

# Impact of COVID-19 Pandemic on Continuing Professional Development of Endodontists: A Comprehensive Survey Study

## COVID-19 Pandemisinin Endodontistlerin Sürekli Mesleki Gelişimleri Üzerine Etkisinin Etkisi: Kapsamlı Bir Anket Çalışması

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**ABSTRACT Objective:** Continuing professional development (CPD) is a lifelong process that continues despite all kinds of obstacles. The aim of this study was to evaluate of endodontists' attitudes towards CPD during the coronavirus disease-2019 pandemic and online educational resources (OERs). **Material and Methods:** A questionnaire on demographic data and preferred resources before and after the pandemic was sent to 554 potential participants via e-mail. A chi-square test and multivariate logistic regression test were conducted on the obtained data at a 5% significance level. **Results:** One hundred seventy five participants responded to the survey. Of all the participants, 67% were women and 45% were academicians. Since the pandemic began, OERs have been preferred over traditional resources, but traditional ones were considered more useful than OERs. Most of the respondents believed that contagion concerns represented the greatest obstacle to CPD. Gender and experience were related to the perception that the pandemic affected the respondents' CPD activities ( $p<0.001$ ). Specialty/PhD students tended to benefit more than others from OERs ( $p<0.05$ ). The respondents mostly considered that OERs are comfortable and advantageous in terms of time, cost, professional knowledge and skill. **Conclusion:** The resources endodontists chose for CPD activities seemed to have changed in favour of OERs during the pandemic despite their lower perceived usefulness as compared with traditional resources.

**ÖZET Amaç:** Sürekli mesleki gelişim (SMG), her türlü engele rağmen yaşam boyu devam eden bir öğrenme sürecidir. Bu çalışmanın amacı, endodontistlerin koronavirüs hastalığı-2019 pandemisi sırasında SMG'ye ve online eğitim kaynaklarına (OEK) yönelik tutumlarını değerlendirmektir. **Gereç ve Yöntemler:** Beş yüz elli dört katılımcıya pandemi öncesi ve sonrası olmak üzere demografik veriler ve tercih edilen kaynaklar hakkında hazırlanmış bir anket e-posta yoluyla gönderildi. Elde edilen veriler üzerinde %5 anlamlılık düzeyinde ki-kare testi ve çok değişkenli lojistik regresyon analizi yapıldı. **Bulgular:** Yüz yetmiş beş katılımcı anketi cevaplamıştır. Tüm katılımcıların %67'si kadın ve %45'i akademisyendi. Pandemi başlangıcından itibaren OEK geleneksel kaynaklara tercih edilmiş, ancak geleneksel olanlar OEK'den daha kullanışlı kabul edilmiştir. Ankete katılanların çoğu, bulaş endişesini SMG'nin önündeki en büyük engel olarak görmüştür. Cinsiyet ve deneyim, pandeminin katılımcıların SMG faaliyetlerini etkilediği algısıyla ilişkili bulunmuştur ( $p<0,001$ ). Uzmanlık/doktora öğrencileri OEK'den daha fazla yararlanma eğiliminde bulunmuştur ( $p<0,05$ ). Ankete katılanlar OEK'nin zaman, para, mesleki bilgi ve beceri düzeyleri açısından rahat ve avantajlı olduğunu düşünmektedirler. **Sonuç:** Her ne kadar endodontistler pandemi döneminde SMG için OEK tercih etmiş olsalar da geleneksel kaynakları OEK'ye göre daha kullanışlı olduklarını düşünmektedirler.

**Keywords:** COVID-19; continuing professional development; endodontics; internet usage; online resources

**Anahtar Kelimeler:** COVID-19; sürekli mesleki gelişim; endodonti; internet kullanımı; online kaynaklar

Continuing professional development (CPD) is defined as the career-long training required by dentists to maintain, update and expand their attitudes,

knowledge and skills to benefit their patients.<sup>1</sup> Dentists must document their participation and time spent in CPD over a given period to be recertified in many

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European countries and the United States.<sup>2</sup> Beyond the fact that certification renewal motivates physicians' professional development, a trend and desire for professional development is common among health professionals, including dentists, all over the world.<sup>3</sup>

The time that physicians allocate for professional development, the resources they use and their attitudes on this matter vary in studies due to the passage of time and changing conditions.<sup>4-7</sup> The internet has become a useful resource for both patient communication and physicians' CPD.<sup>8</sup> The internet allows paid or free dentistry journals and educational resources to be published online and provides many platforms on which physicians can quickly share their cases and knowledge.<sup>9</sup> The development and widespread use of online educational resources (OERs) has arguably improved physicians' ability to spread and communicate information as compared to printed sources.<sup>4</sup> In online education, various platforms can be used to acquire relevant knowledge and skills synchronously or asynchronously.<sup>10</sup> In addition, online resources enable health professionals in rural and remote areas to participate in such educations.<sup>11</sup>

On March 11, 2020, a pandemic was declared by the World Health Organization (WHO) upon the emergence of atypical pneumonia patients in more than 110 countries and due to the impact in densely populated areas.<sup>12,13</sup> Because of the risk of transmission of the coronavirus disease-2019 (COVID-19) virus through droplets and direct contact, a series of measures and guidelines (such as postponing elective procedures in clinical services, including dental professional practice) were published in line with the recommendations of scientific boards and international organisations, such as WHO and the Centers for Disease Control and Prevention.<sup>14</sup> In the same context, many congresses and meetings that had been scheduled to be held on site were postponed to an uncertain date.

All working professionals must adapt to changing environments to keep their skills and knowledge current, and the impact of the COVID-19 pandemic made clear that dentists' access to and demands on the resources they use and will use for professional

development may vary.<sup>15</sup> Thus, the current study (i) investigated the existing resources preferred by endodontists for their CPD as well as their opinions on those resources and (ii) evaluated the professional development resources they preferred as well as their opinions on those resources during the period since WHO declared the COVID-19 pandemic.

## MATERIAL AND METHODS

This study was conducted following the approval of the Çanakkale Onsekiz Mart University Clinical Research Ethics Committee (no: 2011-KAEK-27/2020-E.2000102391, date: 01.10.2020) and obeyed the Declaration of Helsinki on medical protocol. The survey comprised 3 parts (supp.) and was planned and prepared to evaluate demographic data, preferred resources for CPD and the effects of the COVID-19 pandemic on CPD and online education. No names or personal data were requested. The survey was sent by e-mail to 554 endodontists registered in the Turkish Endodontic Society; the e-mail addresses were gathered from the websites of national and private universities in Turkey.

In the form sent to the participants, a brief information about the survey was first given and a link containing the survey was added, which they can click if they want to participate.

## STATISTICAL ANALYSIS

A chi-square test and multivariate logistic regression test using SPSS 21.0 software (IBM-SPSS Inc., Chicago, IL, USA) were used to analyse the data related to the perception "*Pandemic conditions negatively affect my access to the resources I use for professional development*" and to the frequency of OER usage since the beginning of the pandemic. The data were analysed according to gender, academic degree, experience and affiliations, and the statistical significance level was set at 5% for each analysis. The data of all other questions were given as frequency.

## RESULTS

### POST HOC SAMPLE SIZE DETERMINATION

A total of 175 dentists responded to the survey, a response rate of 31.6%. The 95% confidence inter-

val (CI) (1- $\alpha$ ), 95% test power (1- $\beta$ ), odds ratio (OR)=0.55 and logistic regression power analysis indicated that the minimum acceptable number of samples was 137.

## DEMOGRAPHICS OF THE RESPONDENTS

Table 1 shows the demographic data of the survey's participants. Approximately two-thirds of the respondents were women (67% female vs. 33% male). Nearly half of the respondents were academics (45%), while the remaining half were specialists (26%) or specialty or PhD students (29%). The

	n=175	%
Gender		
Female	117	66.9
Male	58	33.1
Degree		
Speciality/PhD student	51	29.1
Specialist	45	25.7
Academician	79	45.1
Experience		
<5 years	43	24.6
5-10 years	64	36.6
11-15 years	25	14.3
16-20 years	20	11.4
>20 years	23	13.1
Affiliation		
Private practice	27	15.4
Public hospital	19	10.9
University	129	73.7

largest proportion of respondents had between 5 and 10 years of experience in the private practice (37%), followed by less than 5 years (25%). A majority of the respondents were in universities (74%), and the others were in private practice (15%) and public hospitals (11%).

## EVALUATION OF THE PREFERRED RESOURCES FOR CONTINUING PROFESSIONAL DEVELOPMENT

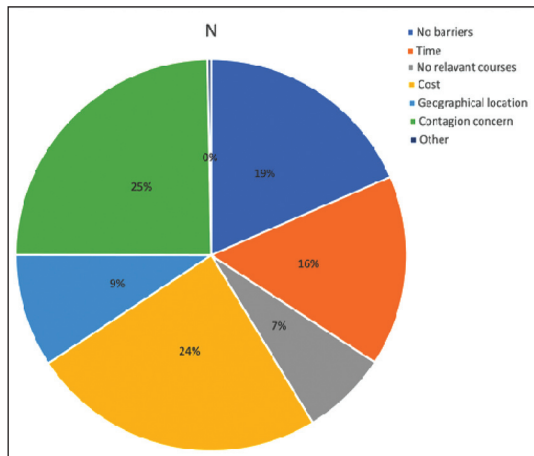
Most of the respondents had preferred to attend fairs (27%), hands-on courses (26%) and conferences (21%) before the pandemic, they had also used webinars (37%), online courses (24%), the internet (sources outside of courses or webinars like blogs, websites and forums) (14%) and professional videos (12%).

Table 2 shows the perceived usefulness of the educational resources on a five-point Likert scale. The respondents found printed books/journals [mean score (MS): 4.4] and online books/journals (MS: 4.3) to be the most useful. Fairs (MS: 4.1) and hands-on courses (MS: 4.1) followed these resources in usefulness. Peer review (in the same profession) (MS: 3.1) was the least useful and the internet (MS: 3.5) was the second least useful resource in the respondents' view.

Most of the respondents used the internet for CPD daily (75%), and the others used it weekly (20%), monthly (2%) or occasionally (3%). The factors that respondents considered to be barriers to ac-

Resources	Not at all useful n (%)	Not useful n (%)	Neutral n (%)	Useful n (%)	Definitely useful n (%)	Mean score*
Printed book/journal	0 (0.0)	20 (3.2)	41 (6.6)	208 (33.7)	337 (54.5)	4.4
E-book/online journal	0 (0.0)	18 (2.9)	47 (7.6)	226 (36.6)	313 (50.6)	4.3
Conference/symposium	0 (0.0)	56 (9.1)	130 (21)	278 (45)	109 (17.6)	3.8
Fair	5 (0.8)	22 (3.6)	96 (15.5)	186 (30.1)	267 (43.2)	4.1
Hands-on course	6 (1)	20 (3.2)	57 (9.2)	342 (55.3)	181 (29.3)	4.1
Online course	3 (0.5)	41 (6.6)	152 (24.6)	235 (38)	142 (23)	3.8
Webinar	14 (2.3)	36 (5.8)	155 (25.1)	265 (42.9)	85 (13.8)	3.6
Professional video	20 (3.2)	65 (10.5)	145 (23.5)	247 (40)	101 (16.3)	3.6
Internet	15 (2.4)	64 (10.4)	191 (30.9)	212 (34.3)	88 (14.2)	3.5
Peer review	18 (2.9)	145 (23.5)	230 (37.2)	161 (26.1)	38 (6.1)	3.1

\*Mean scores for each continuing professional development resources; 1 to 5 scale was used where 1 represented "not at all useful" and 5 represented "definitely useful".



**FIGURE 1:** Barriers to accessing the resources for continuing professional development.

cessing resources for CPD are shown in Figure 1. Most of the respondents viewed contagion concern (25%) as a barrier to CPD.

### COVID-19'S IMPACT ON CONTINUING PROFESSIONAL DEVELOPMENT

The statement that “*Pandemic conditions negatively affect my access to the resources I use for professional development*” was rated by the respondents on a 5-point Likert scale (Table 3). Among females,

35% largely agreed with this statement, while 39% of males disagreed ( $p < 0.001$ ). The academic degree was not found to be associated with this perception ( $p > 0.05$ ). Experience was found to be significant ( $p < 0.001$ ). Respondents with less than 5 years’ experience mostly agreed with the perception (40%), while 31% of those with 5-10 years, 44% of those with 16-20 years and 51% of those with more than 20 years’ experience disagreed. The respondents affiliated with universities believed that it affected their CPD activities in a lesser extent (31%).

### FREQUENCY OF ONLINE EDUCATIONAL RESOURCES USAGE

Among the respondents, 44% had benefited from OERs 20 or more times since the beginning of the pandemic. Table 4 shows the effects of the demographic factors in relation to frequency of OER usage since the beginning of the pandemic according to a multivariate ordinal logistic regression test at  $p < 0.05$ . Gender was not observed as a relevant factor in terms of the frequency of benefiting from OERs [ $OR = 0.851$ ;  $p > 0.05$ ; 95%  $CI = -0.489/0.168$ ]. While there was no difference in the frequency of benefiting from OERs ( $p = 0.504$ ), specialty/PhD students tended to benefit more than others ( $OR = 1.699$ ;  $p < 0.05$ ; 95%

**TABLE 3:** Perceptions to “Pandemic conditions negatively affect my access to resources I use for my professional development” according to the gender, degree, experience and affiliations.

		Strongly disagree	Disagree	Uncertain	Agree	Strongly agree	p value
		n (%)	n (%)	n (%)	n (%)	n (%)	
Gender	Female	18 (4.4)	122 (29.5)	92 (22.3)	146 (35.4)	35 (8.5)	<0.001 <sup>a</sup>
	Male	30 (14.6)	79 (38.5)	38 (18.5)	43 (21.0)	15 (7.3)	
Degree	Specialty/PhD student	8 (4.1)	58 (29.7)	46 (23.6)	64 (32.8)	19 (9.7)	0.091 <sup>a</sup>
	Specialist	9 (6.3)	50 (35.0)	29 (20.3)	40 (28.0)	15 (10.5)	
	Academician	31 (11.1)	93 (33.2)	55 (19.6)	85 (30.4)	16 (5.7)	
Experience	<5 years	8 (5.0)	38 (23.6)	36 (22.4)	65 (40.4)	14 (8.7)	<0.001 <sup>b</sup>
	5-10 years	14 (6.5)	66 (30.6)	59 (27.3)	55 (25.5)	22 (10.2)	
	11-15 years	10 (10.9)	25 (27.2)	18 (19.6)	29 (31.5)	10 (10.9)	
	16-20 years	5 (7.9)	28 (44.4)	7 (11.1)	19 (30.2)	4 (6.3)	
	>20 years	11 (12.8)	44 (51.2)	10 (11.6)	21 (24.4)	0 (0.0)	
Affiliation	Private practice	7 (7.3)	24 (25.0)	27 (28.1)	26 (27.1)	12 (12.5)	0.004 <sup>b</sup>
	Public hospital	0 (0.0)	26 (52.0)	7 (14.0)	15 (30.0)	2 (4.0)	
	University	41 (8.7)	151 (32.0)	96 (20.3)	148 (31.4)	36 (7.6)	

<sup>a</sup>Pearson chi-square test; <sup>b</sup>Likelihood ratio chi-square test.

**TABLE 4:** Factors related with frequency of online educational resources usage since the beginning of the pandemic according to the multivariate ordinal logistic regression analysis at  $p < 0.05$ .

Variables	OR	p value	95% CI	
<b>Gender</b>				
Female	0.851	0.338	-0.489	0.168
Male	Reference			
<b>Degree</b>				
Speciality/PhD student	1.699	0.024	0.068	0.993
Specialist	1.269	0.504	-0.459	0.935
Academician	Reference			
<b>Experience</b>				
<5 years	0.696	0.243	-0.968	0.245
5-10 years	0.515	0.009	-1.162	-0.165
11-15 years	1.024	0.935	-0.546	0.593
16-20 years	0.434	0.007	-1.437	-0.232
>20 years	Reference			
<b>Affiliation</b>				
Private practice	0.756	0.427	-0.972	0.412
Public hospital	0.331	0.004	-1.863	-0.351
University	Reference			

OR: Odds ratio; CI: Confidence interval.

CI=0.068/0.993). There was no statistical difference in using OERs between those with less than 5 years of experience or with 11-15 years of experience and the others ( $p > 0.05$ ), but endodontists with 5-10 years (OR=0.515;  $p < 0.05$ ; 95% CI=-1.162/-0.165) or with 16-20 years of experience (OR=0.434;  $p < 0.05$ ; 95% CI=-1.437/-0.232) tended to use OERs less. While the frequency of endodontists working in private practice who benefited from OERs did not differ from the others ( $p > 0.05$ ), working in a public hospital was found to be associated with a decreased frequency of OER usage (OR=0.331;  $p < 0.05$ ; 95% CI=-1.863/-0.351).

Fifty-four percent of the online education attended by the respondents since the beginning of the pandemic was in Turkish, while 46% was in English. Thirty-six percent of the online education consisted of company-sponsored personal presentations, 33% consisted of club/community/association education and 28% was organised by universities.

The participants reported that they paid no fees for 77% of the education. Thirty-one percent of the respondents had been a presenter in online education

at least once. In this process, those who participated in the survey mostly attended education related to their area of expertise (69%).

The subjects of the attended online education during the COVID-19 pandemic were investigated. The most attended education topic was root canal preparation (nickel-titanium file systems) (17%), followed by COVID-19 and dentistry/endodontics (15%), problem solving in endodontics (15%) and regenerative endodontic procedures (14%).

#### TECHNICAL EVALUATION OF ONLINE EDUCATIONAL RESOURCES

The OERs were also evaluated technically. In terms of asking questions and getting answers, 57% of the respondents considered online education as sufficient, while it was considered insufficient by 27%. In the part of the questionnaire that asked whether the learner's level of knowledge could be measured and whether their opinions about the OER were solicited, the respondents were asked about the extent to which they were asked for feedback; 41% reported that very few OERs solicited feedback, and 38% said that the question was not applicable. Twenty-four percent of



the respondents reported that they encountered no technical problems during online education, while the rest reported technical problems (very few: 60%; almost half the time: 10%; many: 6%). The problems encountered were largely (43%) associated with accessing the education (slowness of internet speed, etc.), while 31% were technical problems (problems caused by computers, such as sound output). A requirement for a special program or software for education was perceived as a problem by 15% of the respondents, while 12% had problems during registration.

### GENERAL CONSIDERATIONS ON ONLINE EDUCATIONAL RESOURCES

General considerations related to OERs were examined. Many respondents strongly agreed that OERs saved time (42%) and money (45%). The respondents largely agreed with statements that OERs contributed to their professional knowledge level (48%) and skill level (37%). The respondents also agreed with the statement that the subjects of online education were suitable for their area of interest (49%) and included current issues (48%). Many of the respondents (31%) were undecided as to whether online education would replace traditional education in the postgraduation period in the future. Among the respondents, 31% agreed with the statement, "I feel more comfortable during online education than in traditional education". Thirty-six percent of the respondents were undecided as to whether they preferred OERs to traditional education (face-to-face in a specific location).

The participants were asked when they would like future online education to take place, and 48% preferred that it be done after 8.00 pm on weekdays, followed by the weekend option (30%). The most popular endodontics education that the respondents wanted to attend in the future were regenerative endodontics (13%), bioceramic materials (12%) and problems and solutions encountered in endodontics (11%).

## DISCUSSION

Effective CDP is crucial to gaining new knowledge and/or skills, providing high quality service to pa-

tients and maintaining an up-to-date knowledge base.<sup>3</sup> Face-to-face undergraduate and graduate education has been disrupted and changed technically worldwide due to the COVID-19 outbreak.<sup>16</sup> In this changing environment, this study examined endodontists' attitudes towards CPD, resource preferences and OERs.

In contrast to previous studies, in which conventional techniques, such as fairs, hands-on courses and printed publications and journals were preferred over new technologies, this pandemic era study found that dental professionals mostly used OERs, such as webinars, online courses, professional videos, websites and forums, their use increasing since the beginning of pandemic because their accessibility was easier and more attractive.<sup>6,7,17-19</sup> The respondents thought that conventional techniques offered the most useful resources, however, and they mostly preferred face-to-face education to online education. Nayak et al. point out that, while textbooks are more useful, dentists prefer them less, as other sources are easy to access.<sup>7</sup> According to the results of the present study, although OERs have advantages, the demand for traditional resources still remains strong.

Many studies have investigated CPD activity in various populations under normal conditions before the pandemic.<sup>6,7,17</sup> Contrary to the results of the present study, Nayak et al. examined the CPD activity of dentists in India and found that discussion with colleagues was the most preferred and useful resource.<sup>7</sup> The different result obtained may be due to the fact that Nayak et al.<sup>7</sup> included both experts and non-experts in the study.

Many barriers to CPD have been identified, and the contagion concern (25%) was identified as the most important barrier to CPD in the present study.<sup>20,21</sup> Other barriers have been identified as time and cost, both in this and in previous studies.<sup>22,23</sup> Online education is defined as comfortable, inexpensive and timesaving.<sup>24,25</sup> The time and cost, seen as barriers to CPD, seem to become advantages with OERs. Already, 77% of the participants in the present study did not pay any fee for online education. Gottlieb et al. state that online conferences can be advantageous in overcoming travel restrictions and barriers related

to limited budgets.<sup>26</sup> Leggate and Russell investigated the attitudes of Scottish dentists to CPD and reported heavy clinical commitments as a first barrier and cost as a second barrier to CPD, although this may differ depending on the country and working conditions.<sup>22</sup>

Abbasi et al. state in their questionnaire study on dentistry students that the vast majority of students find internet-based learning satisfactory in acquiring information and use the internet daily (71%).<sup>27</sup> In the present study, most respondents (75%) used the internet daily. In this survey of endodontists, OERs were evaluated, and the participants found OERs to be sufficient in terms of time, cost, comfort, professional knowledge and skill development. Also, most of the respondents pointed out that the subjects of the OERs matched their subject of interest. This is an important finding, suggesting that the education carried out during the pandemic was up to date and oriented towards demand. This principle, which is the main determining factor in adult education, is important, as it allows learners to choose what they want to learn.<sup>28</sup> Having many OERs during the pandemic gave physicians the opportunity to access the source they wanted, mostly at no cost.

Although females thought that the pandemic affected their CPD activities more than males, gender did not make a difference in using OERs, possibly due to the fact that the preferred resources for CPD shifted towards OERs from traditional ones. Maher et al. also found that females tend to use online resources more than males.<sup>23</sup> The finding for females was also valid for endodontists with less than 5 years of experience, who also tended to benefit more from OERs, although they believed more than other groups that the pandemic conditions affected their CPD. Clark found that younger dentists enrol more in online activities, similar to this study.<sup>29</sup> Working conditions and years spent in the profession have been identified as risk factors for benefitting less from OERs. Endodontists with 16-20 years' experience who worked in public hospitals tended to use OERs less than others. Lifelong learning requires an instinct that differs among individuals depending on who will benefit most in career advancement.<sup>7</sup> Abbott et al. found that older dentists were less likely to attend courses.<sup>30</sup> According to the results of this study, being

in an academic environment and being early in one's professional life may be incentives to use OERs.

Some countries have official CPD systems that are compulsory for those in practice.<sup>31</sup> The Turkish Dental Association has prepared a Continuing Dental Education Accreditation Directive, and dentists (with the exception of academics and dentists in public hospitals) must be renewed every 4 years. Therefore, the participants in private practice benefited more from OERs than those in public hospitals.

As new dental materials and technologies develop, dental practitioners' CPD needs will increase.<sup>30</sup> According to the data obtained from the present survey, the most popular education concerned root canal preparation with nickel-titanium files and the effects of the pandemic on dentistry and endodontics (due to the topic's currency). In addition to including basic education subjects to ensure high quality treatment standards, those offering education should take into account the needs of participants.<sup>3</sup>

Interactivity between participant and presenter is essential for the quality of education.<sup>32</sup> Although online education's lack of a physical environment for the participants may cause problems related to the audience's reactions and not being able to engage with them, OERs were found to be highly sufficient from the participants' perspective in terms of asking questions and getting answers.<sup>33</sup> However, post-education feedback was not solicited in most OERs, which can be a negative situation for the presenter due to the lack of reaction. The online education experiences of the participants were examined in order to contribute to planned future online education under more favourable conditions. However, many of the participants encountered problems, such as slow internet speeds and the need to download programs and software for the education. In MacWalter et al.'s study, the most common reported problem during online education was slow internet speed, followed by the need for additional software.<sup>25</sup> It is clear that the internet and information technologies are still the main problem, as supported by the result of this study.<sup>25</sup>

It is important that the providers of CPD activities as well as many institutions take responsibility in this process in terms of meeting the diversity of

needs.<sup>34</sup> One-third of the respondents had been a speaker in an OER at least once. This result may be due to the fact that almost half of the respondents (45%) were academics. Companies, clubs, communities, associations and universities were active in supplying OERs in the pandemic period.

The participants mostly requested education after 8.00 pm on weekdays, followed by weekend hours. Evening courses were favoured by dentists in Abbott et al.'s study because of the dentists' intensive daytime work programs.<sup>30</sup> Similar results to those of this study regarding education hours were found by Maher et al.<sup>23</sup> These collected data should be carefully analysed to provide more effective and easily accessible education in the future through the incorporation of information technology.<sup>10,24</sup>

The participants largely believed that online education will replace traditional offerings in postgraduate education in the future. Although this pandemic was seen as an obstacle to CPD, the endodontists benefited from these resources at a high rate.

## CONCLUSION

This survey examined the attitudes of endodontists towards CPD activities and OERs after the start of the pandemic. According to the results obtained, the preferred resources for CPD have changed, and there has been a tendency towards OERs. Strategies should

be developed for CPD activities during the pandemic period and beyond based on the risk factors of decreased benefit from OERs that were determined in this study.

### 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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