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Investigation of Turkish Periodontists' Attitudes and Behaviors During COVID-19 Pandemic: A Questionnaire Survey

COVID-19 Salgını Sırasında Türk Periodontologlarının Tutum ve Davranışlarının İncelenmesi: Bir Anket Çalışması

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ÖZ

Amaç: Periodontologların kendilerini, hastalarını ve yardımcılarını korumada ve böylece enfeksiyonun yayılmasını önlemedeki rolü kritiktir. Bu çalışmanın amacı, Türk periodontologlarının Corona virüs (CoV) pandemisi sürecinde klinik uygulamalardaki tutum ve davranışlarındaki değişiklikleri incelemektir.
Gereç ve Yöntemler: Google Forms üzerinde oluşturulan 21 soruluk çevrimiçi anket formu veri toplama amacıyla kullanıldı. Anket linki, Ocak 2021 ve Mart 2021 tarihleri arasında 130 periodontoloğa gönderildi. Sayı ve yüzde değerleri hesaplanarak tanımlayıcı istatistikler elde edildi, gruplar arasında kategorik verilerin karşılaştırılması için ki-kare testi uygulandı.
Bulgular: Bu çevrimiçi çalışmaya, Türkiye'de görev yapmakta olan 126 periodontolog dahil edildi. COVID-19 pandemisi döneminde katılımcıların klinik işlemlerde koruyucu ekipman kullanım sıklığı konusunda; FFP/3 ve FFP/2 maske kullanımında % 100, gözlük kullanımında % 60.32'lık artış görüldü. 20 yıl ve üzeri mesleki tecrübe süresine sahip periodontolog grubu, hem 0-5 yıl hem de 5-10 yıl arası tecrübe süresine sahip periodontolog gruplarına kıyasla gözlük kullanımını artırdı ($p<0.05$). Ancak antibiyotik, antienflamatuvar ve analjezik reçete etme sıklığının değişmediği bildirildi. Pü çıkışı varlığı ve periodontal apse tedavisinde erkek periodontologlar, kadın periodontologlara göre daha fazla antibiyotik reçete ettiğini bildirdi ($p<0.05$).
Sonuç: Türk periodontologlar, COVID-19 pandemisi sırasında sürekli güncellenen tedbirlerle kişisel korunma önlemlerini arttırmış olsa da bilimsel birikim ve klinik tecrübeyle edinilen ilaç reçete etme sıklığı konusunda eski alışkanlıklarına olan bağlılıklarını devam ettirdi.
Anahtar Kelimeler: COVID-19 pandemisi, periodontolog, anket.

ABSTRACT

Objectives: The aim of this study was to investigate the possible COVID-19 changes in the attitudes and behaviors of Turkish periodontists in clinical practice during the pandemic.
Materials and Methods: A 21-question survey form created on Google Form was used as a collection tool. The survey link was sent to 130 periodontists between January 2021 and March 2021. While number and percentage values were calculated for descriptive statistics, chi-square test was used to compare categorical data between groups.
Results: This online study included 126 Turkish periodontists. Regarding the frequency of use of protective equipment in clinical procedures during the COVID-19 pandemic, an increase of 100 % in the use of FFP/3 and FFP/2 masks, 60.32 % in the use of goggles was observed. The group of periodontists with 20 years or more of professional experience increased the use of goggles compared to both the groups of periodontists with 0-5 years and 5-10 years of experience ($p<0.05$). The frequency of antibiotic, anti-inflammatory and analgesic prescription did not change during COVID-19 pandemic. However, male periodontists reported prescribing antibiotics more often than female periodontists in the presence of pus outflow and in the treatment of periodontal abscess ($p<0.05$).
Conclusions: Despite the implementation of enhanced personal protection measures by Turkish periodontologists in response to the ongoing pandemic, there has been a persistence in the frequency of medication prescription, which is guided by scientific knowledge and clinical experience.
Keywords: COVID-19 Pandemic, periodontists, questionnaire.

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INTRODUCTON

Towards the end of 2019, cases of an unusual form of pneumonia of unknown etiology were observed in Wuhan, the capital of Hubei province of the People's Republic of China (Adhikari et al., 2020). The World Health Organization (WHO) has identified this pneumonia-inducing virus with unknown human effect as a new coronavirus (2019-nCoV) and dubbed it Severe Acute Respiratory Syndrome SARS-CoV-2 because to its taxonomic similarities to the virus linked with (SARS). The disease caused by SARS-CoV-2 has been called COVID-19. Coronaviruses are enveloped, single-stranded RNA viruses with the capacity for rapid mutation (Lai, 1990). Coronaviruses can cause mild colds with different strains found in humans, but they can also cause serious diseases such as SARS and Middle East Respiratory Syndrome (MERS) (Soysal et al., 2020).

The transmission of respiratory viruses is typically facilitated by droplets and aerosols, as well as direct or indirect contact. While there are various threshold values, WHO has established a criterion of 5 μm for particle diameter in differentiating between aerosols and droplets. Particles with a diameter of less than 5 μm are classified as aerosols, while larger particles are defined as droplets (WHO, 2007). The diameter of particles and ambient weather conditions are significant factors in the transmission of infectious diseases via aerosols (Cole & Cook, 1998). Infectious agents excreted from the respiratory tract can remain airborne for extended periods in a matrix of mucus and other secretions, largely due to rapid drying (Darquenne, 2012).

The main route of human-to-human transmission of SARS-CoV-2 is exposure to infective viral particles by inhalation of virus-carrying respiratory droplets produced by breathing, sneezing or coughing of an infected person. Individuals in good health may become infected indirectly by touching their hands to the mucous membranes of the mouth, nose, or eyes after touching contaminated surfaces (Leung, 2021). The viral load is reduced due to the dilution and accelerated inactivation of viruses in aerosolized particles that remain airborne for an extended period. Therefore, unless there is a significant exposure to SARS-CoV-2, the disease is not expected to be particularly severe through aerosol transmission (Imai et al., 2020). Nevertheless, research indicates that exposure to aerosolized particles with a high viral load in a confined space may elevate the likelihood of transmission (Liu et al., 2020). Viruses transported in droplets have been shown to persist on surfaces for a period of time. The viability of SARS-CoV-2 has been demonstrated to persist for up to 4 hours on copper surface, 24 hours on cardboard, 48 hours on stainless steel, and 72 hours on plastic surface (Van Doremalen et al., 2020). The most effective method to prevent the spread of the SARS-CoV-2 is to avoid exposure to the virus. However, this principle is not applicable or realistic for healthcare workers who are unable to maintain social distancing during the diagnosis and treatment of diseases and also exposed to patients' blood, saliva, and other body fluids and respiratory products for extended periods. Among healthcare workers, dentists are one of the occupational groups with the highest risk of contracting the novel coronavirus due to the transmission of aerosols, blood, and saliva, as well as close contact with patients. The isolation of the virus in the saliva of CoV-infected patients and the high expression of angiotensin-converting enzyme-2, in the oral mucosa and tongue dorsum (Guo et al., 2020) reveal the high potential risk of the oral cavity for COVID-19 transmission.

It has even been postulated that dental treatments may carry a risk of transmission of the SARS-CoV-2 virus as high as bronchoscopy (Wahidi et al., 2020). In addition to exposure to these pathogens, dentists and ancillary staff may even function as hosts for microorganisms (Peng et al., 2020). The patients serve in the incubation period, unaware of their infection status, or concealing their disease complicate the protection of dental personnel from contracting the COVID-19. This raises the possibility that dental clinics may become sites for cross-infection if appropriate precautions are not taken. In response to the sudden emergence of the pandemic, a few studies evaluating the protective methods, attitudes, and behaviors applied by dentists to safeguard themselves, their staff, and patients have been published (Kato et al., 2024; Kuldaş et al., 2022; Shah et al., 2021). However, to the best of our knowledge, no survey study has been conducted to evaluate the attitudes and behaviors of periodontists in Turkey during the course of the ongoing pandemic. The objective of this study was to investigate the possible alterations in the attitudes and behaviors of periodontists during the course of the COVID-19 pandemic.

MATERIALS AND METHODS

This cross-sectional study was approved by the Ministry of Health's Scientific Research Evaluation Commission (protocol number 2020-12-08T23) and the Marmara University Faculty of Dentistry Clinical Research Ethics Committee (protocol number 2020-442/01.10.2020). Prior to their participation in the study, volunteers were provided with a comprehensive explanation of the study protocol and were asked to provide their informed consent.

The sample size was calculated using the data obtained from a similar survey study conducted by Matteheos et al. (Mattheos et al., 2012). The number of volunteers was determined to be 110 with 80% power at an effect level of 0.5 with a 95% confidence interval using a computer program (PASS Sample Size Software, NCSS, LLC).

A 21-item questionnaire was specially constructed using Google Forms for the purpose of data collection. The initial section of the questionnaire encompassed inquiries pertaining to demographic data, including age, gender, and the duration of professional experience among periodontists. The subsequent section delved into the procedures and frequency of antibiotic administration by periodontists during SARS-CoV-2 pandemic. The concluding section focused on the evolving attitudes and behaviors of periodontists in the context of the ongoing pandemic. The survey link was distributed to 130 periodontists via email and WhatsApp between January 10 and March 27, 2021. 126 of these physicians answered the entire survey completely.

Statistical analysis

SPSS (Statistical Package for Social Sciences) Windows 25.0 package program was used for data analysis. Number and percentage values were calculated for descriptive statistics. Participants were grouped according to gender and educational status. Chi-square test was used to compare categorical data between groups. Results were evaluated at $p<0.05$ significance level.

RESULTS

This online study included 126 periodontists practicing in Turkey. Table 1 presents the demographic data, including age, gender, and years of professional experience. Among the volunteers, 65.09% were between the ages of 23 and 41, while 21.43% were between the ages of 48 and 65. The female respondents constituted 60.32% of the total number of participants. The distribution of periodontists according to the duration of their experience in the profession was as follows: 30.95% had been in practice for less than five years, 26.98% for a period between five and ten years, 17.46% for a period between ten and twenty years, and 24.60% for a period of twenty years or more. Table 2 presents the frequency of antibiotic administration in various clinical scenarios during the pandemic period according to gender and professional experience subgroups. A statistically significant difference was noticed in the prescription of antibiotics between male and female periodontists in the presence of pus formation. In this case, male periodontists prescribed more antibiotics than female periodontists ($p<0.05$). Following free gingival graft or connective tissue graft operations, a significant difference was observed in the frequency of antibiotic prescription based on according to the duration of professional experience. Physicians with 0-5 years of professional experience prescribed antibiotics more frequently than those with 11-20 years of experience ($p<0.05$) (Table 3).

Table 1. Demographic data of the participants

		n=126	%
Age	23-29	29	23,02
	30-35	32	25,40
	36-41	21	16,67
	42-47	17	13,49
	48-53	13	10,32
	54-59	10	7,94
	60-65	4	3,17
Gender	Female	76	60,32
	Male	50	39,68
Professional experience	5 years	39	30,95
	5-10 years	34	26,98
	11-20 years	22	17,46
	20 Years+	31	24,60
Postgraduate Education	PhD	87	69,05
	Specialists	39	30,95
	Master	0	0,00
Institution worked for	Clinic	26	18,71
	Private Polyclinic/ Hospital	34	24,46
	Public Hospital	11	7,91
	University Hospital	68	48,92

Table 2. Evaluation of participants' frequency of antibiotic administration in different clinical situations during the COVID-19 pandemic period according to gender and duration of professional experience

Clinical Situations	Frequency	Total (n=126)		Gender				p	Professional Experience								p
				Female (n=76)		Male (n=50)			5 Years (n=39)		5-10 Years (n=34)		11-20 Years (n=22)		20+ Years (n=31)		
		n	%	n	%	n	%		n	%	n	%	n	%	n	%	
Generalized gingival inflammation	**Never**	14	11,11	10	13,16	4	8,00	0,488	4	10,26	5	14,71	3	13,64	2	6,45	0,888
	Occasionally	96	76,19	58	76,32	38	76,00		29	74,36	26	76,47	17	77,27	24	77,42	
	Always	16	12,70	8	10,53	8	16,00		6	15,38	3	8,82	2	9,09	5	16,13	
Pus formation	**Never**	27	21,43	21[a]	27,63	6[b]	12,00	**0,029**	5	12,82	11	32,35	5	22,73	6	19,35	0,361
	Occasionally	85	67,46	50	65,79	35	70,00		31	79,49	19	55,88	13	59,09	22	70,97	
	Always	14	11,11	5[a]	6,58	9[b]	18,00		3	7,69	4	11,76	4	18,18	3	9,68	
Mean pocket depth> 5 mm	**Never**	4	3,17	2	2,63	2	4,00	0,764	1	2,56	1	2,94	1	4,55	1	3,23	0,994
	Occasionally	62	49,21	36	47,37	26	52,00		18	46,15	17	50,00	12	54,55	15	48,39	
	Always	60	47,62	38	50,00	22	44,00		20	51,28	16	47,06	9	40,91	15	48,39	
Mean bone loss ≥ %50	**Never**	4	3,17	3	3,95	1	2,00	0,825	0	0,00	2	5,88	0	0,00	2	6,45	0,641
	Occasionally	68	53,97	41	53,95	27	54,00		23	58,97	18	52,94	12	54,55	15	48,39	
	Always	54	42,86	32	42,11	22	44,00		16	41,03	14	41,18	10	45,45	14	45,16	
Periodontitis associated with systemic diseases	**Never**	12	9,52	7	9,21	5	10,00	0,941	5	12,82	3	8,82	0	0,00	4	12,90	0,257
	Occasionally	108	85,71	65	85,53	43	86,00		30	76,92	30	88,24	22	100,00	26	83,87	
	Always	6	4,76	4	5,26	2	4,00		4	10,26	1	2,94	0	0,00	1	3,23	
Patients who are thought to be unable to maintain oral hygiene	**Never**	3	2,38	2	2,63	1	2,00	0,814	0	0,00	2	5,88	1	4,55	0	0,00	0,068
	Occasionally	34	26,98	19	25,00	15	30,00		8	20,51	8	23,53	11	50,00	7	22,58	
	Always	89	70,63	55	72,37	34	68,00		31	79,49	24	70,59	10	45,45	24	77,42	
Patients who smoke more than 10 cigarettes a day	**Never**	2	1,59	2	2,63	0	0,00	0,121	1	2,56	1	2,94	0	0,00	0	0,00	0,172
	Occasionally	21	16,67	16	21,05	5	10,00		3	7,69	9	26,47	6	27,27	3	9,68	
	Always	103	81,75	58	76,32	45	90,00		35	89,74	24	70,59	16	72,73	28	90,32	

Chi-Square test, $p<0,05$

Tablo 3. Evaluation of participants' frequency of antibiotic administration in different treatment procedures during the COVID-19 pandemic period by gender and professional experience

Treatment procedures	Frequency	Total (n=126)		Gender				p	Professional Experience								p
				Female (n=76)		Male (n=50)			5 Years (n=39)		5-10 Years (n=34)		11-20 Years (n=22)		20+ Years (n=31)		
		n	%	n	%	n	%		n	%	n	%	n	%	n	%	
Scaling and root planning	Never	1	0,79	1	1,32	0	0,00	0,671	0	0,00	1	2,94	0	0,00	0	0,00	0,316
	Occasionally	55	43,65	32	42,11	23	46,00		22	56,41	14	41,18	9	40,91	10	32,26	
	Always	70	55,56	43	56,58	27	54,00		17	43,59	19	55,88	13	59,09	21	67,74	
Periodontal abscess	Never	43	34,13	27	35,53	16	32,00	**0,007**	10	25,64	12	35,29	12	54,55	9	29,03	0,109
	Occasionally	74	58,73	48	63,16	26	52,00		26	66,67	18	52,94	8	36,36	22	70,97	
	Always	9	7,14	1[a]	1,32	8[b]	16,00		3	7,69	4	11,76	2	9,09	0	0,00	
Frenectomy	Never	2	1,59	1	1,32	1	2,00	0,517	1	2,56	0	0,00	0	0,00	1	3,23	0,292
	Occasionally	22	17,46	11	14,47	11	22,00		9	23,08	2	5,88	6	27,27	5	16,13	
	Always	102	80,95	64	84,21	38	76,00		29	74,36	32	94,12	16	72,73	25	80,65	
Gingivectomy	Never	3	2,38	2	2,63	1	2,00	0,343	0	0,00	0	0,00	2	9,09	1	3,23	0,087
	Occasionally	27	21,43	13	17,11	14	28,00		10	25,64	3	8,82	6	27,27	8	25,81	
	Always	96	76,19	61	80,26	35	70,00		29	74,36	31	91,18	14	63,64	22	70,97	
Flap operation	Never	46	36,51	24	31,58	22	44,00	0,366	15	38,46	15	44,12	7	31,82	9	29,03	0,29
	Occasionally	66	52,38	43	56,58	23	46,00		22	56,41	17	50,00	12	54,55	15	48,39	
	Always	14	11,11	9	11,84	5	10,00		2	5,13	2	5,88	3	13,64	7	22,58	
Regeneration of periodontal defects with graft and membrane materials	Never	1	0,79	0	0,00	1	2	0,098	28	71,79	28	82,35	19	86,36	22	70,97	0,471
	Occasionally	28	22,22	13	17,11	15	28,00		11	28,21	6	17,65	3	13,64	8	25,81	
	Always	97	76,98	63	82,89	34	68,00		0	0,00	0	0,00	0	0,00	1	3,23	
Regeneration of periodontal defects with enamel matrix proteins	Never	54	42,86	32	42,11	22	44,00	0,788	14	35,90	14	41,18	15	68,18	11	35,48	0,095
	Occasionally	52	41,27	33	43,42	19	38,00		21	53,85	12	35,29	5	22,73	14	45,16	
	Always	20	15,87	11	14,47	9	18,00		4	10,26	8	23,53	2	9,09	6	19,35	
Free gingival or connective tissue graft	Never	24	19,05	13	17,11	11	22,00	0,381	2[a]	5,13	7[a,b]	20,59	7[b]	31,82	8[a,b]	25,81	0,038
	Occasionally	60	47,62	40	52,63	20	40,00		25	64,10	12	35,29	11	50,00	12	38,71	
	Always	42	33,33	23	30,26	19	38,00		12	30,77	15b	44,12	4	18,18	11	35,48	

Chi-Square test, p<0,05

Table 4. Evaluation of participants' frequency of use of protective equipment in clinical procedures during the COVID-19 pandemic period according to gender and professional experience

Protective Equipment		Total (n=126)		Gender				p	Professional Experience								p
				Female (n=76)		Male (n=50)			5 Years (n=39)		5-10 Years (n=34)		11-20 Years (n=22)		20+ Years (n=31)		
		n	%	n	%	n	%		n	%	n	%	n	%	n	%	
FFP3/FFP2 Mask	Increased	126	100,00	76	100,00	50	100,00	-	39	100,00	34	100,00	22	100,00	31	100,00	-
	Unchanged	0	0,00	0	0,00	0	0,00		0	0,00	0	0,00	0	0,00	0	0,00	
	Decreased	0	0,00	0	0,00	0	0,00		0	0,00	0	0,00	0	0,00	0	0,00	
Others	Increased	93	73,81	53	69,74	40	80,00	0,200	27[a]	69,23	20[a]	58,82	16[a,b]	72,73	30[b]	96,77	**0,005**
	Unchanged	33	26,19	23	30,26	10	20,00		12	30,77	14	41,18	6	27,27	1	3,23	
	Decreased	0	0,00	0	0,00	0	0,00		0	0,00	0	0,00	0	0,00	0	0,00	
Goggles	Increased	76	60,32	45	59,21	31	62,00	0,754	19[a]	48,72	18[a]	52,94	13[a,b]	59,09	26[b]	83,87	**0,017**
	Unchanged	50	39,68	31	40,79	19	38,00		20	51,28	16	47,06	9	40,91	5	16,13	
	Decreased	0	0,00	0	0,00	0	0,00		0	0,00	0	0,00	0	0,00	0	0,00	
Protective apron	Increased	100	79,37	59	77,63	41	82,00	0,553	32	82,05	23	67,65	17	77,27	28	90,32	0,148
	Unchanged	26	20,63	17	22,37	9	18,00		7	17,95	11	32,35	5	22,73	3	9,68	
	Decreased	0	0,00	0	0,00	0	0,00		0	0,00	0	0,00	0	0,00	0	0,00	
Bonnet	Increased	94	74,60	54	71,05	40	80,00	0,259	28	71,79	24	70,59	14	63,64	28	90,32	0,117
	Unchanged	32	25,40	22	28,95	10	20,00		11	28,21	10	29,41	8	36,36	3	9,68	
	Decreased	0	0,00	0	0,00	0	0,00		0	0,00	0	0,00	0	0,00	0	0,00	
Hand sanitizer	Increased	107	84,92	62	81,58	45	90,00	0,196	33	84,62	27	79,41	18	81,82	29	93,55	0,427
	Unchanged	19	15,08	14	18,42	5	10,00		6	15,38	7	20,59	4	18,18	2	6,45	
	Decreased	0	0,00	0	0,00	0	0,00		0	0,00	0	0,00	0	0,00	0	0,00	

Chi-Square test, p<0,05

Table 5. Evaluation of participants' attitude change in clinical procedures during the COVID-19 pandemic period by gender and professional experience

Attitude Change		Total (n=126)		Gender				p	Professional Experience								p
				Female (n=76)		Male (n=50)			5 Years (n=39)		5-10 Years (n=34)		11-20 Years (n=22)		20+ Years (n=31)		
		n	%	n	%	n	%		n	%	n	%	n	%	n	%	
Examining a patient with COVID-19 infection	Yes	79	62,70	37[a]	48,68	42[b]	84,00	0,001	26	66,67	25	73,53	10	45,45	18	58,06	0,168
	No	47	37,30	39[a]	51,32	8[b]	16,00		13	33,33	9	26,47	12	54,55	13	41,94	
Time to start periodontal treatment of the patient who has completed the quarantine period of COVID-19 infection	After 7-10 days	23	18,25	12	15,79	11	22,00	0,808	10	25,64	5	14,71	4	18,18	4	12,90	0,398
	After 14 days	31	24,60	20	26,32	11	22,00		12	30,77	9	26,47	4	18,18	6	19,35	
	After 21 days	35	27,78	22	28,95	13	26,00		10	25,64	12	35,29	6	27,27	7	22,58	
	After 28 days	37	29,37	22	28,95	15	30,00		7	17,95	8	23,53	8	36,36	14	45,16	
Work tempo	Increased	9	7,14	6	7,89	3	6,00	0,688	5	12,82	2	5,88	2	9,09	0	0,00	0,472
	Unchanged	12	9,52	7	9,21	5	10,00		4	10,26	5	14,71	0	0,00	3	9,68	
	Decreased	90	71,43	52	68,42	38	76,00		27	69,23	22	64,71	17	77,27	24	77,42	
Frequency of antibiotic prescription	Increased	14	11,11	9	11,84	5	10,00	0,239	5	12,82	3	8,82	1	4,55	5	16,13	0,225
	Unchanged	104	82,54	60	78,95	44	88,00		33	84,62	29	85,29	17	77,27	25	80,65	
	Decreased	8	6,35	7	9,21	1	2,00		1	2,56	2	5,88	4	18,18	1	3,23	
Frequency of prescribing anti-inflammatory and analgesic drugs	Increased	16	12,70	12	15,79	4	8,00	0,134	8	20,51	4	11,76	2	9,09	2	6,45	0,314
	Unchanged	103	81,75	58	76,32	45	90,00		30	76,92	29	85,29	17	77,27	27	87,10	
	Decreased	7	5,56	6	7,89	1	2,00		1	2,56	1	2,94	3	13,64	2	6,45	
Frequency of use of instruments that can cause aerosols	Increased	2	1,59	1	1,32	1	2,00	0,308	1	2,56	0	0,00	1	4,55	0	0,00	0,078
	Unchanged	53	42,06	28	36,84	25	50,00		13	33,33	21	61,76	10	45,45	9	29,03	
	Decreased	71	56,35	47	61,84	24	48,00		25	64,10	13	38,24	11	50,00	22	70,97	

Chi-Square test, p<0,05

In regard to the frequency of utilization of protective equipment in clinical procedures during the period of the global pandemic caused by the novel coronavirus, an increase of 100% was observed in the use of FFP/3 and FFP/2 masks, 60.32% in the use of goggles, and 73.81% in the use of other equipment. The findings demonstrated that the frequency of using goggles and other equipment varies significantly according to the duration of professional experience. The group with 20 years or more of professional experience increased goggles use more than the group with 0-5 years of experience during the COVID-19 pandemic (p<0.05) (Table 4). The least increase in other equipment use was observed among periodontists with five to ten years of professional experience (58.82%), whereas the highest increase was observed among periodontists with twenty or more years of professional experience (96.77%). In response to the question "Have you seen patients with COVID-19 infection during the pandemic?", 62.70% of periodontists indicated that they had encountered while 84% of male periodontists and 48.68% of female periodontists reported that they had examined such cases. This was statistically significant between gender groups. A greater proportion of male physicians than female physicians examined patients with a confirmed diagnosis of COVID (p<0.05) (Table 5). Regarding the frequency of prescribing antibiotics, the majority of participants (82.54%) reported no change. Similarly, the frequency of prescribing anti-inflammatory and analgesic drugs did not differ during the pandemic period by 81.75% of the periodontists (Table 5). Prior to the intraoral examination procedure, 83.33% of the participants reported having their patients use mouth rinse solution. The order of preference among these rinses was: 0.2% povidone iodine, 1.5% hydrogen peroxide, 0.2% chlorhexidine gluconate, 0.12% chlorhexidine gluconate+benzidamine hydrochloride, 0.05% sodium hypochlorite (Fig. 1).

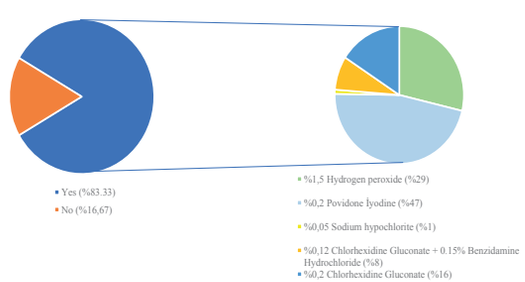

Figure 1: Participants' use of mouth rinse during the COVID-19 pandemic and preferred solution content

DISCUSSION

The history of humanity has been marked by the prevalence of infectious diseases, including the plague, Ebola, AIDS, SARS, and MERS. The global health crisis caused by the SARS-CoV-2, which originated in China and subsequently spread worldwide, has been incorporated into this series of pandemics. In addition, clinical trials became more difficult to conduct during this pandemic, and online tools such as Google Forms and WhatsApp became popular for efficient and secure data collection.

Of particular note is the impact on healthcare workers, who have been identified as the most affected professional group in terms of economic, mental, social, and routine working order (Shah et al., 2021). The considerable impact of the pandemic on the healthcare system has resulted in the postponement of addressing several health concerns, including antimicrobial resistance (Blandino, 2020). In the context of the challenging crisis management of the current situation, there have been reports of an increased use of antibiotics to treat the SARS-CoV-2 infection itself or to prevent co-infections (Iwu et al., 2020). It is imperative that periodontists adhere to the established guidelines regarding the interaction of their prescribed medications with those utilized for the treatment of COVID-19, particularly during this period of frequent drug use (Saglik.gov.tr, 2020).

Rational antibiotic use is defined as prescribing the right antibiotic and its form in the indicated situation, at the optimal dose and duration, by providing sufficient information to the patient, and then evaluating the treatment results. The physicians who perform treatments by adhering to these principles play an important role in the process. When antibiotic usage is required in dentistry, it is usually chosen empirically. The types of antibiotics selected may vary according to the systemic condition of the patient and the dental procedure to be performed.

Recently it has been suggested that periodontal disease can affect systemic health and is associated with most chronic non-communicable diseases (Genco & Sanz, 2020). In this context, periodontists frequently encounter patients with systemic diseases. During the pandemic process, periodontists have tried to adapt to the new situation by making changes in many areas such as the frequency of using of protective equipment, procedures in patient admission, frequency of antimicrobial use, and work tempo in order to protect themselves, their staff and patients against this new situation (Kato et al., 2024; Kuldaş et al., 2022; Rocha-Gomes et al., 2021; Tuncer & Karkaç, 2021). This study is the first survey study to evaluate the attitudes and behaviors of periodontists in Turkey during the COVID-19 pandemic.

Given that saliva is an active carrier of SARS-CoV-2 and the oral cavity is the site of initial replication of SARS-CoV-2 (Meister et al., 2022), dentists have adopted the practice of utilizing different mouth rinses prior to examinations as a straightforward and cost-effective method to reduce viral titers and prevent cross-contamination. The majority of periodontists (83.3%), who participated in the study reported that they instruct their patients to use mouth rinses before the intraoral examination. Our findings are corroborated by the fact that this rate ranged from 70.5% to 98.1% in a limited number of survey studies conducted on periodontists (Kato et al., 2024; Rocha-Gomes et al., 2021; Shah et al., 2021). Moreover, in other survey studies performed on general dentists, this rate ranged from 51.68% to 89.9% (Izzetti et al., 2021; Kuldaş et al., 2022; Tuncer & Karkaç, 2021). It is our contention that periodontologists, who interact frequently with patients suffering from systemic diseases, are more inclined to take additional precautions than general dentists, both in establishing potential disease links and in working in an aerosol-intensive environment during this treatment. In our study, it was observed that the order of preference of mouth rinse solutions was 0.2% povidone iodine with 47%, 1.5% hydrogen peroxide with 29%, and 0.2% chlorhexidine gluconate solution with 16%. Just as there are results consistent with our finding (Duruk et al., 2020), there are also differences in the rankings in some survey studies (Kato et al., 2024; Tuncer & Karkaç, 2021). Although the efficacy of solutions on SARS-CoV-2 is still under investigation, a recent meta-analysis revealed that povidone iodine is the most effective mouth rinse for reducing the viral load of this oxidation-sensitive virus (Lin et al., 2023).

Primary prevention plays a crucial role in the management of epidemics. This protection includes all measures taken to avoid contracting the disease. Considering the working conditions, dentists should always pay attention to the use of personal protective equipment to prevent splashing or scattering of blood, saliva and water droplets during dental treatment. While our respondents reported a 100% increase in the use of FFP2/FFP3 during the COVID-19 pandemic, similar surveys of general dentists have only found increases in the use of such filtering masks between 12.36% and 49.58% (Duruk et al., 2020; Kato et al., 2024). The difference between the increases in the percentage of utilization may be due to the procedures performed by physicians in the clinic, their level of knowledge about the COVID-19 pandemic and their financial possibilities. In order to prevent direct or indirect contact transmission of SARS-CoV-2, periodontists should pay special attention to hand hygiene. The ratio of our participants increasing the frequency of hand sanitizer use (84.92%) was higher than the ratio in similar studies (44.62% – 82.94%) (Duruk et al., 2020; Kato et al., 2024). In contrast to findings indicated that goggles is protective against COVID-19 transmission (Guo et al., 2023), the study suggested that it is ineffective (Navaratnam et al., 2024). Despite this uncertainty, there was an increase in goggles use in dental clinics between 21.92% and 53.52% during the pandemic (Duruk et al., 2020; Kato et al., 2024). It was observed that 60.32% of the periodontists participating in the study demonstrated an increase in the frequency of goggle use. Although no difference was present between females and males, it yielded a statistically significant difference according to the duration of professional experience. It is hypothesized that the observed statistical difference between the youngest and oldest groups may be attributed

to two distinct factors. Firstly, the observed increase in the percentage of physicians wearing goggles may have been less pronounced during the pandemic period due to the fact that younger physicians, who are more likely to be currently wearing goggles, may have been more likely to wear them throughout the period. Secondly, more experienced physicians, who are in the more risky group considering age and systemic diseases, may have increased their use of goggles more than other groups to protect themselves from COVID-19 transmission.

During the COVID-19 pandemic, although periodontists made changes in many areas to adapt to the new normal, they reported that they did not change the frequency of prescribing antibiotics and anti-inflammatory/analgesic drugs. Reduced work tempo and inability to get rid of some habits acquired through experience may have had an effect on this result. Male periodontists reported prescribing antibiotics more often than female periodontists in the presence of pus outflow and in the treatment of periodontal abscess ($p<0.05$). In this context, it is hypothesized that male physicians demonstrate a more reassuring approach than female physicians. In recent studies, it has been observed that the frequency of antibiotic prescription by periodontists ranged from 18.3 % to 48.8% in the presence of abscess and suppuration (Nourah & Aldahlawi, 2022; Yiğit et al., 2022; Yıldız et al., 2023). Although periodontists frequently utilize systemic antibiotics in the case of pus formation, which is an indicator of active periodontal destruction, antibiotics are recommended especially in the presence of systemic findings such as fever, malaise, cellulitis and lymphodenopathy (Herrera et al., 2000). Periodontists have long been aware of the negative impact of dental and gingival diseases, which are closely related to systemic diseases, on the general health of the individual. Indeed, our participants have stated that 70.63% always and 26.98% occasionally received antibiotic support for patients who they thought could not maintain good oral hygiene.

It has been reported that the antimicrobial effect of enamel matrix proteins (MMP) is at a level that effectively prevents bacterial invasion of the surgical site, obviating the need for antibiotic prophylaxis following MMP application (Sculean et al., 2011). Moreover, it has been proposed that the administration of antibiotics following the procedure in the regeneration of periodontal defects with MMP does not result in enhanced clinical attachment level gain or pocket depth reduction (Sculean et al., 2011). Among our respondents, 42.86% reported not prescribing antibiotics after regeneration with MMP. In a recent similar survey study, this rate was 38% (Yıldız et al., 2023). The discrepancy between our findings and those of Yıldız et al. (Yıldız et al., 2023) may be attributed to a greater proportion of experienced respondents (69.4%) in our survey compared to periodontists with 5 years or more of professional experience (28.6%). The answer to the question of "How many days after would you start the periodontal treatment of the patient who had Covid-19 and completed the quarantine process" varied considerably. This highlights a need for further research to elucidate the duration of SARS-CoV-2 persistence in oral fluids, such as saliva and gingival crevicular fluid, and its impact on infectiousness.

In the wake of the global pandemic caused by the SARS-CoV-2 virus, periodontists must identify and implement effective strategies to prevent future outbreaks and ensure the continued provision of essential health services.

he primary limitation of this study is the relatively small sample size. Secondly, the study lacked patient-specific evaluation criteria, as the questions did not inquire about the patients' systemic status. Thirdly, the reasons for alterations in the frequency of antibiotic utilization were not sufficiently detailed.

CONCLUSION

Despite the implementation of enhanced personal protection measures by Turkish periodontologists in response to the ongoing pandemic, there has been a persistence in the frequency of antibiotic and analgesic prescribing guided by scientific knowledge and clinical experience.

Ethics Committee Approval

Ethics committee approval was received from Marmara University Faculty of Dentistry Ethics Committee.

Conflicts of Interest

The authors declare no conflict of interest.

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Authors' Contributions

B.O: Conceptualization, Methodology, Formal Analysis, Investigation, Resources, Data curation, Writing – Original Draft, Visualization

H.S.G: Conceptualization, Methodology, Formal Analysis, Investigation, Validation, Writing – Original Draft, Visualization

L.K: Conceptualization, Methodology, Writing – Review and Editing, Supervision, Project Administration

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