



## Research Article

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# A SURVEY STUDY OF COVID-19 VACCINE HESITANCY OF RELATIVES OF PATIENTS ADMITTED TO A TRAINING AND RESEARCH HOSPITAL IN ISTANBUL

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## Abstract

**Objectives:** Treatment and immunization studies of the COVID-19 infection are still ongoing. Vaccine hesitancy or refusal, which is an important public health problem, has also come to the fore as a factor that negatively affects community immunization during the COVID-19 pandemic. In this study, it was aimed to analyze the thoughts and attitudes of the relatives of patients who were under observation in the hospital due to COVID-19 in the second wave of the pandemic, whether they should have the COVID-19 vaccine or not, and the factors that caused it.

**Materials and Methods:** The study was carried out between 20.12.2020-20.01.2021 in Başakşehir Çam and Sakura City Hospital COVID-19 Emergency Clinic Yellow Zone. A 25-question questionnaire was applied to a total of 429 relatives of patients who gave consent to the study.

**Results:** While 40.09% of the participants were considering getting the COVID-19 vaccine, 24.94% were not thinking, and 34.97% were not sure. Those who were positive about getting vaccinated mostly (69%) stated that they were worried about the serious infection of COVID-19 infection, and nearly half of those who did not plan to have the vaccine stated that they made this decision because the content of the vaccine was unknown. When asked which sources they trust more about COVID-19 and its vaccine, they said that they trust the official statements at the highest rate and then their family physician.

**Conclusion:** The most effective method of protection against COVID-19 infection is vaccination. The fact that family physicians are the second source that people trust should be considered as a great opportunity for vaccine hesitancy and refusal problems.

**Keywords:** COVID-19, immunization, vaccination refusal, family physician.

## Introduction

Vaccines, which have been around for nearly 200 years in the history of medicine, seem to be more effective than treatments in eradicating infectious diseases. Access to clean water has been found to be more effective than vaccines in the fight against infectious diseases.<sup>1</sup> Smallpox has been completely eradicated globally, while infections such as measles, polio, tetanus, and diphtheria have been eradicated locally, with the vaccination studies carried out so far.<sup>2</sup>

Decreased incidence and prevalence of vaccine-preventable diseases are closely linked to vaccination rates. The highness of this rate provides not only direct protection of vaccinated individuals but also provides indirect protection of society from such infections (herd immunity).<sup>3,4</sup> Although vaccination programs are generally accepted, and most of the population is vaccinated, there are individuals or communities who are hesitant or object to these studies. There is a growing literature on vaccine hesitancy, with the most important reasons varying by country, region, subgroups, vaccine type and many related effects. Despite the diversity of reasons for hesitancy across geographic regions and vaccines, there are common themes that emerge globally.<sup>5</sup> The Strategic Advisory Group of Experts (SAGE) on Immunization, affiliated with the World Health Organization (WHO), on vaccine hesitancy, defined as "delaying or refusing vaccination acceptance despite the availability of vaccination services". Vaccine hesitancy is complex, situation-specific, and varies with time, place, and vaccines. It includes hesitation about one or more vaccines.<sup>6</sup> (Table 1). Vaccination refusal is the case of rejecting all vaccines in the literature voluntarily and not having them done.<sup>5,6</sup>

When vaccine hesitancy or refusal is examined, it is seen that this attitude began with the first vaccination studies. Edward Jenner's attempt to popularize smallpox vaccination in England was criticized or rejected by some religious circles and by some parts of society because of the high complication rates (30% mortality, etc., skin scars and blindness) related to the vaccine.<sup>4,7</sup>

### *COVID-19 Pandemic*

Coronaviruses are RNA viruses from the Coronaviridae family and have taken this name because of the crown appearance caused by the spikes on their surfaces. WHO has identified many Coronavirus types since 2002.<sup>8,9</sup> On the other hand, the COVID-19 type was defined for the first time on December 31, 2019, as the causative agent of pneumonia in Wuhan, China, and the cases spread rapidly, first in Wuhan and then throughout the country. The treatment and immunization studies of this epidemic disease, which was declared a "pandemic" by WHO on March 11, 2020, are still ongoing.<sup>10</sup> As in other infectious diseases, vaccine hesitancy or refusal in the COVID-19 pandemic affects immunization studies.

The aim of this study was to analyze the rates of hesitancy and refusal to vaccinate against COVID-19 in the relatives of patients who were under observation in the COVID-19 yellow zone in a tertiary hospital in Istanbul during the second wave of the pandemic and the personal or social factors affecting it.

**Table 1.** The factors affecting vaccine hesitancy<sup>6</sup>

<b>1. Contextual effects (The effect of historical, sociocultural, environmental, health system / institutional, economic, and political factors)</b>	<b>2. Individual or group effects (Effects arising from personal vaccination perception or social environment)</b>	<b>3. Special issues about vaccine/vaccination</b>
a. Communication or media	a. Personal, familial, and environmental vaccination experiences, including pain	a. Calculation of risk/benefit (epidemiological or scientific evidence)
b. Effective leaders, anti-vaccine or pro-vaccine lobbies	b. Beliefs and attitudes about health and prevention	b. A new vaccine, a new formulation, or a new recommendation for an existing vaccine
c. Historical effects	c. Knowledge/awareness	c. Form of application
d. Religion/culture/ gender/socio-economical effects	d. Personal experience and confidence with the healthcare system and its providers	d. Vaccination program design / Vaccination campaign method
e. Political effects	e. Risk/benefit perception-intuition	e. Reliability and/or supply of vaccine and/or vaccination equipment
f. Geographic barriers	f. No vaccination required / harmful thought as a social norm	f. Vaccination program
g. Perception of the pharmaceutical industry		g. Costs
		h. Strength of recommendation and/or source of information and/or attitude of health professionals

## Materials and Methods

The study was carried out between 20.12.2020 and 20.01.2021 in Başakşehir Çam ve Sakura City Hospital COVID Emergency Polyclinic Yellow Zone. The universe of the study consisted of the relatives of the patients who applied to the COVID-19 Emergency Polyclinic Yellow Zone. Since the number of patients who applied to this area in a month was approximately 1000 at that time, and approximately 80% of these patients had

relatives, our sample size was 360 people at the 95% confidence interval. It was planned to reach approximately 420 patient relatives by calculating the losses. A survey form was applied to 429 patients' relatives in total. The local ethics committee approved the study. All procedures followed the Declaration of Helsinki, and informed consent was obtained from all participants.

The first part of the questionnaire contains sociodemographic information about the relatives of the patients, their general approach to childhood and adult vaccines, and their thoughts on COVID-19 infection and vaccines, the second part of the questionnaire contains questions about the sources of information about the vaccines, with a total of 25 questions. In the survey, the income level question was determined according to a person's subjective opinion.

SPSS-24 (Statistical Package for Social Sciences, IBM) program was used for statistical analysis of the data in the study. In addition to descriptive statistical methods, in comparison of quantitative data, normally distributed parameters were evaluated with Student's t-test, and non-normally distributed parameters were evaluated with Mann Whitney U test. The Chi-square test was used to compare qualitative data. The results were accepted as a 95% confidence interval and statistical significance  $p < 0.05$ .

## Results

The mean age of the 429 participants to whom we applied the questionnaire was  $33.69 \pm 11.47$  years old. The female/male ratio was 47.09%/52.91%. The demographic data of the participants, their previous attitudes about getting vaccinated and their thoughts on getting vaccinated for COVID-19 are given in Table 2.

When asked which rules they had the most difficulty following during the pandemic, 41.49% (n: 178) stated that they had difficulty wearing a mask, and then they had difficulty complying with the social distance isolation rules (n: 150, 34.96%) and 134 people (31.23%) stated that they had no difficulty in obeying any rule. When people who are considering or undecided about getting the COVID-19 vaccine were asked about their reasons for choosing to get the vaccine as multiple options, 149 (68.98%) of the 216 respondents answered that they were concerned about the serious infection of COVID-19 infection. The second most important reason for a positive approach to Vaccination was that they did not want to infect their families and loved ones (n: 84, 38.88%), and the positive approach of scientists to vaccination was the third important reason (n: 78, 36.11%).

**Table 2.** Sociodemographic characteristics of the participants, their knowledge and opinions about previous vaccinations and COVID-19 infection

	n	%		n	%
<b>Gender</b>			<b>Contact with COVID-19 patient</b>		
Woman	202	47.09	Yes	273	63.64
Man	227	52.91	No	156	36.36
Total	429	100.00	Total	429	100.00
<b>Education degree</b>			<b>Compliance with isolation rules</b>		
Literate or Primary school	77	17.94	Yes	253	58.97
Middle or High school	148	34.50	Partially	168	39.16
Undergraduate- License	184	42.89	No	8	1.87
Graduate	20	4.67	Total	429	100.00
Total	429	100.00	<b>Influenza vaccination</b>		
<b>Income level</b>			Yes	42	9.79
Too bad	32	7.46	No	327	76.22
Bad	77	17.95	Sometimes	60	13.99
Medium	241	56.18	Total	429	100.00
Good	74	17.25	<b>Pneumococcus vaccination</b>		
Very good	5	1.16	Yes	71	16.55
Total	429	100.00	Not in the risk group, so didn't have done	333	77.62
<b>Marital status</b>			Never done	25	5.83
Married	223	51.98	Total	429	100.00
Single	187	43.59	<b>Parents' vaccination status</b>		
Divorced/widow	19	4.43	Yes	196	82.01
Total	429	100.00	No	31	12.97
<b>Having chronic disease</b>			Irregular	12	05.02
Yes	87	20.28	Total	239	100.00
No	342	79.72	<b>Thought on COVID-19 vaccine efficacy</b>		
Total	429	100.00	Effective	190	44.29
<b>Regular use of medication</b>			Ineffective	85	19.81
Yes	84	19.58	Not sure	154	35.90
No	345	80.42	Total	429	100.00
Total	429	100.00	<b>Thinking about getting the COVID-19 vaccine</b>		
<b>Had COVID-19 infection</b>			Yes	172	40.09
Yes	155	36.13	No	107	24.94
No	232	54.08	Not sure	150	34.97
Not sure	42	9.79	Total	429	100.00
Total	429	100.00			
<b>Hospitalization due to COVID-19 infection</b>					
Inpatient	23	14.84			
Outpatient	132	85.16			
Total	155	100.00			

When the participants were asked the reason for their negative thoughts about the COVID-19 vaccine, about half of the 249 respondents (n:128, 51.40%) said the content of the vaccine was unknown, 116 people (46.58%) had the vaccine imported from a foreign country, and 93 people (37.34%) cited the fact that the Phase-3 studies of the vaccine are still ongoing. The relationship between COVID-19 vaccination intention and sociodemographic characteristics is given in Table 3.

**Table 3.** Statistical analysis of the factors affecting the thought of getting the COVID-19 vaccine

		COVID-19 Vaccination intentions n(%)			P*
		Yes	No	Not sure	
<b>Age</b>	18-30	78(35.94)	64 (29.50)	75(34.56)	<b>0.047</b>
	31-50	63(40.38)	33(21.16)	60 (38.46)	
	51 and up	31(55.36)	10(17.86)	15(26.78)	
<b>Gender</b>	Woman	72(35.64)	47(23.27)	83(41.09)	<b>0.041</b>
	Man	100(44.05)	60(26.43)	67(29.52)	
<b>Job</b>	Officer	46(40.35)	27(23.69)	41 (35.96)	<b>0.002</b>
	Worker	38(33.63)	38(33.63)	37 (32.74)	
	Self-employment	39(55.71)	11(15.72)	20 (28.57)	
	Retired	12(75.00)	1(6.25)	3 (18.75)	
	Housewife	37(31.90)	30(25.86)	49 (42.24)	
<b>Education degree</b>	Literate or primary school	31 (40.26)	17 (22.08)	29 (37.66)	0.820
	Middle or high school	59 (39.86)	40 (27.03)	49 (33.11)	
	Undergraduate-License	71 (38.59)	46 (25.00)	67 (36.41)	
	Graduate	11 (55.00)	4 (25.00)	5 (20.00)	
<b>Marital status</b>	Married	97 (43.50)	49 (21.97)	77 (34.53)	0.381
	Single	70 (37.43)	51 (27.27)	66 (35.30)	
	Divorced/widowed	5 (26.32)	7 (36.84)	7 (36.84)	
<b>Having chronic disease</b>	Yes	48(55.17)	20(22.99)	19(21.84)	<b>0.003</b>
	No	124(36.26)	87(25.44)	131(38.30)	
<b>Regular use of medication</b>	Yes	41 (48.81)	20 (23.81)	23 (27.38)	0.153
	No	131 (37.97)	87 (25.22)	127 (36.81)	
<b>Had COVID-19 infection</b>	Yes	80 (51.61)	30 (19.36)	45 (29.03)	<b>0.007</b>
	No	80 (34.48)	64 (27.59)	88 (37.93)	
	Not sure	12 (28.57)	13 (30.95)	17 (40.48)	
<b>Compliance with isolation rules</b>	Yes	106(41.90)	66(26.09)	81(32.01)	0.234
	Partially	64(38.10)	37(22.02)	67(39.88)	
	No	2(25.00)	4(50.00)	2(25.00)	
<b>Influenza vaccination regularly</b>	Yes	34(80.95)	5(11.90)	3(7.15)	<b>&lt; 0.001</b>
	No	117(35.78)	90(27.52)	120(36.70)	
	Sometimes	21(35.00)	12(20.00)	27(45.00)	
<b>Parents' vaccination status of children</b>	Yes	96(48.98)	31(15.81)	69(35.21)	<b>0.002</b>
	No	9(29.02)	11(35.49)	11(35.49)	
	Irregular	6(50.00)	6(50.00)	0(00)	

When asked under what circumstances they would consider getting vaccinated, nearly half of the 240 respondents (n:112, 46.66%) said that they would get the vaccine if a local vaccine was produced, 94 (39.16%) respondents said that they would get the vaccine if the vaccine content was explained clearly, and 85 (35.41%) respondents would get the vaccine if the Phase-3 studies were completed.

Twenty-seven people (11.25%) stated that they do not intend to apply the COVID-19 vaccine under any circumstances. When asked where they follow their information sources about COVID-19 and its vaccine, 347 people stated that they got information from television (80.88%), 253 people (58.97%) stated that they got information from social media and 91 people (21.21%) from forums on the internet.

When asked which sources they trust more about COVID-19 and its vaccine, 286 people (66.66%) stated that they trust the official statements, 131 people (30.53%) stated that they trust their family physician, and 121 people (28.20%) stated that they trust the doctors who appear on television.

## Discussion

Vaccine hesitancy or rejection is based on very complicated reasons. In our study, it was aimed to analyze the cases of COVID-19 Vaccination in the relatives of patients under observation in the COVID-19 Emergency Yellow Zone of a training and research hospital and the multifaceted factors affecting it.

In the study, it was seen that male participants were more likely to consider getting the COVID-19 vaccine, while females were more undecided. When the age factor was evaluated, it was seen that those aged 51 and over were thought to be vaccinated statistically significantly compared to those at a younger age. In a study conducted on the Chinese population, the rate of those who intended to have the vaccine was 45.3%, while the rate of those who were undecided was 29.2%, and the rate of those who did not intend to have it was 25.5.<sup>11</sup> In a study conducted in the USA, while the majority of medical students were willing to get the COVID-19 vaccine, nearly a quarter were hesitant.<sup>12</sup> In our study, those considered to have the COVID-19 vaccine were retirees at the highest rate, then self-employed, and the difference was statistically significant. The fact that retirees considered having a high rate of Vaccination were considered as a result compatible with high age. The most undecided group was housewives. This result was also consistent with the female gender being undecided in our study.

Being a parent or having marital status are also factors that can affect vaccination rates and COVID-19 vaccine hesitancy. In a study of Italian parents, only 26.5% of parents stated that they were considering getting the



COVID-19 vaccine. Vaccine hesitancy was due to safety concerns at a rate of 76%. Female gender, younger age and low education level were the negative conditions that affected the positive attitude toward Vaccination. The external factor, on the other hand, only informed by the National Health Authorities had a positive effect on the vaccination rates.<sup>13</sup>

In our study, it was seen that an education degree did not affect vaccine hesitancy. Although the intention to vaccinate was higher in those with postgraduate education, it was not statistically significant. In Fedele's study, low education level was a reason for hesitations about the COVID-19 vaccine.

In a study conducted in Kazakhstan, COVID-19 vaccination hesitancy was approximately 36%. In this study, sociodemographic factors affecting COVID-19 vaccine hesitancy were the female gender, being 30 years old and over, being widowed or divorced, and having children, while the most important external factor was the country where the vaccines were produced.<sup>14</sup> As can be seen, sociodemographic factors affecting vaccine hesitancy vary between countries and cultures. In our study, while gender caused hesitations about Vaccination, marital status did not cause it, and the presence of chronic disease and COVID-19 had a positive effect on Vaccination. In this result, it can be thought that the experiences of those who have had COVID-19 regarding the severity of the infection may have positively affected the Vaccination.

Vaccination against COVID-19 may depend on being vaccinated against other viruses regularly. In our study, the thought of getting COVID-19 Vaccination was found to be statistically significantly higher in individuals who regularly get influenza vaccination every year and in parents who have their children vaccinated regularly. Sociocultural factors play an important role in vaccination hesitancy. In a social study conducted in Pakistan, COVID-19 vaccine hesitancy was found to be as high as 49%. Of the 46% group who wanted to have the vaccine, 42% stated that they would prefer not to have Western vaccines.<sup>15</sup> In a study conducted by Abbas et al. in the same country, while the belief that the vaccine would cause infertility was common in the low-education group, this belief was found to be very low in the graduate group.<sup>16</sup>

The duration of the pandemic also seems to be effective in COVID-19 Vaccination. Our study was carried out in January 2021, towards the end of the COVID-19 second wave. In a Hongkok study, willingness to accept the COVID-19 vaccine was lower in the third wave (34.8%) than in the first wave (44.2%). There appeared to be more concern about vaccine safety in the third wave.<sup>17</sup>

When vaccine hesitancy was investigated in a study conducted in the USA in April 2020, just at the beginning of the pandemic, it was seen that 57.6% were planning to be vaccinated, and 31.6% were undecided. Factors associated with vaccine hesitancy were younger age, lower education level, and no previous year flu vaccination. Reasons for vaccine hesitancy included vaccine-specific concerns, the need for more information, anti-vaccine attitudes or beliefs, and a lack of confidence.<sup>18</sup>

We have some limitations to this study. We applied the study only to the relatives of COVID-19 patients who applied to the emergency department of one hospital.

As a result, clarifying COVID-19 vaccine hesitancy can help effectively design public education campaigns aimed at improving vaccine acceptance behaviors. The fact that family physicians are an important source that people trust should be considered as a great opportunity for vaccine hesitancy and refusal problems.

**Ethical Considerations:** The study was evaluated at the meeting of the University of Health Sciences Hamidiye Scientific Research Ethics Committee dated 18.12.2020, and permission numbered 28/21 and 20/516 was obtained.

**Conflict of Interest:** The authors declare no conflict of interest.

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