Psychological Influences of the Covid-19 Pandemic on Dentists, Parents, and Children, and its Impact on Children's Oral Health in Egypt

Mohamed Hassan Mostafa[1], Alaa Mohamed El Dehna[1], Salsabeel Maher Ghaleb Soliman[1*]

1Pedodontics and Oral Health Department, Faculty of Dental Medicine for Girls Al-Azhar University

Email: bellasolimang@gmail.com

Abstract

BACKGROUND: COVID-19 pandemic caused by severe acute respiratory syndrome Coronavirus 2 (SARS CoV-2) is affecting millions of lives across the world. The pandemic has unavoidably produced an enormous amount of mental health stress for individuals and families around the world. However, most children and adolescents infected with COVID-19 appear to have had mild to moderate symptoms, and limited mortality rates. Aim**:** Assessment of the psychological effect of the Covid-19 Pandemic on dentists, children, and parents. **Materials and methods:** This study was a Cross-sectional descriptive study performed on groups of parents and children who attend educational and governmental hospitals in Egypt. **Results:** According to pandemic-related changes in the number of dental visits, the first wave is the most effective. According to Pandemic-related symptoms, difficulty pronouncing due to dental problems had the largest percentage in the first wave, Pain in the mouth in the second wave, and Difficulty in living life due to teeth problems in the Successive wave. Regarding Pandemic-related influence on family/social life, the strongest effect was the highest in the first wave, the smallest effect in the second wave, and the non-effect in the successive wave. Regarding Pandemic-related influence on work, the strong effect was the highest in the first wave, the little effect in the second wave, and the non-effect in the successive wave. **Conclusion:** Influences of covid-19 pandemic on dentists, parents, and children, and its impact on children's oral health, pandemic-related change in the number of dental visits decreased during the COVID-19 pandemic.

Keywords: Covid-19 Pandemic, Oral Health, Impact.

Introduction

The COVID-19 pandemic caused by severe acute respiratory syndrome Coronavirus 2 (SARS CoV-2) is affecting millions of lives across the world. In the United States, the number of confirmed cases of COVID-19 and associated mortality has steadily risen since mid-February 2020. As of May 1st, 2020, COVID-19-positive cases were reported in 55 states and territories in the United States, infecting around 1,062,446 people and causing over 62,406 deaths. (1)

The first pediatric case in the United States was reported on March 2nd, 2020. Around 2,572 children under 18 have tested positive, representing 1.7 percent of the total infected population, and no gender predilection has been detected. (2)

Decreasing the disease's direct impact on children. Children most commonly experience fever (56 percent), cough (54 percent), headache (28 percent), sore throat (24 percent), and myalgia (23 percent), in addition to minor symptoms, including nausea, vomiting, and diarrhea. (3)

The reported mortality rate is much lower in children than in older age groups. COVID-19 has disrupted the conventional practice and teaching of pediatric dentistry in the United States. During this unprecedented time, only emergency dental treatment is being recommended. (4, 5)

It was found that this negative psychological impact and the fear of infection impacted the frequency of children with their parents to pediatric dental clinics and their interest in their children's oral health during the three waves of the Coronavirus. [6] Providing children with dental care during the COVID-19 pandemic, and in particular during the increased social restrictions, can be a challenging task.

This primarily originates from fears of procedure and pain. but under a pandemic-related lockdown, these emotions and feelings can potentially be further exacerbated by the new stressors present in their environment as well as by the psychological tension resonating from the caregivers who need to make a decision to leave home and potentially risk contracting SARS-COV-2. [7-10]

As the main route of SARS-CoV-2 transmission is via airborne droplets, the dental staff must use personal protective equipment (PPE), i.e., suits, goggles, face visors, and face masks. The PPE affects the voice tone, makes it more difficult for children to understand what a dentist is communicating, does not allow children to read facial expressions, which are important for building their trust with a dentist and adds to white coat syndrome overall hindering interaction with the patient. [11]

MATERIAL AND METHODS

This study was a Cross-sectional descriptive study performed in Egypt, and the printed questionnaire was collected in educational and governmental hospitals on these three groups at the same time.

This study was applied to groups of parents and children who attend educational and governmental hospitals in Egypt.

In this study, by using various type of questionnaires and collecting the appropriate information. The psychological impact of covid 19pandemic on dentists. Parents and children were evaluated, and the extent to which the oral and dental health of children were affected by this.

Ethical approval: The Research Ethics Committee (REC) of the Faculty of Dental Medicine for Girls, Al-Azhar University approved the study proposal.

Methodology:

This study was applied to three groups: group 1: 360 dentists of both genders working in Egypt, group 2: 255 Parents who bring their children to the dental clinic. And Group 3: 255 Children who come to dental clinics in a regular or irregular manner.

Model questions for children were answered by their parents in order to obtain more accurate information, except for adult children.

Methods of Data Collection

The questionnaire was applied into two types: Paper or printed questionnaires offered in educational and governmental institutions and online questionnaires.

Face-to-face interviews: Personal interviews were conducted with some of the dentists, some of the parents, and some of the children of different age groups, provided that they can express and talk about themselves and answer the questions directed to them in an appropriate manner for each child.

The collected data included part related to personal protective equipment (PPE): their discomfort or anxiety owing to PPE, Do children feel afraid of personal protective equipment? Does personal protective equipment hinder the dentist's treatment of the child? And how the dentist felt about PPE?

Comparison between these influences and results during various waves of covid 19 pandemic: The COVID-19 pandemic heavily influences the respondents' decline in mental health, so there is a need to implement appropriate psychological support programs, especially for those who recovered from COVID-19 or lost their loved one due to the disease. Therefore, we made a comparison between the results of the questionnaires during the different waves of the pandemic to know the severity of each of them and the extent of their impact on mental health.

The results were statistically analyzed using one-way analysis of variance (ANOVA) when comparing more than two means, a Post Hoc test for multiple comparisons between different variables, Chi-square (X^2) test of significance was used in order to compare proportions between two qualitative parameters, and Pearson's correlation coefficient (r) test was used for correlating data.

For evaluations of the dentists, a minimum total sample size of 360 samples was sufficient to detect the effect size of 0.15, a power (1β=0.99) of 99% at a significance probability level of $p<0.05$.

For evaluations of the Parents and Children, A minimum total sample size of 255 samples was sufficient to detect the effect size of 0.15, and a power (1-β=0.99) of 99% at a significance probability level of $p<0.05$.

The sample size was calculated according to G*Power software version 3.1.9.7.

RESULTS

According to pandemic-related changes in the number of dental visits, there were 248 (97.3%) were affected by the first wave, 231 (90.6%) by the second wave, and 95 (37.3%) by successive. **(Table 1)**

According to difficulty pronouncing due to dental problems, there were 238 (93.3%) who were affected in the first wave, 20 (7.8%) who were affected in the second wave, and 4 (1.6%) who were affected in successive waves. According to pain in the mouth, there were 211 (82.9%) were affected in the first wave, 38 (14.9%) were affected in the second wave, and 13 (5.1%) who were affected in the successive wave. According to stopping eating due to mouth and teeth pain, there were 188 (73.8%) were affected in the first wave, 33 (12.9%) were affected in the second wave and 41 (16.1%) were affected in successive waves. According to difficulty to live life due to teeth problems there were 169 (66.3%) who were affected in the first wave, 35 (13.7%) who were affected in the second wave, and 64 (25.1%) who were affected in successive waves. **(Table 2)**

During the first wave, there were 45 (17.6%) were a little affected, 48 (18.8%) weren't affected, and 162 (63.5%) were strongly affected. During the second wave, there were 105 (41.2%) were a little affected, 55 (21.6%) weren't affected, and 95 (37.2%) were strongly affected. During successive waves, there were 68 (26.7%) were a little affected, 128 (50.2%) weren't affected, and 59 (23.1%) were strongly affected. **(Table 3)**

This table shows that among the studied cases there were 85 (33.33%) visited the dentist with their child during the period March 2020 to December 2021, there were 142 (55.7%) didn't have a toothache, and 55 (19.8%) with fear of infection, there were 12 (4.7%) with declining health and 38 (14.9%) with toothache continued, and there were 95 (37.3%) concerned because of protective tools, and there were 160 (62.7%) relieved, there were 113 (44.3%) who thinks that their child feels afraid of personal protective equipment and 89 (34.9%) who thinks that protective tools hinder the dentist. **(Table 4)**

During the first wave, there were 53 (14.7%) were a little affected, 12 (3.3%) weren't affected, and 295 (81.9%) were strongly affected. During the second wave, there were 187 (51.9%) were a little affected, 37 (10.3%) weren't affected, and 136 (37.8%) were strongly affected. During successive waves, there were 146 (40.6%) were a little affected, 152 (42.3%) weren't affected, and 62 (17.2%) were strongly affected. **(Table 5)**

among the studied cases there were 209 (58.1%) feel discomfort or anxiety owing to personal protective equipment, there were 180 (50%) think children feel afraid of personal protective equipment, there were 196 (54.4%) think that personal protective equipment hinders the dentist's treatment with the child and there were 112 (31.1%) who wear personal protective equipment more than 8 hours and 248 (68.9%) less than or equal 8 hours. **(Table 6)**

Table (1):Pandemic-related change in the number of dental visits

	Subjects (n = 255)			
	No		Yes	
	No.	%	No.	%
First wave	7	2.7	248	97.3
Second wave	24	9.4	231	90.6
Successive wave	160	62.7	95	37.3

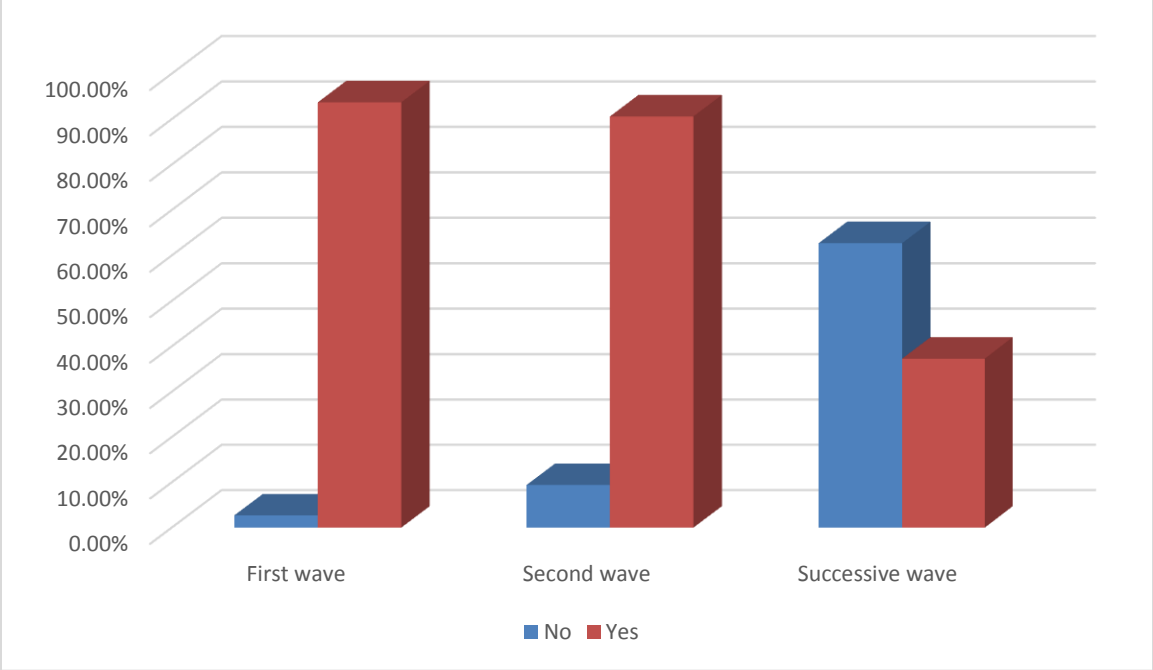

Fig (1): Pandemic-related change in number of dental visits.

Table (2):Pandemic-related symptoms

	Subjects (n = 255)					
	First wave		Second wave		Successive wave	
	No.	%	No.	%	No.	%
Difficulty pronouncing due to dental problem	238	93.3	20	7.8	4	1.6
Pain in mouth	211	82.8	38	14.9	13	5.1
Stop eating due to mouth and teeth pain	188	73.8	33	12.9	41	16.1
Difficulty in living life due to teeth problem	169	66.3	35	13.7	64	25.1

Table (3):Pandemic-related influence on family/social life

	Subjects (n = 255)					
	First wave		Second wave		Successive wave	
	No.	%	No.	%	No.	%
Little	45	17.6	105	41.2	68	26.7
Non	48	18.8	55	21.6	128	50.2
Strong	162	63.5	95	37.2	59	23.1

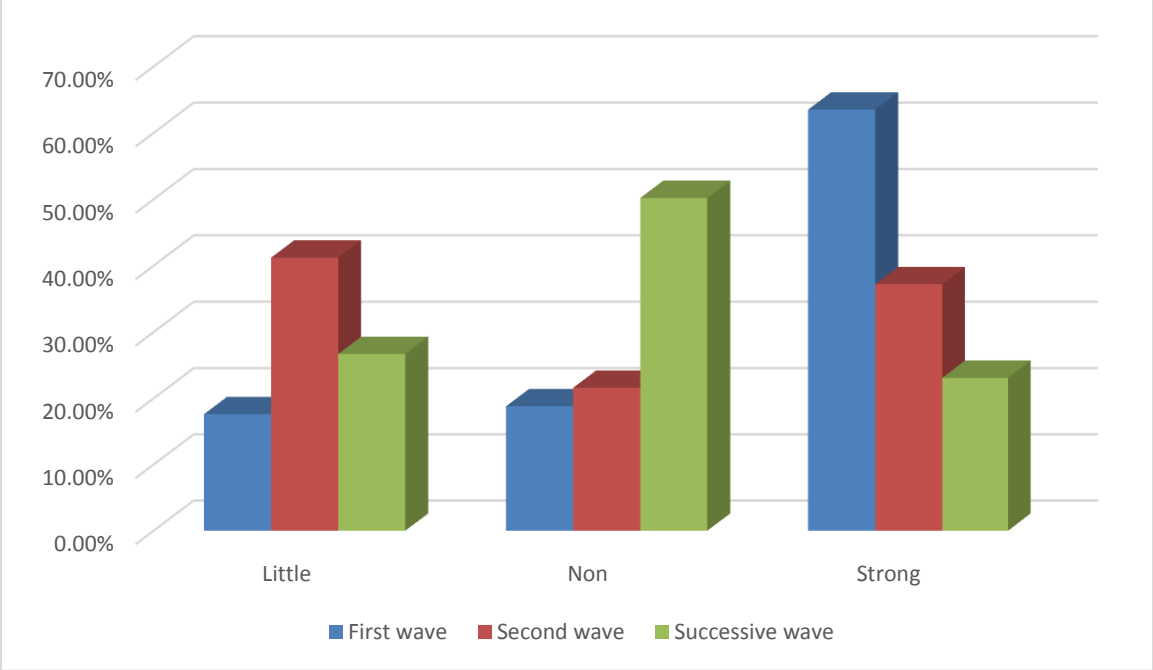

Fig (2): Pandemic-related influence on family/social life.

Table (4):Distribution of the studied cases according to pandemic effect

	Subjects (n = 255)	
Visited the dentist with your child during period march 2020 to December 2021		
No	170	66.7
Yes	85	33.3
If (no), why?		
Didn't have toothache	142	55.7
Fear of infection	55	19.8
If you answered "fear of infection" what was the effect of not visiting		
Declining health	12	4.7
toothache continued	38	14.9
Feel towards doctor protective tools		
Concerned	95	37.3
Relieved	160	62.7
Does your child feel afraid of personal protective equipment		
No	142	55.7
Yes	113	44.3
Do you think protective tools hinder the dentist		
No	166	65.1
Yes	89	34.9

Table (5):Pandemic-related influence on work

	Subjects (n = 360)					
	First wave		Second wave		Successive wave	
	No.	%	No.	%	No.	%
Little	53	14.7	187	51.9	146	40.6
Non	12	3.3	37	10.3	152	42.3
Strong	295	81.9	136	37.8	62	17.2

Table (6):Distribution of the studied cases according to protective tools

	Subjects (n = 360)	
Feeling discomfort or anxiety owing to personal protective equipment		
No	151	41.9
Yes	209	58.1
Do children feel afraid of personal protective equipment		
No	180	50.0
Yes	180	50.0
Does personal protective equipment hinder the dentist's treatment with the child		
No	164	45.6
Yes	196	54.4
Duration of wearing personal protective equipment		
>8 hours	112	31.1
≤8 hours	248	68.9

DISCUSSION

The practice of dentistry involves close contact with patients and using rotary and surgical instruments that create a visible spray containing droplets of water, saliva, blood, microorganisms, and other debris. SARS-CoV-2 transmission during dental procedures may happen through the inhalation of aerosol/droplets from infected individuals or direct contact with mucous membranes, oral fluids, and contaminated instruments and surfaces [(12).]

Dental health personnel are thus at high risk of contagion when performing routine dental procedures, and the dental office may serve as a cross-infection location if adequate precautions are not taken [(13)]. In addition, as individuals with COVID-19 may be asymptomatic for several days, they pose a risk to dental health personnel when seeking dental treatment. The role of dental professionals in preventing the transmission of SARS-CoV-2 is, therefore, critically important [(14).]

This study aimed to an assessment of the psychological effect of the Covid-19 pandemic on dentists, children, and parents, a description of the personal protective equipment effect on the physical and mental health of dentists and children's anxiety toward it, an evaluation of the relationship of these effects on the oral and dental health of children and compare these influences during various waves of Covid-19 pandemic.

These cross-sectional descriptive uses various types of questionnaires and collect the appropriate information. The psychological impact of covid 19pandemic on dentists. This study was applied to three groups:

- **Group** 1: 360 dentists of both genders working in Egypt.
- **Group** 2: 255 Parents who bring their children to the dental clinic.
- **Group** 3: 255 Children who come to dental clinics regularly or irregularly.

In our study, there were 79 (32.9%) whom the pandemic didn't change the repeat of their daily brush, 33 (13.8%) who decreased, and 128 (53.3%) who increased. According to pandemic-related changes in the number of dental visits, there were 233 (97.1%) were affected by the first wave, 217 (90.4%) by the second wave, and 89 (37.1%) by successive.

During the first phase of the COVID-19 pandemic, restricting dental interventions to urgent and emergency cases showed that pediatric dentists must reassess the benefits of treatment and the risks for the patient associated with potential infection. In this context, good cooperation with the parents/guardians of the child about assessing the health condition and the observed symptoms, as well as the measures that can be taken if a visit to the office of the dentist is not essential, as minor issues can be managed at home, makes it

possible for pediatric dentists to effectively diagnose and treat patients through the use of "teledentistry." [15].

The new experience of the COVID-19 pandemic shows how important the roles played by the development of information and communication technology and the ability to remotely solve dental problems that do not require a visit to a dental office are in doctor–patient communication [16].

101 (42.1%) were relieved to see protective tools and 139 (57.9%) were concerned. Among the studied cases, 113 (44.1%) had a history of covid-19 infection, and 143 (55.9%) didn't. According to Pandemic-related restrictions in life, during the first wave, there were 33 (12.9%) who were a little affected, 5 (21.5%) who weren't affected, and 168 (65.6%) who were strongly affected. During the second wave there were 112 (43.8%) who were a little affected, 51 (19.9%) who weren't affected, and 93 (36.3%) who were strongly affected. During successive waves there were 61 (23.8%) who were a little affected, 150 (58.6%) who weren't affected, and 45 (17.6%) who were strongly affected.

During the first wave there were 11 (4.3%) with much less burden, 22 (8.6%) with less burden, 44 (17.2%) with equal burden, 44 (17.2%) with greater burden, and 135 (52.7%) with much greater burden. During the second wave there were 12 (4.7%) with much less burden, 35 (13.7%) with less burden, 64 (25.0%) with equal burden, 85 (33.2%) with greater burden, and 60 (23.4%) with much greater burden. During successive waves there were 23 (9%) with much less burden, 57 (22.3%) with less burden, 82 (32%) with equal burden, 44 (17.2%) with greater burden, and 50 (19.5%) with much greater burden.

The study by Uhlen et al. (2021) [17] investigated the psychological impact of the COVID-19 pandemic among dentists, dental hygienists, and dental assistants about perceived preparedness for dental service and work situation. The findings indicated a substantial psychological burden among dental personnel in terms of fear of being infected and infecting others, regardless of working clinically with patients.

Among the studied cases there were 85 (33.33%) visited the dentist with their child during the period March 2020 to December 2021, there were 142 (55.7%) didn't have a toothache and 55 (19.8%) with fear of infection, there were 12 (4.7%) with declining health and 38 (14.9%) with toothache continued and there were 95 (37.3%) concerned because of protective tools. There were 160 (62.7%) relieved, there were 113 (44.3%) who thinks that their child feel afraid of personal protective equipment and 89 (34.9%) who thinks that protective tools hinder the dentist.

In the Second section, the mean age of the studied subjects was 33.81 (±7.85 SD) with range (24-61) years. Among the studied cases, there were 218 (60.6%) females and 142 (39.4%) males, there were 174 (48.3%) rural residents and 186 (51.7%) urban residents, there were 253 (70.3%) married, 17 (4.7%) divorced and 90 (25%) single, there were 43 (11.9%) smokers, and there were 249 (69.2%) with a postgraduate degree and 111 (30.8%) with a university degree.

Restrictions in life during first wave there were 50 (13.9%) who were a little affected, 24 (6.7%) who weren't affected, and 286 (79.4%) who were strongly affected. During the second wave, there were 183 (50.8%) who were a little affected, 33 (9.2%) who weren't affected, and 144 (40%) who were strongly affected. During successive waves, there were 197 (54.7%) who were a little affected, 123 (34.2%) weren't affected, and 40 (11.1%) who were strongly affected.

Influence on work during the first wave, there were 53 (14.7%) who were a little affected, 12 (3.3%) who weren't affected, and 295 (81.9%) who were strongly affected. During the second wave, there were 187 (51.9%) who were a little affected, 37 (10.3%) who weren't affected, and 136 (37.8%) who were strongly affected. During successive waves, there were 146 (40.6%) were a little affected, 152 (42.3%) weren't affected, and 62 (17.2%) were strongly affected.

During the first wave there were 1 (0.3%) with much less burden, 40 (11.1%) with equal burden, 82 (22.8%) with greater burden, and 237 (65.8%) with much greater burden. During the second wave there were 1 (0.3%) with much less burden, 16 (4.4%) with less burden, 98 (27.2%) with equal burden, 192 (53.3%) with greater burden, and 53 (14.7%) with much greater burden. During successive waves, there were 16 (4.4%) with much less burden, 101 (28.1%) with less burden, 157 (43.6%) with equal burden, 66 (18.3%) with greater burden, and 20 (5.6%) with much greater burden.

Ciardo et al. [18] found that anxiety level has been mild to moderate (PHQ-4 score: 2.4 ± 2.6). 38% of the participants stated subjectively greater emotional burden compared to pre-pandemic.
Recent studies have indicated that the COVID- 19 pandemic has increased the levels of fear and anxiety among the dental workforce [19, 20]

CONCLUSIONS

Influences of covid-19 pandemic on dentists, parents, and children, and its impact on children's oral health, pandemic-related change in the number of dental visits decreased during the COVID-19 pandemic. Our study provided evidence of the widespread decline in oral health status and access to oral health care among children in the United States early during the COVID-19 pandemic.

REFERENCES

1. American Dental Association. ADA Interim Guidance for Management of Emergency and Urgent Dental Care. April 2020. Available at: "https://www.ada.org/~/media/CPS/Files/COVID/ADA_Int_Guidance_ Mgmt_EmergUrg_Dental_COVID19.pdf?utm_source=cpsorg&utm_m edium=cpsalertbar&utm_content=cv-pm-ebd-interimflowchart&utm_campaign=covid-19". It was accessed April 11, 2020.
2. Bizzoca, M.E.; Campisi, G.; Lo Muzio, L. Covid-19 Pandemic: What Changes for Dentists and Oral Medicine Experts? A Narrative Review and Novel Approaches to Infection Containment. Int. J. Environ. Res. Public Health 2020, 17, 3793.
3. Centers for Disease Control and Prevention. Cases in the U.S. Centers for Disease Control and Prevention. Available at: "https://www.cdc.gov/coronavirus/2019-ncov/cases-updates/cases-inus.html". It was accessed May 1, 2020.
4. Centers for Disease Control and Prevention. CDC Guidance for Providing Dental Care During COVID-19. Available at: "https://www.cdc.gov/oralhealth/infection control/statement-COVID.html." Accessed April 30, 2020.
5. Centers for Disease Control and Prevention. Coronavirus Disease 2019 in Children. Available at: "https://www.cdc.gov/mmwr/volumes/69/wr/mm6914e4.htm".Accessed May 1, 2020.
6. Centers for Disease Control and Prevention. How to Protect Yourself and Others. Available at: "https://www.cdc.gov/coronavirus/2019ncov/prevent-getting-sick/prevention.html".Accessed May 1, 2020.telehealth/index.html". It was accessed April 23, 2020.
7. Centers for Disease Control and Prevention. Strategies to Optimize the Supply of PPE and Equipment. Healthcare Professionals. Coronavirus Disease 2019 (COVID-19). Available at: "https://www.cdc.gov/coronavirus/2019-ncov/hcp/ppestrategy/index.html". It was accessed April 13, 2020.
8. Centers for Disease Control and Prevention. Transmission-Based Precautions. Infection Control Basics. Infection Control. Available at: "https://www.cdc.gov/infectioncontrol/basics/transmission-basedprecautions.html#anchor_1564058235". It was accessed April 13, 2020.
9. Coronavirus disease (COVID-19) technical guidance: Infection prevention and control
10. Dahlander, A.; Soares, F.; Grindefjord, M.; Dahllöf, G.: Factors Associated with Dental Fear and Anxiety in Children Aged 7 to 9 Years. Dent. J. 2019, 7, 68.
11. Ing EB, Xu QA, Salimi A, Torun N.: Physician deaths from corona virus (COVID-19) disease. Occup Med (Lond) 2020;70:370–411-Delay phase. [Last accessed on 2020 May 26].
12. Lee YL, Chu D, Chou SY, Hu HY, Huang SJ, Yen YF. Dental care and infection-control procedures during the COVID-19 pandemic: The experience in Taipei City Hospital, Taiwan. J Dent Sci. 2020;15(3):369-72.
13. Chaudhary FA, Ahmad B, Ahmad P, Khalid MD, Butt DQ, Khan SQ. Concerns, perceived impact, and preparedness of oral healthcare workers in their working environment during the COVID-19 pandemic. J Occup Health. 2020;62(1):e12168.

14. Coulthard P. Dentistry and coronavirus (COVID-19) - moral decision-making. Br Dent J. 2020;228(7):503-5.
15. Olszewska A, Paszynska E, Roszak M, Czajka-Jakubowska A. Management of the Oral Health of Children During the COVID-19 Pandemic in Poland. Frontiers in Public Health. 2021;9.
16. Sun P, Lu X, Xu C, Sun W, Pan B. Understanding COVID-19 based on current evidence. J Med Virol. 2020;92(6):548-51.
17. Uhlen MM, Ansteinsson VE, Stangvaltaite-Mouhat L, Korzeniewska L, Skudutyte-Rysstad R, Shabestari M, et al. The psychological impact of the COVID-19 pandemic on dental health personnel in Norway. BMC Health Serv Res. 2021;21(1):420.
18. Ciardo A, Simon MM, Sonnenschein SK, Büsch C, Kim T-S. Impact of the COVID-19 pandemic on oral health and psychosocial factors. Scientific Reports. 2022;12(1):4477. 10.
19. Chaudhary FA, Ahmad B, Ahmad P, Khalid MD, Butt DQ, Khan SQ. Concerns, perceived impact, and preparedness of oral healthcare workers in their working environment during the COVID-19 pandemic. J Occup Health. 2020;62(1):e12168.
20. 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).