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REVIEW

A Comprehensive Analysis of Covid-19 Research in Turkish Dentistry

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ÖZET

Pandemi başlangıcından 2021 yılı sonuna kadar 2 yıllık süreçte COVID-19 ile ilgili Türk diş hekimliği literatüründeki güncel verileri analiz etmek, sınıflandırmak ve özetlemektir. PubMed ve Google Akademik veri tabanlarında "koronavirüs", "diş hekimliği", "pandemic", "coronavirus", "dentistry", "pandemics", "SARS-Cov-2" terimleri ayrı ayrı ve kombinasyon halinde arandı. Türkçe ve/veya İngilizce olmasına bakılmaksızın Türk diş hekimlerine ait olan, girişimsel ve/veya gözlemsel olan ve pandemi başlangıcından 2021 yılı sonuna kadar yayımlanan ve diş hekimliğinde COVID-19 salgını hakkında bilgi içeren çalışmalar değerlendirildi. PubMed veri tabanında 46, Google Scholar'da 74 çalışma tespit edildi. Çalışmalar 8 ana başlık (bilgi düzeyi ve davranış değerlendirmesi, psikolojik etkiler, diş hekimliği bölümlerine özgü araştırmalar, uygulamalar, eğitim, pandeminin önemi, enfeksiyon kontrolü ve önlemler, sosyal medya ve sosyal ağların analizi) altında sınıflandırıldı. Analiz bulguları ile diş hekimliği alanında hizmet veren diş hekimleri ve sağlık meslek mensuplarının bilgi, tutum ve davranışlarının güncellenmesi, gelecekte yaşanabilecek olası pandemi durumlarına karşı hazırlıklı olmaları ve bulaşıcı hastalıklara bakış açılarını literatürün rehberliğinde şekillendirmeleri sağlanacaktır.

Anahtar kelimeler: COVID-19, Diş hekimliği, Pandemi, SARS-Cov-2

ABSTRACT

To analyze, classify and summarize current data in Turkish dentistry literature related to COVID-19 in 2-year duration from beginning of the pandemic to the end of 2021. The terms ''COVID-19", "koronavirüs", "diş hekimliği", "pandemic", "coronavirus", "dentistry", "pandemics", "SARS-Cov-2"'' were searched separately and in combinations in PubMed and Google Academic databases. Regardless of whether the studies were in Turkish and/or English, it was taken into account that they belong to Turkish dentists, interventional and/or observational, and have been published in the duration starts from the beginning of the pandemic to the end of 2021 and contain information on the COVID-19 pandemic in dentistry. 46 studies in PubMed database and 74 studies in Google Scholar were identified. Studies were classified under 8 main topics (knowledge level and behavioral assessment, psychological effects, research specific to dentistry departments, practices, education, importance of the pandemic, infection control and precautions, social media and social network analysis). Through the findings of the analysis, it will be ensured that dentists and healthcare professionals serving in the field of dentistry will be updated on their knowledge, attitudes and behaviors, be prepared for possible future pandemic situations and shape their perspectives on infectious diseases under the guidance of the literature.

Keywords: COVID-19, Dentistry, Pandemic, SARS-Cov-2

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INTRODUCTION

The COVID-19 pandemic appeared in China at the end of 2019 and affected society, suddenly came into our lives with social, political, economic, psychological effects and caused great changes. The unknown origin of emergence, failure to control virus and possible risk to all people regardless of geography have made the pandemic a global trauma (1). Risky environment and one-to-one contact with patients have caused healthcare professionals to be most affected community and have resulted in a great battle against COVID-19 at the beginning of 2020. The World Health Organization (WHO) and all countries have made changes in health policies and prepared guides to control pandemic and minimize its effects (2). Along with unexpected pandemic, scientific research has been performed in many areas affected by virus, such as identifying the virus, evaluating psychological effects, arranging treatment plans/practices and preventing disruption of education (3,4). The fact that dentistry is shown as the most susceptible profession to risk of coronavirus transmission has increased the value of studies in this branch. Route to be followed when a patient with suspected COVID-19 is encountered, SARS-CoV-2 transmission routes, infection control measures, patient evaluation, use of personal protective equipment and hand hygiene, considerations in dental procedures and disinfection of clinical areas are listed as infection control precautions to be taken in dentistry in the course of the pandemic and important for the dentists, dentistry students and auxiliary personnel who are in the high risk for infectious diseases to fulfill their duties in accordance with conditions during pandemic and normalization process and manage the process correctly (5).

The aim of this study is to analyze, classify and summarize current data in Turkish dentistry literature related to COVID-19 in the 2-year duration from beginning of the pandemic to the end of 2021. Through the findings of the analysis, it will be ensured that dentists and healthcare professionals serving in the field of dentistry will be updated on their knowledge, attitudes and behaviors, be prepared for possible future pandemic situations and shape their perspectives on infectious diseases under the guidance of the literature.

MATERIAL AND METHODS

The studies by Turkish dentists on the COVID-19 pandemic in the 2-year period from the time of the first COVID-19 case appeared in Turkiye until the end of 2021 were evaluated. The terms ‘‘COVID-19”, “koronavirüs”, “diş hekimliği”, “pandemic”, “coronavirus”, “dentistry”, “pandemics”, “SARS-Cov-2” were searched separately and in combinations in PubMed and Google Academic databases. Regardless of whether the studies were Turkish and/or English, it was taken into account that they belong to Turkish

dentists, interventional and/or observational, published in the duration starts from the beginning of the pandemic to the end of 2021 and contain information on COVID-19 pandemic in dentistry. Descriptive and content analysis were used in evaluation of the data.

RESULTS

A total of 120 research studies, 46 from the PubMed database and 74 from the Google Scholar database, were included in this study. The research studies are classified under 8 main headings according to the researchers specifically addressed topics (Figure1).

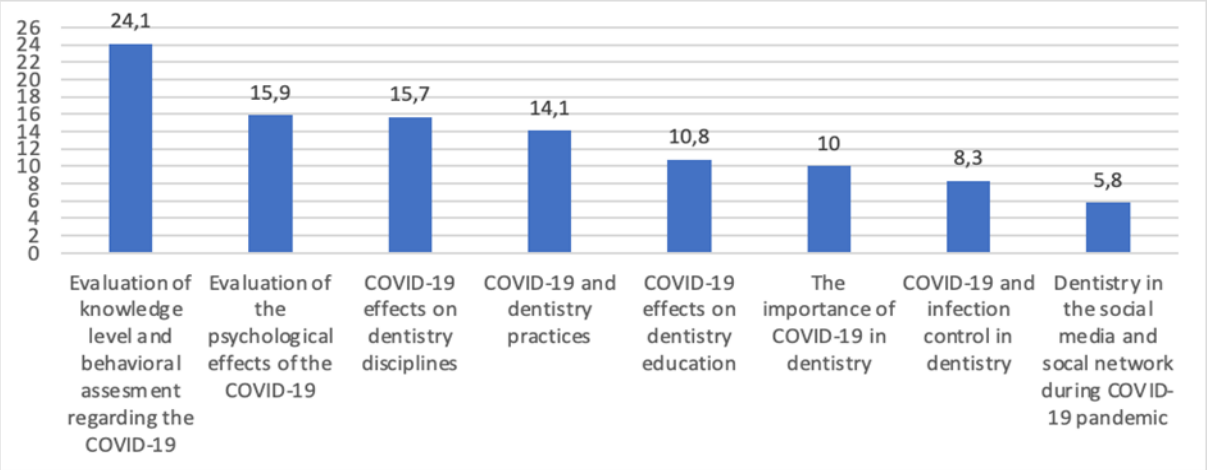

Figure 1. Percentage distribution of COVID-19 literature data in dentistry by main headings

1. Evaluation of knowledge level and behavioral assessment regarding the COVID-19: 29 studies

2. Evaluation of the psychological effects of the COVID-19: 19 studies

3. The effect of COVID-19 on dentistry disciplines:19 studies

4. COVID-19 and dentistry practices:17 studies

5. COVID-19 effects on dentistry education:13 studies

6. The importance of COVID-19 in dentistry:12 studies

7. COVID-19 and infection control in dentistry:10 studies

8. Dentistry in the social media and social network during COVID-19 pandemic:7 research

Turkish dentists have conducted 29 research studies under the heading of knowledge level and behavior assessment on the COVID-19 pandemic and the normalization process. 23 studies were conducted only on the level of knowledge, awareness and behavior assessment; 6 studies also include psychological effects like stress, anxiety and mood changes. Knowledge level and behavior assessment studies are analyzed under 4 main groups according to what they

are carried out. The groups were determined as dentistry undergraduate students, dentists continuing their postgraduate education, dentists serving in the public/private sectors and oral health workers and research on patients/society (Figure 2).

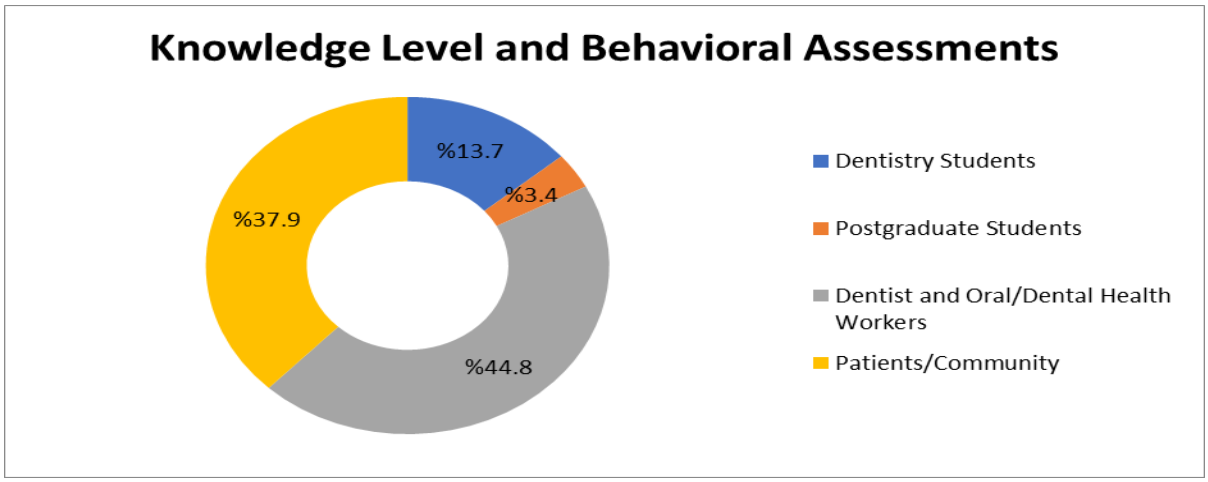

Figure 2. Distribution of knowledge level and behavioral assessment research on the COVID-19 pandemic by groups

13 research studies have been performed to assess the psychological consequences of the pandemic for dentistry workers. In addition, 6 studies include stress, anxiety and mood changes, as well as knowledge level and behavior assessment. Psychological studies were analyzed under 4 main groups according to they are carried out. The groups were determined as dentistry undergraduate students, dentists continuing their postgraduate education, dentists serving in the public/private sectors and oral health workers and research on patients/society (Figure 3).

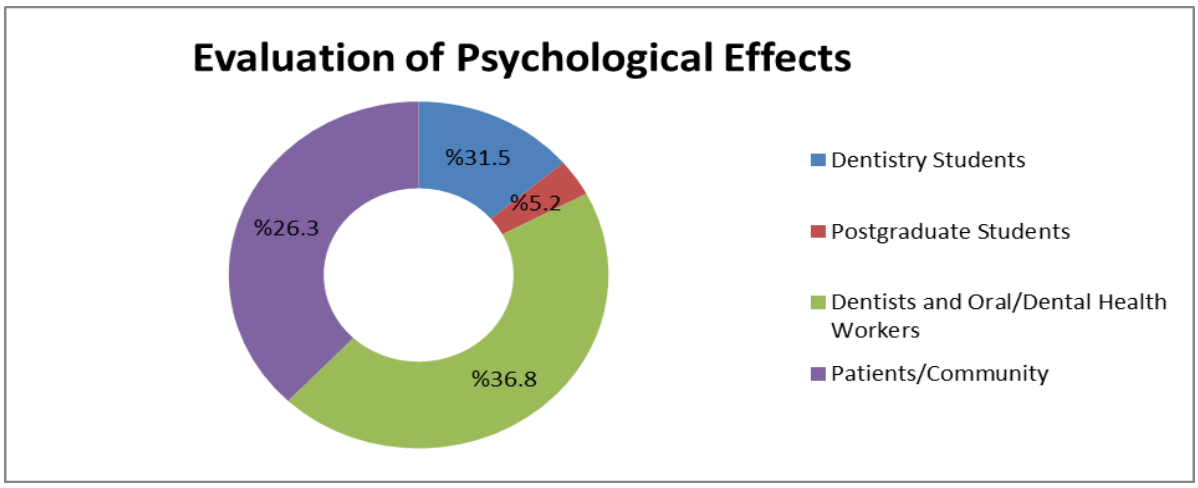

Figure 3. Distribution of research evaluating the psychological consequences of the COVID-19 pandemic by groups

19 research studies were conducted to analyze the effects of the COVID-19 pandemic specifically on eight dentistry disciplines (Figure 4).

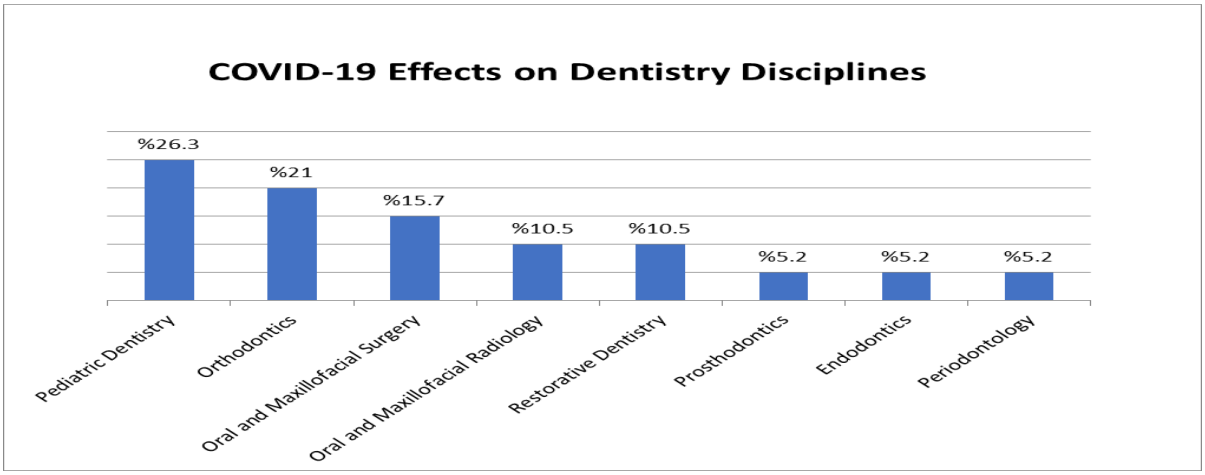

Figure 4. Percentage distribution of COVID-19 pandemic literature data by dentistry disciplines

17 research studies involving the COVID-19 pandemic effects on dentistry practice protocols, assessment of the ongoing situation and consideration of further measures to be taken in the coming period and their potential effects on the future of dentistry, environmental arrangements, patient appointment arrangements, chair side procedures and financial arrangements have been done. 13 studies fulfilled to assess the COVID-19 effects and the normalization process on dental education, the investigation of the ongoing situation, the new normal in education and suggestions for educators and students. Within the context of the influence of the COVID-19 pandemic in dentistry, 12 studies were conducted. In these studies which provide general information, the basic epidemiological features of SARS-Cov-2 virus, molecular immunopathogenesis, contagiousness and transmission routes, clinical characteristics and the significance of asymptomatic carriers, methods used in diagnosis, the importance of saliva and public oral and dental health while the pandemic were emphasized. During the time of the COVID-19 pandemic and normalization process, 10 studies were conducted on infection control and precautions. 8 studies included all the precautions to be taken comprehensively in the field of dentistry, 1 study included specific information for allied healthcare workers and 1 study for private clinics (Figure 5).

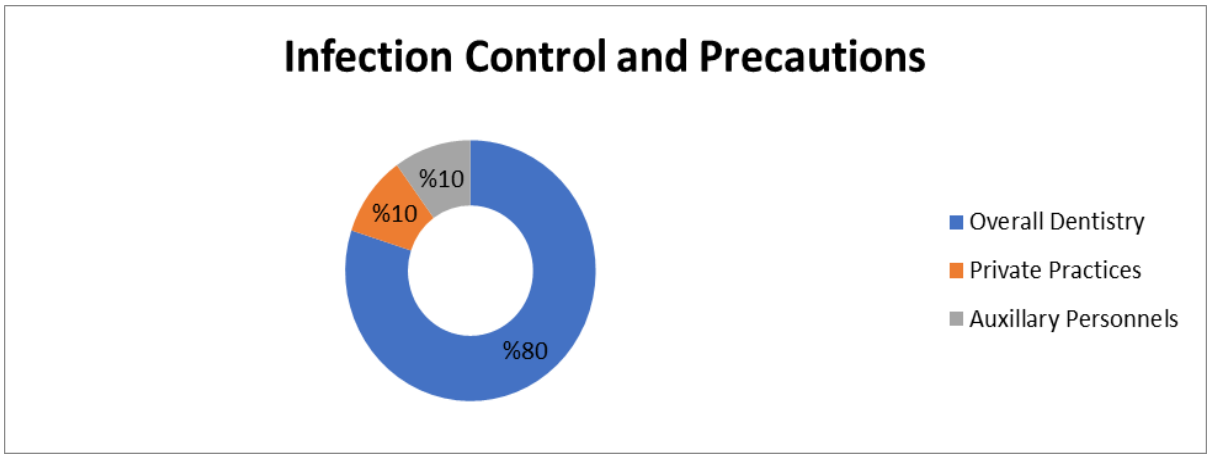

Figure 5. Percentage distribution of infection control research by groups in the COVID-19 pandemic

7 studies on the analysis of social media posts about the COVID-19 pandemic and dentistry were analyzed.

DISCUSSION

1. Knowledge Level and Behavioral Assessment Studies on the COVID-19 Pandemic Process in the Field of Dentistry in Türkiye

It is crucial to know the causative factor and all its possible effects in order to successfully manage the COVID-19 pandemic and a possible health crisis. Infection control and preventive measures may be ineffective if knowledge about the agent is not sufficient. This is a major disadvantage for dental professionals who take role in hindering the spread of pandemic. Therefore, a great number of studies have been conducted to establish the level of knowledge, attitudes and behaviors regarding COVID-19.

In the study of Tozar et al. (6) which evaluating the knowledge level of dental students about the COVID-19 pandemic, it was emphasized that the relationship of information sources about the COVID-19 pandemic with gender and class was independent from each other. As the transmission route of COVID-19 infection, a great difference was reported between female and male students only in the parental route in favor of females and no differences between genders were obtained in other transmission routes. Significant results were obtained in favor of women in the answers that the symptoms of COVID-19 infection may occur as shortness of breath, joint and muscle pain, or asymptomatic. In a study investigating the knowledge and protection levels of senior dentistry students about COVID-19, it was determined that senior students had a remarkable level of knowledge about COVID-19 but students who were continuing their clinical internship did not fully implement measures to protect against COVID-19 (7). In the study of Kara

and Ataş (8), which investigated pandemic effects on the protective behaviors of dental research assistants, it was found that dentistry research assistants who are in the high-risk group for COVID-19 transmission, did not fully practice their protective behaviors during and after the pandemic but the protection score increased with the pandemic; as the age increased it was observed that the protection score decreased after the pandemic. The post-pandemic protection score of those who did not have children was reported to be higher. In terms of other socio-demographic characteristics, it was observed that the prevention scores did not change during and after the pandemic and the pandemic changed the protective behaviors in dentistry practices, but it was not sufficient. In a study by Tunç and Toprak (9) which the sociodemographic data affecting the knowledge levels and attitudes of dentists about COVID-19 infection were evaluated, female physicians compared to males, physicians working in state hospitals compared to those working in private practices and those who stated that they were quite worried about the process were in comparison with those who did not were determined that they had a statistically quite higher level of knowledge than their counterparts. Also, it was reported that dentists should reshape their attitudes and perceptions with definite and contemporary information conducive to endure with the COVID-19 infection and transmission. Duruk et al. (10) in their survey study to analyze the clinical behaviors and attitudes of Turkish dentists towards the COVID-19 pandemic, determined that although they have increased their protective measures during the COVID-19 pandemic, they have not yet reached sufficient levels in terms of attitudes and behaviors. The authors also emphasized that the prevalence of Turkish dentists infected with COVID-19 is an issue that should definitely be investigated. The study involving also specialist dentists by Karayürek et al. (11) which investigated the awareness and knowledge of SARS-CoV-2 infection among dentists according to the Turkish dentistry guideline, demonstrated that Turkish dentists have satisfactory knowledge about the etiology of COVID-19, mode of transmission and pre-procedural warnings. It was reported that the participants recorded a good assessment of performing emergency dental treatment correspondingly to the guidelines prepared by the Turkish Dental Association (TDB) during the current COVID-19 pandemic. The authors specified that there is an immediate need to improve the knowledge of Turkish dentists on risk assessment through training programs, given the updates on coronavirus transmission and preventive strategies.

In a study, which included 765 patients and evaluated the patients' perspectives on dental treatments and institutional preferences during the COVID-19 normalization process in Turkiye, it was recorded that 69.30% of the candidates chose private practices for dental treatments, 18.80% preferred dentistry schools and 11.90% preferred oral and dental health centers. Also, a remarkable relationship was noticed between the patients' thinking that they

protect themselves adequately against the COVID-19 risk, the thought that COVID-19 is under control, the crowd-related anxiety in the reception room and institution preferences (12). In a study investigating the attitudes, behaviors and knowledge related to oral and dental health during COVID-19 times, it has been detected that there is a propensity towards food consumption that will positively affect oral and dental health according to the nutritional habits scoring. 20.2% of men and 11.4% of women smoked less during this period. 20.6% of the participants increased their frequency of brushing, 9.4% of them used floss, 28.7% of them used mouthwash. The frequency of use of brushing teeth by 7.8%, flossing by 7.1% and mouthwash by 7.5% of the participants decreased. 67.8% of the candidates agreed that oral and dental health is attributed to systemic health and 80.5% of them thought that the risk of COVID-19 transmission is possible in dental treatment. 21.7% of the participants had a problem with their dental and oral health in the COVID-19 times. While 25.6% of these individuals applied to the dentist because of the problem they experienced, 74.4% stated that they did not (13). According to a cross-sectional survey that evaluated parents' knowledge and habits respecting self-medication for their children's dental problems, most parents (70.2%) self-medicated for their children's dental problems during COVID-19. Self-medication with previously prescribed drugs was usually preferred (62.2%). Analgesics (98%) were the most frequently self-administered medication group for their children's dental problems. Conforming to the results, it was realized that the currency of self-medication by parents for dental problems of children was high in Turkiye during the pandemic (14). In a study evaluating the health-related quality of life and oral health habits of a group of children in the early times of the pandemic, it was noticed that the consumption of fast food, packaged foods and carbonated beverages decreased during the COVID-19 pandemic. Half of the parents reported that they were worried or afraid about their child going to the dentist during the pandemic and 64.2% of them reported that they missed their routine dental visits. Conforming to the results, the attitude of the general quality of life in a group of Turkish children was significantly affected by the COVID-19 pandemic (15).

2. Evaluation of the Psychological Effects of the COVID-19 Pandemic in the Field of Dentistry in Türkiye

The maintenance of psychological health and well-being have critical importance in the fight against the pandemic and post-pandemic period, especially for dentistry workers who are at high risk for infectious diseases. Infectious diseases are one of the causes that affect the physical health of individuals negatively, as well as their psychological health and well-being (1). To understand the psychological repercussions of the pandemic, emotions such as fear and anxiety compel to be pointed out and closely observed. Researchers assess the psychological outcomes of the pandemic on doctors, nurses, and caregivers and observed that fear, anxiety

and stress in healthcare workers increased during the pandemic (16).

In a study, investigating the anxiety levels of Turkish dentistry students during the pandemic, researchers reported that most of the students (81.1%) were concerned that the classes would be held in groups with the changeover to face-to-face education. This study showed that the thought of graduating late created fear in most of the participants (69.9%). Moreover, it was stated that relatively one-fourth of the students had the idea of changing professions due to the pandemic and the anxiety value of the group with the idea of changing professions was reported higher than the other group (17). In a study inspecting the relationship between depression, anxiety, sleep quality, stress levels and temporomandibular joint disorders in Turkish dentistry students, it was reported that sleep quality was impaired and higher depression, anxiety, stress levels, temporomandibular joint disorders have been shown among dental students in the COVID-19 pandemic times (18).

In a study evaluating the fear and anxiety levels of dentistry research assistants during the COVID-19 pandemic, it was stated that COVID-19 caused fear and anxiety and this process affected female assistants more than male ones. In this study, assistants in specialties where less aerosol procedures were performed stated that they experienced less anxiety and fear due to the coronavirus since the incidence of contamination was lower (19). Ovalıoğlu et al. (20) examined the patient's level of anxiety during the COVID-19 pandemic and observed that the pandemic had an impact on the patient's anxiety levels. Researchers found that patients who applied to the dentist in a non-emergency situation had lower anxiety levels, and women were found more concerned about the pandemic than men. In a study evaluating the perceptions and anxiety levels of patients with respect to dental treatment, it was stated that the patients' anxiety levels who applied to dental clinics for dental treatment during the pandemic period increased. Nevertheless, it was stated that the cautions taken in this process increased the confidence of the patients. This research affirmed that the patients were conscious of the instructions regarding COVID-19 and the significance of being vaccinated, it was concluded that being vaccinated reduced the anxiety level of people (21).

3.COVID-19 Pandemic Research Conducted Especially on Dentistry Disciplines in Türkiye

Şirin and Özçelik (22) investigated the correlation between COVID-19 and the stage of dental damage determined by radiological examination and included 137 patients (20-65 years old) based on examination reports and orthopantomographic images of 1516 COVID-19 patients diagnosed with real-time PCR tests. In this study, the stage of dental damage was established with respect to the apical periodontitis grading scale obtained from dental radiological images, the pathophysiological process of dental caries and radiological alveolar bone loss. The stage of dental damage was specified according to the

parameters of age, gender, number of dental caries, root canal treatment, dental fillings, tooth deficiency, dental implants, the severity of dental pathology and hospitalization due to COVID-19, presence of systemic chronic disease and symptoms associated with COVID-19 were used. Researchers accentuated that the correlation between the dental damage stage and the severity and prognosis of COVID-19 is remarkable. In the review about orthodontic practice during the COVID-19 pandemic, Töz et al. (23) made recommendations for at-home treatment of orthodontic emergencies in order to define new working conditions in orthodontic clinics and to provide treatments under appropriate conditions during the pandemic process. In patients with broken elastic chain, removing the elastic chain with sterile tweezers or cutting it with sterile scissors, placing a small piece of orthodontic relief wax rolled on it in the presence of brackets or lengthening wires that cause irritation on the lip and/or cheek and patients with critical appliances such as mini-screws, springs, forsus, etc., they should report problems in their appliances quickly and that they can use smartphones in such cases to take pictures of the problem and report the situation is among the current recommendations in this review. Topal (24) aimed to determine the number of brackets separated from the teeth and the oral hygiene status of 102 patients receiving active orthodontic treatment during the COVID-19 pandemic. It was established that the plaque index (PI) values of male patients were higher than females, and female patients broke more brackets than males. In the results, patients who continued active orthodontic treatment at the beginning of the pandemic were found insufficient to provide oral hygiene.

In a study which evaluated the impact of the COVID-19 pandemic on the transmission risk in prosthetic dental treatment clinical applications, the riskiest prosthetic applications in terms of SARS-CoV-2 transmission were determined as tooth preparation and denture adjustments. It has been determined that Turkish dentists show sufficient awareness of aerosol formation and risk during the COVID-19 pandemic process. Despite a positive attitude towards the use of protective equipment, it was stated that the current level of knowledge on surface types should be increased (25). According to a cross-sectional study investigating the need for emergency endodontic treatment along the COVID-19 process, it was recognized that as the number of COVID-19-positive cases across the country increased, the number of patients applying the faculty decreased. However, as the number of positive cases decreased, the number of patients applied and the need for urgent endodontic treatment increased. Furthermore, the number of patients compared to 2019 was declined (26). Bayraktar et al. (27) evaluated the effect of SARS CoV-2 effective mouthwash on the color change, translucency and average surface roughness of the nanofill resin composite and found that some mouthwashes affect the color change and translucency parameter of Filtek Ultimate nanofill resin composite, but not the surface

roughness. It was stated that surface roughness was not altered by any mouthwashes. Kara et al. (28) pointed out that there is a possible correlation between the severity of periodontal diseases and COVID-19 infections and this relationship may be caused by increased immune response mediated by Galectin-3 and increased viral binding. Researchers emphasized that it is crucial to take periodontal diseases under control and to provide meticulous oral hygiene during the COVID-19 pandemic period.

Şimşek and Yosun (29) reported that oral, dental and maxillofacial surgery is among the disciplines that should be pointed out because it includes emergency approaches and specific procedures that can not be deferred, even in the COVID-19 pandemic period. Performing the operations by an experienced team as much as possible, minimizing the formation of aerosols, avoiding the use of medical saws, ultrasonic devices and piezoelectric devices, especially during the pandemic period, avoiding the use of electrocautery devices, as self-threaded fixation screws can be a different option in the fracture treatment classified as emergency cases are among the current recommendations. Yüce et al. (30) conducted a retrospective study to investigate the experience of managing emergency patients in the oral, dental and maxillofacial surgery department during the prevention and control period of novel coronavirus pneumonia and they reported that non-operative tooth extraction as a radical treatment option with a lower aerosol generation rate and it has been most selected treatment option in patients who apply to the triage clinic and meet the definition of emergency during the pandemic period. In the review which focused on permanent dental treatments in pediatric dentistry during the pandemic period, Çakır (31) emphasized that trauma and pain caused by caries in permanent teeth are often at the forefront in pediatric dental clinics and mostly aerosol-producing dental procedures are required and stated that atraumatic restorative treatments are an effective option to reduce the spread of the virus in the solution of dental problems that are closely related to systemic health.

4. Dentistry Practices in the COVID-19 Pandemic and Normalization Process in Türkiye

Özdede et al. (32) investigated teledentistry and mentioned the application areas, advantages and disadvantages of teledentistry and suggestions for the development of teledentistry in this process. Also, it has been emphasized that teledentistry has high specificity and sensitivity in most previous studies and also research that evaluated the compatibility between the gold standard clinical examination and teledentistry have shown that there was moderate and strong agreement. Moreover, the positive predictive value and accuracy rate in teledentistry is quite high. Since unpredictable situations such as natural disasters or pandemics may always be encountered, researchers have suggested that integrating teledentistry and other telemedicine applications into the health system, not only in

local or global emergencies but also in other times, will contribute significantly to increasing the time, space, personnel needs and accessibility of health services. İlhan et al. (33) examined the application of telemedicine in existing oral health services and stated that telemedicine is a reliable and valid communication appliance between healthcare professionals and it can be preferred as "advanced triage" to handle medical/dental emergencies and to reduce contact between clinicians and patients during the coronavirus pandemic. Gürkan et al. (34) reviewed the importance of mouthwashes in post-coronavirus dental treatment applications and examined the general characteristics, types and usability of mouthwashes against COVID-19 in the manner of the literature. Authors have reported as the use of oral disinfectant mouthwashes has become widespread during the pandemic period. Although it is known that mouthwashes have antimicrobial effects principally but it is not clear yet how effective these products can be used against COVID-19. Akın et al. (3) investigating the presence of SARS-CoV-2 in aerosols associated with scaling and tooth preparation with ultrasonic instruments and COVID-19 contamination distance stated that aerosol-cannulated saliva ejectors are very important to minimize aerosol-mediated viral contamination. Also, a high-volume suction capacity (air volume) of 150 mm Hg or 325 L/min has been defined as sufficient to eliminate viral contamination and using high-volume aspiration has been suggested for dental treatment of COVID-19 patients.

5. Dentistry Education in the COVID-19 Pandemic and Normalization Process in Türkiye

Recen et al. (35) evaluated distance education in dentistry and pointed out the blended education, which means providing support from online platforms (lecture or lab videos, use of social media platforms, etc.), complementary and reinforcing face-to-face education which is traditionally and obligatory held in classrooms and laboratories and it has been described as a vital approach for education. In a study evaluating the perceptions of dentistry students to online education, it was found that they were mostly upset due to the discontinuity of conventional education and had to continue online, but in terms of continuing their education and preventing the suspension of education completely, they described this situation as an advantage (36). Demirel et al. (37) analyzed the effects of the pandemic on postgraduate education and reported that pandemic and filiation assignments adversely affected clinical training and the thesis process in particular. Moreover, it was reported that including interactive/visual elements in order to improve clinical education would be beneficial to re-organize the process which lost in the pandemic. In a study investigating the video course preferences of students, although there was no difference between the demonstration types in terms of the learning preferences of the students, the students mostly preferred the video demonstration method

where they met with the lecturers regularly (38).

6. Importance of the COVID-19 Pandemic in Dentistry in Türkiye

Duran (4) in his study investigating the importance of the COVID-19 pandemic in dentistry, mentioned the disadvantages of the Polymerase Chain Reaction (PCR) test, which is the current standard diagnostic method, such as the need for expensive facilities, well-trained personnel and often time requirements, recommended that dentists use alternative chair-side tests that use saliva as a sample and can be routinely applied before starting the emergency procedure. In the research, some methods studied in the literature such as LAMP tests (Loop-mediated isothermal amplification tests), antibody tests, and micro-fluid RT-PCR devices, which are being developed day by day and their sensitivity is increasing, are also mentioned. Torul and Omezli (39) reviewed 11 studies which investigated the effectiveness of saliva in the COVID-19 diagnosis in different patient groups and stated that saliva is a reliable and safe tool for the COVID-19 diagnosis. They also reported that saliva offers logistical and economic benefits as well as improved safety when compared to current methods used to diagnose COVID-19 but there is not enough information in the literature to make a clinically appropriate and definitive decision.

In a study evaluating xerostomia, taste and smell impairments after COVID-19, the most common finding in patients after treatment was reported as xerostomia, while taste and smell impairments were more common in women. It has been emphasized that dentists should be aware of these differences that can be observed in the oral cavity after COVID-19 during the diagnosis and treatment phase (40). Altıok et al. (41) specifically focused on the effect of polymorphic variants of host proteins that have been shown to be involved and/or affected in the pathogenesis of COVID-19, additionally what possible changes might be and how COVID-19 diagnosis and treatment procedures were affected by these variants have been investigated. Uzun et al. (42) evaluated the drug called Artesunate for the treatment of COVID-19 and stated that Artesunate is an effective treatment for COVID-19 due to its anti-inflammatory activity, chloroquine-like endocytosis inhibition mechanism and NF-κB (Nuclear Factor kappa B) coronavirus effect.

7. COVID-19 and Infection Control in the Field of Dentistry in Türkiye

In a study which the preventive measures against the coronavirus pandemic in dentistry were discussed, the route to be followed when a patient with suspected COVID-19 is encountered, the transmission routes of SARS-CoV-2, patient evaluation during the epidemic period, hand hygiene, use of personal protective equipment and disinfection of clinical areas are listed as points to be considered for infection control in dental procedures (5). Soysal et al. (43) evaluated the role of the assistant team in the dental health services in infection control during the

COVID-19 period and they stated that the entire dental health care team should provide infection control and drew attention to the responsibilities of the assistant team in infection control. In a study evaluating the precautions taken in private dental clinics during COVID-19 pandemic period in Turkiye, the most important difficulties faced by dentists working in private clinics during this period were expressed as the expense of the necessary protective equipment and the difficulty of equipment transportation (44).

8. The COVID-19 Pandemic and Dentistry on Social Media and Social Network

Along with the advancing technology and common use of the internet, digital platforms have become more powerful and important. Social media has been one of the ultimate advantages in informing patients, sharing experiences and reaching large communities during the pandemic process.

Özdede and Peker (45) analyzed the videos of dentistry and the new coronavirus on YouTube and determined that dental YouTube videos from official institutions have a higher information level and video quality, also they declared that it would be favorable for experts, universities and other institutions have upload scientific videos with sufficient duration, especially during the pandemic process. The researchers reported that the video contents were insufficient regarding dental emergencies and legal-financial issues during the pandemic, more videos were needed for these contents. Moreover, it was considered that the videos shared on the internet, especially about health, should be uploaded by subjected to an institutional approval and control system so it would be beneficial for YouTube to analyze and remove the low-quality videos containing unnecessary/false information and increase the relevance of useful videos when uploading. Conforming to a study of Google Trend Analysis, which aimed to present an analysis of internet data on dental treatments during the COVID-19 outbreak, no convincing correlation was noticed between total approved COVID-19 cases and Google Trends Values (GTV). Researchers stated that Google is one of the information sources of society in this process but after the end of the pandemic, new studies including more specific data are needed (46). Accordingly, a study presented an analysis of YouTube videos as an informational source for dentists in preventing the COVID-19 outbreak, the credibility of the videos was potentially significant, but shortcomings were found. Researchers noted that only 2 out of 55 videos are in good quality and that there is a huge demand to improve the quality and credibility of information to obtain better results during the pandemic (47). Altan and Coşgun (48) conducted a study to analyze the emotional responses of individuals experiencing toothache using the CrystalFeel algorithm for the first time. Researchers have emphasized that following the social media posts of individuals who experience toothache during the pandemic will help reduce feelings of fear and anger and draft public information messages properly for the demands of the target audience.

CONCLUSION

In the COVID-19 pandemic and future similar pandemics and social crisis, it will always be imperative to meet the community's immediate and elective dental and oral treatment needs. Dentists and healthcare professionals serving in dentistry should be update on their knowledge, attitudes and behaviors, prepare for possible future pandemic situations and shape their perspectives on infectious diseases under the guidance of the literatüre.

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