



(RESEARCH ARTICLE)



COVID-19 and orthodontist behavior: A cross-sectional study

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Abstract

Introduction: To indicate how COVID-19 effects on behavior and their reactions to COVID-19 for orthodontist's lives in two neighbor countries (Turkey and Iraq).

Material and method: An online Google survey form in order to make a special questioner designed by specialist phycologist consist from nineteen questions were sent to Turkish Orthodontic Society and Iraq Orthodontic Society in order to investigate orthodontist behavior and their reactions to COVID-19 pandemic. Descriptive statistics were used to shown and chi-square for association. Level of significance was set at $p < 0.05$.

Results: Two hundred seventeen Iraqi and Turkish orthodontists (104 Turkish orthodontists; 113 Iraqi orthodontists) answered to the form. Most of them had stop working during pandemic period of COVID-19. Most of the participated orthodontist reports that just works on emergency cases during the COVID-19 pandemic, this have a deleterious effect on orthodontist economic status that was very significant ($p:0.002$) in this study, also their future and psychological status, this could be attributed their thinking in virus dangerous on themselves and their family life's and highly significant ($p:0.001$) used their time seeing online presentation and read a scientific researches related to their fields.

Conclusion: COVID-19 effect on orthodontist life, economic and psychological status, orthodontist should take their cover protection them self from different virus's diseases and other and COVID-19 lockdown provide a much time for orthodontist reading some books and scientific papers also seen allot of online lectures and presentations and spend a time with their family.

Keywords: COVID-19; Corona virus; Orthodontist; Lockdown.

1. Introduction

COVID -19 or in the long name Coronavirus disease 2019, affecting people, is an infectious respiratory disease caused by serve acute respiratory syndrome coronavirus 2 (SARS-COV-2) [1]. The disease, which was first discovered in 2019 in Wuhan, China's Hubei province, has spread around the world since its discovery, causing a COVID-19 pandemic [2,3]. Common symptoms seen in the disease include fever, cough, and problems in breathing. Muscle aches, sputum production and sore throat are fewer common symptoms [4,5]. Gastrointestinal symptoms such as diarrhea have been reported [6,7]. In some studies, it is stated that the symptoms of the central nervous system stiffness, loss of smell and respiratory distress of the virus are due to this reason [8]. Although most of the cases have mild symptoms [9], some

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patients may experience severe pneumonia and multiple organ failure [2,10]. Among patients with diabetes, high blood pressure, heart disease, or respiratory problems, deaths were more than five times more common among cases confirmed by the first major analysis on more than 44,000 others [11]. The World Health Organization (WHO) declared this viral outbreak a pandemic affecting 57,274,018 individuals in more than 200 countries and territories, with a total of 1,368,000 confirmed deaths by Nov 22, 2020.¹² The highest number of reported cases and deaths were in the United States of America, with the total number of 11,597,979 and 250,607, respectively [12].

Virus is usually transmitted from person to person through droplets formed as a result of cough [13,14]. After touching the contaminated surfaces, it is thought that touching one's own face may be another spread method [13]. Since the virus is also present in the teeth of infected people, the meeting with the fecal-oral route is being investigated [6,7]. The incubation time from exposure to the virus to the appearance of symptoms is between 2 and 14 days and lasts on average 5 days [15,16]. The standard diagnostic method is real-time reverse transcriptase polymerase chain reaction (rTR-PCR) tests to be performed with nasopharyngeal swab taken from the person [17]. The infection can also be diagnosed by evaluating symptoms, risk factors, and chest CT scans that indicate pneumonia [18,19]. The suggested highlights include frequent hand washing, maintaining physical distance with other persons, using face masks and keeping hands away from the face [20]. At the beginning of the Covid-19 pandemic, many countries implemented lockdown measures to stop the spread of the coronavirus. As the number of cases decreased, lockdowns were lifted, and with the arrival of summer, many people believed that the worst was over and they could start socially meeting others again. Unfortunately, with the northern hemisphere moves into winter, coronavirus rates are rising in parts of Europe and the USA as named second wave. In response to the threat posed by the second wave, European countries and several US states introduced again population lockdowns, which included various restrictions on movement, meeting people, work, schooling, shopping, hospitality and entertainment [21].

Resulting the effects of the COVID-19 on social and business life, most people take a break from work, especially dentists (orthodontists) like that first wave. Unfortunately, orthodontists are among the highest risk occupational groups in infectious diseases. Orthodontists had standard working lives before COVID-19. Some of orthodontists only work in emergency cases because of COVID-19, while some of them doesn't. Orthodontists may break their psychology because they stop working.

The aim of this study to indicate how COVID-19 effects on behavior and their reactions to COVID-19 for orthodontist's lives in two neighbor countries (Turkey and Iraq), The bond between these two neighboring countries was based on many 100 years but they are different in social and economy field.

2. Material and methods

This study was approved by the Research Ethics Committee of Altınbas University, Turkey with approval number 21\11\2020-22176.

The study population was made up of all orthodontists in the Iraq and Turkey region. The Self-administered survey was created by using the free- access Google forms application and the link was uploaded on the official page of the Iraq Orthodontic Society for Iraqi orthodontists, and was sent to Turkish Orthodontists by Turkish Orthodontic Societies via an e-mail. The survey was remained accessible between April 24 and May 4, 2020. An informed consent letter was added to survey, and the participants were informed about the study and participation in the survey was enabled with the participant's own consent.

Power analysis performed with G*Power Ver. 3.1.9.7 (Franz Faul, Universität Kiel, Germany) software was used to construct the study group, and it was found sufficient to include 183 Orthodontists ($\alpha = 0.05$, $f = 0.30$, power = 0.90). 217 Orthodontists answered the survey and composed the study group.

The data were evaluated by using the Statistical Package for Social Sciences (SPSS, version 22). SPSS for windows 10 version, results were created using demographic distributional Chi-square analysis. The P value of ≤ 0.005 was considered statistically significant.

3. Results

Two hundred seventeen Turkish and Iraqi orthodontists (104 Turkish orthodontists (77 females and 27 male); 113 Iraqi orthodontists (68 females and 45 male) with an age averaged 37.79 ± 6.09 years and work experience as orthodontist average 10.34 ± 5.02 had participated in this questionnaire from different Iraqi and Turkish governorate.

Most of the participants was married (65 Turkish and 87 Iraqi orthodontists) and had kids (45 Turkish and 88 Iraqi orthodontists). Demographic characteristics of the groups were shown in Table 1.

Table 1 Demographic characteristics of the orthodontists

Demographic characteristics	Group		Total n (%)	P value
	Turkish n (%)	Iraqi n (%)		
Gender				
Female	77 (74.0%)	68 (60.0%)	145 (66.8%)	0.030*
Male	27 (26.0%)	45 (40.0%)	72 (33.2%)	
Age				
25-35	67 (64.4%)	35 (30.9%)	102 (47.0%)	0.001***
35-45	22 (21.2%)	45 (39.9%)	67 (31.0%)	
45-55	8 (7.7%)	18 (15.9%)	26 (11.9%)	
55-65	7 (6.7%)	13 (11.5%)	20 (9.2%)	
65+	0 (0%)	2 (1.8%)	2 (0.9%)	
No of years of Specialist				
0-5	60 (57.7%)	37 (32.7%)	97 (44.8%)	0.001***
5-10	14 (13.5%)	22 (19.5%)	36 (17.6%)	
10-15	8 (7.7%)	29 (25.7%)	37 (17.0%)	
15+	22 (21.1)	24 (22.1%)	46 (21.2%)	
Married				
Yes	65 (62.5%)	87 (76.9%)	152 (70.0%)	0.020*
No	39 (37.5%)	26 (23.1%)	65 (30.0%)	
Have kids				
Yes	45 (43.3%)	88 (77.8%)	133 (61.3%)	0.001***
No	59 (56.7%)	25 (22.2%)	84 (38.7%)	

* P≤.05; ** P≤.01; ***P≤.001

Regarding the participants' replies on where they work and did stop their working during COVID-19 pandemic period. 116 orthodontists work in different Turkish or Iraqis universities, 89 works in private clinic and 12 worked at different health government (p:0.002). 184 orthodontists stopped there works during COVID-19 pandemic and 33 orthodontists continued in there works, as shown in Table 2.

About 211 orthodontists (101 Turkish and 110 Iraqi) reported that COVID-19 was a danger on themselves and their jobs. Non-significant differences had reported (Table 3).

Regarding, do you think you are protecting yourself from COVID-19 while at work? Answer was; 140 orthodontist report by Yes (56 Turkish and 84 Iraqi) while 77 of them report by No (47 Turkish and 30 Iraqi orthodontist) with highly significant differences (p:0.003) as shown Table 3.

About answers, are you afraid of taking COVID-19 from your patients during work? 204 orthodontists (96 Turkish and 108 Iraqi) said Yes and 13 orthodontists (7 Turkish and 8 Iraqi) said No, with non-significant differences (Table 3).

The participants responded positively in sterilizing methods during work, as most of them (199 (89 Turkish and 110 Iraqi orthodontist) used autoclave machine in sterilization process and only 18 orthodontist used disinfection solution during COVID-19 pandemic period. With highly significant differences (Table 3, p: 0.002).

Table 2 The working status of the orthodontists during the COVID-19 pandemic

		Group		Total n (%)	P value
		Turkish n (%)	Iraqi n (%)		
Where are you working?	Universities	48 (46.2%)	68 (60.3%)	116 (53.5%)	0.002**
	Private	54 (51.9%)	35 (31.0%)	89 (41.0%)	
	Government	2 (1.9%)	10 (7.7%)	12 (5.5%)	
Did you stop working for COVID-19?	Yes	90 (86.5%)	94 (83.2%)	184 (84.8%)	0.715
	No	14 (13.5%)	19 (16.8%)	33 (15.2%)	

* P≤.05; ** P≤.01

About 181 orthodontists (89 Turkish and 92 Iraqi) work just emergent cases during COVID-19 pandemic period. With non-significant differences (Table 3).

Regarding, does COVID-19 affect your economic income? 191 reports by Yes and 26 orthodontist report by No, with highly significant differences. Regarding, do you think COVID-19 will affect your future? 187 reports by Yes and 30 by No, with non-significant differences. Also, does COVID-19 could effect on orthodontist psychological status? 182 orthodontist report by Yes and 35 report by No. with non-significant differences.

Regarding, during lockdown did you read any Orthodontic books, scientific articles or participate in any online presentation? Answers was: 129 orthodontists get benefit from the lockdown during COVID-19 pandemic period by reading books. 153 orthodontists read a scientific paper and 178 orthodontists used their time participating in online presentation and those show highly significant differences (p:0.001, Table 3).

Also, during the COVID-19 pandemic lockdown period, 162 orthodontist reports that they did a virtual consultation of their patients, as shown in Table 3.

Table 3 Effects of the pandemic on economic and psychologic status, professional development and use of tele dentistry applications of orthodontists

		Group		Total n (%)	P value
		Turkish n (%)	Iraqi n (%)		
Do you think COVID-19 is a danger to you for your job?	Yes	101(97.1%)	110 (97.3%)	211 (97.2%)	0.091
	No	3 (28.8%)	3 (2.7%)	6 (2.3%)	
Do you think you are protecting yourself from COVID-19 while at work?	Yes	56 (53.8%)	84 (74.3%)	140 (64.5%)	0.003**
	No	47 (45.2%)	30 (26.6%)	77 (35.5%)	
Are you afraid of taking COVID-19 from your patients?	Yes	96 (92.3%)	108 (95.6%)	204 (94.0%)	0.646
	No	7 (0.7%)	6 (5.3%)	13 (6.0%)	
During COVID-19 how do you sterilize your Orthodontic Pliers?	Autoclave	89 (85.6%)	110 (97.3%)	199 (91.7%)	0.002**
	Disinfection solution	15 (14.4%)	3 (2.7%)	18 (8.3%)	
Will you work for emergency cases during COVID-19?	Yes	89 (85.6%)	92 (81.4%)	181 (83.4%)	0.060
	No	15 (14.4%)	20 (17.6%)	36 (16.6%)	

Does COVID-19 affect your economic income?	Yes	84 (80.8%)	107 (94.6%)	191 (88.0%)	0.002**
	No	20 (19.2%)	6 (5.3%)	26 (12.0%)	
Do you think COVID-19 will affect your future?	Yes	90 (86.5%)	97 (85.8%)	187 (86.2%)	0.861
	No	14 (13.5%)	16 (14.2%)	30 (13.8%)	
Does COVID-19 affect your psychology?	Yes	80 (76.9%)	102 (90.3%)	182 (83.9%)	0.008**
	No	24 (23.1%)	11 (9.7%)	35 (16.1%)	
During lockdown did you read any Orthodontic books?	Yes	60 (57.7%)	69 (61.1%)	129 (59.4%)	0.616
	No	44 (42.3%)	44 (38.9%)	88 (40.6%)	
During the lock down did you read any scientific researches?	Yes	85 (81.7%)	68 (60.2%)	153 (70.5%)	0.001***
	No	19 (18.3%)	45 (39.8%)	64 (29.5%)	
During the lock down did you participate in any online presentation?	Yes	99 (95.2%)	79 (69.9%)	178 (82.0%)	0.001***
	No	5 (4.8%)	34 (30.1%)	39 (18.0%)	
During the lock down did you want any virtual consultation from your patients?	Yes	79 (75.9%)	83 (73.4%)	162 (74.7%)	0.671
	No	25 (24.1%)	30 (26.6%)	55 (25.3%)	

* P≤.05; ** P≤.01

4. Discussion

In this study, aimed to reach most of the orthodontist recorded in Turkish Orthodontic Society and Iraq Orthodontic Society to comparison between two countries in orthodontist behavior during COVID-19 pandemic period. The bond between these two neighboring countries was based on many 100 years, but they are different in social and economy field.

Social media and google service provide allot of benefit's during COVID-19 pandemic period through easily contact with colloquies without touching and get a lot of information from them. The survey was created by using the free- access Google forms application and the link was reached to orthodontists by means of Turkish Orthodontic Society and Iraq Orthodontic Society.

Even if the work continues without going into routine in summer, it can be thought that with the second wave, there will be a transition to a difficult period for orthodontists again. Garcia-Camba et al.²¹ summarized the working changes awaiting orthodontists during the COVID-19 period in 4 main groups; (1) with the increased use of personal protective equipment, measures such as applying stricter protocols inside and outside of the clinical area and minimizing aerosol generating procedures; (2) social distance measures by organizing waiting areas and appointments and reducing the number of patients and attendants in clinics; (3) increasing the use of less scheduled teleorthodontics and devices and techniques that require urgent appointments; and (4) ethical approach that takes into account the psychology of patients and their families more.

Regarding our results, most of participated orthodontist was worked in the universities, most of them (184 from 217 participants [90 Turkish and 94 Iraqis]) had stop working during pandemic period of COVID-19, this could be attributed to riskies caused by coronavirus as mentioned by orthodontist participated in this research who sided that COVID-19 was danger on themselves and their jobs (104 Turkish and 113 Iraqi) and most of them reported protecting themselves during this pandemic and afraid from taken the virus from their patients and this ensure the dangerous of coronavirus. In addition, 86.2% of the participants concerned about the COVID-19 would affect their future, in accordance with this result, Gerald et al, [22], Carter, [23] evaluated the impact of the COVID-19 pandemic to Nigerian orthodontists and reported that 57% of the 73 orthodontists thought that COVID-19 would permanently change their practice and 44% thought that number of orthodontic patients would reduce.

Even if there is a statistically significant difference between Iraqi and Turkish orthodontists using autoclave, 91.7% of participants of the present study sterilized orthodontic pliers using autoclave. In addition, there are publications²³ recommending the use of 0.12-0.2% chlorhexidine before procedures to reduce the risk of COVID-19 transmission, there are also authors [24,25] who recommend the use of 1% hydrogen peroxide or 0.2% povidone mouthwash.

Most of the participated orthodontist (83.4%) reports that just works on emergency cases during the COVID-19 pandemic, this have a deleterious effect on orthodontist's economic status that was found very significant ($p= 0.002$) in this study, also their psychological status, this could be attributed their thinking in virus dangerous on themselves and their family life's. 75.7% of the Nigerian orthodontists also preferred only saw emergency cases in their practice during COVID-19 pandemic [22]. Cotrin et al, [26] stated the most frequent emergencies during the pandemic were bracket breakage, arch wire breakage, and breakage of molar tubes and/or bands.

Despite of virus danger, there was another aria of life we should take in our calculation. During COVID-19 pandemic most of countries reports lockdown in order to reduce the spread of infection by contact, this provide a rest period of many orthodontists in their home, regarding this study, 129 orthodontists (60 Turkish; 69 Iraqi) used their time reading orthodontics books, but in highly significant ($p= 0.001$) used their time seeing online presentation and read a scientific researches related to their fields, this could be attributed to that most of them as in home taken rest from working and given a time for reading and recovering their information, also spend a wonderful moment with their family.

Teledentistry is a form of telehealth in which various telecommunication methods including imaging are used for the continuation of treatment planning and clinical information exchange of patients over long distances [27], and it can be a suitable option to reduce the risk of viral transmission and compliance with social distancing measures. 74.7% orthodontists expressed that they follow up their patient patients through teledentistry or virtual consultation in the pandemic. Positive patient experiences towards the use of teledentistry were claimed in patient satisfaction and usefulness, reliability and ease of use by Rahman et al, [28] in their study with the questionnaires of 52 patients. In light of social distancing and locking measures, orthodontists should consider adapting patient pathways and using teledentistry methods as a consultation method in planning recovery of services.

This study has a number of limitations; one of them, despite being two different countries, Iraq and Turkey, because of their common history and culture, some of the results of this study may not directly reflect the data of the orthodontist working in other countries. In addition, the unusual nature of the pandemic and the uncertainty of the second wave's severity, the potential new lockdown and its impact may differ in different regions. The results of this study can provide a basis for future work on the second wave and subsequent lockdowns.

5. Conclusion

Both Turkish and Iraqi orthodontists gave similar answers to the survey questions, expressing the effects of COVID-19 on their profession, economic status and psychology. To summarize briefly, the results of this study provided common advantages and disadvantages for orthodontists of both countries:

- The alarming effect of orthodontists on life, economic and psychological situation.
- Orthodontists to protect themselves and their patients from different viral diseases and other diseases.
- The COVID-19 lockdown gives orthodontists a lot of time to read some books and scientific articles, they also see online lectures and presentations and spend time with their families.
- Thanks to the active use of teledentistry, communication with distant patients and providing treatment and work flow has attracted attention.

Compliance with ethical standards

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Disclosure of conflict of interest

There are no conflicts of interest.

Statement of informed consent

Electronic Informed consent had been obtained from all orthodontist participants included in this study.

Data Availability

The data that support the findings of this study are available from the corresponding author upon reasonable request.

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