Archives of Current Medical Research
Arch Curr Med Res 2022;3(2):86-96

Received: 03 January 2022
Revised: 12 January 2022
Acccepted: 18 January 2022
DOI: 10.47482/acmr.2022.52

ORIGINAL ARTICLE

Prevalence of COVID-19 vaccine hesitancy among dentists in Turkey

Nevra Karamüftüoğlu[1], **Fatma Semanur Korkmaz Öner**[1], **Asiye Uğraş Dikmen**[1], **Seçil Özkan**[1],

1 Gazi University Faculty of Medicine, Department of Public Health, Ankara, Turkey

Abstract

Background: Although dentists are among high-risk groups for COVID-19 due to their practice requiring to be in close proximity to patients's oral cavities, there is a clear lack of studies on the frequency of hesitancy towards COVID-19 vaccines and the factors that influence the said hesitancy. This study aims to determine the factors causing hesitancy to receive COVID-19 vaccines in dentists and the frequency of the hesitancy.

Methods: The universe of this online cross-sectional survey was 23,664. Participants were then selected from the association's member list using the numbers table. Dentists were selected by random sampling method and the sample size was 458. SPSS 22.0 for Windows was used for the data analysis. Chi-square test was used in the comparison analysis of categorical variables, and the statistical significance level was set as $p<0.05$.

Results: Of the 458 dentists participating in the study, the mean age was 38±10.5, 133 (29.0%) were male and 325 (71.0%) were female. 59 (12.9%) dentists stated that they have not been vaccinated with the COVID-19 vaccine, 399 (87.1%) participants stated that they have.

Conclusions: In this study, 87.1% of dentists in Turkey stated that they have been vaccinated with the COVID-19 vaccine; proving that there is no vaccine hesitation among dentists in Turkey.

Keywords: COVID- 19, Vaccine Hesitancy, Dentist, Turkey

Cite this article as: *Karamüftüoğlu M, Korkmaz Öner FS, Uğraş Dikmen A, Özkan S. Prevalence of COVID-19 vaccine hesitancy among dentists in Turkey. Arch Curr Med Res. 2022;3(2):86-96*

Corresponding Author:
Nevra Karamüftüoğlu, Gazi University Faculty of Medicine,
Department of Public Health, Ankara, Turkey
E-mail: nvrserbest@hotmail.com

INTRODUCTION

Coronavirus disease 2019 (COVID-19) is a new disease caused by the pathogen "Severe Acute Respiratory Syndrome Coronavirus 2" (SARS-CoV- 2) (1). The World Health Organization (WHO) declared the status of COVID-19 to have risen to a pandemic on 11 March 2020 (2). The pandemic has created a heavy burden of disease worldwide, and there is currently no specific antiviral treatment for COVID-19 (3,4). In view of Benjamin Franklin's words, "One gram of prevention is better than one kilogram of cure", standart restriction measures were introduced to prevent contamination (mask mandates, social distancing, hygiene and ventilation). However, they were found to be not sufficient to control the progression of the COVID-19 pandemic (5,6). In line with this, vaccines are considered to be the most successful and cost-effective health interventions in preventing the spread of a pandemic, with vaccine development and mass immunization playing the most important role in preventive health services. In the midst of a pandemic that has been on the agenda for more than a year globally, the hesitation towards vaccination and different hesitancy trends in different countries require careful considerations to be made in order to ensure effective prevention of the spread of the disease.

Vaccine hesitancy, as defined by WHO; vaccine delays, acceptance or rejection of vaccination despite the availability of vaccination services, is observed in more than 90% of countries around the world (4).

According to the Turkish Medical Association (TMA), the rate of those who are willing to receive a COVID-19 vaccine in Turkey has been in the range of 40 – 45% for a period of time (5). In Turkey, studies were carried out on the hesitation of the society and healthcare workers that were against the COVID-19 vaccine. Although some studies on the COVID-19 vaccine hesitation of dentists and dentistry students around the world are being published, a study focusing on dentists regarding their hesitation, hesitation frequency and contributing factors towards COVID-19 vaccines was yet to be conducted in Turkey. Considering that dentists are continuously exposed to SARS CoV–2 infection due to aerosol released during dental treatment and are in a high-risk group, the importance of administering COVID–19 vaccines to dentists rises (6-8).

The aim of this study is to evaluate the frequency of COVID-19 vaccine hesitation among dentists and the factors affecting dentists in Turkey.

MATERIALS AND METHODS

An online cross-sectional survey consisting of 19 questions for dentists working in private practice, clinics, universities, and state hospitals was conducted in April 2021 via "Google Forms". The study was carried out in accordance with the Declaration of Helsinki, and the protocol was approved by the Ethics Committee of Gazi University (Date: 23.03.2021 number: 05), with all participants giving their informed consent to participate. The survey included questions on socio-demographic characteristics, the impact of COVID-19, risk perception for COVID-19 vaccines, attitudes, acceptance and hesitation preferences during the pandemic. Of the total 32,859 dentists working in the public and private sectors throughout Turkey; 23,644 dentists are members of the Turkish Dental Association. Accordingly, the sample size was calculated by taking the frequency of vaccine hesitation as 50% (the unknown frequency that extracted the maximum sample size) with a confidence interval of 95%, deviation 5%; resulting in a sample size of 458. Participants were then selected by random sampling method from the members list of the association.

The Statistical Package for Social Sciences (SPSS), version 22.0 for Windows (SPSS Inc. Chicago, USA) computer package program was used for statistical analysis of the data. In the descriptive statistics section, categorical variables are presented by giving number and percentage, while continuous variables are presented with mean ± standard deviation and median (min-max) value. Yates Continuity Correction Test, Pearson Chi-Square Test, and Likelihood Ratio Test were used in the evaluation of categorical variables. Statistical significance was accepted as $p<0.05$. Descriptive statistics, chi-square and logistic regression analysis were used to evaluate the data. A P value of <0.05 was considered significant. Variables with $p<0.20$ in the chi-square analysis were included in the logistic regression model.

RESULTS

The average age of the participants was 38±10.5. Distribution of some descriptive characteristics of dentists participating in the research are shown in Table 1. A total of 72.5% (n=332) of them had doctorate, specialty or master's degrees. 94.8% (n=434) of participants were still working, 3.5% (n=16) were not working and 1.7% (n=8) stated that they were retired. In terms of chronic disease and/or disability, it was found that 16.6% (n=76) of the participants had such, while 83.4% (n=382) did not.

Table 1. Distribution of some descriptive characteristics of dentists participating in the study, Turkey, 2021

	Number	(%)*
Gender (n=458)		
Female	325	71.0
Male	133	29.0
Marital Status (n=456)		
Single	306	67.1
Married	150	32.9
Education Status (n=458)		
Post graduate	126	27.5
Doctorate, speciality, masters degree	332	72.5
Working Status (n=458)		
Still working	434	94.8
Not working	16	3.5
Retired	8	1.7
Employed Institution (n=444)		
Own clinic	129	29.1
Private hospital	104	23.4
Public hospital	93	20.9
Faculty of dentistry	99	22.3
Other	19	4.3
Chronic Disease and / or Disability Status (n=458)		
No	382	83.4
Yes	76	16.6
Living with others (n=456)		
Alone	70	15.4
With friends	8	1.8
with family members	374	82.0
Other	4	0.9
Living with People Over 65 (n=450)		
Yes	76	16.9
No	374	81.7

*percentage column

Distribution of professional working conditions of dentists participating in the research is shown in Table 2. Considering the frequency of working with aerosols during the study, 56.6% (n=249) of the participants stated that they have regularly performed procedures causing aerosol production, 27.0% (n=119) stated that they have occasionally performed such procedures, and 16.4% (n=72) stated that they did not perform any aerosol-producing procedures.

Table 2. Distribution of professional working conditions of dentists participating in the study, Turkey, 2021

	Number	(%)*
Active Work Throughout the Pandemic (n=455)		
Yes	368	80.9
No	87	19.1
Work Intensity in the Pandemic (n=441)		
Similarly	130	29.5
Less	236	53.5
More	75	17.0
Aerosol-producing Applications in the Pandemic (n=440)		
Occasionally doing the operations that create aerosol	119	27.0
Regularly doing the operations that create aerosol	249	56.6
Never doing the operations that create aerosol	72	16.4
Taking Part in Filiation (n=458)		
Yes, I worked in filiation for a while	47	10.3
Yes, I'm still in filiation	50	10.9
No	361	78.8

*percentage column

Distribution of dentists participating in the study regarding the diagnosis of COVID-19 and other vaccines are shown in Table 3. When evaluated for having been diagnosed with COVID-19 during the pandemic, it was found that 88.0% (n=403) of the participants were not diagnosed.

Table 3. Distribution of dentists participating in the study regarding the diagnosis of COVID- 19 and vaccination history of participants, Turkey, 2021

	Number	(%)*
COVID- 19 Diagnosis During the Pandemic (n=456)		
Yes, treated at the hospital	1	0.2
Yes, treated using medicines at home	44	9.6
Other	8	1.7
No	403	88.4
Being Diagnosed with COVID- 19 in the Same Household (n=453)		
No diagnosis	379	83.7
Have a diagnosis	74	16.3
Being Diagnosed with COVID- 19 in People Nearby (n=458)		
No diagnosis	288	62.9
Have a diagnosis	170	37.1
Getting Pneumococcal Vaccination in the Pandemic (n=456)		
Yes	69	15.1
No	387	84.9
Getting Influenza Vaccination in the Pandemic (n=458)		
Yes	67	14.6
No	391	85.4
Getting COVID-19 Vaccination (n=458)		
Yes	399	87.1
No	59	12.9

*percentage column

Of the dentists participating, 16.3% (n=74) stated that one of the people that they were living in the same household were diagnosed with COVID-19, 83.7% (n=379) stated that the people they lived with were undiagnosed. When questioned whether they have had an influenza vaccine since September 2020; it was found that 14.6% (n=67) participants have received the influenza vaccine during the pandemic, and 85.4% (n=391) did not receive the vaccine. 12.9% (n=59) of the 87.1% (n=399) participants stated that they were vaccinated with the COVID-19 vaccine, which is given free of charge by the state, once it was their turn.

The evaluation of COVID-19 vaccination status of the dentists participating in the study is presented in Table 4 in line with some descriptive characteristics. In terms of gender, male participants were observed to be vaccinated more (93.2%) (p=0.019). In terms of marital status, being married was associated with more frequent vaccination (89.9%) (p=0.011). In terms of the place of employment, all dentists working in their own clinic, private hospitals, public hospitals and dentistry faculties were vaccinated (p<0.001). A significant relationship was found between dentists living in different residences in isolation since the beginning of the pandemic and vaccination status (p<0.001), and dentists who did not follow such isolation measures were vaccinated more (99.3%). A significant relationship was found in vaccination status of dentists who lived with somebody who was diagnosed with COVID-19 (p=0.007). Dentists living with people who had not been diagnosed with COVID-19 received more vaccinations (92.9%). There was a significant difference between being vaccinated against influenza and being vaccinated against COVID-19 during the pandemic (p=0.007). Dentists who were not vaccinated against influenza were found to have received the COVID-19 vaccines more (89.0%). Dentists who did not think that the 60% of the population being vaccinated in order to ensure mass vaccination would be effective against the pandemic were vaccinated on a higher frequency (98.8%). This difference was statistically significant (p<0.001).

Table 4. Evaluation of COVID- 19 vaccination status of the dentists participating in the study according to some descriptive characteristics, Turkey, 2021

	COVID- 19 Vaccination Status			
	Yes		No	
	Number	(%)*	Number	(%)*
Gender (n= 458)				
Female	275	84.6	50	15.4
Male	124	93.2	9	6.8
χ 2 = 5.501 p= 0.019**				
Marital Status (n= 456)				
Married	122	89.9	31	10.1
Single	275	81.3	21	18.7
χ 2 = 6.511 p= 0.011***				
Employed Institution (n= 425)				
Own clinic	118	91.5	11	8.5
Private hospital	91	87.5	13	12.5
Public hospital	70	75.3	23	24.7
Faculty of dentistry	95	96.0	4	4.0
χ 2 = 21.712 p< 0.001***				
Chronic Disease and / or Disability Status (n= 458)				
Yes	68	89.5	8	10.5
No	331	86.6	51	13.4
χ 2 =0.234 p=0.629****				
Living with others (n= 456)				
Alone	63	90.0	7	10.0
With friends	7	87.5	1	12.5
With family members	324	86.6	50	13.4
Other	3	75.0	1	25.0
χ 2 =1.116 p=0.773***				
Living with People Over 65 (n= 450)				
Yes	62	81.6	14	18.4
No	332	88.8	42	11.2
χ 2 = 2.374 p= 0.123**				
Work Intensity in the Pandemic (n= 441)				
Similarly	120	92.3	10	7.7
Less	202	85.6	34	14.4
More	62	82.7	13	17.3
χ 2 = 4.918 p= 0.086***				
Aerosol-producing Applications in the Pandemic (n= 440)				
Occasionally doing the operations that create aerosol	95	79.8	24	20.2
Regularly doing the operations that create aerosol	230	92.4	19	7.6
Never doing the operations that create aerosol	59	81.9	13	18.1
χ 2 = 13.595 p= 0.001***				

Table 4. (continued) Evaluation of COVID- 19 vaccination status of the dentists participating in the study according to some descriptive characteristics, Turkey, 2021.

	COVID- 19 Vaccination Status			
	Yes		No	
	Number	(%)*	Number	(%)*
Taking Part in Filiation (n= 458)				
Yes, I worked in filiation for a while	34	72.3	13	27.7
Yes, I'm still working in filiation	37	74.0	13	26.0
No	328	90.9	33	9.1
χ 2 = 21.313 p< 0.001***				
Self-isolation from Household Members in the Pandemic (n= 405)				
Yes	95	65.1	51	34.9
No	304	99.3	2	0.7
χ 2 = 113.688 p< 0.001****				
COVID-19 Diagnosis During the Pandemic (n= 458)				
Yes	46	86.8	7	13.2
No	353	87.2	52	12.8
χ 2 = 0.006 p= 0.940****				
Being Diagnosed with COVID-19 in the Same Household (n= 453)				
Yes	65	87.8	9	12.2
No	332	87.6	47	12.4
χ 2 = 0.003 p= 0.954****				
Being Diagnosed with COVID-19 in People Nearby (n= 458)				
Yes	241	83.7	47	16.3
No	158	92.9	12	7.1
χ 2 = 7.365 p= 0.007****				
Getting Pneumococcal Vaccination in the Pandemic (n= 456)				
Yes	55	79.7	14	20.3
No	342	88.4	45	11.6
χ 2 = 3.169 p= 0.075**				
Getting Influenza Vaccination in the Pandemic				
Yes	51	76.1	16	23.9
No	348	89.0	43	11.0
χ 2 = 7.350 p= 0.007**				
60% Vaccination will be Effective in COVID- 19				
Yes	237	80.6	57	19.4
No	162	98.8	2	1.2
χ 2 = 41.093 p< 0.001****				

* Percentage column

** Yates Continuity Correction Test

*** Pearson Chi-Square Test

**** Likelihood Ratio Test

The evaluation of the COVID-19 vaccination status of the dentists participating in the study is presented in Table 5. Married dentists were 4.229 times more likely to receive the COVID-19 vaccine than the unmarried dentists. Dentists working in dentistry faculties were 11.264 times more likely to be vaccinated than those working in private clinics. Those who occasionally apply aerosol-producing treatments were 9.416 times, and those who perform aerosol-producing treatments on a regular basis were 11.568 times more likely to receive the COVID-19 vaccine than those who do not use aerosols at all. Dentists currently working in filiation units were 13.174 times more likely to receive the COVID-19 vaccine than those who have never worked in filiation units.

Table 5. Analysis of Factors Affecting Dentists' Vaccination for COVID-19 (Multivariate logistic regression)

		P	OR*	%95 Confidence Interval	
			Min	Max	
Marital Status					
	Single	Reference	1		
	Married	0.015	4.229	1.320	13.544
Employed Institution					
	Own clinic	Reference	1		
	Private hospital	0.657			
	Public hospital	0.411			
	Faculty of dentistry	0.010	11.263	1.793	70.768
Aerosol-containing Applications in the Pandemic					
	Never doing the operations that create aerosol	Reference	1		
	Occasionally doing the operations that create aerosol	0.017	9.416	1.490	59.506
	Regularly doing the operations that create aerosol	0.006	11.568	2.005	66.731
Taking Part in Filiation					
	No	Reference	1		
	Yes, I worked in filiation for a while	0.254			
	Yes, I'm still working in filiation	0.032	13.174	1.248	139.096

*OR: Estimated relative risk as indicated by odds ratio

DISCUSSION

The main purposes of health services are to protect the health of the society, to improve the existing health and to restore the deteriorated health. In view of these purposes, the first stage of health services is preventive health services. Practices within the boundaries of preventive health services have social characteristics as well as individual characteristics. The first application that comes to mind when talking about preventive services is vaccination. Vaccination is one of the most successful public health interventions in human history (9). The success of immunization is directly related to vaccination rates and the factors that reduce vaccination rates, such as vaccine instability or adversity that negatively affects the control of vaccine preventable diseases (10,11). Vaccination provides individual immunity; and mass vaccination provides social immunity. In line with this, as the number of vaccinated individuals in a community increases, the possibility of contact for the unvaccinated individuals with the disease agent, therefore the frequency of the disease in said society decreases.

In view of the benefits vaccination provides under public health interventions, the need to identify factors that may contribute to the adoption of COVID-19 vaccination, especially among healthcare professionals that are at high risk of becoming infected with COVID-19 such as dentists increases.

Development in COVID-19 vaccines is advancing at an unprecedented pace, and countries around the world are accelerating research and development. As of 18 February 2021, at least seven different vaccines have been launched across three platforms in countries, and more than 200 additional vaccine candidates are under development, more than 60 of which are in clinical development (4,12). However, there is still uncertainty in the acceptance of the vaccine by the society (13,14).

"Vaccine Hesitancy Working Group" defined the term vaccine hesitation or vaccine instability as "delay in accepting or not allowing some vaccines to be administered despite the availability of vaccine services". In 2019, WHO identified one of the 10 global health problems before the COVID-19 pandemic as the anti-vaccine movement (15). In many studies on vaccine hesitation, factors affecting hesitation are found to be behaviors such as health belief model or protection motivation theory, risk perception, vaccine safety and effectiveness perception, general vaccination attitude, past vaccination, date, advice from doctors, price, vaccination convenience and socio-demographic characteristics (16-19).

Vaccine hesitancy and rejection cases, which were previously very few in Turkey, have increased rapidly with the winning of a lawsuit related to "obtaining parental consent for vaccination application" in 2015 and the frequent coverage of anti-vaccine statements in the media (17). The scientific literature around the world indicates that the hesitation to receive the COVID-19 vaccine in society is a major health problem. A study conducted on attitudes towards vaccination and awareness of health behaviors in adult Israelis showed that attitudes towards COVID-19 vaccines were more negative than attitudes towards general vaccines (18). Another study published in The Lancet Public Health Journal provided a new perspective on determinants of acceptance or rejection of the COVID-19 vaccine (19). Another survey concluded that a high degree of hesitation is present in society rather than direct opposition to vaccines, with the hesitation being mostly due to the fear of the side effects related to the COVID-19 vaccine (20).

In a review of more than 100 surveys examining the acceptance of the COVID-19 vaccine, it shows that many participants will decide whether to accept the vaccine based on the findings obtained by waiting for other people to receive the COVID-19 vaccine. This situation reveals the urgent need for active campaigns to build confidence in the vaccine (21).

There also are studies on vaccine hesitation in different groups at the national level. The behaviors of healthcare professionals not to be vaccinated directly affect the society's approach to the vaccination in general. In some studies conducted in Turkey, the behaviors of healthcare workers regarding vaccination have been discussed. In an evaluation of the attitudes of physicians in a university hospital towards vaccination, it was found that 10.5% of the participants were hesitant to vaccinate themselves or their children, and 2.6% did not want to vaccinate for religious and philosophical reasons (22). In another study aiming to determine the general vaccination status, knowledge and attitudes of healthcare professionals working and studying in a university hospital, it was found that 10.1% of healthcare workers completely refused vaccines and 89.6% were vaccinated against influenza viruses. Also, healthcare workers tending to young age groups showed more hesitation when vaccinating their children (23).

Vaccination of healthcare professionals is important as they set a precedent for their patients and their immediate environment. Vaccination hesitation in healthcare professionals should be heeded, details of this issue should be investigated and interventions to reduce vaccination hesitancy should be planned. In a study investigating the hesitations and acceptance of COVID-19 vaccine among dentistry and medical students, the need for a profession-specific curriculum designed to increase the knowledge of dental students about vaccination and vaccine counseling skills was highlighted (24). In another study investigating the attitudes and hesitations of dentistry students against the COVID-19 vaccine, almost all participants had a generally positive attitude towards vaccines, agreeing that they would be exposed to COVID-19 during their practice, and they personally knew someone who had been infected with COVID-19. However, it has been found that only 56% are willing to get the COVID-19 vaccine as soon as an

FDA-approved vaccine is available. 63% of those who do not want to receive the vaccine stated that they will receive the vaccine if it is mandated by the health systems or the dental school; 16.3% of the respondents stated that they would not receive the COVID-19 vaccine even if it were made mandatory. There are several factors associated with vaccine acceptance and the likelihood of recommending the vaccine, such as relying on public health professionals, concerns about side effects, and accepting vaccine instructions. These studies display a clear need for an education curriculum on vaccine safety and effectiveness to promote the adoption of the COVID-19 vaccine (25).

In this study, it was found that dentists did not hesitate on receiving the COVID-19 vaccine. The reason for the different results from other studies is thought to be that the group in which the study was conducted consisted of dentists who were at high risk of being infected with the current virus, and that the vaccine studies had positive findings regarding reliability across countries.

This cross-sectional study also aimed to explore the perspectives of dentists in Turkey regarding the COVID-19 vaccine and the dynamics of vaccine hesitations. According to the results of this study, dentists with higher leniency to be vaccinated are those who are male, married, working in the dentistry faculties, regularly performing the operations that involve aerosols, not employed in filiation units, diagnosed with COVID-19, have somebody in proximity who is diagnosed with COVID-19, did not receive an influenza vaccine during the pandemic, and those who do not think that 60% of the population being vaccinated against COVID-19 will be effective against the virus.

A study investigating the vaccine hesitation trends of healthcare professionals towards COVID-19, conducted after the second dose of the COVID-19 vaccines were administered found that 68.6% of the professionals were open to vaccination, and no prior hesitation before or after the vaccination were present in healthcare professionals; revealing that vaccination is more frequent and there is no hesitation in this regard (26).

All over the world, hesitation towards vaccines is increasing with different variables between countries, and vaccines are being associated with conspiratorial worldviews (27). Vaccine hesitation is an imminent threat to the fight against COVID-19 as it threatens achieving herd immunity, vaccine efficacy and population impact. It is important to devise an evidence-based strategy to promote vaccine acceptance by dentists who are at high risk of infection and to reduce vaccine hesitancy. These precautions would protect dentists against the virus and also reduce the transmission of the disease to their families, patients and society. When developing vaccination strategies for dentists, evidence-based planning should be considered prior to the administration of vaccines. Vaccination acceptance should be encouraged by the authorities within the scope of new developments in legislation and freedom of information and health guarantee. Maintaining the health of healthcare professionals through vaccination is an important component of pandemic preparedness as acceptance of vaccines is crucial to its success. Our findings add to the growing research on vaccination among oral health professionals.

When we look at the past, the pandemics ended in 2- 3 years. The SARS-CoV-2 virus will also be eradicated; however, it is still important to keep the rate of infection low as it does. Vaccines may not be effective against mutated viruses, so education comes to the fore and dentists' health literacy on vaccination needs to be increased.

Vaccination of healthcare professionals is important in terms of setting a precedent for their patients and their immediate environment. In this study, 87.1% of dentists in Turkey stated that they had the COVID-19 vaccine provided by the government. This result shows us that there is no vaccine hesitation in dentists in Turkey.

There are very few studies on the frequency of hesitancy and the factors affecting the COVID-19 vaccine among dentists in Turkey. This study is one of the first studies on this subject and more work needs to be done in this area. As a result, 87.1% of dentists in Turkey stated that they had the COVID-19 vaccine; proving that there is no vaccine hesitation in dentists in Turkey.

Declarations

The authors received no financial support for the research and/or authorship of this article. There is no conflict of interest.

This study was approved by the clinical research ethics committee of the Gazi University (Date: 23.03.2021 number: 2021/05).

REFERENCES

1. Guan W, Ni Z, Hu Y, Liang W, Ou C-Q, He J-X et al. Clinical characteristics of coronavirus disease 2019 in China. New Engl J Med. 2020;382:1708–20.
2. WHO Director-General's opening remarks at the Member States information session on COVID-19 - 11 March 2021. 2021. Available at https://www.who.int/director-general/speeches/detail/who-director-general-s-opening-remarks-at-the-member-states-information-session-on-covid-19---11-march-2021 Accessed March 20, 2022
3. Huang C, Wang Y, Li X, Ren L, Zhao J, Hu Y et al. Clinical features of patients infected with 2019 novel coronavirus in Wuhan, China. Lancet. 2020;395:497–506.
4. World Health Organization. WHO coronavirus disease (COVID-19) Dashboard. 2021. Available at https://covid19.who.int/?gclid=EAIaIQobChMI2_CM6eDZ6gIVghh9Ch3nDQm1EAAYASAAEgLqwPD_BwE Accessed March 24, 2022
5. TMA COVID-19 Pandemic 10th Month Evaluation Report. Vaccine Hesitation and Confidence. 2021. Available at https://www.ttb.org.tr/haber_goster.php?Guid=5b50dd24-5993-11eb-a234-396657807ef8 Accessed March 12, 2022
6. FDI council statement on COVID-19 vaccination. 2021. Available at https://www.fdiworlddental.org/vaccines Accessed March 10, 2022
7. Journal of the Turkish Dental Association. COVID-19 continues to take lives. 2021. Available at http://www.tdb.org.tr Accessed March 13, 2022. Turkish.
8. Gür E. Vaccine hesitancy - Vaccine refusal. Turk Pediatri Ar. 2019;54:1–2.
9. Kutlu R. Childhood vaccines. J Fam Med-Special Topic. 2017;8:311-8.
10. Health topics. Immunization. 2021. Available at https://www.who.int/immunization/monitoring_surveillance/data/tur.pdf Accessed March 14, 2022
11. Global Vaccine Action Plan. 2021. Available at https://www.who.int/teams/immunization-vaccines-and-biologicals/strategies/global-vaccine-action-plan Accessed March 13, 2022
12. COVID-19, Different COVID-19 Vaccines. 2021. Available at https://www.cdc.gov/coronavirus/2019-ncov/vaccines/different-vaccines.html Accessed March 13, 2022
13. Filiz M, Kaya M. Systematic review of studies to determine factors affecting vaccine rejection / instability / contrast. Turk Res J Academ Soc Sc. 2019;2:1-7.
14. Report of the Sage Working Group on Vaccine Hesitancy. 2021. Available at https://www.thecompassforsbc.org/sbcc-tools/report-sage-working-group-vaccine-hesitancy Accessed March 20, 2022
15. World Health Organization. Ten threats to global health in 2019. 2019. Available at https://www.who.int/news-room/spotlight/ten-threats-to-global-health-in-2019 Accessed March 20, 2022
16. Determann D, Korfage IJ, Lambooij MS, Bliemer M, Richardus JH, Steyerberg E.W. et al. Acceptance of vaccinations in pandemic outbreaks: A discrete choice experiment. PLoS ONE. 2014;9:e102505.
17. T.R. Ministry of Health, General Directorate of Health Information Systems. Health statistics annuals. 2021. Available at https://sbsgm.saglik.gov.tr/TR-73387/saglik-istatistikleri-yilliklari.html Accessed March 14, 2022. Turkish.
18. Shacham M, Greenblatt-Kimron L, Hamama-Raz Y, Martin LR, Peleg O, Ben-Ezra M et al. Increased COVID- 19 vaccination hesitancy and health awareness amid COVID- 19 vaccinations programs in Israel. Int J Environ Res Public Health. 2021;1:3804.
19. Schwarzinger M, Flicoteaux R, Cortarenoda S, Obadia Y, Moatti J-P. Low acceptability of A/H1N1 pandemic vaccination in french adult population: Did public health policy fuel public dissonance? PLoS ONE. 2010; 5: e10199.
20. Marco-Franco JE, Pita-Barros P, Vivas-Orts D, González-de-Julián S, Vivas-Consuelo D. COVID- 19, fake news, and vaccines: should regulation be implemented? Int J Environ Res Public Health. 2021;1:744.
21. Lin C, Tu P, Beitsch LM. Confidence and receptivity for Covid- 19 vaccines: a rapid systematic Review. Vaccine. 2021;9:16.
22. Arıcan MD. Overview of vaccination among healthcare professionals, factors affecting vaccine acceptance and rejection. Master thesis, Health Sciences University İzmir Tepecik Training and Research Hospital Family Medicine Clinic. İzmir, Turkey, 2019. Turkish.
23. Alben AF. Vaccine awareness and thoughts of healthcare professionals in a university hospital on vaccine rejection. Master thesis, Gaziantep University, Faculty of Medicine, Department of Public Health. Gaziantep, Turkey, 2019. Turkish
24. Kelekar AK, Doktora VCL, Afonso NM, Mascarenhas AK. COVID- 19 Vaccine acceptance and hesitancy among dental and medical students. J Am Dent Assoc. 2021;152:596-603.
25. Mascarenhas AK, Lucia VC, Kelekar A, Afonso NM. Dental students' attitudes and hesitancy toward COVID- 19 vaccine. J Dent Educ. 2021:1-7.
26. Kose S, Mandiracioglu A, Sahin S, Kaynar T, Karbus O, Ozbel Y et al. Vaccine hesitancy of the COVID- 19 by health care personnel. Int J Clin Pract. 2020;00:e13917.
27. Salali GM, Uysal MS. COVID- 19 vaccine hesitancy is associated with beliefs on the origin of the novel coronavirus in the UK and Turkey. Psychol Med. 2020;19;1-3.