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Original Article

Dental Professionals' Perceptions of Personal Protective Equipment During the Covid-19 Pandemic in India

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ABSTRACT

A considerable percentage of healthcare personnel are picking up COVID when working with affected persons. Due to their direct contact with patients through blood, saliva, and aerosol, dentists and dental clinics are more likely to spread the virus. Dental practitioners and clinical auxiliary personnel must use the proper fluid-resistant masks and protective equipment to lower the probability of contamination. The present research aimed to assess dental professionals' knowledge and perception of Personal Protective Equipment (PPE) kits during the COVID-19 outbreak in India. During the height of the Covid-19 outbreak in India, an online survey was carried out. A thorough survey questionnaire that was self-administered and self-validated was used to collect data. The SPSS 13.01 application was used to analyze the data and display the findings. Karl Pearson, one-way ANOVA, and the chi-square test were used for statistical analysis. 79.46% of the 589 respondents are between the ages of 25 and 35, and 70% have less than five years of job experience. Protocols for donning and doffing were known to more than half (60.3%) of the participants. The usage of PPE kits in dental clinics has increased, and 52.3% of participants stated this has increased the cost of service. Approximately 93.3% of participants worried about being sick as a result of improper PPE use. According to this study, Indian dental practitioners and postgraduate students exhibited good adherence to infection control protocols.

Keywords: Coronavirus-19, Dental professional, Survey, Personal protective equipment

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Introduction

Before the end of 2019, a novel virus called coronavirus appeared in China. Due to its rapid expansion, the World Health Organization (WHO) was forced to issue a global outbreak signal in March 2020. In the Chinese district of Wuhan, the RNA with a single-strand virus called coronavirus was first identified and identified as pneumonia of a mysterious origin [1]. In response to the dramatic rise in viral pneumonia, the World Health Organization said on January 9, 2020, that a new coronavirus that wasn't yet identified in humans was the reason. It was officially designated as Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2) by the International Committee on Taxonomy of Viruses after being first identified as 2019-nCoV. India stated its first COVID-19 fatality on March 12, 2020, in Karnataka, and its first COVID-19 case on January 30, 2020, in a student who traveled from Wuhan, China, to Kerala state [2]. India has a remarkably low rate of COVID-19 infection, with a stated 63.45% rate of recovery among afflicted individuals and a 2.3% fatality rate, which is lower than the global norm [3]. Corona Virus Disease 19 (COVID-19) is the common name for the infectious respiratory condition caused by the coronavirus [4, 5]. Fever, cough, and breathing difficulties are the typical symptoms of SARS-CoV-2 infection, and they typically appear between two and fourteen days [6]. Those who have close contact with infected persons may get SARS-CoV-2 due to its airborne nature, and

healthcare workers (HCWs) are seen to be particularly vulnerable [2, 7].

HCWs, especially dentists, are more likely to be infected by the virus because of the numerous concurrent circumstances. In the dental field, COVID-19 can spread by contact, contaminated surfaces, and airborne transmission through aerosols and droplets created during dental procedures. Several medical professionals have experienced significant stress during the COVID-19 epidemic due to the conflict between their professional obligations and humanitarianism on the one hand, and their fear and suspicion of possibly exposing their family members to a lethal virus on the other [8].

Because of COVID-19's quick spread in dental settings and the precision needed in clinical practice, dental care and education faced early challenges [9]. The World Health Organization (WHO), the American Dental Association (ADA), and the Centers for Disease Control and Prevention (CDC) have released certain instructions for dentists and dental professionals to follow to track the expansion of COVID-19. The precautions include pre-procedural mouthwash, hand washing, rubber dam protection, anti-retraction handpiece, personal protective equipment (PPE), thorough patient assessment, and clinic cleanliness, as for other infectious diseases [10].

PPE is employed in healthcare settings to safeguard healthcare workers (HCWs) who are susceptible to infections and to stop the spread of infections to other patients. Standard masks, gowns, gloves, goggles, and face shields are among the most important PPE kinds used to protect healthcare workers and other patients from these dangerous hospital-acquired diseases [11]. While goggles and face shields are essential for protecting the eyes and avoiding contact dissemination, medical masks are vital for droplet prevention, and long-sleeved gloves and gowns that are resistant to fluid are recommended [12]. Therefore, it is essential to understand the differences between protective clothing and respiratory shielding equipment. Masks are generally divided into three categories: respirators, medical masks, and non-medical masks. The number of layers, face fit, and filtering effectiveness are some of the variables that affect mask potential [13].

Medical masks are often referred to as surgical masks. These loose-fitting masks not only shield the dentist from blood, respiratory droplets, and bodily fluids that may be released into the air during the procedure, but they also act as a barrier to stop dentist-to-patient droplets. According to their filtration effectiveness (95%, 99%, and 99.7%) and their capacity to filter oil droplets (N95, 99, 100: not resistant to oil; R95, 99, 100: mildly resistant to oil; and P95, 99, 100: highly resistant to oil), the US National Institute for Occupational Safety and Health (NIOSH) has classified particulate filtering facepiece respirators (FFRs) into nine classifications.

It can filter 95% of aerosol particles with a size of 0.3 microns, according to its N95 designation [14]. Gloves and fluid-repellent gowns were recommended by the CDC and WHO for use when caring for patients during this epidemic. Gowns are divided into high-performance and ordinary effectiveness categories by the European standard EN13759 according to how impermeable they are to liquids and microorganisms. However, gowns must satisfy EN14126 standards, consisting of testing for resistance to fluid, blood, or microbe penetration under varied hydrostatic pressures from Class 1 (0 kPa) to Class 6 (20 kPa), to safeguard healthcare personnel from infectious sources [12]. In addition to surgical masks or respirators, goggles, and face shields are precautionary precautions [14].

The 2014–2016 Ebola virus disease (EVD) epidemic highlighted the requirement for additional scientific evidence regarding safe PPE donning and doffing practices [15]. The present research aimed to assess dental professionals' knowledge and perception of PPE kits during the COVID-19 outbreak in India. Effective application of PPE becomes critical when healthcare personnel handle patients who may be symptomatic or asymptomatic carriers of highly dangerous species like coronavirus.

Materials and Methods

A web-based survey was conducted using Google Forms in May 2020. Ethical clearance was granted by KAHER University (Sl No: 1364) and consent was acquired from participants before the study. The study included dental practitioners and dental postgraduate students from all over India. The study excluded the participants who were not practicing dentistry. A self-designed questionnaire was prepared and validated using Chronbach alpha and the value was 0.84. The questionnaire was distributed through social media applications like WhatsApp, Instagram, Facebook, and Twitter. The confidentiality of study participants was maintained throughout the study. The questionnaire included 22 questions out of which 16 were knowledge-based (k1 to k16) and 6 on perception (p1 to p6) and all the questions were closed-ended. Survey feedback was gathered from May 2020 to July 2020. A total of 589 responses were obtained. Demographic details included name, age, gender, years of working experience, region, and designation of the study participant. Respondents were asked about the recent

protective measures used during the COVID-19 outbreak, knowledge regarding COVID-19, PPE, difficulties faced while using PPE, and their attitude towards them. Survey responses were downloaded into a Google sheet and descriptive analysis was performed using SPSS version 22. Comparison of demographic details was done using Mean and standard deviation. Linear comparison between knowledge was done by chi-square t-test in which a p-value less than 0.05 was considered significant. The correlation between knowledge and perception scores was analyzed using Karl Pearson's correlation coefficient method. Paired t-test and ANOVA were also used to compare between different groups.

Results and Discussion

Of the 589 participants in the research, 79.46% were between the ages of 25 and 35 years, while just 5.9% were between the ages of 45 and 55 years. 70% of those who responded had less than five years of job experience. South India accounted for 52% of the research participants, with the remaining participants coming from the East (15.9%), West (12.9%), and North (18.34%).

Most of the participants (98.6%) knew what COVID-19 symptoms were, 86.9% were scared of the dangers of working in dentistry, and 98.5% knew about the different precautions taken during the COVID-19 pandemic. Though only 60.3% of the subjects comprehended the correct procedure of donning and doffing processes, the majority of them (98.8%) were knowledgeable about the different components of a PPE kit. Of those, only 46% and 62.3% of the subjects knew the proper course of donning and doffing methods, respectively, suggesting the possibility of cross-contamination because dental professionals deviated from the protocol.

The chi-square test indicated that all of the other questions were statistically insignificant, except "Do you feel that you have enough understanding concerning the application of PPE and how safely you can work in a dental clinic" (P-value = 0.008) and "whether you know how to dispose of the PPE kit properly" (P-value = 0.018). Additionally, it was shown that dentists in the 45–55 years age range were better knowledgeable about PPE practices **(Table 1)**.

Table 1. Comparison of age groups with correct knowledge in each item of respondents

Item	25-35 years (%)	35-45 years (%)	45-55 years (%)	Total	%	χ^2	P-value
K1	98.7	97.7	100.0	581	98.6	1.1030	0.5760
K2	86.3	86.0	97.1	512	86.9	3.4220	0.1810
K3	98.3	98.8	100.0	580	98.5	0.7220	0.6970
K4	66.0	77.9	85.7	406	68.9	9.6830	0.0080*
K5	98.9	98.8	97.1	582	98.8	0.8880	0.6420
K6	57.9	67.4	74.3	355	60.3	5.8110	0.0550
K7	45.9	44.2	51.4	271	46.0	0.5300	0.7670
K8	61.8	62.8	68.6	367	62.3	0.6550	0.7210
K9	95.1	90.7	91.4	555	94.2	3.1070	0.2110
K10	87.6	82.6	77.1	508	86.2	4.1620	0.1250
K11	84.8	86.0	74.3	497	84.4	2.9590	0.2280
K12	57.9	66.3	80.0	356	60.4	8.0840	0.0180*
K13	90.8	83.7	88.6	528	89.6	3.9810	0.1370
K14	96.6	95.3	94.3	567	96.3	0.7120	0.7000
K15	77.8	74.4	68.6	452	76.7	1.8500	0.3960
K16	24.4	33.7	34.3	155	26.3	4.5030	0.1050

*P < 0.05

Only two questions were found to be statistically significant when comparing the participants' years of experience and knowledge: "Are you conscious of donning and doffing procedures?" (P-value = 0.005) as well as "Filtering facepiece respirators known as." It was determined that other inquiries were statistically insignificant **(Table 2)**.

Table 2. Comparison of Years of experience with correct knowledge in each item of respondents

Item	< 5 years (%)	5- 10 years (%)	> 10 years (%)	Total	%	χ^2	P-value
K1	98.6	97.8	100.0	581	98.6	1.6820	0.4310
K2	86.5	92.2	83.3	512	86.9	3.2400	0.1980
K3	97.8	100.0	100.0	580	98.5	3.8320	0.1470
K4	68.0	67.8	75.0	406	68.9	1.6860	0.4300
K5	98.6	100.0	98.8	582	98.8	1.3160	0.5180
K6	56.4	74.4	64.3	355	60.3	10.732	0.0050*
K7	46.0	44.4	47.6	271	46.0	0.1760	0.9160
K8	61.7	68.9	58.3	367	62.3	2.2930	0.3180
K9	93.7	95.6	95.2	555	94.2	0.6350	0.7280
K10	85.1	91.1	86.9	508	86.2	2.3190	0.3140
K11	86.5	81.1	77.4	497	84.4	5.2750	0.0500*
K12	58.3	64.4	66.7	356	60.4	2.7510	0.2530
K13	89.2	91.1	90.5	528	89.6	0.3770	0.8280
K14	97.1	94.4	94.0	567	96.3	2.7990	0.2470
K15	79.0	72.2	70.2	452	76.7	4.2440	0.1200
K16	24.3	27.8	34.5	155	26.3	3.8550	0.1450

*P < 0.05

95–100% of dentists from the western and southern regions answered correctly when the participants' regions and levels of knowledge were compared, and there was no discernible difference between them on any of the questions other than "What are the different types of masks?" and "What is the difference between masks and respirators?"

In comparison to a standard surgical gown, 73.2% of research participants believed that the usage of PPE kits at a dental clinic is a required necessity, and about half (58.4%) had begun using PPE kits in their everyday dentistry practice. Regarding the question "How to limit the use of PPE kits in a dental clinic," different answers were noted. Of the study participants, 31.9% believed that nonurgent procedures should be delayed, while 71.5% recommended using alternative tools like telemedicine. Additionally, 45.5% believed that patient contact should be minimized, and 49.4% believed that PPE could be reused with appropriate decontamination guidelines. 93% of the survey participants stated that they are afraid of infection from improper usage of PPE. An annoyance was reported by 46.5% of respondents regarding the challenges of donning the PPE equipment. The increasing trend of PPE kit use in dental clinics has led to higher treatment expenses, according to more than half of the public (52.3%).

When comparing age groups with accurate perception, the chi-square test revealed a statistically significant (P-value = 0.028) various in the response to the question, "Importance of usage of PPE in a clinic than a surgical gown" (P2) **(Table 3)**.

Table 3. Comparison of age groups with correct perception in each item of respondents

Item	25-35 years (%)	35-45 years (%)	45-55 years (%)	Total	%	χ^2	P-value
P1	64.8	56.7	28.6	344	58.4	1.6830	0.4310
P2	79.8	80.0	33.3	431	73.2	7.1330	0.0280*
P3.1	37.6	25.6	10.7	188	31.9	2.1110	0.3480
P3.2	80.0	68.9	32.1	421	71.5	0.6330	0.7290
P3.3	51.1	45.6	17.9	268	45.5	0.2700	0.8740
P3.4	56.1	48.9	16.7	291	49.4	1.3720	0.5040
P4	106.0	90.0	38.1	553	93.9	0.3960	0.8200
P5	52.0	44.4	21.4	274	46.5	0.3640	0.8340
P6	57.3	55.6	23.8	308	52.3	1.8960	0.3870

*P < 0.05

A statistically significant difference (0.05) was also seen when years of experience with accurate perception were compared with the question, "Do you have a fear that misuse of PPE can get you infected?" Regardless of years of experience, P4 indicated that dental professionals were most afraid that improper use of PPE might lead to infection **(Table 4)**. Except for working in various industries (P-value = 0.009), there were no significant differences in the mean knowledge scores from the one-way ANOVA **(Table 4)**. Karl Pearson's method of correlation coefficient analysis also revealed a substantial link between knowledge and perception scores (P-value = 0.001).

Table 4. Comparison of years of experience with correct perception in each item of respondents

Item	< 5 years (%)	5- 10 years (%)	> 10 years (%)	Total	%	χ^2	P-value
P1	58.6	50.0	66.7	344	58.4	4.9810	0.0830
P2	74.5	70.0	70.2	431	73.2	1.1790	0.5550
P3.1	31.8	28.9	35.7	188	31.9	0.9390	0.6250
P3.2	69.4	76.7	76.2	421	71.5	2.9840	0.2250
P3.3	45.1	48.9	44.0	268	45.5	0.5210	0.7710
P3.4	50.4	46.7	47.6	291	49.4	0.5290	0.7680
P4	93.5	98.9	90.5	553	93.9	5.7390	0.0500*
P5	46.0	43.3	52.4	274	46.5	1.5680	0.4570
P6	54.5	47.8	46.4	308	52.3	2.6730	0.2630

* P < 0.05

Regarding the COVID-19 epidemic, this study was carried out to gauge the awareness of dental practitioners and postgraduate students in India regarding the level of understanding as well as the perception of PPE kits.

A sizable percentage of participants (64.4%) in the Lodhi *et al*. [16] study were unaware of the differences between N95, N99, and N100 masks, but 94.2% of study subjects in the present research were knowledgeable about different kinds of face masks. Nearly 86.2% of participants were informed about the many aspects that affect mask effectiveness, and 84.4% of participants were aware of the difference between respirators and masks. Additionally, 89.6% of participants knew that N95 masks are another name for filtering facepiece respirators. On the other hand, 84% of respondents concurred that under this COVID scenario, N-95 masks were required for conventional dental treatments. On the other hand, 85% of the population surveyed believed that a surgical mask was inadequate for preventing COVID-19 cross-infection, and 90% of them did not utilize an N-95 mask when giving patient care, as reported by Ahmed *et al*. [17]. In low-risk operations, such as non-aerosol surgeries, medical masks can be worn in regular clothing with surgical gloves and goggles. This is because there may be a scarcity of respirators during this peak time. However, WHO created regulations mandating that medical staff use a NIOSH-certified N95 respirator, which is equivalent to the European standard FFP2, to prevent the epidemic of COVID-19, especially when engaging in high-risk or aerosol-causing operations [18].

The vast majority of dentists (98.5%) were using the new safety precautions that were implemented during the COVID-19 outbreak, such as hand sanitizer, frequent hand washing, and protective face masks. This is comparable to a study by Lodhi *et al*. [16] that found that 91.7% of participants showed a positive curve when asked about the precautions they took before seeing a patient. In the Kwon *et al*. [15] study, hand hygiene and degloving protocol changes were common during the doffing of both contact precaution PPE and Ebola virus disease, but in this research, only 46% of study participants knew the precise sequential order of donning, and only 62.3% knew the doffing sequence. The Kwon *et al*. [15] study showed that hand hygiene and degloving provide a significant risk of self-contamination for healthcare workers. 93% of participants in the current study were afraid that they may become infected if they misused their protective equipment. Wearing PPE, cleaning surfaces near questionable patients, and routinely washing hands with soap-and-water or alcohol-based rubs can all help prevent the transmission of COVID-19, based on a study by Khader *et al*. that included 368 dentists [10]. Based on Khader *et al*. [10], when questioned about the details that need to be observed to determine patients in danger of getting COVID-19, 316 (85.9%) participants stated the existence of a respiratory

infection, 347 (94.3%) stated a history of travel to COVID hotspot regions, and 345 (93.8%) stated a history of contact with potentially infected patients. Similarly, 98.6% of individuals in this survey were aware of the clinical symptoms of COVID-19. Approximately 86.9% of postgraduate students and dentists expressed fear of the dangers of working in the dentistry field. This is similar to the results of Ahmed *et al*., who discovered that a significant percentage of dentists (66%) want to reduce their practices until the number of COVID-19 cases drops and that 87% of participants were terrified of catching the virus from a patient or a colleague [17]. A research study by Cheng *et al*. [19] examined how COVID-19 affected dentists' attitudes, knowledge, and infection control procedures. They found that 94.76% of dentists had accurate COVID-19 knowledge, 94% were afraid of contracting the virus, and 95% used PPE, which includes masks, gloves, and protective gowns. Regarding PPE availability, Tysiąc-Miśta and Dziedzic [20] found that just 46% of individuals who began their practice had enough PPE supplies, while 75.3% of respondents overall had insufficient access to PPE. In contrast, during the COVID-19 pandemic, 58.4% of dentists in this Indian population began utilizing PPE kits as part of their regular practice. In contrast to coveralls, which are difficult to take off and can lead to self-contamination and increased heat stress, gowns are straightforward, comfortable, and easy to put on and take off [12]. According to the results of research by Lodhi *et al*. [16], about 60.3% of survey participants were aware of the "Donning and Doffing" technique. Almost half of the participants (47.9%) had no instruction on how to properly use PPE, while 67.2% of the dentists were aware of the most recent worldwide standards for PPE from the CDC and WHO. As seen by the SARS outbreak in Canada, which severely affected a large number of healthcare workers, a complicated PPE is thus not necessary. The sequential order of PPE donning and doffing may be accurately inspected with the use of a "buddy system," and practitioners should have the necessary training and execution before beginning any therapeutic operations [21].

Universal face masking might be one of the cornerstones of managing the COVID-19 pandemic as SARS-CoV-2 spreads quickly. This could assist in reducing the disease's severity and guarantee that a greater proportion of newly diagnosed cases remain asymptomatic. Masking can reduce the amount of inoculum that a vulnerable person inhales [22].

In their investigation, Aladelusi *et al*. [23] concluded that teledentistry, clinical triaging, preprocedural mouth rinses, and the proper use of PPE are all preventive strategies against the development of COVID-19 in dental practice. Because it may be linked to an infection risk, dental practitioners' instruction on how to put on and take off PPE is just as important as selecting the right PPE [24]. Since the use of respirators, N95 masks, and PPE has been demonstrated to lower the rate of new infections, this must become the new standard to defeat the new, deadly coronavirus.

Conclusion

In conclusion, our research shows that PPE use reduces the spread of COVID-19 and protects healthcare professionals. In India, a sizable portion of dental practitioners and postgraduate students showed a favorable attitude toward infection control guidelines, even though there was a clear lack of understanding of the correct technique for wearing PPE kits. To prevent the transmission of the new coronavirus from patients to dentists and vice versa, dental workers must understand the role and purpose of PPE.

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References

1. Peng X, Xu X, Li Y, Cheng L, Zhou X, Ren B. Transmission routes of 2019-nCoV and controls in dental practice. Int J Oral Sci. 2020;12(1):1-6.
2. Prasad N, Kumar A, Tripathi M. Novel coronavirus disease (COVID-19) pandemic in India: a review. Eurasian J Med Investig. 2020;4(3):279-83.
3. The Economic Times. India has one of world's lowest COVID-19 infection and death rates: harsh Vardhan. 2020. Available from: https://economictimes.indiatimes.com/news/politics-and-nation/india-has-one-of-worlds-lowest-covid-19-infection-and-death-rates-harsh vardhan/articleshow/77154473.cms?from=mdr
4. Consolo U, Bellini P, Bencivenni D, Iani C, Checchi V. Epidemiological aspects and psychological reactions to COVID-19 of dental practitioners in the northern Italy districts of

Modena and Reggio Emilia. Int J Environ Res Public Health. 2020;17(10):3459.
5. Yan Y, Shin WI, Pang YX, Meng Y, Lai J, You C, et al. The first 75 days of novel coronavirus (SARS-CoV-2) outbreak: recent advances, prevention, and treatment. Int J Environ Res Public Health. 2020;17(7):2323.
6. Kanathila H, Pangi A. COVID-19-threat to dentistry-how to overcome? J Evol Med Dent Sci. 2020;9(37):2746-51.
7. Ather A, Patel B, Ruparel NB, Diogenes A, Hargreaves KM. Coronavirus disease 19 (COVID-19): implications for clinical dental care. J Endod. 2020;46(5):584-95.
8. Shacham M, Hamama-Raz Y, Kolerman R, Mijiritsky O, Ben-Ezra M, Mijiritsky E. COVID-19 factors and psychological factors associated with elevated psychological distress among dentists and dental hygienists in Israel. Int J Environ Res Public Health. 2020;17(8):2900.
9. Gurgel BCV, Borges SB, Borges REA, Calderon PDS. COVID-19: perspectives for the management of dental care and education. J Appl Oral Sci. 2020;28(10224):e20200358.
10. Khader Y, Al Nsour M, Al-Batayneh OB, Saadeh R, Bashier H, Alfaqih M, et al. Dentists' awareness, perception, and attitude regarding COVID-19 and infection control: cross-sectional study among Jordanian dentists. JMIR Public Health Surveill. 2020;6(2):e18798.
11. Meng L, Hua F, Bian Z. Coronavirus disease 2019 (COVID-19): emerging and future challenges for dental and oral medicine. J Dent Res. 2020;99(5):481-7.
12. Park SH. Personal protective equipment for healthcare workers during the COVID-19 pandemic. Infect Chemother. 2020;52(2):165.
13. Mahmood SU, Crimbly F, Khan S, Choudry E, Mehwish S. Strategies for rational use of personal protective equipment (ppe) among healthcare providers during the COVID-19 crisis. Cureus. 2020;12(5):e8248.
14. Gurzawska-Comis K, Becker K, Brunello G, Gurzawska A, Schwarz F. Recommendations for dental care during COVID-19 pandemic. J Clin Med. 2020;9(6):1833.
15. Kwon JH, Burnham CA, Reske KA, Liang SY, Hink T, Wallace MA, et al. Assessment of healthcare worker protocol deviations and self contamination during personal protective equipment donning and doffing. Infect Control Hosp Epidemiol. 2017;38(9):1077.
16. Lodhi SK, Ehsan S, Rafique A, Tahir S, Khan T. Knowledge and practices of dentists regarding personal protective equipment during COVID-19 pandemic: a cross-sectional study among pakistani dentists. Biomedica. 2020;36(2S):275-80.
17. Ahmed MA, Jouhar R, Ahmed N, Adnan S, Aftab M, Zafar MS, et al. Fear and practice modifications among dentists to combat novel coronavirus disease (COVID-19) outbreak. Int J Environ Res Public Health. 2020;17(8):2821.
18. Passarelli PC, Rella E, Manicone PF, Garcia-Godoy F, D'Addona A. The impact of the COVID-19 infection in dentistry. Exp Biol Med. 2020;245(11):940-4.
19. Cheng HC, Chang YJ, Liao SR, Siewchaisakul P, Chen SL. The impact of COVID-19 on knowledge, attitude, and infection control behaviors among dentists. BMC Oral Health. 2021;21(1):1-11.
20. Tysiąc-Miśta M, Dziedzic A. The attitudes and professional approaches of dental practitioners during the COVID-19 outbreak in Poland: a cross-sectional survey. Int J Environ Res Public Health. 2020;17(13):4703.
21. Cook TM. Personal protective equipment during the coronavirus disease (COVID) 2019 pandemic–a narrative review. Anaesthesia. 2020;75(7):920-7.
22. Gandhi M, Rutherford GW. Facial masking for Covid-19 - potential for "variolation" as we await a vaccine. N Engl J Med. 2020;383(18):e101.
23. Aladelusi TO, Atiba FA, Gbadebo SO, Adeyemo YI, Olusanya AA, Akadiri OA. COVID-19 outbreak and dental health care provision in Nigeria: a national survey. BMC Oral Health. 2021;21(1):1-1.
24. Melo P, Afonso A, Monteiro L, Lopes O, Alves RC. COVID-19 management in clinical dental care part II: personal protective equipment for the dental care professional. Int Dent J. 2021;71(3):263-70.