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Diş Hekimlerinin COVID-19 Aşısı Olma İstekliliğinin Araştırılması

Investigation of Dentists' Willingness to have COVID-19 Vaccine

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ÖZ

Amaç: Çalışmanın amacı, diş hekimleri arasında COVID-19 aşısı konusundaki istek ve tereddütlerini değerlendirmektir.

Materyal ve Metot: Bu kesitsel çalışma için hazırlanan anket formları, çevrimiçi anket formuna dönüştürülerek diş hekimilerine gönderilmiştir. Türkiye'de bu yöntemle ulaşılabilen ve araştırmaya katılmaya gönüllü olan diş hekiminin yanıtları analiz edilmiştir. İstatistiksel analiz Ki -Kare Testi, Kruskall Wallis testi ve multinomial regresyon analizi kullanılarak yapılmıştır. İstatistiksel anlamlılık $p<0,05$ olarak belirlenmiştir.

Bulgular: Ankete toplam 290 diş hekimi katılmıştır. Medeni durumu bekar olan katılımcıların %91,7'si aşı olmayı kabul ederken, %2,1'i kararsız ve %6,2'si aşı olmayı reddetmiştir. Çalışmayan katılımcıların %33,'ü aşı olmayı kabul ederken, %66,7'si kararsız kalmıştır. ($p<0,05$) Katılımcıların ek gelire sahip olması ile aşıyı kabul etmelerinin arasında pozitif ilişki bulunmuştur.

Sonuç: Çalışmamız Türk diş hekimleri arasında COVID-19 aşısının kabulünün yüksek düzeyde olduğunu göstermiştir. Aşı kabul oranlarını daha da artırmak için COVID-19 aşısı hakkındaki bilgiler güçlendirilmelidir. Diş hekimlerinin COVID-19 aşısını yüksek oranda yaptırmayı kabul etmelerinin, toplumda aşı yaptırmayı kabul edenlerin oranını arttıracağı yönünde bir etki yaratması beklenmektedir.

Anahtar Kelimeler: Aşı, COVID-19, diş hekimliği, isteklilik, karar verme

ABSTRACT

Objective: The aim of the study is to evaluate the willingness and hesitancy of COVID-19 vaccine among dentists.

Materials and Methods: The questionnaire forms prepared for this cross-sectional study were converted into an online questionnaire and sent to dentists. The answers of the dentists who could be reached by this method in Turkey and volunteered to participate in the research were analyzed. Statistical analysis was performed using Chi-Square Test, Kruskall Wallis test and multinomial regression analysis. Statistical significance was determined as $p<0.05$.

Results: A total of 290 dentists participated in the survey. 91.7% of the respondents whose marital status is single agree to be vaccinated, while 2.1% are undecided and 6.2% refuse to be vaccinated. 33.4% of non-working participants agreed to be vaccinated, while 66.7% were undecided. ($p<0.05$) There is a positive relationship between the participants' having additional income and their acceptance of the vaccine.

Conclusions: Our study showed that the acceptance of the COVID-19 vaccine among Turkish dentists is high level. Knowledge about the COVID-19 vaccine should be strengthened to further increase vaccine acceptance rates. Dentists' high acceptance of the COVID-19 vaccine is expected to have a positive impact on population acceptance.

Keywords: COVID-19, decision making, dentistry, vaccines, willingness

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INTRODUCTION

In December 2019, China reported that some cases of pneumonia occurred for unknown reason in the city of Wuhan. After the examinations, it was determined that a new virus belonging to the coronavirus family and called "2019-nCov" was encountered which was later named "SARS-CoV-2". Being seen cases all over the world WHO (World Health Organization) declared the disease as a pandemic on March 2020. The disease, which can be seen in a wide clinical spectrum from asymptomatic cases to cases requiring intensive care, causes more than 4 million infections and more than 300,000 deaths as of November 2, 2021.[1]

Health care providers were also infected with the virus. WHO and Chinese Health authorities organized a meeting and publicized 2055 registered cases and 22 of them died with the cause of COVID-19 (0.6%). April 2020, some countries reported over 10% of health care workers infected with virus, 12.3% seropositivity was found among healthcare workers.[2]

Since the beginning of the COVID 19 pandemic, scientists have been intensely trying to find a cure for the disease. Despite newly created treatment options, the development of vaccines may change the course of the disease. For November 2021, 24 vaccines have been approved by authorities, and 495 vaccines are still undergoing safety testing.[3-5]

While the strongest factor in vaccine acceptance is the act of boosting immunity against COVID-19, the strongest factor in vaccine hesitancy is the side effects of vaccines. The main guideline for vaccine acceptance is the recommendation of health professionals for vaccination. However, there is a suspicion that the person declaring their acceptance of the vaccine cannot fully rely on the data collected.[6]

Vaccine hesitancy is defined by WHO as "delay or refusal to accept vaccines despite the availability of vaccine services". Vaccine hesitancy is seen as a major obstacle to the goal of herd immunity.[7]

A well -constructed, validated survey can provide powerful for clinical practice, guide future research development. Surveys have transformative potential on medicine.[8]

The purpose of this study is to assess the attitudes of dentists to the novel COVID-19 vaccine. Vaccine hesitancy and acceptance are assessed to identify potential concerns that need to be addressed not only to ensure adequate uptake of the vaccine among these essential healthcare providers, but also to ensure that they provide vaccine recommendations and counsel vaccine-hesitant patients.

MATERIALS AND METHODS

Ethics Committee Approval: Ethical approval of the study protocol was obtained from the Research Ethical Board of Istanbul University-Cerrahpaşa, Faculty of Medicine, Istanbul, Turkey (Date: 02/02/2021, decision no:A-49). This study adhered to the tenets of the Declaration of Helsinki.

Contents of the Survey: The survey was created through a literature review and included sociodemographic section and COVID-19 attitudes and perceptions section. Voluntary consent form was added to the questionnaire, participants who responded positively to the voluntary consent form completed the questionnaire. The first section requested participants to complete their demographic information (age, sex, educational level, working status, working year, work as filiation member, working status during lockdown, self-perceived socio-economic status). In the second part, questions assessed perceptions, including risks for COVID-19, barriers to vaccination, and attitudes toward COVID-19 vaccines. In the evaluation of the scale, a 5-point Likert type scale was used; "Definitely agree" option was scored with 1 point, "Agree" option with 2 points, "Undecided" option with 3 points, "Disagree" option with 4 points, "Definitely Disagree" option with 5 points.

Sample Size Determination: The sample size was calculated with an open-source calculator OpenEpi version 3 using the formula as "Sample size n = [DEFF * Np (1−p)]/ [(d2/Z2 1-α/ 2 * (N−1) + p * (1−p)]. Parameters were used as 40000 dentists which is the number of dentists in Turkey according to Turkish Dental Association is 39000 in the year 2020, margin of error as 5% and confidence interval (CI) as 90%, an assumption percentage of willingness to accept the COVID-19 vaccine (p) 50%, sample size calculated as 269.[9]

Performing the Survey: This cross-sectional survey study was made between 1 and 31 May 2021 among dentists in Turkey through an electronic documented survey (Google forms). Participants were contacted through Turkish dental associations network, WhatsApp groups, Facebook groups and efforts of volunteers forward the questionnaire to their network. All dentists who consented to participate in the survey were included in the study. Participants who do not have a profession in dentistry or dentistry students were not included in the study. In the study, it was aimed to reach 269 dentists. 290 dentists responded to our survey.

Statistical Analysis: Data were analyzed by IBM SPSS Statistics version 21 (IBM, Armonk, NY, USA). A Chi-square test was used to compare categorical data. Kruskall Wallis test and pairwise comparison tests were used to compare data. Multinomial logistic regression analysis was used to evaluate the factors affecting the willingness to get the

COVID-19 vaccine with for demographic variables. The 'refusal group' served as the reference group. General model results: −2 Log Likelihood = 101,45. χ^2 [16] = 32,11. p < 0.01; Nagelkerke R^2 = 0.29. A p value of <0.05 was considered to be statistically significant.

RESULTS

The socio-demographic data of the study is examined as; 91.7% of the respondents whose marital status is single agree to be vaccinated, while 2.1% are undecided and 6.2% refuse to be vaccinated. While 78.4% of the participants who are married in marital status agree to be vaccinated, 14.4% are undecided and 7.2% refuse to be vaccinated. (p<0.05) While 83.8% of working participants agree to be vaccinated, 9.2% are undecided and 7% refuse to be vaccinated. 33.4% of non-working participants agreed to be vaccinated, while 66.7% were undecided. (p<0.05) While 60% of the participants with an additional source of income agree to be vaccinated, 20% are undecided and 20% refuse to be vaccinated. While 86.4% of the participants who do not have an additional income source agree to be vaccinated, 8.8% are undecided and 4.8% refuse to be vaccinated (p<0.05) (Table 1).

Opinions of the participants against the COVID-19 vaccine are given in Table 2. The answers given to the questions Q3, Q8 and Q9 by those who agreed to be vaccinated among the participants in the survey were statistically different than other groups (p<0.05). The answers to the Q1 question of the respondents who were undecided about getting vaccinated were statistically different than other groups (p<0.05). The answers given to the questions Q5, Q6, Q7 of the respondents who refused to be vaccinated were statistically different than other groups (p<0.05) (Table 2).

Table 1. Demographical data of the participants.

		Willingness to get COVID-19 vaccine (n:290)			
Characteristics	**Category**	**Yes (%)**	**Undecided (%)**	**No (%)**	**p value**
Gender	Male	77.3 [a]	11.4 [a]	11.4 [a]	0.346
	Female	85.1 [a]	9.9 [a]	5.0 [a]	
Age	18-25	100.0 [a]	0.0 [a]	0.0 [a]	0.369
	26-35	72.5 [a]	15.7 [a]	11.8 [a]	
	36-50	87.7 [a]	8.8 [a]	3.5 [a]	
	51-65	88.2 [a]	5.9 [a]	5.9 [a]	
Marital status	Single	91.7 [a]	2.1 [b]	6.2 [b]	**0.045**
	Married	78.4 [a]	14.4 [b]	7.2 [b]	
Working Status	Working	83.8 [a]	9.2 [b]	7.0 [b]	**0.005**
	Not Working	33.3 [a]	66.7 [b]	0.0 [b]	
Employment Status	Full Time	82.6 [a]	8.3 [a]	9.2 [a]	0.076
	Part Time	83.3 [a]	16.7 [a]	0.0 [a]	
Work organization	Private Clinic	81.6 [a]	12.2 [a]	6.1 [a]	**0.005**
	Polyclinic	76.9 [a]	3.8 [a]	19.2 [b]	
	Public Hospital	55.6 [a]	44.4 [b]	0.0 [b]	
	Private Hospital	80.0 [a]	20.0 [a]	0.0 [a]	
	University Hospital	91.1 [a]	5.4 [a]	3.6 [a]	
Specialty Status	Has a specialty	87.4 [a]	8.0 [a]	4.6 [a]	0.189
	General Practitioner	75.9 [a]	13.8 [a]	10.3 [a]	
Work in Filation team	Yes	71.4 [a]	14.3 [a]	14.3 [a]	0.668
	No	83.3 [a]	10.1 [a]	6.5 [a]	
Years of Work	0-3	80.0 [a]	10.0 [a]	10.0 [a]	0.609
	3-5	66.7 [a]	33.3 [a]	0.0 [a]	
	5-10	76.7 [a]	13.3 [a]	10.0 [a]	
	10-20	87.5 [a]	7.5 [a]	5.0 [a]	
	20-30	85.3 [a]	5.9 [a]	8.8 [a]	
	Over 30	86.4 [a]	9.1 [a]	4.5 [a]	
Additional Income	Yes	60.0 [a]	20.0 [b]	20.0 [b]	**0.009**
	No	86.4 [a]	8.8 [b]	4.8 [b]	

[a,b]: Chi-square test and different letters on the same line represent statistical difference (p<0.05).

Table 2. Assessment of dentists' opinions by scale scores about the COVID-19 vaccine.

	Willing to get vaccination (n:290)			
	Agree	Undecided	Disagree	
	Mean±SD	Mean±SD	Mean±SD	p value
Q1- Prevention properties of a vaccine affect the making decision of the getting a covid-19 vaccine	1.88±0.9[a]	2.66±0.4[b]	1.60±0.8[a]	**0.004**
Q2- The side effects of the vaccine are a determining factor when deciding to vaccinate.	2.32±1.0 [a]	2.00±0.9 [a]	2.00±1.7 [a]	0.300
Q3- The belief of vaccination is essential for to stop contagion during a pandemic	1.26±1.2[a]	2.50±0.8[b]	3.20±1.4[b]	**0.000**
Q4- I think that recovery after having the disease will affect the decision to vaccinate	2.64±1.3 [a]	2.72±1.0 [a]	1.40±0.5 [a]	0.131
Q5- WHO recommendations will affect my making decision of having a covid-19 vaccination	1.77±0.9[a]	2.83±1.0[a]	3.40±1.1[b]	**0.000**
Q6- The developments regarding the covid-19 vaccine make me feel safe.	2.13±0.8[a]	2.83±1.0[a]	4.60±0.5[b]	**0.000**
Q7- I am concerned about possible side effects of the covid-19 vaccine	2.81±1.1[a]	2.16±0.9[a]	1.60±1.3[b]	**0.004**
Q8- I am concerned that the covid-19 vaccine has not been adequately tested	2.60±1.1[a]	1.61±0.6[b]	1.60±1.3[b]	**0.000**
Q9- Other forms of prevention different than covid-19 vaccine are safer	3.50±1.0[a]	2.72±1.0[b]	2.20±1.3[b]	**0.001**

[a,b]: Kruskall Wallis test and different letters on the same line represent statistical difference ($p<0.05$).

In the multinomial logistic regression analysis seen in the Table 3, no differences were seen by demographic variables except age (95% CI, 1.07-10.06) and additional income (95% CI, 1.58-43.55) have positive correlation ($p<0.05$) (Table 3).

DISCUSSION AND CONCLUSION

COVID-19 is a highly contagious disease and the control of the disease depends on very strict rules. Education and behavioral change, which are one of the necessary factors for the control of the disease, are of interest not only to the society but also to those who work in the field of dentistry.[10] Changing negative attitudes and behaviors about vaccination with education is very important in controlling the disease.

Dentists make up one of the most sensitive groups of healthcare professionals who are given priority for vaccination. The proximity of the physician to the patient and the length of the visit during a dental

Table 3. Distribution of factors associated with vaccination acceptance.

	Acceptance					Undecided				
Variables	**B**	**SE**	**p-value**	**OR**	**95% CI**	**B**	**SE**	**p-value**	**OR**	**95% CI**
Gender	0.93	0.73	0.201	2.55	0.6-10.73	0.90	0.90	0.397	2.15	0.36-12.66
Age	1.19	0.57	0.037*	3.29	1.07-10.06	0.68	0.68	0.913	0.92	0.24-3.54
Marital Status	0.60	0.91	0.510	1.83	0.30-11.08	1.39	1.39	0.224	0.18	0.01-2.81
Specialty	-1.07	0.88	0.226	0.34	0.06-1.94	1.12	1.12	0.893	1.16	0.12-10.63
Work under Filiation Groups	0.88	1.32	0.503	2.42	0.18-32.21	1.78	1.78	0.632	2.34	0.07-76.91
Additional Income	2.11	0.84	0.012*	8.30	1.58-43.55	1.01	1.01	0.302	2.84	0.39-20.79
Stop working during Lockdown	0.22	1.29	0.861	1.25	0.10-15.75	1.40	1.40	0.267	4.77	0.30-75.56
Actively Working	-0.80	0.83	0.332	0.08	0.08-2.27	1.08	1.08	0.715	0.67	0.08-5.63

*: Multinomial logistic regression analysis and statistically significant ($p\leq0.05$); B: Estimated Multinomial Logistic Regression Coefficients; SE: Standardized Error; OR: Odd Ratio; 95% CI: 95% Confidence Interval.

visit, and the evidence that the virus is transmitted via aerosols and droplets, place dentists in the high-risk category for exposure to COVID-19 infection. These factors highlight the importance of dentists accepting the COVID-19 vaccine while also serving their patients as vaccine advocates.[11]

When the studies on vaccines are examined, it is seen that the studies in the field of dentistry are very few in terms of number. Vaccine acceptance rates of university students were mostly evaluated in studies on vaccines, and vaccine acceptance rates among young adults were found to be low in many studies.[12,13] It is thought that the low acceptance rate may be related to the optimistic bias among young people. Compared with other age groups, it is reported that young adults are more likely to underestimate disease severity and perceive low susceptibility to COVID-19.[13,14]

When students in the field of medicine and dentistry were examined, it was seen that vaccinated medical students had more positive attitudes towards vaccines than dentistry students. [11] The reason why vaccines are less accepted among dental students may be that they will not care for patients who are positive for SARS-CoV-2 or that they think that the infection control procedures in place are sufficient to protect them from contracting the virus from a patient.[11]

It is important for all healthcare professionals who interact with patients in the clinical setting to have a positive attitude towards COVID-19 vaccines in order to prevent the spread of the disease, both for themselves and for the society. In addition, it is thought that health professionals can contribute to the vaccination percentage of the society and patients with positive and strong recommendations about vaccination.[13,15] Because other studies have shown that the advice given by health professionals or health organizations reduces hesitations and reluctance to be vaccinated, and it has been stated that it creates an increase in vaccine acceptance rates.[11,13,16] Considering these data, in our study, it is seen that there is a statistical difference between the recommendations of WHO regarding vaccination and the vaccination acceptance rates of dentists, which supports previous studies.

In our study, it was aimed to evaluate the attitudes and behaviors of dentists, who are at high risk due to the working environment, both to protect themselves and the society, and to consider that their views on vaccination may affect the attitudes and behaviors of the society about vaccination. In addition, the factors affecting the attitudes and behaviors towards the COVID-19 vaccine among dentists were examined.

In studies examining attitudes and behaviors towards the COVID-19 vaccine, it has been stated that the elderly is more willing to be vaccinated than the young.[17-19] Some studies have shown that the age factor does not cause an increase in the rate of vaccination.[20,21] In comparisons in terms of gender, it is seen that the desire to be vaccinated in women is less than in men.[17-19,21]

In a study conducted across Europe, it was found that the desire to be vaccinated against COVID-19 is higher, especially in men over 55.[22] When these studies are taken into consideration, it is seen that there is a positive correlation between male gender and being vaccinated against COVID-19.[22,23] The reason of this is thought to be that men are more exposed to the outcomes of disease and they believe less in conspiracy theories.[24] In our study, contrary to the studies mentioned, it was seen that the gender and age difference among dentists did not significantly affect the vaccine acceptance rates. However, it was found that the vaccine acceptance rates of married dentists were significantly higher than single dentists. Bulca et al. stated that the married physicians developed a more positive attitude towards COVID-19 vaccines in their study among family physicians.[25] These findings are similar to our study, and it can be thought that this is due to the concern of healthcare professionals that may transmit the infection to their families.

Zigron et al. showed that there is a positive correlation between unemployment status and willingness to vaccine in their study involving 506 dentists.[26] Contrary to this study, in our study; it was observed that the dentists who agreed to be vaccinated were more common among the dentists who performed routine dental treatment. The reason for this situation can be shown as the fact that dentists are under threat with the aerosol that emerges while performing the procedure. When the vaccine willingness rates of dentists are examined in terms of the institutions they work, it is seen that the dentists working in the private sector are higher than the dentists working in public institutions. This situation can be explained by the fact that the recommendation to close dentistry clinics during the pandemic is an effective factor for dentists working in the private sector to be more willing to be vaccinated.

In addition, the efficacy and safety of the vaccine and discussions are among the effective factors in vaccine acceptance rates.[27-29] In our study, a positive correlation was found between the effectiveness of the vaccine in breaking the chain of transmission and the confidence in the expected results from the vaccine and the vaccine acceptance rates of dentists. These results are similar to the results of other studies.[27, 28]

The side effects of the vaccine and the fact that it has not been tested for a sufficient time are another important factor affecting attitudes and behaviors towards the vaccine.[27,28] According to Kaur et al.

45.5% of the dentists participating in the study were concerned about the unknown side effects of the vaccine.[30] Rieter et al. stated in their study that there is a negative relationship between the willingness of vaccines to the population and the possible side effects of the vaccine.[28] In our study, the thought of dentists that the vaccine did not have sufficient testing time and that there might be undesirable side effects, affected the vaccine acceptance rates negatively.

Several studies have compared the incomes of surveyed dentists with acceptance of the COVID-19 vaccine.[13,16,20,28] In the results obtained from the studies, the expectation of willingness to be vaccinated increases as the income level increases.[13,16,20,28] In our study, the effect of having an additional income source on the willingness to vaccinate was examined. It has been found that dentists with additional income are more willing to be vaccinated than those who do not. This finding will be a guide for increasing the willingness to be vaccinated at the societal level.

In conclusion, our study showed acceptance of COVID-19 vaccination among Turkish dentists were in a high level. Healthcare professionals, especially dentists working in aerosol-generating procedures, have a higher risk of getting the disease. Knowledge about the COVID-19 vaccine should be strengthened to further increase vaccine acceptance rates. Dentists' high acceptance of the COVID-19 vaccine is expected to have a positive impact on the population.

Ethics Committee Approval: Ethical approval of the study protocol was obtained from the Research Ethical Board of Istanbul University-Cerrahpaşa, Faculty of Medicine, Istanbul, Turkey (Date: 02/02/2021, Decision No:A-49). This study adhered to the tenets of the Declaration of Helsinki.

Conflict of Interest: No conflict of interest was declared by the authors.

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