



Research Article

DOI: 10.36959/545/418

Acceptance and Attitudes towards the COVID-19 Vaccines between 18-55 Ages: A Mixed Study from Turkey

Ayşegül Yılmaz, RN^{1*} and Gözde Özaras Öz, PhD²¹Konya Beyhekim Training and Research Hospital, Konya, Turkey²Cankiri Karatekin University, Vocational Health High School, Health Care Services Department, Cankiri, Turkey

Abstract

Background: One of the most effective, safe and cost-effective public health strategies to prevent COVID-19 is vaccine. Vaccines are effective interventions that can reduce the high burden of diseases globally. However, the public's hesitation and skepticism about vaccines is a pressing problem for public health authorities. This study was carried out to determine the attitudes of individuals aged between 18-55 towards the COVID-19 vaccine in Turkey.

Design: This study was designed as a mixed study with both quantitative and qualitative designs.

Method: The quantitative dimension of the study was completed with a total of 421 participants between the ages of 18-55 who applied to the emergency department of the hospital in 2020. The qualitative dimension of the research was completed with 15 participants. The research data were collected utilizing "Introductory Information Form" and "Attitudes Towards the COVID-19 Vaccine-ATV-COVID-19 Scale".

Results: The findings of this study showed that the acceptance and attitudes of the individuals, aged between 60-69 age, married, retired, having a social security, with a working time of 15 years and above, having a chronic disease, with a COVID-19 history and not following the recommendations of family doctor regarding the vaccine, are negative. Attitudes with negative attitudes towards the COVID-19 vaccine include: "Uncertainty in vaccine content, foreign vaccines, production of vaccine in a short time/rapid release of vaccine, COVID-19 infection after being vaccinated, fear of the unknown".

Conclusion: The most effective measure to control the spread of the virus is individual measures, and the individuals should be vaccinated as soon as possible. The widespread COVID-19 vaccine hesitancy necessitates governments, health policymakers and social media companies to act cooperatively. It is of importance to establish a COVID-19 vaccine safety in the public by giving timely and clear messages on the safety and efficacy of COVID-19 vaccines through reliable channels.

Keywords

COVID-19, Vaccines, Acceptance, Attitudes

List of Abbreviations

ATV-COVID-19: Attitudes towards the COVID-19 Vaccine; COVID-19: Coronavirus Disease; ECDC: Centers for Disease Control and the European Center for Disease Prevention and Control; MoH: Turkish Ministry of Health; PHE: Public Health England; SARS-CoV-2: Severe Acute Respiratory Syndrome Coronavirus 2; WHO: World Health Organization

Introduction

Coronavirus disease 2019 (COVID-19) is a fatal disease that is going on to globally affect many countries in the world. This is caused by the novel coronavirus strain SARS-CoV-2 that is a highly infectious virus which has become a serious public health concern across the world [1]. The World Health Organization (WHO) declared the COVID-19 outbreak as a pandemic on 11 March 2020 [2]. According to the Johns Hopkins Coronavirus Resource Center [3], the confirmed COVID-19 case number is above 1.2 million in the world,

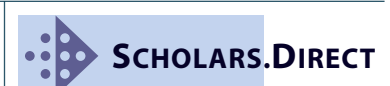
***Corresponding author:** Ayşegül Yılmaz, Konya Beyhekim Training and Research Hospital, Konya, Turkey, Tel: +90-505-359-64-28

Accepted: May 11, 2022

Published online: May 13, 2022

Citation: Yılmaz A, Öz GO (2022) Acceptance and Attitudes towards the COVID-19 Vaccines between 18-55 Ages: A Mixed Study from Turkey. J Nurs Pract 5(1):450-460

Copyright: © 2022 Yılmaz A, et al. This is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.



which resulted in 50.5 million deaths. The first COVID-19 case in Turkey was reported on 11.03.2020 [4]. Since that day, the number of new cases in the country has increased rapidly. As of 18 July 2021, a total of 5,470,764 positive COVID-19 cases and 50.155 deaths were reported in the country [5].

One of the most effective, safe and cost-effective public health strategies to prevent COVID-19 is vaccine [1,6]. The news regarding the confirmation of SARS-CoV-2 vaccines gives hope to us regarding the end of the pandemic with community immunity. The long-term success of the public health response to the COVID-19 pandemic depends on achieving acquired immunity in 50-67% of the population. It is believed that hesitation and doubt about vaccination among the world population is one of the most important obstacles in achieving this goal [6]. Vaccine hesitancy is defined to be “hesitating or not accepting to be vaccinated despite the availability of vaccination services” and is a public health issue [7]. Factors related to the novelty of the COVID-19 vaccine, its safety and potential side effects are concerns regarding the refusal of the vaccine [8,9]. Thousands of people protested worldwide to criticize COVID-19 social distancing policies and the possibility of mass vaccination. The attitude people show towards vaccine safety relates to getting vaccinated [10]. In the study conducted by Thunstrom, et al. [11] to investigate the relationships between general vaccine attitudes and intention to vaccinate against COVID-19, they reported that the most significant determining factor of vaccine safety was belief and trust. El-Elimat, et al. [6] argued that the primary factors for acceptance of vaccine should be confidence, convenience, and complacency.

According to the results obtained by IPSOS company between 25-29 December, it was found out that the tendency to vaccinate was very strong in China (80%), Brazil (78%) and the UK (77%), while the tendency not to vaccinate was very high in France (40%) and Russia (43%) [12]. In a research carried out in Europe, it was discussed that reluctance and uncertainty about getting a COVID-19 vaccine would be a challenge before reaching the required vaccine rate. In addition, 26% of adults in European countries were reported to be unsure or reluctant in terms of getting vaccinated in the early periods of the pandemic [8]. It was urged in a study administered in the USA that 50% of the population was willing to take the vaccine, 30% was unsure, while 20% of them refused the vaccine [13]. In another study conducted with Americans, it was reported that 58% of adults had an intention to be vaccinated, 32% was unsure, and 11% was not thinking of getting vaccinated [14]. Another study suggested that 67% expressed to accept the COVID-19 vaccine if they were recommended [15]. When examining the data regarding other countries, it was stated that 72% of individuals aged 16-74 living in Brazil would take the COVID-19 vaccine, while only 19% of Japanese people would take it. It was also reported that whereas 69% of individuals aged 16-74 living in Mexico stated to take the vaccine soon, this rate was specified to be only 13% in South Korea. 66% of the Japanese people were concerned about the side effects of the vaccine, while 51% of the Brazilian people stated that the vaccine passed the clinical trials very rapidly. 77% of Mexican people stated that

vaccination should be compulsory for individuals above 18 [12]. According to the result of other studies, those following COVID-19 protective measures in a lower level, having lower levels of education, with low-income, who were women and who were not vaccinated against influenza last year [9] were reported to reject the COVID-19 vaccine when it was available [8,9,11,16]. Although there are few studies conducted in Turkey regarding this subject, it was suggested in a study conducted by Salali, et al. [17] that 31% of individuals were unsure about the COVID-19 vaccine, and 3% of them strictly refused to take the COVID-19 vaccine. In the study carried out by Özceylan, et al. [18] on vaccine refusal and hesitancy, the COVID-19 vaccine acceptance and likelihood to believe in natural origin of the virus of Turkish male were found to be higher.

In order to achieve a safe and confident vaccination process, the obstacles and uncertainties before vaccine acceptance should be revealed. Accordingly, there is a need to determine the attitude of Turkish people towards COVID-19 vaccines. To this end, this study was carried out to determine the attitudes of individuals aged between 18-55 towards the COVID-19 vaccine in Turkey. This study is of importance in specification of attitudes towards the COVID-19, removal of prejudices against vaccine in the country and to guide government and policy-makers for obtaining an increase in the rate of vaccination.

Methods

Research design

This study was designed as a mixed study with both quantitative and qualitative designs.

Participants

This investigation was carried out at Konya Beyhekim Training and Research Hospital between March 2021 - May 2021, and the sample of the study consisted of individuals aged between 18-55, who applied to emergency service as outpatient. Sample number was calculated by the formula of $Nt^2pq/d^2(N-1)+t^2pq$ [19]. It was aimed to reach at least 370 cases with 95% confidence and 5% sensitivity by referencing a total of 10 thousand patients aged between 18-55 who applied to the hospital's emergency department in 2020. The sample was calculated using the following formula when the universe was known. The quantitative part of the study was completed with 421 participants due to voluntary participation. The inclusion criteria were as follows: (a) Not getting vaccinated against COVID-19 (b) Aged between 18-55 (c) Proficiency in the Turkish language (d) Residing in Turkey (e) Willingness to participate in research (f) Filling out questionnaire questions. Based on these criteria, the sample consisted of 420 people. Data were collected from individuals using a questionnaire, and each questionnaire was filled approximately in 10 minutes. While collecting data, social distancing, mask and individual hygiene rules were complied with. The participants were informed about the purpose and method of the research, and their informed consent was obtained. They were also informed that they could withdraw from the study at any time. The number

of participants for the qualitative part of the research was determined according to data saturation, data were collected from the same participants until saturation was reached. Data saturation was achieved with 15 participants. The participants were contacted via WhatsApp, and online interviews were organized. The interviews were made online via zoom (only voice record) on a day determined mutually by the researcher and participants. Interviews lasted between 15-20 minutes.

Data collection tools

The research data were collected utilizing "Introductory Information Form" and "Attitudes towards the COVID-19 Vaccine-ATV-COVID-19 Scale".

Introductory information form: The Introductory Information Form was prepared by the researcher, which consisted of a total of 11 closed-ended questions regarding individuals' age, gender, marital status, education status, occupation, social security, working time, chronic disease history, history of COVID-19, adherence to mask, distance, hygiene rules, and compliance with the doctor's vaccine recommendations.

ATV-COVID-19: The scale developed by Çırakoğlu [20] against H1N1 virus was adapted to COVID-19 by Geniş, et al., [21] and Turkish validity and reliability were fulfilled. It was determined that ATV-COVID-19 had a valid and reliable structure to measure COVID-19 related perceptions and attitudes in both health care personnel and non-health care personnel. A permission was obtained from Dr. Bahadır Geniş to use the scale.

The Attitudes towards the COVID-19 Vaccine-ATV-COVID-19 Scale has 9 items and two sub-scales (positive and negative attitude). The identified sub-scales were evaluated with confirmatory factor analysis, and good fit indices were observed. The Cronbach's alpha coefficient was found to be 0.80. The expressions in the scale were rated as "Definitely Disagree (1)", "Disagree (2)", "Undecided (3)", "Agree (4)", and "Strongly Agree (5)". The items in the negative attitude sub-scale (5, 6, 7, 8 and 9) are reversely scored. A value between 1-5 is obtained by dividing the total score achieved by summing the item scores in the sub-scale by the number of items in that sub-scale. High scores from positive sub-scale (1, 2, 3 and 4 items) show a positive attitude toward vaccination. The items in the negative attitude sub-scale are calculated after being reversed, and high scores in this sub-scale refer to less negative attitude towards vaccination. Reverse items are coded as follows: 1→5; 2→4; 3→3; 4→2; 5→1.

The items of the scale are as follows: The items regarding positive attitude: "I want my family to have the vaccine developed for this disease. I want to have the vaccine developed for this disease as much as possible. I think everybody should have the vaccine developed for this disease. I trust to explanations made for the vaccine developed". The items showing negative attitude: "The vaccine developed may cause spread of the disease. I think the vaccine developed does not have a protective effect. The vaccine developed is

dangerous. I think the effectiveness of the vaccine developed has not been tested adequately. I think I may survive the epidemic without a vaccine".

Semi-structured interview form: Researchers developed a semi-structured interview form in order to discover the opinions of the participants' acceptance and attitudes regarding COVID-19 vaccines. There were three basic questions in the form: Can you introduce yourself shortly? What do you think about the positive aspects of the COVID-19 vaccines? What do you think about the negative aspects of the COVID-19 vaccines? Write any additional information you would like to add about your experience on this subject.

Statistical analysis

The data obtained were analyzed by SPSS 21 package program. Due to the non-normal distribution of the data, Mann-Whitney U test was utilized for comparisons with two groups, while Kruskal-Wallis H test with Post-hoc comparison was administered for comparisons with three or more groups. Bonferroni test was used in multiple comparisons. The significance level was specified to be 0.05, accordingly $p < 0.05$ referred to a significant difference, whereas $p > 0.05$ indicated no significant difference. Each expression was written separately in the open-ended questions, same or similar words were gathered under a title under the content integrity, and a category was created. The created categories were evaluated with the "descriptive analysis method", one of the qualitative data analysis methods. The data were coded by two researchers independently, and these two researchers convened to interpret the results after the coding process. In addition, after voice recordings were transcribed, the interview texts were sent to participants. The participants confirmed these texts. The codes were grouped in accordance with their meanings, were associated with each other within a certain meaning, and themes were developed by merging codes. Accordingly, the consistency was checked by researchers and participants, thus, reliability was ensured in the study.

Ethical consideration

To collect the study data, approval of a University Research Committee and Publication Ethics Board (Protocol Number: 2021/ea66fa595ce14279) in Turkey was obtained. A consent page was attached on the front part of the questionnaire that explains the purpose of the research, which is supposed to be read before filling the questionnaire. Participants could only proceed to fill the questionnaire after they had given their consent.

Results

Quantitative findings of the study

Socio-demographic characteristics: 41.3% of the participants were between 40-49 age range, 58.9% of them were male, 77.9% of them were married, 43.9% of them had high school graduation, 47.7% of them were workers, 94.8% of them had a social security, 35.6% of them were unemployed, 66.5% of them did not have a chronic disease,

Table 1: Descriptive characteristics of participants.

Descriptive Characteristics		n	%
Age	19-29 age	39	9.3
	30-39 age	130	30.9
	40-49 age	174	41.3
	50-59 age	32	7.6
	60-69 age	46	10.9
Gender	Female	173	41.1
	Male	248	58.9
Marital Status	Married	328	77.9
	Single	67	15.9
	Divorces	26	6.2
Educational Status	Primary School and Lower	180	42.8
	High School	185	43.9
	University	56	13.3
Occupation	Unemployed	31	7.4
	House wife	114	27.1
	Worker	201	47.7
	Civil Servant	46	10.9
	Retired	29	6.9
Social Security	Available	398	94.8
	Not Available	22	5.2
Working Period	1-5 years	26	6.2
	6-10 years	42	10.0
	11-15 years	62	14.7
	15 year and above	141	33.5
	Unemployed	150	35.6
Chronic Disease	Hypertension	50	11.9
	Diabetes Mellitus	91	21.6
	None	280	66.5
Covid-19 infection	First infection	111	26.4
	Previously infected	238	56.5
	Noninfected	72	17.1
Following hygiene rules	Yes	396	94.1
	No	25	5.9
Implementation of recommendations	Yes	408	96.9
	No	13	3.1
TOTAL		421	100.0

56.5% of them were previously infected with COVID-19, 94.1% of them followed hygiene rules and 96.9% of them acted in accordance with the recommendations of their doctors (Table 1).

Relationship of the attitudes towards the COVID-19 vaccine-ATV-COVID-19 scale with socio-demographic variables: The mean score of the individuals in the 60-69 age group was found to be significantly higher than other age groups in terms of negative opinion factor ($h = 35.256$, $p < 0.05$). No significant difference was obtained with the gender regarding positive ($z = 21067.5$, $p > 0.05$) and negative ($z = 20602$, $p > 0.05$) opinion factors. The mean score of the

married individuals was specified to be significantly higher than single and divorced individuals in terms of negative opinion factor ($h = 6.068$, $p < 0.05$). Any significant difference was not concluded with the education status regarding positive ($h = 0.355$, $p > 0.05$) and negative ($h = 5.823$, $p > 0.05$) opinion factors. The mean score of the retired individuals was found to be significantly higher than other individuals in terms of negative opinion factor ($h = 17.487$, $p < 0.05$). No significant difference was achieved regarding having a social security and positive opinion factors ($z = 3639$, $p > 0.05$). The mean scores of the individuals with a social security were concluded to be significantly higher compared to other individuals regarding negative opinion factor ($z = 26.86$, $p < 0.05$).

The mean scores of the individuals with a working period of 15 years and above were found to be significantly higher than other individuals with a lower working period in terms of negative opinion factor ($h = 14.675, p < 0.05$). The mean scores of the individuals with Diabetes Mellitus and Hypertension chronic disease were specified to be significantly higher than other individuals without any chronic disease regarding negative opinion factor ($h = 32.959, p < 0.05$). The mean scores of the individuals with Covid-19 history were concluded to be higher than the individuals without Covid-19 infection

in terms of negative opinion factor ($h = 11.66, p < 0.05$). It was determined that the mean scores of the individuals following the hygiene rules were found to be significantly higher than those not following the rules in terms of positive opinion factor ($z = 3555, p < 0.05$). No significant difference was observed in following hygiene rules in terms of negative opinion factor ($z = 42.09, p > 0.05$). The mean scores of the individuals not following the recommendations of their family doctors related to vaccine were found to be significantly higher than the individuals following recommendations

Table 2: Comparison of the attitudes towards the COVID-19 vaccine-ATV-COVID-19 scale according to socio-demographic variables.

Descriptive characteristics		Positive opinion			Negative opinion		
		Mean scores (X±SD)	Statistical evaluation		Mean scores (X±SD)	Statistical evaluation	
			Test	p		Test	p
Age	19-29 age	15.18 ± 2.62	h = 37.143	0.0001*	18.23 ± 2.92	h = 35.256	0.0001*
	30-39 age	15.58 ± 2.79			19.03 ± 2.73		
	40-49 age	15.89 ± 2.72			19.43 ± 2.65		
	50-59 age	17.00 ± 2.20			20.75 ± 2.24		
	60-69 age	18.09 ± 2.29			21.09 ± 2.47		
Gender	Female	15.97 ± 2.73	z = 21067.5	0.749	19.29 ± 2.80	z = 20602	0.485
	Male	16.10 ± 2.80			19.61 ± 2.72		
Marital Status	Married	16.32 ± 2.75	h = 14.851	0.001*	19.66 ± 2.67	h = 5.823	0.054
	Single	15.16 ± 2.45			18.73 ± 2.68		
	Divorces	14.96 ± 3.07			19.15 ± 3.61		
Educational Status	P. School	16.16 ± 2.87	h = 0.355	0.837	19.36 ± 2.62	h = 5.823	0.054
	High School	15.94 ± 2.60			16.82 ± 2.70		
	University	16.05 ± 2.99			18.73 ± 3.18		
Occupation	Unemployed	15.03 ± 2.99	h = 21.544	0.0001*	18.35 ± 2.44	h = 17.487	0.002*
	House wife	16.20 ± 2.82			19.47 ± 2.81		
	Worker	15.73 ± 2.55			19.53 ± 2.59		
	Civil Servant	16.65 ± 3.09			19.00 ± 3.11		
	Retired	17.83 ± 2.36			21.10 ± 2.73		
Social Security	Available	16.10 ± 2.74	z = 3639	0.172*	19.57 ± 2.77	z = 26.86	0.002*
	Not Available	15.32 ± 3.15			17.91 ± 1.93		
Working Period	1-5 years	15.42 ± 2.30	h = 11.738	0.019*	18.23 ± 2.42	h = 14.675	0.005*
	6-10 years	15.74 ± 2.67			19.05 ± 2.63		
	11-15 years	15.32 ± 2.78			19.26 ± 3.03		
	15 years ↑	16.64 ± 2.66			20.09 ± 2.56		
	Unemployed	15.99 ± 2.88			19.33 ± 2.81		
Chronic Disease	HT	16.62 ± 2.37	h = 20.301	0.0001*	20.30 ± 2.32	h = 32	0.0001
	D	17.08 ± 2.56			20.67 ± 2.40		
	None	15.61 ± 2.80			18.94 ± 2.78		
Covid-19 infection	First	16.13 ± 2.89	h = 8.278	0.016*	19.86 ± 2.57	h = 11.66	0.003*
	Previously	16.28 ± 2.66			19.62 ± 2.64		
	Noninfected	15.18 ± 2.78			18.42 ± 3.16		
Following hygiene rules	Yes	16.13 ± 2.80	z = 3555	0.016*	19.52 ± 2.80	z = 4209	0.205
	No	14.80 ± 1.71			18.84 ± 1.91		
Implementation of recommendations	Yes	16.16 ± 2.71	z = 846.5	0.0001*	17.15 ± 3.05	z = 1497.5	0.007*
	No	12.54 ± 2.47			19.55 ± 2.72		

Abbreviations: h: Kruskal-Wallis H; z: Mann-Whitney U. *p < 0.05

regarding negative opinion factor ($z = 1497.5, p < 0.05$) (Table 2).

Qualitative findings of the study

Opinions of Individuals on COVID-19 vaccine: Regarding the acceptance and attitudes of the individuals aged between 18-55 for the COVID-19 vaccine, two main themes of “Positive Opinions on COVID-19 Vaccine” and “Negative Opinions on COVID-19 Vaccine” and five sub-themes were developed. Table 3 shows these main themes, each of the sub-themes, and the results of the respective individuals.

1st THEME: Positive Opinions on COVID-19 Vaccine

This theme includes five sub-themes of “Pfizer/Biontech vaccine, Sinovac vaccine, vaccination of community leaders, confidence in state policies and confidence in Turkish science”.

Pfizer/BioNTech vaccine: Seven of the 15 participants stated that they had confidence in the Biontech vaccine, and the relevant quotations are below. *“I have used the drugs produced by Pfizer before and I have seen a lot of benefits. For this reason, I think that the Pfizer vaccine is effective against COVID-19. It makes me feel more confident”* [P2]. *“Some people do not have any side effects but some have side effects albeit little. I prefer German vaccine, I trust them more. Maybe because the Turks developed it. I think that the vaccine is effective”* [P7]. *“I have information on Biontech, Sinovac, Sputnik V vaccines. I believe that they are effective to prevent the pandemic. I prefer the Biontech vaccine because it provided the best results in tests and I believe it is highly reliable”* [P10]. *“I think the Biontech vaccine is more effective. It is more reassuring when people who developed the vaccine state that its effectiveness is high. When this vaccine was developed, it had a great impact in the world media. While Chinese vaccine is said to have 6 months protection, this vaccine is argued to protect for 1 year. It has started to be administered in our country now, I am thinking to make Biontech vaccine after following the side effects for a while”* [P12].

Sinovac vaccine: Six of 15 participants thought that Sinovac vaccine had no side effect and trusted in the protection of

Sinovac vaccine, quotations are provided below. *“Some of my elders were vaccinated, and they have no problem now. I think they preferred to be vaccinated with the Chinese vaccine as it has fewer side effect than another vaccine. I am also thinking to get vaccinated the Chinese vaccine due to its fewer side effect. I consider that the vaccine is reliable because statesmen were also vaccinated. If the vaccines were harmful, they would not have been vaccinated. I'm not sure if the vaccine is fully protected as a negative side of the vaccine. On the positive side, you have the disease milder”* [P6]. *“I think that the inactivated vaccine produced with the old method is more protective. I think the Chinese vaccine is more protective”* [P1]. *“I prefer the Chinese vaccine. mRNA vaccine scares me a little. As the Chinese vaccine is prepared with the methods of other vaccines, this makes the Chinese vaccine more reliable for me. Injection of mRNA into my body concerns me”* [P14]. *“Some of my elders were vaccinated, and they have no problem now. I think they preferred to be vaccinated with the Chinese vaccine as it has fewer side effect than another vaccine. I am also thinking to get vaccinated the Chinese vaccine due to its fewer side effect”* [P6].

Vaccination of community leaders: Four of the 15 participants stated that the vaccination of statesmen and celebrities gave them confidence. Relevant quotations are provided below. *“I find vaccines reliable. Celebrities and statesmen are getting vaccinated, if it is insecure, they would not be vaccinated. Thus, I trust in”* [P3]. *“I think it is reliable. If everyone gets this vaccine, the pandemic will end. It is reliable because the President and the Minister of Health were vaccinated. I find it reliable. I think vaccines are effective, but everyone needs to be vaccinated rapid so that pandemic ends. I think vaccines do not have negative effects, but I do not know if it will happen in the future. Vaccination is slow. Vaccination rate is low”* [P5].

Confidence in state policies: Three of the 15 participants stated that they trusted in the state policies. The following quotations emphasize their confidence in state policies: *“Human structure is different. It varies for each person. It affected some positively and some negatively. I want to be vaccinated, when my turn comes, I will get vaccinated*

Table 3: Opinions of Individuals on COVID-19 vaccine.

Context	Themes	Sub-themes
Opinions of Individuals on COVID-19 vaccine	Positive Opinions on COVID-19 Vaccine	<ul style="list-style-type: none"> ➤ Pfizer/Biontech vaccine ➤ Sinovac vaccine ➤ Vaccination of community leaders ➤ Confidence in state policies ➤ Confidence in Turkish science
	Negative Thoughts on the COVID-19 Vaccine	<ul style="list-style-type: none"> ➤ Uncertainty in vaccine content ➤ Foreign vaccines ➤ Production of vaccine in a short time/rapid release of vaccine ➤ COVID-19 infection after being vaccinated ➤ Fear of the unknown

immediately. I will take whatever vaccine our state applies. Because I trust in my state. I think it wouldn't do anything bad for its citizens" [P8]. "It is hopeful that countries like Israel have started to walk without masks. The government has taken measures properly. It is impossible to prevent this disease without getting vaccinated. For this reason, it is a must to get vaccinated" [P14]. "I think vaccine will be beneficial. As far as I can see in the news, other European countries have reduced the number of daily corona cases thanks to the vaccine, I think we can observe the same situation in our country. I do not have any idea about taking which vaccine. Whatever the state approves is reliable" [P15].

Confidence in Turkish science: Two of the 15 participants stated that they trusted in Turkish science. This is referred in the following quotations. "I trust in the Turkish scientific committee, but it shouldn't have taken this long. We also have good universities but Turkish scientists should find immediately and put into practice. If they had done their best, a vaccine would have been found by now. It is now too late" [P1].

2nd THEME: Negative Thoughts on the COVID-19 Vaccine

This theme has five sub-themes: "Uncertainty in vaccine content, foreign vaccines, production of vaccine in a short time/rapid release of vaccine, COVID-19 infection after being vaccinated, fear of the unknown".

Uncertainty in vaccine content: Eight of the 15 participants reported that the contents of the vaccines were uncertain as shown in the following quotation. "It may have negative effects on us in the following years such as infertility, other diseases. The content of the vaccine should be examined properly" [P4].

Foreign vaccines: Seven of the 15 participants stated that they did not trust in foreign vaccines as shown in the following quotations. "I do not find reliable. I do not trust foreign vaccines. They may have effects as they are foreign. I don't know what they put in it. I do not know whether they will manipulate my tissue and biology. It comes from China. America, England Germany do not like us. I know they don't like Muslims. They may have side effects" [P1]. "If I have to, I will consider getting the vaccines other than the Chinese vaccine. Because I do not trust in China, do not know that they have put in it. They produced the microbe, and they were the first to find the vaccine, so it's doubtful. This doesn't give me confidence" [P9]. "I do not find COVID-19 vaccines safe because they have been produced abroad. I do not want to take any of the vaccines produced abroad. I do not know what there is in it. It is being examined by the state, but we do not know if it may have a side effect in the future. However, if Turkish vaccine is developed, I can get vaccinated" [P11]. "I hear high blood pressure complaints from the people who have been vaccinated with the Chinese vaccine. In addition, I consider six months length antibody production as a negative situation" [P14].

Production of vaccine in a short time

Five of the 15 participants expressed that the vaccines were produced in a short time, not adequately tested, and

quickly released as provided in the following quotations: "I have heard that prior vaccines were produced over a long period of time. A lot of tests were made. The COVID-19 vaccine was produced in a very short time. To this end, this does not make me feel confident. I am not sure about their protection either" [P9]. "It is thought-provoking that the vaccines have been developed even one year has not passed from the beginning of COVID-19 pandemic. Moreover, the virus always mutates, and the effect of mutant virus continues without any decrease. Vaccines were sent without completing phase 3 trials, it is said that they will be tested on us, there is much wrong information, and the development of this vaccine was not raised so much in the world" [P12]. "I'm not actually anti-vaxxer. However, as this vaccine has been released rapidly, I consider that adequate tests were not fulfilled" [P14].

COVID-19 infection after being vaccinated

Three of the 15 participants reported that there were individuals who were diagnosed with COVID-19 again after being vaccinated, as shown in quotation below. "We heard about people infected with COVID-19 one more time after having vaccinated. I am in constant contact with my friends who are active in the field, they say that the vaccinated people do not undergo the disease mildly" [P12].

Concern about unpredictable effects: Two of the 15 participants stated that they did not have any information on the effects of the vaccines and this worries them, as shown in the quotations below. "Vaccines can be effective in preventing this disease. I am not so sure. For example, I don't know if they are effective on mutant viruses. Public should be given information on these. The government should make more explanation about this. The negative effect of the vaccine is that individuals are worried whether they will be affected negatively" [P3].

Discussion

Do sociodemographic characteristics affect individuals' acceptance and attitudes towards the COVID-19 vaccine?

This study discusses the acceptance and attitudes of the individual aged between 18-55 in Turkey towards the COVID-19 vaccine. To this end, our findings will be significant in the development of awareness and health education programs regarding COVID-19 vaccination.

The findings of this study showed that the acceptance and attitudes of the individuals, aged between 60-69 (elderly), married, retired, having a social security, with a working time of 15 years and above, having a chronic disease, with a COVID-19 history and not following the recommendations of family doctor regarding the vaccine, are negative. These are unexpected findings, thus, it is considered that the participants have conspirator beliefs, are indecisive and reluctant to take a vaccine, accordingly show negative attitude against vaccination. This may make exposure to the virus worse in our country. In this regard, the individuals who are indecisive and reluctant to take a vaccine should be provided with public health campaigns aimed at increasing the COVID-19

vaccination rate, should be distributed guides, and should be given correct information on the pandemic [9]. Prior studies report the need to adapt such campaigns especially to individuals from lower socio-economic backgrounds [16]. Technical sources can be provided from the Turkish Ministry of Health (MoH), WHO, Public Health England (PHE), Centers for Disease Control and the European Center for Disease Prevention and Control (ECDC). When examining other studies on the subject, it has been reported in the Turkey Report research conducted across Turkey in 12 provinces in April 2021 that 20% of the participants have been vaccinated, 53% were considering getting vaccinated, and 25% were not thinking of getting a COVID-19 vaccine [22]. In the latest research carried out in April 2021, it has been stated that the rate of those considering vaccination among those who have not been vaccinated yet increased to 61% [12]. However, it is significant that those not thinking to be vaccinated under no circumstances are still 14%, while those who are undecided are at the rate of 23%. This shows that approximately one in three (31%) people in Turkey have a hesitancy to take the COVID-19 vaccine [17]. In the investigation regarding global acceptance of the COVID-19 vaccines conducted with 13.426 participants, vaccine acceptance rate has been reported to be 54.8% in Russia and 88.6% in China [23]. The Middle East is among the regions with the lowest global COVID-19 vaccine acceptance rate. Kuwait has the lowest rate in this regard, which is followed by Jordan (28.4%), Saudi Arabia (64.7%), and Turkey (66.0%) [6,24].

What factors do individuals refer to in developing acceptance and attitude towards the COVID-19 vaccine??

The ideal solution for preventing the pandemic is to develop a successful vaccine against the COVID-19. A significant number of vaccine candidates are being developed in countries, and positive clinical trial results have been published recently. However, it is not sufficient alone to develop a successful vaccine. It is necessary to vaccinate sufficient number of people in a society so that a vaccine become successful to provide population immunity. Requesting to provide a massive speed in vaccination, WHO [25], has called for all countries to vaccinate at least 10% of their population by September (24.05.2021). As of July 1, 2021, 50 million 275 thousand 691 doses of COVID-19 vaccine have been administered in Turkey. According to the latest data, the number of people to whom the first dose administered is 38 million 901 thousand 307, while the number of people with 2 doses is 20 million 555 thousand 339 [26]. According to the latest data, 62% of the country has been vaccinated so far. Considering that it is necessary to vaccinate from 50% to 75% of the population in order to prevent the spread of the COVID-19 virus, the vaccination rate in Turkey is now quite well. According to our findings, many statements of the participants have been determined regarding their **negative** attitude against the COVID-19 vaccine, these attitudes refer to followings: "Uncertainty in vaccine content, foreign vaccines, production of vaccine in a short time/rapid release of vaccine, COVID-19 infection after being vaccinated, fear of the unknown".

In this study, wrong information on vaccines has been specified to be the most significant determinants of individuals' hesitations and reluctance regarding COVID-19 vaccines. It is considered that this lack of knowledge and concern about unpredictable effects are caused by limited information and introduction activities held by the government. Incomplete or wrong data on the severity of COVID-19 incidence, morbidity and mortality rate may raise concerns about vaccine safety [27] and may make society reluctant on taking information on COVID-19 vaccines. In addition, information on internet and social medial, social circle may negatively affect an individual's behaviors regarding getting vaccinated. The information, which is not scientifically confirmed and obtained from social media, family, friends and social circle, becomes widespread rapidly, anecdotal and frequently misinterpreted information can be adopted without questioning, and this can create hesitations about vaccines. It has been reported in the previous studies that the individuals, who delayed or rejected vaccination, have made more searches on social media and have been exposed to wrong information circulated in this environment [1]. It is of paramount importance to obtain reliable, evidence-based vaccine information in order to remove current obstacles before vaccination. Unknown factors regarding COVID-19 and its vaccination as well as related concerns increase reluctance for vaccination. When prior studies are examined, Callaghan, et al. [28] reported in their study titled the relationship and differences between COVID-19 vaccination intention that one-unit increase in COVID-19 concern is associated with a 23% reduction in intention to refuse vaccination, and the vaccination refusal likelihood of people tested for COVID 19 has been 68% less. As in other previous pandemics, the COVID-19 pandemic is associated with feelings of fear and anxiety [29]. Yet, it is unique in that people are concerned about getting infected or transmitting the disease to others [30].

It has been found out in this study that being infected with COVID-19 again after vaccination is a negative experiment after vaccination, thus, other individuals will less likely to accept the COVID-19 vaccine. This may be caused by the fact that the vaccinated people go on their normal life by thinking that they will not be infected again. After the vaccine is administered, it is necessary to make the second after 4 weeks. After 15 days following the 2nd dose, antibody level can reach a certain level. Accordingly, an individual has protection only 1 and a half months after being vaccinated [31]. In the prospective study of Menni, et al. [32] examining the SARS-CoV-2 infection status after vaccination on users of the COVID Symptom Study administration in the UK, infection rates reduced by 58% at 12-20 days and by 69-72% at 21-44 days after a single dose of vaccine. When compared with unvaccinated controls, a decrease has been observed at 39% after 45-59 days of Pfizer-BioNTech vaccine and 12-20 days after Oxford-AstraZeneca vaccine, and a 60% decrease has been seen after 21-44 days. Another reason is that COVID-19 mutates and re-emerges in different variants. In addition, as some virus variants are strong, it is a contributing factor that some individuals vaccinated but with low immunity have been infected and transmitted the virus to others. Therefore, individuals who have been vaccinated should behave carefully

like those who have never been vaccinated, and follow the rules of mask, distance and hygiene. In this regard, it has been found out in our study that the mean scores of negative opinions about the vaccine were significantly higher in individuals who did not follow the vaccine recommendations of family doctor when compared to the individuals who followed related recommendations.

The participants stated that they do not trust foreign vaccines as they are not informed about their content. This can be explained by several factors. Firstly, individuals may consider foreign vaccines suspicious due to the fact that the success of mRNA-based vaccines, which is a new technology and produced in a shorter time, in medium and long term, as well as their long-term side effects are not known, and there is no previous experience. In addition, the acceptance rate may decrease by the fact that vaccine development and licensing rate lasted less than one year. In this study, production and release of vaccine in a short time is one of the concerns stated by the participants. This has been expressed by one participant as follows: *"It is thought-provoking that the vaccines have been developed even one year has not passed from the beginning of COVID-19 pandemic. Moreover, the virus always mutates, and the effect of mutant virus continues without any decrease. Vaccines were sent without completing phase 3 trials, it is said that they will be tested on us, there is much wrong information, and the development of this vaccine was not raised so much in the world."* For a new vaccine such as COVID-19 to be successful, its safety, efficacy and wide acceptance must be ensured [1]. In a study conducted in China, it has been reported that 48% of the participants have rejected to take a vaccine before the safety confirmation of vaccine [33]. This shows individuals' doubts about rapid release of vaccine without making adequate tests. Development of vaccines in a highly short time, doubts of scientific groups and health professionals may increase doubts about the COVID-19 vaccine. Other studies have also reported concerns regarding the safety of vaccines due to rapid development [8,15,34].

In this study, these negative attitudes towards the COVID-19 vaccine have been found to cause vaccination hesitancy in individuals, and this is getting more significant in public health. WHO (2014) defines vaccine hesitancy to be "hesitating or not accepting to be vaccinated despite the availability of vaccination services", and states that the spread of people who are hesitant about vaccination is an important risk in terms of public health. Moreover, COVID-19 vaccine hesitancy restricts the global efforts to take the pandemic under control due to its negative effects on health and socio-economics [35]. In this regard, doctors and nurses providing health care should give information on "need for vaccines", "value of vaccine" and "vaccine safety". Prior studies report that establishment of confidence in vaccines and provide reliable information about vaccines reduce gaps in vaccination [36].

In this study, the positive attitudes of individuals toward COVID-19 vaccine are specified as follows: "Pfizer/Biontech

vaccine, Sinovac vaccine, vaccination of community leaders, confidence in state policies and confidence in Turkish science".

It has been found out in this study that vaccination of community leaders and celebrities has contributed to the development of positive vaccine attitude in individuals, and they trust in state policies regarding vaccination. It is considered that the news, advertisements and public spots about the vaccine broadcasted by the traditional media have contributed positively to the acceptance of the vaccine in the society. Lazarus, et al. [23] argue that high vaccine acceptance rates depend on the confidence in the governments. Unlike our findings, Callaghan, et al. [28] reported that policy plays an important role in vaccine rejection, and individuals aiming to vote for President Trump in 2020 are 29% more likely to reject the COVID-19 vaccine compared to holding any other political election. One of our participants has emphasized to what extent state policies are crucial on vaccination: *"It is hopeful that countries like Israel have started to walk without masks. The government has taken measures properly. It is impossible to prevent this disease without getting vaccinated. For this reason, it is a must to get vaccinated."* In Israel that is one of the countries with the fastest vaccination program in the world, after administration of two doses of BioNTech vaccine, it has been reported that symptomatic cases decreased by 94% and hospitalizations reduced by 74-87% [37].

Most of the participants have reported positive opinions on the Pfizer/Biontech vaccine. The Pfizer/Biontech vaccine is the first COVID-19 vaccine approved by regulatory authorities, and has shown to be effective more than 90% in phase 3 trials [32]. Moreover, as the Pfizer/Biontech vaccine has been developed by Turkish scientists, this has been raised in the world and has contributed individuals to develop positive attitude toward this vaccine. Two doses of emergency authorization for the Pfizer/Biontech vaccine have been requested from the Food and Drug Administration. Later on, the vaccine produced by Oxford-AstraZeneca, Moderna produced in the USA, Sinovac developed in China and Sputnik V from Russia have been launched for common use. As of 23.06.2021, a total of 24.6 million doses of Biontech vaccine have been delivered to our country. 4.5 million doses of these came before June, while 20,1 million doses were delivered in June 2021. An additional 26-27 million doses of Biontech vaccine will also come. Moreover, 34.5 million doses of Sinovac, 400 thousand doses of Sputnik V vaccine were delivered to Turkey [38]. In a study conducted on approximately 44 thousand people worldwide, it has been reported that the vaccine is 95% effective in preventing COVID-19.

According to the findings, the participants stated positive opinion on the absence of a serious side effect of the Sinovac vaccine. The side effects observed after vaccination are mild as follows: Fatigue, headache, fever, shivering, muscle/joint pain, vomiting, diarrhea, pain at the injection site, redness, swelling. In the study conducted by Menni, et al. [32] to compare local side effects of the vaccine within 8 days of vaccination in users of the COVID Symptom Study, participants were administered one or two doses of Pfizer-

BioNTech vaccine or one dose of Oxford-AstraZeneca vaccine. The most common systemic side effects reported by the participants within the first 24 hours after the administration were fatigue and headache, and sensitivity and local pain at the injection site. Allergic skin reactions such as skin burning, redness, red spots on lips and face have been reported to be other side effects. When examining other previous studies, 89% of participants stated that the COVID-19 vaccine being used in the country may have some side effects in the study investigating the knowledge, attitudes and perceptions towards COVID-19 vaccines in Bangladesh [1].

Our conclusions show that when a transmissible agent or a pandemic occur, people need vaccine, and their opinions on vaccine may change. It is considered that the individuals with hesitancy on vaccine may change their opinions positively. In this regard, Domek, et al. [39] expressed that vaccine hesitancy is a dynamic issue, may change based on period and conditions. Reporting a positive opinion about taking a vaccine can be considered to depend on the safety and efficacy of the vaccine.

In order to fight against this unprecedented pandemic, it is necessary to administer COVID-19 vaccination programs successfully. The most significant difficulties in this administration are mass production of vaccines, their fair distribution around the world and uncertainty regarding their long-term efficacy. In addition, our conclusions urge that vaccine hesitancy is considered to be the most significant obstacle before the control efforts to reduce the negative consequences of the COVID-19 pandemic. The widespread COVID-19 vaccine hesitancy necessitates governments, health policymakers and social media companies to act cooperatively. It is of importance to establish a COVID-19 vaccine safety in the public by giving timely and clear messages on the safety and efficacy of COVID-19 vaccines through reliable channels.

Conclusion

The COVID-19 pandemic continues to cause global damages to lives and sources of income, and the COVID-19 vaccine represents a possible ray of hope for the future. The most effective measure to control the spread of the virus is individual measures, and the vulnerable group should be vaccinated as soon as possible. This study demonstrates that the participants have positive and negative opinions on the COVID-19 vaccines. In this regard, policymakers should take steps to provide adequate information, positive attitudes and perceptions towards COVID-19 vaccines to reduce vaccine hesitancy facilitated and encouraged by wrong information in the media. Referenced social information sources in the field of health and medicine should contribute to the competence, credibility and reliability of the media and similar channels. Future studies examining the changing attitudes towards the COVID-19 vaccination will be important as long as the pandemic goes on. It is suggested to carry out studies on COVID-19 vaccination in different populations and qualitative studies determining the reasons for not getting vaccinated.

Conflicts of Interest

None.

References

1. Islam S, Siddique AB, Akter R, et al. (2021) Knowledge, attitudes and perceptions towards COVID-19 vaccinations: A cross-sectional community survey in Bangladesh. *medRxiv*.
2. Cucinotta D, Vanelli M (2020) WHO declares COVID-19 a pandemic. *Acta Bio-Medica Atenei Parm* 91: 157-160.
3. (2021) COVID-19 data in motion: Saturday, July 17, 2021. Johns Hopkins Coronavirus Resource Center.
4. (2020) The first case of coronavirus was detected in Turkey. TRT News.
5. (2021) Covid-19 Information Platform, 2021. T.R. Ministry of Health.
6. El-Elimat T, AbuAlSamen MM, Almomani BA, et al. (2020) Acceptance and attitudes toward COVID-19 vaccines: A cross-sectional study from Jordan. *medRxiv*.
7. MacDonald NE (2015) Vaccine hesitancy: Definition, scope and determinants. *Vaccine* 33: 4161-4164.
8. Neumann-Böhme S, Varghese NE, Sabat I, et al. (2020) Once we have it, will we use it? A European survey on willingness to be vaccinated against COVID-19. *Eur J Health Econ* 21: 977-982.
9. Sherman SM, Smith LE, Sim J, et al. (2020) COVID-19 vaccination intention in the UK: Results from the COVID-19 vaccination acceptability study (CoVAccS), a nationally representative cross-sectional survey. *medRxiv* 17: 1612-1621.
10. de Figueiredo A, Simas C, Karafillakis E, et al. (2020) Mapping global trends in vaccine confidence and investigating barriers to vaccine uptake: A large-scale retrospective temporal modelling study. *The Lancet* 396: 898-908.
11. Thunstrom L, Ashworth M, Finnoff D, et al. (2020) Hesitancy towards a COVID-19 vaccine and prospects for herd immunity. SSRN.
12. IPSOS (2021) Global attitudes on a COVID-19 vaccine. Ipsos survey for the World Economic Forum.
13. AP News (2020) AP-NORC poll: Half of Americans would get a Covid-19 vaccine.
14. Fisher KA, Bloomstone SJ, Walder J, et al. (2020) Attitudes toward a potential SARS-CoV-2 vaccine: A survey of U.S. adults. *Ann Intern Med* 173: 964-973.
15. Malik AA, McFadden SM, Elharake J, et al. (2020) Determinants of COVID-19 vaccine acceptance in the US. *E Clinical Medicine* 26: 100495.
16. Peretti-Watel P, Seror V, Cortaredona S, et al. (2020) A future vaccination campaign against COVID-19 at risk of vaccine hesitancy and politicisation. *The Lancet Infect Dis* 20: 769-770.
17. Salali GD, Uysal MS (2020) Covid-19 vaccine hesitancy is associated with beliefs on the origin of the novel Coronavirus in the UK and Turkey. *Psychological Medicine* 19: 1-3.
18. Özceylan G, Toprak D, Esen ES (2020) Vaccine rejection and hesitation in Turkey. *Human Vaccines & Immunotherapeutics* 16: 1034-1039.
19. Çingir H (2009) *Sampling Theory*, third ed. ERK Publishing, Ankara.
20. Çirakoğlu O (2011) The investigation of Swine Influenza (H1N1) pandemic related perceptions in terms of anxiety and avoidance variables. *Turkish Journal of Psychology* 26: 49-64.

21. Geniş B, Gürhan N, Koç M, et al. (2020) Development of perception and attitude scales related with COVID-19 pandemic. *Pearson Journal of Social Sciences & Humanities* 5: 306-326.
22. (2021) Are You Considering Getting a Coronavirus Vaccine? Türkiye Report.
23. Lazarus JV, Ratzan SC, Palayew A, et al. (2020) A global survey of potential acceptance of a COVID-19 vaccine. *Nat Med* 27: 225-228.
24. Al-Mohaithef M, Padhi BK (2020) Determinants of COVID-19 vaccine acceptance in Saudi Arabia: A web-based national survey. *J Multidiscip Healthc* 13: 1657-1663.
25. WHO (2021) Director-General's opening remarks at the World Health Assembly-24 May 2021. World Health Organization.
26. (2021) Covid-19 Vaccine Information Platform, 2021. T.R. Ministry of Health.
27. Geoghegan S, O'Callaghan KP, Offit PA (2020) Vaccine safety: Myths and misinformation. *Front Microbiol* 11: 372.
28. Callaghan T, Moghtaderi A, Lueck J, et al. (2020) Correlates and disparities of COVID-19 vaccine hesitancy. *Social Science & Medicine* 272: 113638.
29. Blakey SM, Abramowitz JS (2017) Psychological predictors of health anxiety in response to the zika virus. *J Clin Psychol Med Settings* 24: 270-278.
30. Holingue C, Kalb LG, Riehm KE, et al. (2020) Mental distress in the United States at the beginning of the COVID-19 pandemic. *Am J Public Health* 110: 1628-1634.
31. WHO (2020) Update on COVID-19 vaccines & immune response. The Latest on the Covid-19 global situation & vaccines. World Health Organization-WHO.
32. Menni C, Klaser K, May A, et al. (2021) Vaccine side-effects and SARS-CoV-2 infection after vaccination in users of the COVID symptom study app in the UK: A prospective observational study. *Lancet Infect Dis* 21: 939-949.
33. Wang J, Jing R, Lai X, et al. (2020) Acceptance of COVID-19 vaccination during the COVID-19 pandemic in China. *Vaccines* 8: 482.
34. Dror AA, Eisenbach N, Tauber S, et al. (2020) Vaccine hesitancy: the next challenge in the fight against COVID-19. *European Journal of Epidemiology* 35: 775-779.
35. Harrison EA, Wu JW (2020) Vaccine confidence in the time of COVID-19. *Eur J Epidemiol* 35: 325-330.
36. Artiga S, Michaud J, Kates J, et al. (2020) Racial disparities in flu vaccination: Implications for COVID-19 vaccination efforts.
37. Dagan N, Barda N, Kepten E, et al. (2021) BNT162b2 mRNA Covid 19 vaccine in a nationwide mass vaccination setting. *The New England Journal of Medicine* 384: 1412-1423.
38. (2021) 24.6 million doses of Biontech vaccine arrived in Turkey. CNN Turk.
39. Domek GJ, O'Leary ST, Bull S, et al. (2018) Measuring vaccine hesitancy: Field testing the WHO SAGE working group on vaccine hesitancy survey tool in Guatemala. *Vaccine* 36: 5273-5281.

DOI: 10.36959/545/418