ORİJİNAL ARAŞTIRMA ORIGINAL RESEARCH

DOI: 10.5336/dentalsci.2021-83037

Evaluation of the Relationship Between Oral Healthcare and COVID-19 Pandemic: A Cross-Sectional Study

Ağız Sağlığı ile COVID-19 Pandemi İlişkisinin Değerlendirilmesi: Bir Kesitsel Çalışma

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ABSTRACT Objective: The aim of this study was to assess the knowledge and apprehension of patients at Afyonkarahisar Health Sciences University Faculty of Dentistry, about coronavirus disease-2019 (COVID-19). **Material and Methods:** The cross-sectional survey study consisted of 43 questions and three sections. These sections included questions about demographic information and general awareness and the source of awareness, the knowledge level about COVID-19, and apprehensions about dentist appointments and patients' knowledge about infection control. A total of 200 patients, who were randomly selected and agreed to answer the questionnaire, participated in the questionnaire survey. Chi-square analysis was conducted to analyze the statistically significant difference between patients' responses and independent variables such as sex and educational level. Statistical significance was set at $p<0.05$. **Results:** Of the participants, 98% thought that they had knowledge about COVID-19. One hundred thirty six participants (68%) indicated television as the source of information. The majority of the participants (82.5%) had excellent and good knowledge. There was no significant difference between the knowledge level and sex ($p>0.05$). However, a significant difference was found between age, educational status, and knowledge level ($p<0.05$). When concerns about COVID-19 transmission were evaluated, 122 subjects (61%) stated that they took some precautions during their visits to dental clinics. **Conclusion:** Most of the patients had heard of COVID-19 and were aware of infection control measures. However, some patients were worried about undergoing dental treatment due to COVID-19. Further steps should be taken to inform patients about COVID-19 transmission and infection control measures in a dental hospital.

Keywords: COVID-19; pandemic; coronavirus; oral health; dentistry; awareness

ÖZET Amaç: Bu çalışmanın amacı, Afyonkarahisar Sağlık Bilimleri Üniversitesi Diş Hekimliği Fakültesine başvuran hastaların koronavirüs hastalığı-2019 [coronavirus disease-2019 (COVID-19)] hakkındaki bilgi ve anlayışlarını değerlendirmektir. **Gereç ve Yöntemler:** Kesitsel anket çalışması 43 soru ve 3 bölümden oluşmakta idi. Bu bölümlerde; demografik bilgiler, genel farkındalık ve farkındalığın kaynağı, COVID-19 hakkındaki bilgi düzeyi, diş hekimi randevuları endişeleri ve hastaların enfeksiyon kontrolü hakkındaki bilgileri değerlendirildi. Anket çalışmasına rastgele seçilen ve anketi yanıtlamayı kabul eden toplam 200 hasta katıldı. Hastaların cevapları ile cinsiyet ve eğitim seviyesi gibi bağımsız değişkenler arasındaki ilişkiyi istatistiksel olarak analiz etmek için ki-kare analizi uygulandı. İstatistiksel anlamlılık $p<0,05$ olarak belirlendi. **Bulgular:** Katılımcıların %98'i COVID-19 hakkında bilgi sahibi olduğunu düşünmekteydi. Yüz otuz altı (%68) katılımcının bilgi kaynağı olarak televizyonu seçtiği saptandı. Katılımcıların çoğunluğunun (%82,5) mükemmel ve iyi düzeyde bilgiye sahip olduğu görüldü. Bilgi düzeyi ile cinsiyet arasında anlamlı bir fark bulunmazken ($p>0,05$) yaş ve eğitim durumu ile bilgi düzeyi arasında anlamlı bir farklılık bulundu ($p<0,05$). COVID-19 bulaşına ilişkin endişeler değerlendirildiğinde, 122 (%61) katılımcının diş hekimi randevularında bazı kişisel önlemler aldıkları saptandı. **Sonuç:** Hastaların büyük çoğunluğunun COVID-19 hakkında bilgi sahibi olduğu ve enfeksiyon kontrol önlemlerinin farkında olduğu görüldü. Bununla birlikte, bazı katılımcıların COVID-19 nedeniyle diş tedavisi görmekten endişe duyduğu belirlendi. Sonuçlar ışığında, hastalara diş kliniklerinde COVID-19 bulaşı ve enfeksiyon kontrol önlemleri hakkında bilgilendirme yapmak için daha ileri adımlar atılmalıdır.

Anahtar Kelimeler: COVID-19; pandemi; koronavirüs; ağız sağlığı; diş hekimliği; farkındalık

On January 8, 2020, the coronavirus disease-2019 (COVID-19) pathogen, a new coronavirus, was declared by the Chinese Center for Disease Control and Prevention.[1] On January 30, 2019, the World Health Organization declared a global public health emergency in the face of COVID-19, reaching a pan-

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Peer review under responsibility of Turkiye Klinikleri Journal of Dental Sciences.

Received: 12 Mar 2021 ***Received in revised form:*** 08 Jul 2021 ***Accepted:*** 09 Jul 2021 ***Available online:*** 11 Aug 2021

demic state quickly. This disease characterized by flu-like symptoms was originally observed among people in Hubei, Wuhan, a Chinese province.[1,2] The organism responsible for this outbreak is the severe acute respiratory syndrome-coronavirus-2 (SARS-CoV-2) belonging to the Coronaviridae family.[3]

The current observations demonstrate that people of all ages are susceptible to this new infectious disease. However, individuals in close contact with symptomatic and asymptomatic COVID-19 patients, including healthcare workers and other patients at the hospital, are at a higher risk for SARS-CoV-2 infection. In an analysis of 138 patients hospitalized with the diagnosis of COVID-19 in Wuhan in the early phase of the outbreak, 57 patients (41%), including 40 healthcare workers (29%) and 17 patients hospitalized due to other reasons (12%), were infected in the hospital.[4] As of February 14, 2020, a total of 1,716 healthcare workers in China have been infected with SARS-CoV-2, and 3.8% of these patients have been affected at the national level, and 6 patients in this group have died.[5] Dentistry has been reported as one of the occupational groups with a high transmission risk, including 9 COVID-19 cases among 169 dentists.[5]

Meng et al. reported more than 700 cases of emergency dental treatment such as pulpectomy and tooth extraction at Wuhan University in Wuhan, where the first transmission was observed when the pandemic broke out and quarantines began.[5] Apart from invasive procedures, 1,600 teledentistry applications were carried out. However, no information was provided about the dental treatment of COVID-19 patients. There have been previous studies suggesting that COVID-19 could be transmitted airborne through aerosols formed during medical procedures or indirectly through saliva.[6,7] A case of COVID-19 infection was reported early in Germany with transmission through contact with an asymptomatic patient.[8]

In dental treatment, there is a large amount of aerosols and splashes containing saliva, blood, or secretions that typically pose a high risk for virus transmission.[9] In dental clinics where dentists and equipment are in close contact with patients, the possibility of infection from micro-droplets of an infected patient and cross-infection risk are high. While the transmission of COVID-19 by inhalation represents a significant risk due to the scattering of saliva, blood, and secretions during the treatment stages with rotary instruments and handpieces under irrigation in dental practice, it is also possible that these aerosols spread to the environment, dental instruments, and surfaces.[3,5] In terms of direct contact transmission, the oral mucosal cavity is considered a potentially high-risk route for SARS-CoV-2 infection, and contaminated hands can help spread the virus to patients.[10] A case of COVID-19 infection was reported early in Germany with transmission through contact with an asymptomatic patient.[10]

Therefore, dentists, like specialists in many health departments, must take strict precautions. These precautions are patient screening, performing emergency treatments only, restricting aerosol formation as much as possible, wearing personal protective equipment, and applying environmental disinfection. However, since some carriers do not show any symptoms, it has become difficult to control COVID-19 in dental clinics.[11]

Many patients have been informed about COVID-19 through hospital propaganda and training. During the COVID-19 pandemic, people were exposed to too much information, which could lead to confusion. For example, announcements about the risk of contamination during dental appointments were made by many dental associations and administrative regions. It is important to know if there is any misunderstanding among people on this issue. At this point, dentists can play an important role in improving hospital/clinical measures and patient education.

While dentists are among healthcare professionals with the highest risk of transmission, dental patients' level of knowledge and concerns about the COVID-19 pandemic have not been assessed yet.[12] Studies have been previously conducted on the knowledge and attitudes of dental patients about other infections that are spread similarly to severe acute respiratory syndrome and Middle East respiratory syndrome through aerosols and droplets.[13,14] These

studies have revealed that patients are aware of how these infections spread and have significant concerns about receiving dental treatment due to their fear of becoming infected with the pathogen involved. Since there has been very little information in the literature about the knowledge and apprehension of dental patients about COVID-19 during the pandemic period, it has been useful to investigate this issue.

The purpose of this survey study is to analyze the knowledge of patients who applied to Afyonkarahisar University of Health Sciences Faculty of Dentistry about COVID-19 and their concerns about dental appointments.

MATERIAL AND METHODS

The cross-sectional study design stage, validation and pilot study were performed before implementing the questionnaire. A pilot study was conducted to test the validity and reliability of the questionnaire on 40 patients who applied to Afyonkarahisar Health Sciences University Faculty of Dentistry. The questionnaire reliability was confirmed with a statistical value of 0.90 (Cronbach's alpha). This study was approved by the Clinical Research Ethics Committee of Afyonkarahisar University of Health Sciences (No: 2020/258). This study was conducted under the principles of 2008 Helsinki Declaration.

The questionnaire consisted of 43 questions and three sections that we prepared for dentistry patients with modifications and additions to the questions created by Kharma et al. and applied to dentistry students.[15] The first section consisted of three questions about sex, age, and educational level, from which sociodemographic information was collected, and 2 questions showing the general awareness and the source of awareness. In the second section, there were 25 questions evaluating the patients' level of knowledge (definition, symptoms, the assessment of awareness of the source, infection, infection control, incubation period, mode of transmission, the risk of death). Possible responses to the questions about the disease were classified as "yes", "no" and "I don't know". While 1 point was given to a correct answer, 0 (zero) points were given to both wrong answers and "I don't know" answers. The higher the score of a person was, the higher his/her knowledge of the disease was accepted to be. The test results were interpreted as follows: 20-25 points were evaluated as excellent knowledge, 15-19 points as good knowledge, 10-14 points as medium knowledge, 5-9 points as mediocre knowledge, and 0-4 points were evaluated as insufficient knowledge. In the third section, 13 questions (12 closed-ended and one open-ended question) were used to evaluate patients' concerns about dental appointments and their knowledge about infection control in one question. The "yes" or "no" option was given to answer these questions. The patients were divided into four groups according to age: <25, 25-50, 50-65, and >65 as in the questionnaire of Kharma et al. According to the education level, the patients were categorized as illiterate, those with primary school, secondary school, graduate, and postgraduate education.[15]

G*power program was used to determine the number of participants to be included in the study. α (Type I error level) was accepted as 0.05, and the power was determined to be 80%, and accordingly, the total number of participants was n=200. Among the patients who applied to Afyonkarahisar Health Sciences University Faculty of Dentistry, between June 15 and September 1, 2020, 200 patients who were randomly selected and agreed to answer the questionnaire were enrolled in the study. Informed consent was obtained from the patients before applying the questionnaire. A statement with details on the purpose of the study, informing the participants that their participation was optional and offering the right to withdraw at any stage of the study, was added to all questionnaires.

STATISTICAL ANALYSIS

The results were analyzed statistically using SPSS 21.0 (SPSS, Chicago, IL, USA) statistical software. Chi-square analysis was conducted to analyze the statistically significant difference between patients' responses and independent variables such as sex and educational level. Statistical significance was set at the $p<0.05$. Since the knowledge level scores have not normally distributed, nonparametric tests were performed. The Mann-Whitney U test was used for pairwise comparisons.

RESULTS

A total of 200 participants, almost evenly distributed in terms of sex, participated in the study (47.5% consisted of males and 52.5% consisted of females). More than half of the participants (58%) were in the 25-50 age group. The patients' sociodemographic characteristics collected in the first section of the questionnaire are presented in Table 1.

TABLE 1: Socio-demographic characteristics of the participants.

Factors	Number of respondents	% of respondents
Sex		
Female	105	52.5
Male	95	47.5
Age group (years)		
18-25	35	17.5
26-50	116	58
51-65	35	17.5
>65	14	7
Education		
Illiterate	5	2.5
Primary	47	23.5
Secondary	63	31.5
Graduate	64	32
Postgraduate	21	10.5
Total	200	100.0

According to the data collected from the first section of the questionnaire, the participants' information sources are summarized in Table 2. When the relationship between the source of information and sociodemographic characteristics was evaluated, a significant difference was observed between social media and age groups, social media and education level ($p<0.05$). However, no statistical difference was found for other sources ($p>0.05$). Eight (4%) participants reported that they had no information about COVID-19.

TABLE 2: Distribution of information sources by sociodemographic characteristics of the participants (participants could select more than one option).

		Television	Newspaper	Social media	Ministry of tealth	Society	Others
Sex	Female n (%)	67 (63.8%)	16 (15.2%)	38 (36.2%)	66 (62.9%)	19 (18.1%)	1 (1%)
	Male n (%)	69 (72.6%)	23 (24.2%)	34 (35.8%)	43 (45.3%)	15 (15.8%)	0
	p value	0.182	0.110	0.953	0.013	0.665	0.340
Age group	18-25 n (%)	24 (68.6%)	4 (11.4%)	18 (51.4%)	19 (54.3%)	3 (8.6%)	0
	25-50 n (%)	74 (63.8%)	26 (22.4%)	47 (40.5%)	71 (61.2%)	25 (21.6%)	0
	50-65 n (%)	27 (77.1%)	7 (20%)	5 (14.3%)	13 (37.1%)	4 (11.4%)	1 (2.9%)
	>65 n (%)	11 (78.6%)	2 (14.3%)	2 (14.3%)	6 (42.9%)	2 (14.3%)	
	p value	0.390	0.507	0.002*	0.068	0.230	0.192
Education	Illiterate n (%)	3 (60%)	1 (20%)	0	2 (40%)	0	0
	Primary n (%)	34 (72.3%)	5 (10.6%)	5 (10.6%)	19 (40.4%)	7 (14.9%)	0
	Secondary n (%)	43 (68.3%)	13 (20.6%)	24 (38.1%)	30 (47.6%)	13 (20.6%)	0
	Graduate n (%)	43 (67.2%)	14 (21.9%)	34 (53.1%)	41 (64.1%)	11 (17.2%)	1 (1.6%)
	Postgraduate n (%)	13 (61.9%)	6 (28.6%)	9 (42.9%)	17 (81.0%)	3 (14.3%)	0
	p value	0.920	0.443	<0.001*	0.008	0.759	0.711

*Statistically significant ($p<0.05$).

According to the results obtained in the second section of the questionnaire, when the participants' knowledge level about coronavirus disease was evaluated, it was observed that most of the respondents (87 individuals, 43.5%) had excellent knowledge, and a significant part (78 individuals, 39%) had good knowledge. They were followed by the participants with the medium level of knowledge with 12.5%, mediocre level of knowledge with 4%, and insufficient level of knowledge with 1%.

There was no significant difference in the amount of knowledge between female and male individuals ($p>0.05$). However, a significant difference was found between age, educational level, and the level of knowledge ($p<0.05$) (Table 3).

TABLE 3: Distribution of the participants' knowledge levels by socio-demographic characteristics.

	Main	SD	p value
Sex			
Female	17.73	4.766	0.486
Male	18.47	3.695	
Age group (years)			
18-25	17.54	3.883	0.001*
26-50	18.99	4.049	
51-65	16.69	4.114	
>65	15.43	5.734	
Education			
Illiterate	14.4	7.981	<0.001*
Primary	16.04	4.734	
Secondary	17.27	3.734	
Graduate	19.53	3.455	
Postgraduate	21.48	1.99	

*Statistically significant ($p<0.05$); SD: Standard deviation.

In the third section of the questionnaire evaluating concerns about COVID-19 transmission during dentist appointments, when the participants were asked if they took any additional precautions during their visits to dental clinics, 122 individuals (61%) stated that they took some precautions. No significant difference was observed in the answers according to age, educational level, and sex ($p>0.05$).

DISCUSSION

Cross-sectional studies have been conducted with dentistry students and dentists on previous infectious diseases and epidemics and the recent COVID-19 pandemic.[15-17] Dentists and dentistry students are better prepared for the fight against the pandemic due to their high medical knowledge and easy access to up-to-date information. Therefore, questionnaires have started to focus on patients.[18] This study also examined different levels of knowledge about COVID-19 (etiology, symptoms, and protection) among patients who applied to Afyonkarahisar Health Sciences University Faculty of Dentistry, and showed that the awareness of COVID-19 was excellent/good/medium/mediocre/insufficient. These results are important since the questionnaire covered different population types, the respondents participated in the study voluntarily, and the results were highly reliable.

The vast majority (86.5%) of the participants thought that COVID-19 was a viral infection. Most of the respondents were aware that the disease was contagious (92%) and could lead to death (82%). The respondents were aware of the fact that the disease could be transmitted by airway (79%) or by contact with eyes, nose, and mouth (93.5%) after touching infected surfaces. Of the participants, 91% were informed that it could be transmitted from an infected person to a healthy person.

Concerning symptoms, the vast majority (83.5%) of the respondents agreed that a person with COVID-19 infection could develop upper respiratory symptoms. When the lower respiratory tract symptoms were questioned, this rate decreased to 62%. While 91.5% of the participants were aware of the symptoms of fever and muscle pain, 54% knew that digestive and excretory system symptoms could develop. The vast majority of the participants (59.5%) did not have any knowledge about central nervous system symptoms.

Most of the participants (79%) thought that preventive measures were needed and stated that they were aware of hand washing and the use of alcoholic hand disinfectants (87%), the use of masks in social areas (95.5%), and social distancing (95%). While 68% of the participants knew that there had not been a vaccine developed yet, 75.5% were aware that good general health would affect the course of the disease and smoking (84.5%) affected the course. The world

will have to deal with the COVID-19 pandemic without an effective treatment or vaccine available yet. New developments will be tested, improved, and adapted.[19]

When the participants were asked an open-ended question about whether they took an additional precaution during their visit to dental clinics, the participants who answered positively were asked to indicate what kind of precaution they took (Appendix 1). Seventy-eight (39%) answers to this question, to which the participants could give more than one answer, were using masks, 52 (26%) answers were having a disinfectant-cologne, 16 (8%) were using a face shield, and 19 (9.5%) answers were paying attention to the social distance in waiting rooms.

The following precautions are recommended: the screening of patients who apply to the dentist with signs and symptoms of infection and the measurement of fever before performing any procedure, making use of mouthwashes containing 1% hydrogen peroxide or 0.2% povidone to reduce the microbial load of saliva with a potential risk of carrying SARS-CoV-2 before a procedure, the use of 0.2% chlorhexidine gluconate mouthwash before the procedure and reducing the microflora in aerosols when applying treatment with ultrasonic devices.[3,20] When the patients were asked about the use of oral antiseptics in routine oral care, 80 (40%) stated that they used them. When they were asked whether it was necessary to rinse the mouth with an oral antiseptic before undergoing an examination in dental clinics, 169 (84.5%) patients answered "yes".

During the pandemic, healthcare workers are recommended to protect the oral, nasal, and eye mucosa by strictly applying personal protective methods using N95 masks, gloves, goggles, visors, and protective gowns.[3,5,21] In a survey conducted during the SARS epidemic, approximately 68% of the participants stated that they were not afraid of the risk of contact with the SARS virus and dental treatments in dental clinics.[13] Likewise, in the questionnaire survey conducted by Sun et al. during the COVID-19 outbreak, 81.08% of the parents of pediatric patients were confident that their children would go to dental clinics and be treated after being informed about preventive measures.[22] It can be said that patients' con-

APPENDIX 1: Questionnaire design.

A. Socio-demographic
1. Sex: Female Male
2. Age: <25 25-50 50-65 >65
3. Education: Illiterate Primary
Secondary Graduate Postgraduate
4. Do you have any information about COVID-19?
Yes No
5. Where did you get this information?
Television Newspaper Social media I have no idea
Ministry of Health Community Other: _____
B. Knowledge level
1. Do you think COVID-19 is caused by a virus?
Yes No I don't know
2. COVID-19 is an infectious and death-causing disease?
Yes No I don't know
3. Do you have information about the incubation period of the disease?
1-14 days
Three weeks
1-2 months
I do not know
4. Can the disease be transmitted by air?
Yes No I don't know
5. Can the disease be transmitted by contact with the mouth, face and eye area after touching surfaces that are infected with the virus?
Yes No I don't know
6. Can the disease be transmitted by pets?
Yes No I don't know
7. Can the disease be transmitted to healthy people by infected people?
Yes No I don't know
9. Does the disease have upper respiratory tract symptoms?
Yes No I don't know
10. Does the disease have lower respiratory tract symptoms?
Yes No I don't know
11. Does the disease have symptoms such as high fever and muscle pain?
Yes No I don't know
12. Does the disease have digestive and excretory system symptoms?
Yes No I don't know
13. Does the disease have central nervous system symptoms?
Yes No I don't know
14. Can washing hands with alcoholic hand sanitizer contribute to preventing the disease?
Yes No I don't know
15. Can using masks contribute to preventing the disease?
Yes No I don't know
16. Can a good general health status contribute to disease prevention?
Yes No I don't know
17. Can maintaining social distance contribute to preventing the disease?
Yes No I don't know
18. Can vaccination prevent disease?
Yes No I don't know
19. Do you think there is no need for any preventive measures?
Yes No I don't know
20. Is supportive treatment at home a treatment measure for this disease?
Yes. No I don't know
21. Is hospital treatment a measure for this disease?
Yes No I don't know
22. Is intensive care a measure of the treatment for this disease?
Yes No I don't know
23. Is there a treatment for the disease with a specific drug?
Yes No I don't know
24. Do you have any information about it as it is contagious and can have a lethal effect (mortality rates)?
Yes No I don't know
25. Does smoking affect the course of the disease?
Yes No I don't know

APPENDIX 1: Questionnaire design *(devamı)*

C. Concern About Dentist Appointments

1. Do you think the coronavirus can be found in saliva?
Yes No
2. Do you hesitate to be in dental clinics due to the risk of coronavirus transmission?
Yes No
3. Do you think that being in dental clinics can increase the risk of contamination?
Yes No
4. Do you think that frequent appointments in dentistry clinics may increase the risk of contamination?
Yes No
5. Do you think that the intervals of appointments between patients in dentistry clinics should be extended?
Yes No
6. Do you take any additional precautions while coming to dentistry clinics?
Yes No
If yes, please specify: _____
7. Do you use oral antiseptics in your routine oral and dental health care?
Yes No
8. Do you think it is necessary to rinse the mouth with antiseptic before the examination in dentists?
Yes No
9. Should dentists, dental assistants and nurses wear protective glasses, high-protection masks and bonnets in every procedure?
Yes No
10. Do you think patients should wear protective glasses during the procedure?
Yes No
11. Should the dentist change the dental assistant and nurse mask in every patient?
Yes No
12. Should the dentist change the dental assistant and nurse bonnet in every patient?
Yes No
13. Should dentist, dental assistant and nurse change protective glasses in every patient?
Yes No

fidence in dental appointments increased in line with the preventive measures in dental clinics. In the present study, when the patients were asked whether the dentist, dental assistant, and nurse should wear protective goggles, high-protection masks, and bonnets in every procedure, 194 patients (96%) answered "yes." When the patients were asked whether protective goggles should be worn during the procedure, this rate decreased to 70%. In the question about changing the protective equipment of the physician and clinical staff during each patient's visit, 173 patients (86.5%) answered that a high protection mask, 135 patients (67.5%) a bonnet, and 132 patients (66%) said that protective goggles should be changed during each patient's visit. Although the participants' knowledge of preventive measures was satisfactory, patients should be further encouraged to take preventive measures to avoid CoV infection.

Contamination with blood and saliva is inevitable due to the use of dental instruments and devices in dental treatment. According to the data obtained by Liu et al. salivary gland epithelial cells could potentially become infected with SARS-CoV-2, and saliva could become a major source of the virus. Furthermore, the risk of spreading the virus in dental clinics is very high due to prolonged close contact in dental treatment.[23,24] There is a potential risk of transmission in the dental office due to aerosols' generation during certain dental procedures.[14] A study investigating the knowledge and attitudes of parents of pediatric dental patients against the COVID-19 pandemic showed that 91.8% of parents believed their children could be infected with coronavirus during dental treatment.[20] Most of the parents in the same study confirmed that this infection was transmitted by aerosols and droplets formed during dental treatment. In this study, 187 (93.6%) of 200 patients thought that the CoV could be present in saliva, while 160 (80%) of the patients stated that they avoided being in dental clinics during this period. At the same time, 168 (84%) patients thought that being in dental clinics and having short appointment intervals increased the risk of transmission, and 154 (77%) patients thought that appointment intervals should be increased. It can be said that the participants are aware of the potential risk in the dental clinics.

Recent studies have shown that patients in the incubation period are asymptomatic and ensure the disease transmission by carrying the virus.[25] More than 80% of the participants had sufficient knowledge about the correct incubation period of the disease. This information is important since it contributes to early healthcare service provision. Therefore, periodic educational interviews with experts to show the clinical picture and level of the disease will help control the disease.

The results of this questionnaire showed that there was a significant difference in knowledge levels about COVID-19 in terms of age and educational level. However, there was no significant difference in the participants' knowledge levels of COVID-19 regarding sex. The results of the studies conducted by Alqahtani and Aldawsari and Al-Abdullah et al. were similar, and the knowledge level of COVID-19

was found to be significantly higher, especially among young people.[26,27] This result may be related with young people's having increased their levels of knowledge about COVID-19 through social media. In this study, social media was shown as a source of information at a significantly higher rate in the 18-25 age group compared to other age groups.

A previous study conducted in Hong Kong during the SARS epidemic stated that approximately 80% of the participants gained knowledge about the disease by listening to and watching the news.[13] In this study, the results showed that television, followed by the Ministry of Health, was the source providing the most information about COVID-19. Since television is the most common source of information among the participants in the study, it can be recommended to determine the information quality of the broadcasts on television and to transfer up-to-date information to patients by specialist doctors/dentists. This result indicated the necessity of increasing the education of the public with newspapers and social media. Despite the high number of people with excellent knowledge of COVID-19 in our study, there is still a need for providing more education to patients who apply to a dental clinic and improving public education on infection control so that everyone can have an excellent level of knowledge.

Sufficient knowledge about the clinical picture of COVID-19 is important and necessary to save lives. The COVID-19 outbreaks in some cities and the increase in the number of people affected remind us that we need to obtain basic information on infection control, which is the main principle of protection from COVID-19. All relevant circles continue to make significant efforts to educate the general public about COVID-19 and protect them. These efforts must be pursued with full vigor. It is hoped that this study will provide useful information for designing programs to increase knowledge about COVID-19 among dental patients.

The main limitation of this study is that most of the questions were about the awareness and concerns of dental patients about COVID-19, and there were fewer questions about the clinical aspect of COVID-19.

CONCLUSION

According to the results of this study, it can be concluded that most dental patients know about COVID-19. While 80% of the patients were worried about undergoing dental treatment due to COVID-19, most of them were aware of the infection control measures to be followed by dentists. COVID-19 is a new formation, and research is conducted to understand the pathology and transmission of the disease.

Younger and well-educated participants were found to have higher knowledge levels. People over the age of 50 and with a low level of education may need to be informed about the COVID-19 pandemic. Further steps should be taken to inform patients about COVID-19 transmission and infection control measures in a dental clinics.

Source of Finance

During this study, no financial or spiritual support was received neither from any pharmaceutical company that has a direct connection with the research subject, nor from a company that provides or produces medical instruments and materials which may negatively affect the evaluation process of this study.

Conflict of Interest

No conflicts of interest between the authors and / or family members of the scientific and medical committee members or members of the potential conflicts of interest, counseling, expertise, working conditions, share holding and similar situations in any firm.

Authorship Contributions

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