters was published in 2017 [22]. Hypertension is characterized as the "silent killer" since it affects 80 million persons over 20 in the United States alone [23] and fewer than 1 billion people worldwide [23-25]. According to estimates, 1.56 billion people will have been diagnosed with hypertension by 2025 [25], and the condition is thought to be the cause of more than 7 million fatalities each year. One risk variable for cardiovascular death is hypertension [26]. When someone taking antihypertensive medication for hypertension has a systolic blood pressure (SBP) of 140 mmHg or a diastolic blood pressure (DBP) of 90 mmHg or higher, it is a sign of the disease [23, 24, 27]. Moreover, increased blood pressure measurements at least twice, either spontaneously or in response to stimulation, are considered hypertension. The two basic forms of hypertension are essential/primary hypertension and secondary hypertension [28]. About 90–95% of cases of hypertension are classified as essential or primary hypertension since there are no clear etiologic causes for the enhancement in blood pressure. In the United States, 5-10% of persons with a diagnosis of hypertension have secondary hypertension, which is characterized as the presence of an identified etiology [24, 28, 29]. Therefore, the present investigation aims to evaluate dental professionals' knowledge of the new categories of diabetes, hypertension, and periodontics.

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 the 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 (SPSS) 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 [30-32]. A P-value < 0.05 was considered significant for all the statistical tests.

Results and Discussion

Of the 118 practitioners who responded to the questionnaire, 131 were male and 49 were female. The participants' mean age was 27.6 ± 5.7 years, and 60.6% of them were from the central area of Saudi Arabia. General dentists and undergraduate dentistry students made up the majority of the participants. Most of the participants in the research had less than 4 years of experience. Nearly 97.3% of the dentists concurred that

they should remain current on the latest knowledge regarding periodontal, diabetic, and hypertension procedures **(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
	5-10 Years	33	18.3
	> 10 Years	15	8.3
Need to stay updated	Agree	175	97.3%
	Disagree	5	2.7%

The questionnaire items and the accurate answers that the study participants submitted are displayed in **Table 2**. Regarding the 2107 categorization of periodontal and peri-implant disorders, 33.9% of the respondents were aware of the addition of the 4 stages and 3 grades of periodontitis. Additionally, 74.4% of dentists correctly identified the transition from plaque-inspired gingivitis to dental biofilm-inspired gingivitis. According to 37.8% of the respondents, tertiary occlusal trauma is not a kind of traumatic occlusal force. Almost 38.9% of those surveyed either attended conferences or lectures or read a paper about the new category for diabetes mellitus. Nevertheless, just 14.4% of respondents knew that 240 mg/dl was the blood sugar threshold for any dental operation. In contrast, 36.1% of those surveyed knew that the cut-off fasting blood glucose level for urgent removal is 180 mg/dl. On the other hand, only 15% of respondents agreed that the blood sugar cut-off threshold is 234 mg/dl two hours after the previous meal **(Table 2)**.

Table 2. Questionnaire items and the correct responses

Items	Correct responses	N	%
One of the modifications made to the 2017 categorization of periodontal and peri-implant disorders was the division of periodontitis into:	4 stages and 3 grades	61	33.9%
Instead of plaque-induced gingivitis, the diagnosis was modified to:	Dental biofilm-induced gingivitis	134	74.4%
There are three categories of traumatic occlusal forces. Which of these does not fall into one of the three categories?	Tertiary occlusal trauma	68	37.8%
Have you seen any articles or heard any talks about the new category of diabetes mellitus?	Yes	70	38.9%
Which blood sugar level is crucial for any dental procedure?	240 mgdl/	26	14.4%
What amount of fasting blood glucose must be met to do an emergency extraction?	180 mgdl/	65	36.1%
After two hours after the previous meal, what is the blood sugar cut-off point?	234 mgdl/	27	15.0%
Concerning the new categorization of hypertension, have you read any articles, go to any conferences, or attended any lectures?	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%
Before continuing, you should visit a doctor 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%

Approximately 30.6% of the research participants read a paper on the new grouping of hypertension or attended conferences or seminars. However, 40% considered blood pressure readings of 130–139 / 80–89 mmHg to be stage I hypertension, and around 30.6% of respondents agreed to see a doctor first if the patient's systolic and diastolic blood pressure is 180 mmHg or higher/109 mmHg or higher. Most research participants (71.7%) were aware that nearly every type of antihypertensive drug causes xerostomia **(Table 2)**.

Table 3. Comparison of answers for various demographic factors (gender and level of education)

Items		Gender					Level of education								
		Male		Female		P	Undergraduate		Intern		General dentist		Specialist		P
		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 with 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	

Except for the question about seeking medical advice before continuing if a patient's blood pressure is 180 mmHg or higher or 109 mmHg or higher, for which more male dentists than females correctly responded (P = 0.011), there was no discernible distinction between the responses of men and women to the questionnaire. The crucial blood sugar level for any dental procedure (P = 0.004), the blood pressure taken into consideration for Stage 1 hypertension (P = 0.012), the substitution of dental biofilm-induced gingivitis for plaque-induced gingivitis (P = 0.009), and the necessity of seeking medical advice before continuing if the patient's blood pressure was 180 mmHg or higher or 109 mmHg or higher (P = 0.011) were among the other statistically significant differences between educational groups. Furthermore, as **Table 3** illustrates, antihypertensive drugs may result in xerostomia (P = 0.009).

This study investigated the dental significance of new categories in diabetes mellitus, hypertension, and periodontics and assessed dental professionals' understanding of these conditions. The majority of dentists agreed to keep up with the most recent dental and medical procedures, according to the research. Richards [1] noted that most experts gave favorable answers when asked if they had attended any conferences or lectures on the new periodontal classification. They highlighted the need to "keep up to date." The readiness of the practitioner to update existing protocols is demonstrated. Nonetheless, people did not go to any lectures or conferences about hypertension and diabetes mellitus.

Participants reported fewer accurate responses about diabetes mellitus and hypertension as a result. This result is consistent with the Albarrak *et al.* [13] investigation. They discovered inadequate data on the highest blood glucose level that diabetic individuals can have before undergoing an emergency tooth extraction [33, 34].

Those with diabetes and hypertension are more prevalent in the eastern area of Saudi Arabia, according

to the General Authority for Statistics' most current household health survey. Dental professionals from this area may thus be more knowledgeable about the most recent protocol. Furthermore, various educational levels have varying levels of comprehension of current protocols.

Unlike previous research, ours has numerous restrictions. First, the research's cross-sectional design and self-reported awareness of revised procedures may not accurately represent dental practitioners' use of updated protocols. Second, poor reaction rates among dental professionals may restrict the generalizability of the research outcomes. As a result, it's crucial to exercise caution when extrapolating research findings. Furthermore, additional investigation with a bigger sample size is needed to corroborate the present investigation outcomes.

Conclusion

Most of the dental practitioners in this research were unaware of revised diabetes and hypertension procedures. As a result, dental practitioners should attend more conferences or lectures to stay up to speed on the latest diabetes and hypertension guidelines related to dental practice. Yet, more studies are required to identify the genuine explanation for the absence of knowledge to make suitable efforts to raise understanding of the new standards among dental practitioners in Saudi Arabia.

Acknowledgments: The authors are grateful for the assistance of this effort from Riyadh Elm University's Research and Innovation Center.

Conflict of Interest: None

Financial Support: None

Ethics Statement: Ethical approval for this study was obtained from the Research and Innovation Centre of Riyadh Elm University (FUGRP/2020/197/289/170).

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