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What Did We Learn About The Covid-19 Pandemic? Covid-19 Pandemisinden Neler Öğrendik?

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ABSTRACT

Objectives: This cross-sectional study aimed to assess the perception of COVID-19 and the awareness of necessary precautionary measures, including knowledge of symptoms, modes of transmission, preventive strategies, and methods of obtaining accurate, up-to-date information about these topics among Turkish dental staff.

Materials and Methods: An online survey consisting of 41 questions was conducted via Google Forms® from November 2, 2022, to January 10, 2023, targeting Turkish dental staff. The responses were entered into and analysed using SPSS version 22. The Chi-square test was applied, with a significance level set at $p<0.05$.

Results: A total of 448 dental workers participated, including 239 (53.3%) dentists and 209 (46.7%) auxiliary dental staff. Participants were asked about various precautionary measures against COVID-19, with the majority providing correct answers. However, only 31.5% of participants correctly identified the proper sequence for wearing Personal Protective Equipment (PPE) according to Centres for Disease Control and Prevention (CDC) guidelines, while 60.3% accurately described the sequence for removal. Among both professional and auxiliary staff, N95/FFP2 masks were considered the most protective, with 75.7% and 78.9% selecting them, respectively.

Conclusion: Dentists mainly reported gaining knowledge about COVID-19 through formal training provided by their institutions, whereas auxiliary staff tended to rely more on information from social media. In general, participants showed a good understanding of the required preventive measures. However, there is a need for more accurate and current institutional training to fill the gaps in knowledge regarding specific protocols.

Keywords: *Behavioral sciences, Dental staff, Educational measurement, Global health, Training support.*

ÖZET

Amaç: Bu kesitsel çalışmanın amacı, Türk diş hekimliği personeli arasında COVID-19 algısını ve COVID-19'a karşı gerekli önleyici tedbirlere ilişkin farkındalığı, semptomlara ilişkin bilgiyi, bulaşma yollarını, önleyici tedbirleri ve güncel doğru bilgi edinme yöntemini incelemektir.

Gereç ve Yöntemler: Google Forms Inc® üzerinden çevrimiçi bir anket (41 soru) yapıldı. Anket, 2 Kasım 2022 ile 10 Ocak 2023 tarihleri arasında Türk diş hekimliği personeli arasında gerçekleştirildi. Elde edilen yanıtlar SPSS 22 sürümüne girilerek ve analiz edilmiştir. Ki-kare testi uygulanarak $p<0,05$ olarak elde edilmiştir.

Bulgular: Çalışmamıza 239'u (%53,3) diş hekimi, 209'u (%46,7) diş hekimliği yardımcı personeli olmak üzere toplam 448 diş hekimliği personeli katılmıştır. Katılımcılara COVID-19'a karşı alınması gereken bazı önlemler sorulmuştur ve çoğunluğu doğru yanıtlar vermiştir. Ancak, Hastalık Kontrol ve Önleme Merkezi (CDC) yönergelerine göre Kişisel Koruyucu Ekipmanın (KKD) doğru takılma sırasını katılımcıların yalnızca %31,5'I doğru olarak bilirken, %60,3'ü çıkarma sırasını doğru bir şekilde bilmiştir. Diş hekimleri ve diş hekimliği yardımcı personeli arasında sırasıyla %75,7 ve %78,9 oranında N95/FFP2 maskenin en iyi koruyucu maske olduğu düşünülmüştür.

Sonuç: Diş hekimleri, COVID-19 hakkında çoğunlukla kurumsal eğitimlerden bilgi edindiklerini belirtirken, diş hekimliği yardımcı personeli bilgilerini genellikle sosyal medya üzerinden aldıklarını ifade etmiştir. Katılımcılar, COVID-19'a karşı alınması gereken önleyici tedbirler konusunda yeterli bir farkındalığa sahip olduklarını göstermiştir. Ancak, bazı protokollerdeki bilgi eksikliklerinin giderilmesi için kurumsal eğitimlerde daha doğru ve güncel bilgiler verilmesi gerektiği vurgulanmıştır.

Anahtar Kelimeler: *Davranış bilimleri, Diş hekimliği personeli, Eğitimsel ölçüm, Küresel sağlık, Alıştırma desteği.*

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Introduction

The dangerous and deadly disease known as the 2019 novel coronavirus (COVID-19), or severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), which emerged in December 2019 in Wuhan, China, has caused widespread confirmed cases worldwide and triggered a pandemic that has resulted in an international public health disaster.[1-3] This pandemic rapidly became a significant and challenging public health issue for countries around the world.3 On January 30, 2020, the World Health Organization (WHO) declared the outbreak a public health emergency of international concern, and on March 11, 2020, it officially declared the disease a pandemic.[4]

In dental hospitals, healthcare practitioners were considered to be at an elevated risk of cross-infection compared to other hospital staff and patients.[5] As a result, strict infection prevention measures for dental clinics and healthcare facilities in areas affected by COVID-19 were implemented to prevent cross-infection.[6] The goal was to control the spread of COVID-19 through guidelines set by international organizations such as the Centers for Disease Control and Prevention (CDC)[7] and the WHO.[8] Similar to other cross-infections, these guidelines include the use of personal protective equipment, hand hygiene, clinical disinfection, cleaning of contact surfaces, and thorough patient evaluation upon entering the clinic. Studies have emphasized that the transmission route of COVID-19 primarily occurs through aerosol particles in the air, making healthcare workers and hospital personnel particularly vulnerable to the virus.[9]

In this context, it is crucial for healthcare personnel working in dental hospitals to be well-informed about the infection control measures and to adhere to these protocols to control the transmission of the virus during the COVID-19 pandemic.[8,10]

The aim of this survey study was to assess the awareness of dentists and auxiliary dental staff—who have direct patient contact—regarding the precautions necessary to mitigate the risk of COVID-19 transmission. The null hypothesis posits that dentists have a greater awareness of precautions against virus transmission compared to auxiliary staff.

Materials and Methods

Ethical approval was obtained from the Ethical Committee of Yeni Yuzyil University (2021/01-563). The survey used for data collection in the present article, which evaluates the knowledge of the precautionary measures required to prevent the transmission of COVID-19 for the actively working dentists and dental staff working face to face with patients in the dental hospital, is composed of a total of 41 questions. Survey questions were prepared by conducting a systematic literature review on the clinical features, transmission routes and treatment methods of COVID-19 in online databases. In the first three questions in the first part of the questionnaire, demographic information including age, gender and educational level of the participants is questioned. The remaining 38 questions in our survey question the participants' information, attitude, and anxiety about COVID-19 and its means of transmission, and the practices they have taken to take precautions in this regard.

Table 1. Study groups used in the study

Group		n	Total n	Total %
Professional Dental Staff (Dentists)	Graduated	158	239	53.3
	Undergraduated	85		
Auxiliary Dental Staff (Dental Assistant, Dental Technician)	Graduated	104	209	46.7
	Undergraduated	105		

Survey participants were determined as professional dental staff and auxiliary dental staff. A percentage of 62.3 of the respondents were female and 37.7% were male. 58.7% of the participants were between 18-25, 24.3% were between 25-35, 10.7% were between 35-45, and 5.3% were over 45 years old. While 46.7% of the participants were composed of auxiliary dental staff, 53.3% were professional dental staff. A percentage of 23.5 of the participants consisted of undergraduate auxiliary dental staff, 23.2% were graduated auxiliary dental staff working in their field. While 16.1% of the participants were undergraduates of the faculty of dentistry, 37.3% consisted of graduated dentists. Both groups were divided into two subgroups as shown in Table 1. This survey study was conducted online between 02 November 2022 and 10 January 2023 via a link sent to the participants. Attention was paid to the fact that the participants in the survey were from various cities of Turkey. The answers to our questionnaire were collected by the transmission of data in online databases.

Statistical analysis

While evaluating the data gathered in the study, IBM SPSS Statistics Version 22.0 (IBM SPSS, Turkey) program was employed for statistical analysis. The study data were assessed using Chi-Square test was used to compare qualitative variables, alongside descriptive statistical methods (mean, standard deviation, frequency). Statistical significance was determined at the $p<0.05$ level. In addition, as a result of the pilot study, the reliability study of the questionnaire was executed, and the Cronbach alpha value was found to be 0.862. Thus, it has been observed that the study method is reliable.

Results

It has been observed that the rate of those who think that the main transmission route of Covid-19 is by droplet route ($p=0.001$) and sneezing ($p=0.005$) is statistically higher in the professional group than the auxiliary dental staff. It has been seen that both professional and auxiliary dental staff groups feel under high risk for COVID-19, however the rate of concern was found to be higher in the professional groups. Details about surface disinfection method preferences according to each group to be used after every dental patient are given in Table 2.

Table 2. Preferred effective disinfection method for the Coronavirus in the Auxiliary and Professional Dental Staff groups

	Auxiliary Dental Staff		Professional Dental Staff		Total		
	n	%	n	%	n	%	p
Using alcohol-based disinfectants	99	47.4%	100	41.8%	199	44.4%	0.049
No idea	12	5.7%	5	2.1%	17	3.8%	
None of them	0	0.0%	3	1.3%	3	0.7%	
Washing with soap	57	27.3%	68	28.5%	125	27.9%	
Disinfection with solutions containing sodium hypochlorite	41	19.6%	63	26.4%	104	23.2%	

All groups agreed that the combination of N95 + surgical mask + goggles + face shield + gloves was more effective against contamination of COVID-19. For patients exhibiting COVID-19 symptoms, most participants from both professional and auxiliary dental staff preferred to request a COVID-19 test and initiate treatment 14 days after receiving a negative result. Auxiliary dental staff were more confident than professional staff in the effectiveness of precautions taken to prevent cross-infection between treatment rooms and the laboratory in their institution (Table 3). Both auxiliary and professional dental staff believe that the

3-ply surgical mask is not enough for dental procedures while N95/FFP2 is more reliable. On the other hand, although the N99/FFP3 mask was another option in the same question, only a small percentage in both professional (36%) and auxiliary (24.4%) dental staff preferred this option (Table 4). The correct order for putting on and removing personal protective garments is given in Table 5 and 6 respectively.

Table 3. Effectiveness of precautions taken to prevent cross-infections according to Auxiliary and Professional Dental Staff

	Auxiliary Dental Staff		Professional Dental Staff		Total		
	n	%	n	%	n	%	p
Definitely disagree	5	2.4%	13	5.4%	18	4.0%	0.007
Agree	10	4.8%	33	13.8%	43	9.6%	
Not sure	58	27.8%	57	23.8%	115	25.7%	
Agree	99	47.4%	103	43.1%	202	45.1%	
Definitely agree	37	17.7%	33	13.8%	70	15.6%	

Table 4. Most effective mask according to Auxiliary and Professional Dental Staff

	Auxiliary Dental Staff				Professional Dental Staff				
	No		Yes		No		Yes		
	n	%	n	%	n	%	n	%	p
N95 / FFP2	44	21.1%	165	78.9%	58	24.3%	181	75.7%	0.418
N99 / FFP3	158	75.6%	51	24.4%	153	64.0%	86	36.0%	0.008
Surgical Mask	187	89.5%	22	10.5%	227	95.0%	12	5.0%	0.044
Medical Mask	204	97.6%	5	2.4%	237	99.2%	2	0.8%	0.259
Cloth/Fabric Mask	208	99.5%	1	0.5%	236	98.7%	3	1.3%	0.627

Auxiliary dental staff believe that the strategies employed by the institution are sufficient to protect the professional and auxiliary dental staff, patients and institutional personnel (secretary/cleaning staff/security personnel), from COVID-19. However, the professional dental staff agreed only that themselves and their patients were adequately protected while they felt undecided about whether the institutional personnel, auxiliary dental staff were adequately protected. The data from this study demonstrated that dental professionals get information about COVID-19 from the institutional training courses while auxiliary dental staff prefer information social media.

Table 5. Correct order of wearing personel prootective equipment according to Auxiliary and Professional Dental Staff

	Auxiliary Dental Staff		Professional Dental Staff		Total		
	n	%	n	%	n	%	p
Gloves - Gown - Mask - Goggles/Face Shield	51	24.4%	43	18.0%	94	21.0%	0.370
Mask - Goggles/Face Shield - Gloves - Gown	27	12.9%	30	12.6%	57	12.7%	
Mask - Gown - Goggles/Face Shield - Gloves	67	32.1%	89	37.2%	156	34.8%	
Gown - Mask – Goggles/Face Shields - Gloves	64	30.6%	77	32.2%	141	31.5%	

Table 6. Correct order of removing personel protective equipment according to Auxiliary and Professional Dental Staff

	Auxiliary Dental Staff		Professional Dental Staff		Total		
	n	%	n	%	n	%	p
Gloves-Goggles/Face Shield-Gown-Mask	123	58.9%	147	61.5%	270	60.3%	0.023
Goggles/Face Shield-Gown-Mask-Gloves	27	12.9%	48	20.1%	75	16.7%	
Mask-Goggles/FaceShield-Gloves-Gown	21	10.0%	11	4.6%	32	7.1%	
Gown-Goggles/Face Shield-Mask-Gloves	38	18.2%	33	13.8%	71	15.8%	

Discussion

COVID-19 marks the first pandemic in history where technology and social media have been extensively utilized to ensure public safety and disseminate information. However, this widespread use has also contributed to the escalation of an infodemic. WHO refers to an infodemic as an excessive volume of information, which includes intentional efforts to spread misinformation that undermines public health responses.[11,12]

In the present study, 77.2% of the dental staff who participated in the survey reported that N95/FFP2 masks should be preferred for the use of masks related to COVID-19 precautions, while only 30.6% thought that N99/FFP3 masks should be preferred. It has been observed that a big percentage of the dental staff prefer to use N95 masks instead of N99 masks. However, as it is known, N99/FFP3 masks provide approximately 99% protection in terms of viral protection, while this rate is only around 95% for N95/FFP2 masks.[13] Although the 99% and 95% protection rates against COVID-19 are both high and similar, many people, including dental staff, believe that N95/FFP2 masks offer better protection due to a lack of information and unclear guidelines. This may be because the Ministry of Health's guidelines, as well as information in social media and the press, mainly mention N95 masks. As a result, dental staff may not have enough knowledge about N99 masks, especially if this information is not included in some institutional training programs. Although they provide a percentage of less protection than N99/FFP3 masks, the superiority of N95/FFP2 masks over surgical and fabric masks should not be overlooked. In a previous study it has been indicated that N95 masks had maximum efficacy, especially when used continuously[14]. According to the survey results, 7.6% of participants preferred surgical masks for professional dentistry approaches, while only 0.9% chose fabric masks. Almost all dental staff are aware that surgical and fabric masks provide less protection than N95 masks. According to the statements published by the CDC[15], the order of wearing personal protective equipment is specified as: Gown-Mask-Glasses/Face Shield-Gloves. In the present survey study, the results emphasized that 37.2% of

the professional dental staff and 32.1% of the auxiliary dental staff believe that the correct order of removal of protective equipment was Mask-Gown-Goggles/Face Shield-Gloves. However, the rate of knowing the correct order of wearing the protective equipment (Gown-Mask-Glasses/Face Shield-Gloves) was observed as only 32.2% in the professional dental staff group and 30.6% in the auxiliary dental staff group. Although the results are similar, both professional and auxiliary dental staff were found to lack accurate knowledge of the correct order for wearing personal protective equipment. This may be due to a misunderstanding, as masks have become a routine part of daily life, leading to less attention to proper usage. Again, according to the declarations published by CDC[15], the order of removing personal protective equipment is specified as Gloves-Goggles/Face Shield-Gown-Mask. As demonstrated by the current study, 61.5% of the professional dental staff and 58.9% of the auxiliary dental staff answered the question about the sequence of removal of the protective garments correctly. However, about 40% of both professional and auxiliary dental staff do not know the correct sequence for removing personal protective equipment. The findings suggest that the removal sequence is better understood than the wearing sequence. Although dental staff may sometimes overlook these procedures, following the correct order for putting on and taking off protective equipment plays a crucial role in preventing both direct and cross-contamination of COVID-19. For this reason, knowing the order of wearing and removing this equipment is a matter to be considered in the fight against COVID-19 infection. It is believed that healthcare professionals should receive more training and information on this topic. A previous study by Zaheer et al.[16] found that only 18.6% of healthcare professionals knew the correct order for wearing personal protective equipment, whereas this rate was 31.5% in the present study. This suggests that dental staff in Turkey follow the correct procedures for wearing personal protective equipment more accurately than healthcare professionals in Pakistan.[16] However, the present study was completed in January 2022, approximately 21 months later than the study of Zaheer et al. For this reason, higher results may have been obtained compared to the study of Zaheer et al, perhaps due to the increased knowledge of health personnel about the pandemic and the increased frequency of personal protective equipment use. In the same study by Zaheer et al, the correct application rate of personal protective equipment removal procedures was determined as 59%.[16] In the present study, a similar rate was found (60.3%). Surface contamination with the virus has been linked to the transmission of infection. Dental professionals, particularly those performing aerosol-generating procedures, are at high risk of exposure, and these procedures should be avoided whenever possible. For essential procedures, appropriate protective attire must be worn, high-volume evacuation suction and dental dams should be used, and thorough disinfection should follow.[17] Surface decontamination can be achieved with 0.1% sodium hypochlorite or 62%-71% ethanol for one minute.[17] The results of the current questionnaire showed that approximately 81.9% of respondents agreed that dental dams should be used during procedures. Additionally, participants agreed that disinfection after each patient should be performed using alcohol-based disinfectants (44.4%) or sodium hypochlorite solutions (23.2%).

In a survey study conducted by Quadri et al. and published in May 2020, it was found that 90.1% of respondents recognized sneezing as a symptom of COVID-19.[18] This supports the findings of our study, where 84.2% of participants identified sneezing as a sign of COVID-19. Findings of a previous survey study conducted by Khader et al.[5] on dentists, as the response to the question of what the symptoms of COVID-19 are, being fever (98.6%), cough (91.0%), shortness of breath (85.9%), were similar to the finding of the present study as fever (% 98) and cough (93.1%), etc. These rates are almost identical to the findings of the present study. In the same study by Khader et al. [5], coughing (90.5%) and hand contact (85.6%) were identified as the most common transmission routes of COVID-19, which aligns with the findings of the present study. Therefore, it can be concluded that certain COVID-19 symptoms are universally recognized due to the

increased awareness brought by the pandemic. In accordance with the collected data of the present study it can be advocated that dental staff generally seem to have sufficient knowledge about COVID-19 symptoms and transmission routes. While it is noticeable that there is no deficiency in general-valid information, it has been determined that there are deficiencies in some clinical applications.

Based on the results of this study, it can be inferred that nearly half of the dental staff believe that the precautions taken in Turkey are not the same as those in other parts of the world. They also feel that adequate measures have not been implemented to protect dentists, auxiliary dental staff, hospital staff, and patients, leading to fear and uncertainty about the pandemic.

Results of the present research demonstrated that the auxiliary dental staff mainly benefit from social media to obtain insights into COVID-19. This could serve as the reason for auxiliary dental staff to have adequate knowledge about the mode of transmission of COVID-19 but not all the preventive measures. Being dependent on social media may end up with incorrect or misleading information about COVID-19.[19] This is observed to cause more confidence in the auxiliary dental staff when compared to the professional dental staff. The higher confidence level and believe that they are protected against the virus in the auxiliary dental staff can be a result of deficient knowledge. Less to know is causing less stress in this case. This result is controversy to the result of a previous study in which it has been concluded that erroneous and deceptive information, coupled with a lack of knowledge, can contribute to increased anxiety and resistance to implemented measures.[19]
Prior investigations carried out in both the general population and among healthcare professionals have demonstrated that higher levels of training and work experience are correlated with increased knowledge of COVID-19.[20, 21] These observations may provide insight into our findings, as professional dental staff indicated that they obtained their knowledge through institutional training and informational sessions that offered current and relevant data. The association between knowledge and fear of COVID-19 has been minimally explored in research. A previous study demonstrated that, after controlling potential confounding variables, knowledge related to COVID-19 was independently associated with heightened fear of SARS-CoV-2 infection and severe manifestations of COVID-19.[21,22] Individuals with greater knowledge of the disease were more likely to fear contracting the virus compared to those with less knowledge. This finding may be influenced by the infodemic, particularly the spread of misinformation on social media platforms, which appears to impact non-professional healthcare workers more significantly than their professional counterparts.

In a previous study, it results showed that the time spent reading about COVID-19 was not significantly correlated with knowledge, whereas the level of scientific knowledge held by professional staff regarding COVID-19 was notably higher.[23]

Conclusion

It can be concluded that more awareness causes more concern about being in higher risk groups. Government authorities should not only disseminate timely, accurate, and up-to-date information but also implement national public health measures tailored to both the general population and specific subgroups. Such actions have the potential to enhance COVID-19-related knowledge, mitigate the impact of the infodemic, and alleviate associated fears. Since the dental staff working as being in the high-risk group, more frequent institutional training programs should be planned to spread accurate and up-to-date knowledge for all dental staff including auxiliary dental staff. Training programs for dental staff on epidemic protection, such as against COVID-19, are essential to ensure the safety of both healthcare workers and patients. These programs should cover key topics like proper use of personal protective equipment, sterilization protocols, patient screening procedures, and infection control measures. Training should be comprehensive, up-to-date with the latest public health guidelines, and regularly reinforced through both initial sessions and ongoing refresher courses. Ideally, dental staff should undergo training at least

quarterly, with additional sessions during peak times of health crises, to maintain high standards of safety and confidence in handling evolving health threats. It may also be concluded that a great amount of information has been gained due to the pandemic, but there is still more to be learned to be prepared for another pandemic that may occur in the future.

Ethical Approval

The ethical approval for this study was obtained from the Ethical Committee of Yeni Yuzyil University (2021/01-563).

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Conflict of Interest

None of the authors of this article have any affiliation, connection or financial interest regarding the subject or material mentioned in the article.

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Authorship Contributions

Idea/Concept: S.O.Y, G.T Design: S.O.Y, G.T Control/Supervision: C.O Literature Review: S.O.Y Data Collection and/or Processing: S.O.Y Analysis and/or Interpretation: G.T Writing the Article: G.T Critical Review: S.O.Y, G.T.

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