Clinical and Experimental Health Sciences

Assesment of Physicians' Attitudes Towards COVID-19 Vaccine

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ABSTRACT

Objective: The aim of this study is to physicians attitudes towards the COVID-19 vaccine.

Methods: Our research is a cross-sectional study, which was conducted between January 4th and February 26th, 2021. A Google Forms questionnaire was prepared according to the literature. The first part of the two-part questionnaire included the sociodemographic characteristics of the physicians and some variables thought to be related to COVID-19. In the second part, questions from the "Attitudes Towards COVID-19 Vaccine Scale (ATCVS)" were included. Multiple linear regression analysis with variables that were significant in univariate analysis was used for further analysis.

Results: Three hundred fifteen (71.9%) of a total of 438 participants stated that they were assigned to units related to COVID-19 during the pandemic. With more than 10 years of work in the profession, physicians had a more positive attitude towards vaccination than those with 1 – 5 years' experience. Most of the physicians reported that there were insufficient studies on these newly developed vaccines. Possible adverse effects, uncertainty about the efficacy and safety of the vaccine, and beliefs that people are not at risk for severe disease were prominent.

Conclusions: Despite all the uncertainties about the efficacy, safety, and long-term adverse effects of newly developed COVID vaccines, it was determined that 79% of the physicians approached the vaccine positively. The most important reason for vaccine hesitation was the insufficient studies about COVID-19 vaccines.

Keywords: COVID-19 vaccines, pandemic, vaccine hesitancy

1. INTRODUCTION

In addition to the mask, social distance and hygiene, we now have a new weapon against to COVID-19 with the production of the vaccine. Vaccination is one of the most successful public health practices in human history (1). The main aims of the vaccination are to stop the transmission of the virus inter individuals and to control the disease by minimizing deaths (2). Thanks to the developing technology, research and development studies have been integrated into immunization and new-generation vaccination (3). While vaccine studies about COVID-19, which is one of the newest agendas of the medical world, continue in many laboratories, studies have evolved to a different stage with new mutations. The new vaccines developed against COVID-19 are expected to be a global weapon that will both reduce virus spread and limit the effect of the virus (4).

Despite great progress in vaccination technologies in the last century, many vaccine-preventable diseases are re-spreading again, which is why the World Health Organization (WHO) defines vaccine hesitancy as a major threat to global health (5). Vaccination hesitation is an important public health problem, and resistance in the control of vaccine-preventable diseases also undermines the power of healthcare professionals. Concerns about the COVID-19 vaccine are mostly due to insufficient information about new vaccines and possible adverse effects, especially in the long term (6). Given the fact that COVID-19 vaccines are new, concerns about the vaccine's efficacy and adverse effects have caused public health professionals to worry about whether enough people will get vaccinated (7).

Several surveys of intention to receive a COVID-19 vaccine, when one becomes available, have been administered throughout the pandemic by academics, politics and researchers. In a meta-analysis study of global acceptance of the Covid-19 vaccine, the estimated acceptance rate was 68.4% (8). In a study on the public's view of the vaccine and the factors affecting this situation from Turkey, it was

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reported that only 41.2% of the participants approached it positively (9).

People obtaining information from reliable sources about the risks and benefits of the vaccine and how it works and protects them could help solve the problem of infodemia. Therefore, it is expected that both physicians and public health professionals will be ready to anticipate, understand, and respond to patients' questions and concerns to combat common misinformation and increase confidence in the vaccine.

Discussions on the efficacy and safety of the COVID-19 vaccines have yet to put an end to doubts in society as a whole, including healthcare professionals (7). In this study, it is aimed to evaluate physicians' attitudes towards the COVID-19 vaccine.

2. METHODS

2.1. Study Design

Our research is a cross-sectional study, which was conducted between January 4th and February 26th, 2021. The questionnaire used in our research was prepared using Google Forms. It was sent across Turkey using social media in various support groups and physician practices using Facebook and WhatsApp. All physicians aged 23 years and over were included in the study.

Assuming a positive attitude rate of 50% towards the COVID-19 vaccine, 95% confidence interval and 5% margin of error, a simple random sampling method was used and the required sample size was estimated as 384 participants. A total of 438 physicians agreed to participate in the study and constituted the study group.

2.2. Data Collection

In our study, a Google Forms questionnaire was prepared according to the literature and was used as the data collection tool (10-12). The first part of the two-part questionnaire included the sociodemographic characteristics of the physicians and some variables thought to be related to COVID-19. In the second part, questions from the "Attitudes Towards COVID-19 Vaccine Scale (ATCVS)" were included.

In the study, the ATCVS was used to evaluate the attitudes of physicians towards the COVID-19 vaccine. The scale, developed by Geniş et al. in 2020, consists of nine questions in 5-point Likert form. The scale has two sub-dimensions as positive and negative attitude. Positive attitude has four questions and negative attitude has five questions. Items in the negative attitude sub-dimensions are scored inversely. A value between 1-5 is obtained by adding the item scores in the scale sub-dimension then dividing the total score by the number of items in that sub-dimension. High scores from the positive attitude sub-dimension indicate that the attitude towards vaccination is positive. The items in the negative attitude sub-dimension are calculated after reversing, and the higher scores in this sub-dimension indicate that the negative attitude towards vaccination is less (10).

2.3. Statistical Analysis

The data were evaluated using the SPSS version 15.0 statistical package program. Descriptive statistical analysis was performed for all variables examined in the study. Normality was tested using the Kolmogorov-Smirnov test. The Mann-Whitney U test and the Kruskal-Wallis test were used for statistical analysis. Multiple linear regression analysis with variables that were significant in univariate analysis was used for further analysis. Statistical significance was considered for p-values of ≤0.05.

2.4. Ethical Considerations

After obtaining permission for scientific research studies on COVID-19 from the Ministry of Health Scientific Research Platform (F.number: 2020-12-24T16_50_38) for conducting the study, ethical permission was sought and granted by Eskisehir Osmangazi University Non-Interventional Clinical Research Ethics Committee (Date: 12.01.2021, E-25403353-050.99-146299)

3. RESULTS

Of the total 438 participants, 310 (70.8%) were women and 128 (29.2%) were men. The mean age was 35.4 ± 8.5 (range, 24 – 71) years. One hundred ninety-eight (45.2%) of the physicians were specialists, and 37.7% (n = 165) were physicians who had practiced medicine for 10 years or more. Three hundred fifteen (71.9%) of the physicians stated that they were assigned to COVID-19–related units during the pandemic, 31.7% (n = 100) of whom were assigned to two or more units during this period. These units were outpatient clinics (29.5%, n = 130), inpatient wards (25.1%, n = 111), fillation (16.1%, n = 71) which is the name given to the process of determining what causes any infectious disease, emergency wards (13.4%, n = 59), intensive care (10.2%, n = 45), and others such as laboratory service, and home care service (5.7%, n = 25).

In the study, positive attitudes towards the COVID-19 vaccine were higher in the 24 – 30 years' age group and the specialist physicians compared with other physician groups. It was found that with more than 10 years of work in the profession, physicians had a more positive attitude towards vaccination than those with 1 – 5 years' experience. The distribution of physicians' ATCVS scores according to their sociodemographic characteristics is given in (Table 1).

The physicians in the study who had an influenza vaccine during the pandemic period had a higher positive attitude than those who did not. Physicians who recommended the vaccine to their patients had a more positive attitude towards the vaccine and less negative attitude than indecisive physician. In addition, it was determined that physicians who

were considering getting the COVID-19 vaccine had less negative attitudes towards the vaccine (Table 2).

Ninety-two (21.0%) of the physicians answered 'No' or 'Not decided yet' to the question, 'Do you consider getting a COVID-19 vaccine?' The common reason for hesitating about the vaccine was 'Not enough information studies about the vaccines' (Figure 1).

Table 1. *Distribution of physicians' ATCVS scores according to their sociodemographic characteristics*

Sociodemographic characteristics		n (%)	ATCVS Positive Attitude Median (min-max)	ATCVS Negative Attitude Median (min-max)
Age Group**	24-30	156 (35.6)	4.0 (1.3-5.0)[a]	3.6 (1.0-5.0)[a]
	31-40	186 (42.5)	4.3 (1.0-5.0)[b]	4.0 (1.0-5.0)[b]
	41 and more	96 (21.9)	4.5 (1.0-5.0)[b]	4.0 (1.8-5.0)[b]
	z/Kw; p		**15.415; <0.001**	**33.498; <0.001**
Sex*	Female	310 (70.8)	4.1 (1.0-5.0)	3.8 (1.0-5.0)
	Male	128 (29.2)	4.0 (1.0-5.0)	4.0 (1.0-5.0)
	z/Kw; p		-0.880; 0.379	1.356; 0.175
Title**	General practitioner	91 (20.8)	4.0 (1.0-5.0)[a]	3.8 (2.0-5.0)[a]
	Assistant physician	149 (34.0)	4.0 (1.0-5.0)[a]	3.6 (1.0-5.0)[a]
	Specialist physician	198 (45.2)	4.5 (1.0-5.0)[b]	4.0 (1.0-5.0)[b]
	z/Kw; p		**16.949; <0.001**	**27.223; <0.001**
Professional experience (year)**	1-5	162 (37.0)	4.0 (1.0-5.0)[a]	3.6 (1.0-5.0)[a]
	6-10	111 (25.3)	4.0 (1.0-5.0)[a,c]	4.0 (2.0-5.0)[b]
	More than 10	165 (37.7)	4.5 (1.0-5.0)[c]	4.0 (1.0-5.0)[b]
	z/Kw; p		**9.484; 0.009**	**31.284; <0.001**
History of chronic illness *	Yes	90 (20.5)	4.0 (1.0-5.0)	4.0 (1.0-5.0)
	No	348 (79.5)	4.0 (1.0-5.0)	3.8 (1.0-5.0)
	z/Kw; p		0.298; 0.766	-1.283; 0.199

** Mann-Whitney U, ** Kruskal-Wallis, a, b, c; The difference between groups that do not have the same letter in each column is significant (p <0.05)*

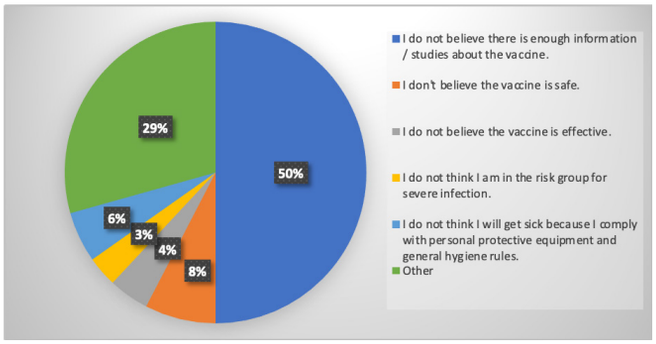

Figure 1. *Reasons for Physicians to Hesitate About Getting the COVID-19 Vaccine*

The sources of information about the COVID-19 vaccine are shown in Figure 2; the most common source was 'articles/ publications/literature information (32.4%), followed by the internet/social media (24.5%).

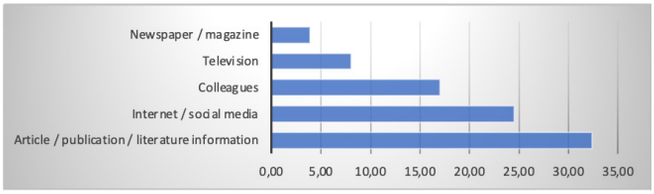

Figure 2. *The sources of information about the COVID-19 vaccine*
** Numbers were evaluated based on the answers given, not individuals.*

According to the results of the multiple linear regression analysis created with variables that were significant in the univariate analyses, it was found that the status of recommending the COVID-19 vaccine to patients and considering having the COVID-19 vaccine were variables that affected the positive and negative attitude towards the vaccine. The results of the multiple linear regression models for the subdimension scores of ATCVS are given in Table 3.

Table 2. *Distribution of physicians' ATCVS scores according to selected variables related to COVID19*

Selected variables related to COVID-19		n (%)	ATCVS Positive Attitude Median (min-max)	ATCVS Negative Attitude Median (min-max)
Influenza vaccination at pre-pandemic period*	Yes	179 (40.9)	4.0 (1.0-5.0)	3.8 (1.0-5.0)
	No	259 (59.1)	4.0 (1.0-5.0)	3.8 (1.0-5.0)
	z/Kw; p		-0.282; 0.778	-0.045; 0.964
Influenza vaccination at the pandemic period **	Yes	171 (39.0)	4.3 (1.0-5.0)[a]	4.0 (1.0-5.0)
	No	244 (55.7)	4.0 (1.0-5.0)[b]	3.8 (1.0-5.0)
	Indecisive	23 (5.3)	4.0 (1.3-5.0)[a,b]	3.8 (2.8-4.6)
	z/Kw; p		**11.609; 0.003**	4.213; 0.122
COVID-19 infection nearby *	Yes	412 (94.1)	4.0 (1.0-5.0)	3.8 (1.0-5.0)
	No	26 (5.9)	4.0 (1.0-5.0)	4.0 (2.8-5.0)
	z/Kw; p		-1.370; 0.171	1.222; 0.222
Have COVID-19 infection *	Yes	72 (16.4)	4.0 (1.0-5.0)	4.0 (2.0-5.0)
	No	366 (83.6)	4.0 (1.0-5.0)	3.8 (1.0-5.0)
	z/Kw; p		0.994; 0.320	-0.388; 0.698
Recommending COVID-19 vaccine to patients **	Yes	362 (82.6)	4.3 (1.0-5.0)[a]	4.0 (1.0-5.0)[a]
	No	17 (3.9)	2.0 (1.0-5.0)[b]	3.2 (1.8-5.0)[a,b]
	Indecisive	59 (13.5)	3.0 (1.0-5.0)[b]	3.4 (1.6-5.0)[b]
	z/Kw; p		**-9.622; <0.001**	**34.399; <0.001**
Willingness for COVID-19 vaccine **	Yes	346 (79.0)	4.5 (1.0-5.0)[a]	4.0 (1.0-5.0)[a]
	No	49 (11.2)	2.5 (1.0-5.0)[b]	3.4 (1.8-5.0)[b]
	Indecisive	43 (9.8)	3.0 (1.8-5.0)[b]	3.4 (1.6-4.8)[b]
	z/Kw; p		**91.827; <0.001**	**28.971; <0.001**

** Mann-Whitney U, ** Kruskal-Wallis, a, b, c; The difference between groups that do not have the same letter in each column is significant (p<0.05)*

Table 3. *Multiple linear regression models for the subdimension scores of ATCVS*

Sociodemographics and variables related to COVID-19	Positive Attitude Sub-dimension	Negative Attitude Sub-dimension
	β (95% CI)	β (95% CI)
Age	0.012 (-0.020-0.044)	0.009 (-0.014-0.031)
Title	0.003 (-0.015-0.021)	0.009 (-0.003-0.022)
Professional experience (years)	-0.008 (-0.035-0.019)	0.016 -0.003-0.035)
Influenza vaccination in the pandemic period	-0.013 (-0.036-0.010)	-
Recommending COVID-19 vaccine to patients	0.060*** (0.038-0.082)	0.022** (0.006-0.038)
Willingness for COVID-19 vaccine	0.048*** (0.023-0.072)	0.019* (0.001-0.036)
R^2 F	0.18 17.319***	0.10 11.258***

*p: *≤ 0.05; **≤ 0.01; ***≤ 0.001; CI: Confidence interval, ß: Unstandardize beta, R2: Adjusted R2, F: Test value*

4. DISCUSSION

Despite all the uncertainties about the efficacy, safety, and long-term adverse effects of newly developed COVID vaccines, it was determined that 79% of the physicians approached the vaccine positively. In addition, the physicians' willingness to be vaccinated and recommending vaccines to their patients were found to be effective variables in positive and negative attitudes towards vaccination. It was stated that the most important reason for vaccine hesitation was the insufficient studies about COVID-19 vaccines.

All activities related to vaccination and vaccine reliability studies that will prevent vaccine hesitation are the primary duties of all healthcare professionals, especially public health experts. Vaccination is our strongest weapon against COVID-19 infection, after hygiene and distancing; and the first vaccinations have been initiated in healthcare workers in many countries (13). During the pandemic, health workers have taken on the treatment and follow-up of infected patients, but also took an active part in the fillation and public education studies. Healthcare workers in Turkey volunteered for the Phase III CoronaVac trial, one of the newly developed vaccines, and vaccination studies were initiated in September 2020 (14).

In the study, 79.0% of the 438 physicians stated that they were considering being vaccinated, 11.2% stated that they did not want to be vaccinated, and 9.8% stated that they were undecided about the vaccine. Phase III of the CoronaVac study was still ongoing at the time the survey was collected; the high numbers of negative and hesitant answers about vaccination could be attributed to the lack of clarity on the data and vaccination studies have not yet accelerated. However, our study was in line with the results of COVID-19 vaccine studies among healthcare workers and the literature (15, 16). The common hesitation (50.0%) about vaccination was related to 'the lack of sufficient information and studies' about the vaccine'. The reasons for those with vaccine hesitation without any explanation (29.0%) could be different financial or political reasons or just a fear of unknown adverse effects of the vaccine. In addition, the government was sharing only the daily number of patients with the public, without any knowledge about the number of infected people until November 25th, 2020, which may have caused different perceptions of the severity of the epidemic among both society and physicians (17).

Positive attitude towards the vaccine increasing with age among the physicians was found in our study, like in many studies in the literature (18-20). Although female physicians were found to have a more positive attitude towards vaccination, the difference was not statistically significant.

Although most of the physicians (71.9%) worked in units related to COVID-19, it was observed that the attitudes of physicians working in non-COVID units were more positive, but there was no statistical difference between the physicians' desire for vaccination in our study. The negative attitudes of the physicians who had recently entered the profession towards the vaccine were less, the positive attitudes of the physicians who had more experience and working more than 10 years was higher towards the vaccine. Based on a COVID-19 study by Dror et al, it was reported that internal medicine branches looked more positively upon vaccines than surgical branches and healthcare workers who did not work in COVID units refused to get the vaccine more (15). In another study about COVID-19 by Shaw et al, it was reported that the desire for vaccination was lower in healthcare workers who were charged with primary patient care (20). Kose et al. reported that a group of people, mostly comprising university students, who had tetanus, pneumococcal, and influenza vaccines, also had a higher willingness for the COVID-19 vaccine (6). Among the participating physicians in our study, those who had influenza vaccines, especially during the pandemic period, had higher positive attitudes towards the COVID-19 vaccine. It is thought that the previous vaccination experiences of healthcare professionals may also influence their behaviors about newly developed vaccines (6, 20,21). It may be due to the fear of being confused about the effects and tracking or discerning the symptoms of COVID and influenza or having the disease more severely, if they have both infections simultaneously.

In our study, 82.6% of the physicians answered 'Yes' to the question, 'Would you recommend the COVID-19 vaccine to your own patients?'. The physicians who responded positively to this question also had more positive attitudes towards the COVID-19 vaccine. On the other hand, it is an important step for physicians to share their own vaccination experiences, which will encourage their patients to get vaccinated (18). The recommendation of a physician is considered the only force in vaccination acceptance (22-24).

In the study, 79.0% of the physicians who stated that they were considering being vaccinated had more positive attitudes towards vaccination. It is thought that physicians who are hesitant about vaccination will clarify their positions in line with the results of scientific research. It may be possible that physicians will have significant influence in the vaccination of the public if they have reliable evidence-based medicine. For example, studies have shown that the willingness to get vaccinated with the influenza vaccine and the trust towards the influenza vaccine were higher (13, 25, 26). The most important issue that physicians have to overcome is to increase vaccination rates and to prevent vaccination hesitation with education on vaccination and different vaccination campaigns.

Age, title, professional experience, and influenza vaccination rates during the pandemic period had a significant impact on ATCVS scores in the multiple linear regression model, only willingness to be vaccinated and recommending the vaccine to patients were still significant after adjusting for confounding factors. The WHO defines vaccine hesitation as a global health problem (24), and many studies have shown that there is a serious distrust among the public against these newly developed vaccines. Lack of information transparency regarding new vaccines, different conspiracy theory beliefs, and distrust towards drug campaigns cause a suspicious approach to vaccination among the public (27-29).

Vaccine hesitation has been identified as one of the greatest challenges in the fight against COVID-19 (15). Previous studies have established that the most common reasons for hesitation about COVID-19 vaccines among healthcare professionals are insufficient information about vaccines, unknown efficacy, and unknown adverse effects (1, 7, 19, 20). The results of our study are similar; physicians reported that there were insufficient studies on these newly developed vaccines. Our study adds that possible adverse effects, uncertainty about the efficacy and safety of the vaccine, and beliefs that people are not at risk for severe disease were prominent.

The present study has some limitations including the small sample size; the participants' were all physicians, most of them were women, a homogeneous group with similar characteristics; and the study was a descriptive-cross-sectional study. The collection of data via social media and in a very short period prevented reaching many physicians. At the time when the survey forms were collected, many vaccination studies had not yet been completed. Nevertheless, the study also has strengths. Conducting the study with a group with a high level of education and knowledge about the disease made the results more reliable. This study is one of the pioneering studies in which the views of physicians who can lead society in the acceptance of vaccines against COVID-19 vaccines are evaluated.

5. CONCLUSION

With time, more vaccine studies will have a positive effect on the vaccine hesitation and awareness of physicians. It is a priority issue for the authorities, physicians, and healthcare professionals to quickly conduct training to increase vaccine acceptance among the public, as well as COVID-19 vaccination studies. Thanks to vaccination programs and education, the desired community immunity will be gained by vaccination of a sufficient part of the population and infodemia with vaccine hesitation will be decreased. It is thought that this study on physicians will be a guide for both other healthcare professionals and community-based studies, and will play an important role in increasing confidence in COVID vaccines with an evidence-based medicine perspective.

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Conflicts of interest

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