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Original Research Article

Acceptance or rejection of the COVID-19 vaccine: A cross-sectional study among orthodontists

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Abstract

Background: Close contact with the infected patient is one of the reason for the spread of infection. COVID-19 can easily infect orthodontists; it may be found in saliva droplets during the removal or insertion of the orthodontic fixed appliance components or even during the removal of the removable appliance.
Aims: This study aims to assess the acceptance or rejection of the COVID-19 vaccine among Iraqi orthodontists.
Materials and Methods: A web-based cross-sectional survey among orthodontists in Iraq was conducted. Thirteen pre-structured questions were sent in a Google Form via their WhatsApp and Telegram groups.
Results: There were 123 orthodontists participating in this survey. The majority of the participants (96.75%) were aware of COVID-19, and 62.60% suggested that coronavirus poses a significant risk. Orthodontists who took the vaccine accounted for 93.50%; among them, those who preferred the Pfizer vaccine accounted for 57.39%. The side effects associated with the vaccine were the leading reasons for vaccine refusal.
Conclusions: Although there is a high level of awareness about COVID-19 viruses among orthodontists, some abstained from the vaccine because of fear. The acceptance of COVID-19 vaccines and the number of participants who got the vaccine were high to achieve precise infection control in orthodontic clinics and decrease viral infection spread.

Keywords: COVID-19, Vaccine, Orthodontists, Health.

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1. Introduction

The COVID-19 outbreak originated in Wuhan, China, in December 2019, leading to significant disruptions in healthcare systems globally. Severe viral pneumonia leads to acute respiratory syndrome with clinical symptoms of infection that are not always specific.[1-2] Healthcare workers are at high risk of infection because they are directly involved in diagnosing, treating, and caring for patients.[3] Dentistry and its related internships are one of the most deeply influenced sectors. Dental professionals are exposed to high-risk environments due to the presence of oral fluids and aerosols, increasing the likelihood of viral exposure and transmission.[4-5] The infection spreads mainly through respiratory droplets and during close contact; symptomatic, pre-symptomatic, and asymptomatic patients can carry it.

WHO governments attempted to contain COVID-19 because of its highly infectious nature. Antiviral medications and immunotherapy (monoclonal antibodies and protease

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inhibitors) are potential therapeutics being developed or in different stages of clinical trials.[6-7] The vaccine is the most effective and frequently used way to prevent disease and control infection.[8] Therefore, vaccination may be the most reliable way to stop and contain COVID-19.[9] COVID-19 vaccine development and supply are an ongoing process.[10] In North America and Europe, well-known companies released many candidate vaccines for high-risk populations and healthcare workers, such as older adults and patients with chronic diseases.[11]

There are 138 vaccine candidates; their mode of action depends on the immune response to its integral parts (DNA, RNA, or protein), and about 21 of these vaccines are approved worldwide for emergency use.[12] Pfizer-Biotech, Moderna, and Johnson & Johnson developed three vaccines that are being administered broadly.[13] The Pfizer-BioNTech BNT162b2 vaccine was approved by the FDA on August 23, 2021, after meeting the FDA requirements for manufacturing, efficacy, and safety.[14] Other approved vaccines are BBIBP, Sinopharm-Wuhan (China), CoronaVac, CoviVac (Russia), QazCovid-in (Kazakhstan), and COVIran Barekat (Iran).[12] There has been a lot of research on the knowledge, attitude, and behaviors during COVID-19 pandemic in addition to the vaccine acceptance among orthodontists, general dentists and health coworkers.[15-24] The present study is the first Iraqi study, and it aims to assess the acceptance and rejection of the COVID-19 vaccine among Iraqi orthodontists.

2. Materials and Methods

The College of Dentistry, University of Baghdad's ethical committee approved this cross-sectional survey. The sample size was estimated using the online Survey Monkey sample size calculator; the population size was 180, representing the current total number of orthodontists in Iraq, with a confidence interval of 95% and a margin of error of 5; hence, the required sample size was 123.

The survey included 13 questions regarding COVID-19 vaccines. It was disseminated by Google Forms and sent as a link through the participants' WhatsApp and Telegram groups. This survey was anonymous to ensure the information's confidentiality.

The questionnaire had two parts. The first collected demographic data such as gender, age, qualification, and place of work. The second part was concerned with questions related to the COVID-19 vaccine. Microsoft Office Excel analyzed the collected responses as frequencies and percentages.

3. Results

This study's results are based on the responses of 123 of 180 Iraqi orthodontists invited to participate in this online questionnaire regarding their acceptance or rejection of the COVID-19 vaccine. **Table 1** shows the demographic information. Half of the respondents were aged 36–45 years 83.74% had a master's degree, and 82.11% worked in both institutional and private clinics.

In **Table 2**, 96.75% of participants were aware of COVID-19, and 54.47% were infected along with their families. Moreover, 62.60% of participants thought that the coronavirus poses a major risk; 47.15% agreed that the COVID-19 vaccine effectively protects from COVID-19. Furthermore, 91.87% of the respondents encouraged their patients to take the vaccine; 93.5% of the participants took the vaccine, and 6.5% did not because of fear of the side effects that could occur after taking the vaccine and the absence of scientific information about it.

Table 3 shows the vaccinated participants' responses. The Pfizer vaccine was preferred by 57.39%. The orthodontists who changed their infection control protocols after vaccination accounted for 54.78%; and 68.70% did not catch the virus after taking the vaccine compared to 9.57% who caught it. Moderate symptoms of infection were found in 45.45% of all orthodontists. Finally, 81.82% of the participants brought antivirus protection to work.

Table 1: Demographic data of the participants

Parameters		**N**	**%**
Age	25-35	48	39.02
	36-45	62	50.41
	46-55	13	10.57
	Total	123	100
Genders	Male	62	50.41
	Female	61	49.59
	Total	123	100
Qualification	Certificate	5	4.07
	Master	103	83.74
	Ph.D.	15	12.20
	Total	123	100
Place of work	Private	8	6.50
	Institutional	14	11.38

	Both	101	82.11
	Total	123	100

Table 2: Awareness to COVID-19 and vaccines

Questions	Responses	N	%
Are you aware of COVID-19?	Yes	119	96.75
	No	4	3.25
	Total	123	100
Have you or any members of your family been infected with COVID-19 in the past?	I and my family were	67	54.47
	I don't sure	8	6.50
	I was only	5	4.07
	No one has been infected	14	11.38
	Someone in the family only	29	23.58
	Total	123	100
To which extent do you think coronavirus poses a risk to you personally?	Major	77	62.60
	Moderate	45	36.59
	No risk	1	0.81
	Total	123	100
Does COVID-19 vaccine effective in protecting you from COVID-19?	Strongly agree	32	26.02
	Agree	58	47.15
	Neutral	32	26.02
	Disagree	1	0.81
	Total	123	100
Do you encourage your patients to take the vaccine?	Yes	113	91.87
	No	2	1.63
	I do not care	8	6.50
	Total	123	100
Did you take the vaccine?	Yes	115	93.50
	No	8	6.50
	Total	123	100
Why don't you want to take the vaccine?	I am afraid of the side effects that may occur after taking the vaccine	5	62.5
	I do not have enough scientific information about it because it is new	2	25
	The vaccine was not available	1	12.5
	I trust my own immunity to protect me	0	0
	Someone else told me that the vaccine is not safe	0	0
	Total	8	100

Table 3: Responses of vaccinated participants about vaccines

Questions	Responses	N	%
Which of the following types of vaccine do you prefer?	Chinese	26	22.61
	Oxford (Astra Zeneca)	21	18.26
	Pfizer	66	57.39
	US Moderna	2	1.74
	Total	115	100
Did your application of health protection instructions against the corona virus change after taking the vaccine?	Yes	63	54.78
	No	52	45.22
	Total	115	100
Did you catch the corona virus after taking the vaccine?	Yes	11	9.57
	No	79	68.70
	I am not sure	25	21.74
	Total	115	100

How were the symptoms of infection?	Mild	4	36.36
	Moderate	5	45.45
	Severe	2	18.18
	Total	11	100
What symptoms did you have after taking a first and a second dose of the vaccine?	Fever	1	9.09
	Fever, weakness, and fatigue	2	18.18
	Flu-like symptoms	3	27.27
	Weakness and fatigue	1	9.09
	Weakness, fatigue, flu-like symptoms	1	9.09
	All of the above	3	27.27
	Total	11	100
How did you deal with your patients next day after the first and second vaccine doses?	I go to the clinic with protection means	9	81.82
	I go to treat only the urgent cases	1	9.09
	I did not go to the clinic	1	9.09
	Total	11	100

4. Discussion

The role of dentists and dental students in the fight against COVID-19 is of paramount value[25] in terms of providing safe oral/dental care during the pandemic and educating and motivating the public to accept COVID-19 vaccines and adhere to preventive measures.[21] A survey taken in Iraq during January 2021 among the general population suggested that only 77.6% of Iraqis were willing to get the vaccine as soon as it was available.[26] The current survey was conducted on orthodontists since all dentists, including orthodontists, can be infected by the virus;[27] however, orthodontic practice produces fewer aerosols than other dental specialties. Clear aligners, attachment bonding, bracket insertion, and residual adhesive removal create aerosol; COVID-19 may also be found in saliva droplets, which might splash while removing or inserting orthodontic ligatures and wires.[28] Most guidelines do not contain sufficient information about orthodontic management during COVID-19. Because orthodontic treatment is continuous and needs follow-up every 4–6 weeks, true orthodontic emergencies during a crisis like this should be clarified, and protocols should be developed on how to manage them.[16]

In this study, orthodontists showed a high level of awareness about COVID-19 viruses, as did orthodontists in China[16] and Turkey,[17] but another study[18] showed a moderate knowledge of COVID-19 vaccination. In Iurcove et al.'s study,[22] which was conducted on dentists, higher infection rates among family members were recorded than in the present study. So, during the lockdown and before the vaccine was available, some orthodontists depended on social media to communicate with and supervise their patients from afar.[29] Social distancing and staying away from family are preventive measures that must be taken during a pandemic.

About 62.60% of the sample thought the coronavirus poses a major risk. This supports taking the preventive measures recommended in dentistry by encouraging vaccination, which is now widespread. The hesitation in taking it and the misleading information and rumors make it a significant challenge because dentists are at high risk of infection.[30] Other potential factors that could influence vaccine acceptance are risk awareness and safety perception among dental professionals. Dentists have been shown to have an acceptable level of risk awareness.[31]

The vaccine's effectiveness showed geographical variations; in the USA, the efficacy was 72%,[32] but in this study, only 47.15% of the orthodontists thought the COVID-19 vaccine effectively protected from the coronavirus. As in the current study, many orthodontists encouraged their patients to get the vaccine to protect them from infection. The USA prioritized the vaccine for American dental and medical students,[33] so giving priority to dentists to receive the COVID vaccine is ethical and necessary to ensure the community's health. Patients may feel reassured when visiting the dentist if they know that a high percentage of their dentist and dental staff were vaccinated and encouraged their patients to get the vaccine.[23]

In many studies.[15-34] a high number of participants were vaccinated, as in the present study, and the most preferred vaccine was Pfizer's vaccine rather than the others,[18,34-36] since mRNA vaccines are an excellent alternative to support immunity against viruses.[35] The most common reason for vaccine refusal among the healthcare workers and staff at Ugandan[36] and Nepalese[37] medical colleges was concern about the vaccine's safety. The side effects that may occur after taking the vaccine were the primary cause of fear of the vaccine in the present study.

After vaccination, side effects typically comprised a small amount of fatigue with a headache, elevated body temperature, and soreness at the injection site; sometimes, the symptoms were mild.[18,34,38-39] In addition, our study noted flu-like symptoms. Some respondents believed that COVID-19 would go away permanently when they changed their ways of practicing the profession; orthodontists and doctors indicated that they would improve infection control methods.[19] N95 respirators and face shields became the norm rather than the exception, particularly for aerosol-generating procedures. Most practices have also begun to adhere to

occupational safety and health administration requirements to test the fit of their N95 respirators at least annually, in addition to developing and training team members in their own respiratory protection programs.[40] Orthodontic clinics must follow thorough and precise infection control measures to meet patients' needs. To minimize the spread of viral infection, all precautionary measures for COVID-19 have to be made available in the clinic, in addition to continuous dental healthcare training for workers and patients.[41]

Vaishya et al.[24] determined that 2.63% of vaccinated healthcare coworkers acquired the SARS-CoV-2 infection after vaccination; this percentage is less than the 9.57% of our sample who were infected after vaccine uptake. Some orthodontists in this study changed their health protection protocols against the coronavirus after taking the vaccine to prevent the infection after immunization, so a high percentage of the sample did not catch the coronavirus after taking the vaccine. This supports the Pietrzak and Hanke[20] study, which stated that healthcare workers were four times less likely to develop asymptomatic COVID-19 infection 12 days after receiving the vaccine.

The study's limitation was that the sample included only orthodontists and did not contain all specializations in dentistry.

5. Conclusions

Although orthodontists are highly aware of COVID-19 viruses, some refuse the vaccine out of fear. The acceptance of COVID-19 vaccines and the number of participants who took the vaccine were high.

5.1. Data availability

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

6. Source of Funding

This study did not receive any funding in any form.

7. Conflict of Interest

None.

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