HAYDARPAŞA NUMUNE MEDICAL JOURNAL

DOI: 10.14744/hnhj.2021.26023
Haydarpasa Numune Med J 2023;63(2):153–160

ORIGINAL ARTICLE

Examination of Factors Affecting the Attitudes of Individuals Toward COVID-19 Vaccinations and Vaccination Preferences

Özge Öz Yıldırım, Mehmet Korkmaz, Dilek Çelik Eren, İlknur Aydın Avcı

Department of Public Health Nursing, Ondokuz Mayıs University, Health Science Faculty, Samsun, Türkiye

Abstract

Introduction: This research was conducted for the purpose of examining the attitudes of individuals toward COVID-19 vaccinations and the factors affecting the vaccination preferences of the individuals.

Methods: This descriptive study was conducted with 592 people who were reached by Haphazard sampling method between February and March 2021. The data were collected using the web-based survey form. The form including questions an introductory and the Attitude Evaluation Form toward Covid-19 vaccine. Descriptive statistics, ANOVA, and Chi-square tests were used in the analysis of the data and statistical significance was accepted as $p<0.05$.

Results: 35.6% of the participants were undecided that the vaccine will end the covid-19 pandemic and 53.4% think that the vaccine was useful and necessary to get rid of Covid-19 disease. 53.5% of the participants consider getting the Covid-19 vaccine. The rate of thinking of vaccination was higher in female, those who have a high level of fear and knowledge about Covid-19, with chronic diseases, and who have routine vaccinations ($p<0.05$).

Discussion and Conclusion: According to the results obtained in this study, more than half of the individuals consider to be vaccinated, this rate is higher in the individuals whose fear and knowledge levels about COVID-19 are higher, those with chronic disease, those who are vaccinated with routine vaccinations and in females.

Keywords: Attidutes; covid-19; pandemic; vaccine.

More than 1 year passed over the first coronavirus case which was officially put on records[1]. In this process, more than 2.2 millions of people died, the burden of the health systems has increased and the communities have been adversely affected from the socio-economic and psychological aspects[2-5]. An effective vaccination should be performed for decreasing the hospitalization, the risk of infection, and the demand for intensive care. The effective vaccination is the most important factor for taking the COVID-19 pandemic under the control[6].

The scientific circles and pharmaceutical industries taking the support of state governments are making great efforts in the development of an effective and reliable vaccination for the coronavirus[7]. 11 vaccinations developed as a result of these great efforts were approved (EpiVacCorona, BioNTech, Moderna, CanSino, Gamaleya (Sputnik V), AstraZeneca, Serum Institute of India, Bharat Biotech, Sinopharm, BBIBP-CorV and Sinovac), the experimental studies of more than 212 vaccinations are being conducted and more than 82 candidate vaccinations are in the pretrial stage. In Türkiye, one (Sinovac) vaccination has been approved, the clinical trials of 3 vaccinations (BioNTech/Pfizer, Sinovac and Health Institutes of Türkiye) are being performed[8]. Although there are approved and developing Covid-19 vaccinations, the negative attitude for the vaccinations is the biggest obstacle in the struggle against

Correspondence: Özge Öz Yıldırım, PhD. Department of Public Health Nursing, Ondokuz Mayıs University, Health Science Faculty, Samsun, Türkiye
Phone: +90 505 491 44 71 **E-mail:** ozge.oz@omu.edu.tr
Submitted Date: 28.04.2021 **Revised Date:** 26.07.2021 **Accepted Date:** 05.08.2021

COVID-19 pandemic[9]. In the achievement of the vaccination campaigns conducted for taking the coronavirus disease under control, not only the efficiency and reliability of the vaccination, but also the attitudes and acceptance status of the individuals are effective[10].

It is seen in the studies in which the attitudes and acceptance status of individuals for COVID-19 vaccinations are evaluated that the attitudes of the individuals for the vaccinations vary from country to country and change in the process of pandemic. In some countries, while the attitude for COVID-19 vaccinations is positive and the rate of the acceptance state is quite high (Malaysia [94.3%], Indonesia [93.3%], Equator [97.0%], and China [91.3]) notwithstanding this rate is low in some countries (Kuwait [23.6%], Jordan [28.4%], Italy [53.7%], Russia [54.9%], Poland [56.3%], USA [56.9%], and France [58.9%])[10-17].

While the attitudes of individuals for the vaccination in many countries such as Italy (77.3% to 53.7%), France (77.1% to 58.9%), and China (91.3% to) at the beginning of the Covid-19 pandemic were highly positive, a decrease is seen in this rate over time. The attitude for the vaccination in the USA has become gradually positive and the rates of vaccination acceptance have increased (56.9–75.4)[11,13,16-20].

In the study of Salali and Uysal (2020), while the attitude toward the vaccine was negative and the vaccine acceptance rate was low (31%) at the beginning of the epidemic in Türkiye, it is seen that the acceptance rate increased (54.7%) in the study of Ikısık friends during the epidemic period[21,22].

The findings obtained from this study reveal both the changes in the attitudes of individuals living in Türkiye toward the Covid-19 vaccine during the epidemic process and the current situation, as well as the factors affecting the vaccine preferences of individuals.

In the literature, there are some studies examining antivaccination, attitudes toward, and acceptance of the vaccine. However, there are no studies examining the vaccine preferences of individuals and the factors affecting these preferences. This study was conducted to examine the attitudes of individuals toward COVID-19 vaccines and the factors affecting their vaccine preferences. Therefore, examining the vaccine preferences of individuals and the affecting factors constitutes the unique aspect of this study.

Materials and Methods

This descriptive research was conducted for the purpose of examining the attitudes of individuals toward COVID-19 vaccinations and the factors affecting the vaccination preferences of the individuals between February and March 2021. This study was carried out in the method of descriptive research.

Population and Sampling of the Research

The population of the research is consisted of individuals who are 18 years old and above and living in Türkiye. The calculation of the sampling is planned to be made with 383 individuals by taking the rate of thinking to be vaccinated as 69%,[21] margin of error as 5%, confidence interval as 95%. The study was performed with 592 individuals with whom it was communicated through e-mail and social media accounts (Whatsapp, Instagram, Facebook, etc.) who were reached with Haphazard sampling method and accepted to participate into the research.

Data Collection Tools

Data of the research were collected by using introductory question form and Assessment Form of Attitude Toward Covid-19 vaccination. The fear level of individuals toward COVID-19 and the opinions of the individuals about whether the knowledge level about COVID-19 is adequate or not were assessed over the degree numbered in range of 0 and 10. Any increase in the points on these degree shows that the fear level and knowledge level increase. The existing vaccination that is currently applied by the state in Türkiye is Sinovac.

Introductory Question Form

The introductory question form is consisted of 18 questions involving the socio-demographic attributes (age, gender, marital status, educational background, etc.) and vaccination preferences.

Assessment Form of Attitude Towards Covid-19 Vaccination

This assessment form is consisted of 23 questions involving Attitudes toward Covid-19 Vaccination prepared by the researchers within the scope of literature[23,24]. The assessment form is a 3-point likert type as "I agree", "I am doubtful," and "I disagree." A pilot study was conducted on a small group to evaluate the comprehensibility of this questionnaire. After the pilot study was completed, the questionnaire was given its final form. Cronbach alpha coefficient of the form was found 0.81.

Collection of Data

Data of the research were collected with the data collection form through "Google Form." After the ethical committee

approval of the study was obtained, the study's invitation announcements were made by using the communication networks. These announcements were issued through the social media networks. The form was shared with the individuals and the participants were reached by snowball method. The research data were obtained with the filling out of the "Data Collection Form" by the individuals who were volunteer for participating into the research within 10–15 min in average.

Assessment of Data

In the assessment of data obtained in the research, Statistical Package for the Social Sciences 21.0 statistical package program was used. The socio-demographical data of the study were expressed as figure/number, percentage, mean, and standard deviation. Whether the data show normal distribution or not were controlled by the Kolmogrov–Smirnov test, descriptive statistics, ANOVA, and Chi-square test were used in the analysis of the data. The statistical significance level was accepted as $p<0.05$.

Ethical Aspect of the Research

Prior to commencing the research, an approval was obtained from Ondokuz Mayıs University, Social Sciences and Humanities Ethical Committee (2021/84, January 29, 2021) and necessary permissions from Republic of Türkiye Ministry of Health. In the first part of the question form created for the individuals participating into the research, the aim of the study and the research team were introduced, it was explained that the participation was based on voluntary basis, the information would be kept confidential and the data obtained at the end of the research would only be used for scientific purposes. At the end of the first part of the web-based question form, two options were created as I agree and I disagree to participate into the research. The participants marking the option of I disagree to participate into the research were excluded from the research. Through this method, the informed consents of participants were obtained. It was complied with the ethical principles set out in Helsinki declaration (2008) in all the phases of the study.

Restrictions of the Research

Since this study was performed only with individuals who were reached with haphazard sampling method, the results can only be generalized to the study group. Since this study was conducted with individuals whose education level is high school and above, the results of the study reflect the individuals at this education level. In addition, since the haphazard sampling method was used in the study, it is limited to people who can be reached through social media.

Results

The age average of the participants included into the scope of the study is 30.34±10.5. 65% of the participants are female, 84.8% have an educational background of university and above, income of 53.7% is equal to the expense, 11% have a chronical disease, the chronical disease of 35.4% is hypertension, and 91% have been vaccinated in the routine vaccination calendar (Table 1).

The fear level mean of the participants toward Covid-19 is 6.14±2.61, the knowledge level mean toward Covid-19 is 7.65±1.59. 97.8% of the participants think that they have

Table 1. Distribution of sociodemographic characteristics

Variables	X±SD	Min-Max
Age	30.34±10.5	18–67
	n	**%**
Gender		
Female	385	65
Male	207	35
Marital status		
Maried	259	43.8
Single	333	56.2
Educational status		
Primary school	16	2.7
Secondary scholl	18	3
High scholl	56	9.5
University and above	502	84.8
Income status		
High	134	22.6
Medium	318	53.7
Low	140	23.7
Chronic disease status		
Yes	65	11
No	527	89
Type of chronic disease (n=65)		
Hypertension	23	35.4
Diabetes	14	21.5
Heart disease	16	24.6
Lung disease	6	9.2
Cancer	6	9.2
Have been vaccinated with vaccinations in their routine vaccination calendar		
Yes	559	91
No	53	9

knowledge about Covid-19, 16.4% underwent Covid-19, 97.9% of those who underwent Covid-19 went through Covid-19 for once and 85.3% went through this process mildly at home. 53.5% of the participants consider to be vaccinated with Covid-19 vaccination, 46.3% consider not to be vaccination with Covid-19 vaccination since it is produced in a short time and its phase studies have been not completed yet (Table 2).

51% of the participants consider to be vaccinated with Sinovac, 27% with Pfizer-Biontech, 18% with vaccination of Turkish origin, 3% with Oxford-Astrazeneca and 1% with Sputnik vaccination (Fig. 1).

46% of the participants have preferred the Covid-19 vaccination they consider to be vaccinated since this vaccination has lower adverse effects, but its reliability is high, 26% of the participants have preferred since they rely on the vaccination selected by the state because this vaccination has gone through the necessary approvals (Fig. 2).

35.6% of the participants are doubtful about that vaccination will terminate the Covid-19 pandemic, 53.4% think that the vaccination is helpful and necessary for getting rid of Covid-19 disease, 42.2% think that this vaccination should be compulsory for the public health, 57.1% are afraid of the adverse effects which the vaccination will create in the human body, 60.4% do not agree with the thought say-

Table 2. Distribution of features related to covid-19

Variables	n X±SD	% Min-Max
Fear level towards covid -19	6.14±2.61	1-10
Knowledge level about covid-19	7.65±1.59	1-10
Having knowledge about covid-19		
Yes	579	97.8
No	13	2.2
Underwenting Covid-19		
Yes	97	16.4
No	495	83.6
How passed the Covid-19 underwent process (n=97)		
Without symptoms at home	15	15.5
Mildly at home	76	78.3
With medical treatment in the hospital	6	6.2
The participants consider to be vaccinated with Covid-19 vaccination		
Consider	317	53.5
Do not consider	108	18.2
Hesitant	167	28.3
Reason for consider not to be vaccinated to Covid-19 Vaccine (n=108)		
Do not trust because it was produced in a short time and phase studies were not completed	50	46.3
Waiting for high-reliability vaccines to be produced	24	22.2
Fear of long-term side effects	17	15.7
Thinking of being immune from passing the disease	11	10.2
Thinking that vaccines are commercially produced and therefore not protective	6	5.6

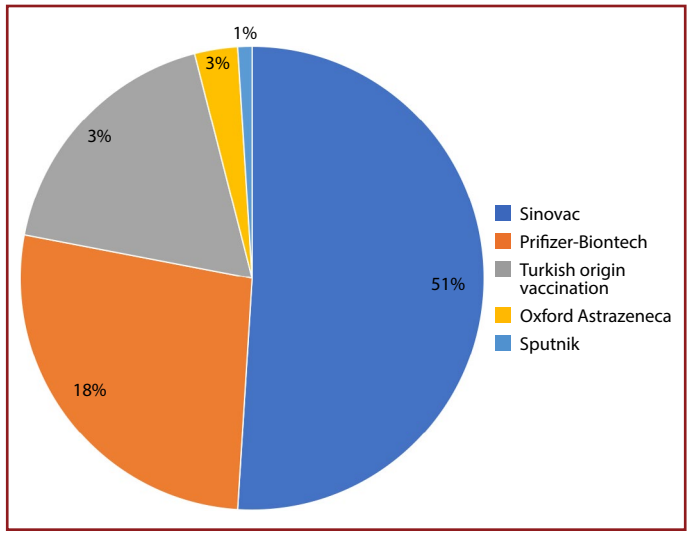

Figure 1. Covid-19 vaccine type that individuals consider to have.

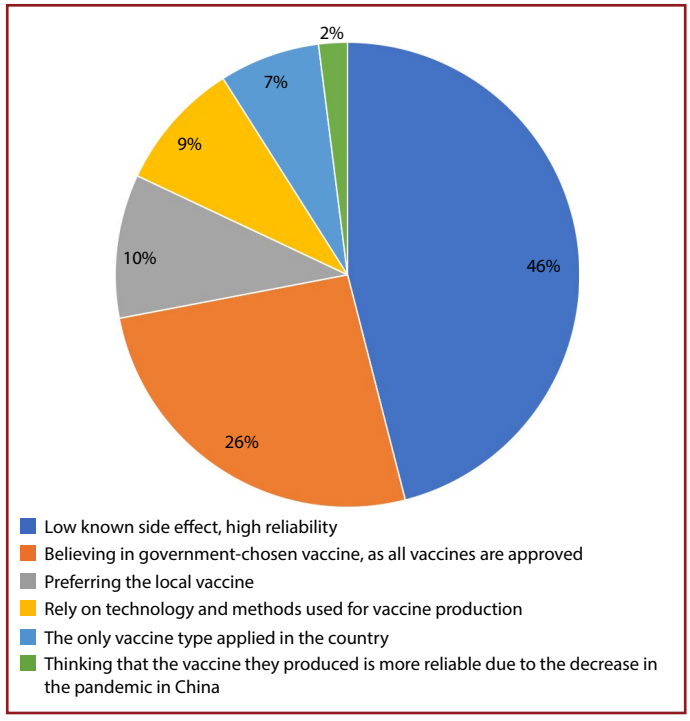

Figure 2. Reason for preferring covid-19 vaccine.

ing that if the majority of the community are vaccinated with Covid-19 vaccination, he/she will not need to be vaccinated, 71.8% think that he/she will make a decision for being vaccinated on his/her own, 79.6% do not agree with the thought saying that the religious belief will influence the vaccination incident, and 83.4% do not agree with the idea saying that individual do not want to be vaccinated since they are afraid of needle (Table 3).

The gender of 58.7% of those who consider to be vaccinated with Covid-19 vaccination is female, the chronic disease of 48.6% is hypertension, 91.8% have been vaccinated with vaccinations in their routine vaccination calendar, 99.4% think that they have knowledge about Covid-19 ($p<0.05$). The fear level of those who consider to be vaccinated with Covid-19 vaccination toward Covid-19 (6.56±2.3) is higher compared with those who do not consider to be vaccinated (4.78±2.9) and who are doubtful about vaccination (6.21±2.6) and this difference was found statistically significant ($p<0.05$). The knowledge level of the participants who consider to be vaccinated with Covid-19 vaccination about Covid-19 (7.78±1.5) is higher compared with those who do not consider to be vaccinated (7.24±1.9) and who are doubtful about the vaccination (7.66±1.5) and this difference was found statistically significant ($p<0.05$) (Table 4).

Table 3. Distribution of individuals' attitudes towards covid-19 vaccine

Variables	Yes		Doubtful		No	
	n	%	n	%	n	%
Thinking the vaccination will terminate the Covid-19 pandemic	168	28.4	211	35.6	213	36
Thinking the vaccination is helpful and necessary for getting rid of Covid-19 disease	99	16.7	177	29.9	316	53.4
Thinking the vaccination should be compulsory for the public health	174	29.4	168	28.4	250	42.2
To be afraid of the adverse effects which the vaccination will create in the human body	140	23.6	153	25.8	299	50.6
Thinking the vaccines currently being developed are safe	155	26.2	241	40.7	196	33.1
Thinking the vaccines are made to monetize companies	218	36.8	194	32.8	180	30.4
To be afraid of the side effects of the vaccine on the human body	109	18.4	145	24.5	338	57.1
Thinking that the vaccine could cause permanent health problems	136	23	251	42.4	205	34.6
Thinking that they do not know how the vaccine will affect the body in future	94	15.9	139	23.5	359	60.6
Preferring to have the disease rather than vaccination to gain immunity against Covid-19	329	55.6	164	27.7	99	16.7
Thinking that if the majority of the society gets the COVID-19 vaccine, they will not need to be vaccinated themselves	358	60.4	130	22	104	17.6
Thinking that they do not know the side effects of vaccines on the body	244	41.2	199	32.3	157	22.5
Believing that the COVID-19 vaccine will prevent this epidemic, as the vaccines so far have prevented diseases	141	23.8	234	39.5	217	36.7
Thinking that the domestic vaccine to be produced will be more reliable than foreign vaccines	139	23.5	232	39.2	221	37.3
Thinking that when Covid-19 is passed, there will be no need to be vaccinated	350	59.1	146	24.7	96	16.2
Thinking that vaccination by an elders of the state will positively affect own vaccination	298	50.3	127	21.5	167	28.2
Trust the vaccine chosen by the government for vaccination	204	34.5	233	39.3	155	26.2
Thinking that it is their decision to vaccinate	86	14.5	81	13.7	425	71.8
Thinking they can deal with the problems caused by the vaccine	225	38	218	36.8	149	25.2
Believing that it is important to obtain important information from health-care professionals regarding vaccination	92	15.5	84	14.2	416	70.3
Thinking that religious belief will affect vaccination	471	79.6	69	11.6	52	8.8
Not wanting to be vaccinated because of fear of needles	494	83.4	53	9	45	7.6
Thinking that the COVID-19 pandemic will end if everyone gets vaccinated	181	30.6	212	35.8	199	33.6

Table 4. Comparison of thinking about getting COVID-19 vaccine with some variables

Variables	Consider to be vaccinated with Covid-19 vaccination						
	Consider		Do not consider		Doubtful		Statistic
	n	%	n	%	n	%	
Gender							
Female	186	58.7	70	64.8	129	77.2	X^2:16.591
Male	131	41.3	38	35.2	38	22.8	p<0.001
Types of chronic disease							
Hypertension	18	48.6	3	17.6	2	18.2	
Diabetes	8	21.6	2	11.8	4	36.3	
Heart disease	4	10.8	10	58.8	2	18.2	X^2:18.797
Lung disease	4	10.8	1	5.9	1	9.1	p=0.016
Cancer	3	8.2	1	5.9	2	18.2	
Have been vaccinated with vaccinations in their routine vaccination calendar							
Yes	291	91.8	91	84.3	157	94	X^2:8.125
No	26	8.2	17	15.7	10	6	p=0.017
Having knowledge about Covid-19							
Yes	315	99.4	105	97.2	159	95.2	X^2:9.019
No	2	0.6	3	2.8	8	4.8	p=0.011
	X±SD		X±SD		X±SD		Statistic
Fear level towards Covid -19	6.56±2.3		4.78±2.9		6.21±2.6		F:20.137 p<0.001
Knowledge level about Covid-19	7.78±1.5		7.24±1.9		7.66±1.5		F:4.645 p=0.010

Discussion

Whereas more than half of the individuals aged between 18 and 67 consider to be vaccinated (53.5%) in this study, the majority of the individuals in the study conducted in Malaysia (94.3%) by Wong et al.[17] (2020) and in the study (93.3%) performed in Indonesia by Harapan et al.[12] consider to be vaccinated. In the studies performed by Sallam et al.[10] (2020) in Kuwait (23.6%) and Jordan (28.4%), they found the rates of individuals who consider to be vaccinated quite low. In the study conducted by La Vecchia et al.[13] (2020) in Italy (53.7%) and in the study conducted by Fisher et al.[11] (2020) in the USA (56.9%), it was found that more than half of the individuals consider to be vaccinated, like Türkiye. It can be contemplated that this difference among the countries may be originated from Covid-19 case number in countries, fear levels of country citizens toward Covid-19 pandemic, Covid-19 infodemic, and different knowledge levels of individuals about Covid-19.

In this study, the rate of the individuals who consider to be vaccinated with Covid-19 vaccination was found 53.5%. In the study performed by Salali and Uysal (2020) in Türkiye at the onset of the pandemic, 69.0% of individuals consider to be vaccinated[21]. According to these results, a decline has been seen in the rate of individuals who are living in Türkiye and consider to vaccinated in the process of the pandemic. Similarly, a decline occurred in the rate of thinking to be vaccinated in the process of Covid-19 pandemic in some countries such as Italy, France, and China, as in Türkiye[13,14,16,18-20]. In the USA, the rate of thinking to be vaccinated with Covid-19 vaccination has increased in the pandemic process[11,14]. It can be contemplated that differing of the change in the rate of individuals thinking to be vaccinated with Covid-19 vaccination by countries during the pandemic process is resulted from the reaction which those countries gave to Covid-19 pandemic.

It was found in this study that more than one-third of individuals (36.8%) think that the Covid-19 virus is an artificial-sourced virus. Similarly, Salali and Uysal (2020) found in their study that about one-fifth of the individuals (18%) think that Covid-19 virus is an artificial virus[21]. Whereas a significant difference is not found between the thought of

the source of Covid-19 virus and thinking to be vaccinated with Covid-19 vaccination in this study, Salali and Uysal (2020) found a significant difference between the thought of the source of Covid-19 virus and thinking to be vaccinated with Covid-19 vaccination[21]. They found that the rates of individuals who think that Covid-19 virus is a natural-sourced virus for being vaccinated with Covid-19 vaccination are higher. In this study, the reason for why individuals consider to be vaccinated with Covid-19 vaccination although they think that Covid-19 virus is an artificial virus can be explained as the lack of final solution of Covid-19 pandemic.

In this study, a significant difference is found between the genders of the individuals and thinking of getting the Covid-19 vaccine ($p<0.05$). The rate of females thinking to be vaccinated is higher than males. In the study conducted by Salali and Uysal (2020), it was found that the rate of males being vaccinated with Covid-19 vaccination is high[21]. This result obtained from this study may be due to the fact that women think that they should be more effective in making health care decisions for themselves, their children and the family. For this reason, female's attitudes towards vaccination may be positive, as they may seek more health-related information and show positive health behaviors than males. In addition, since the rate of females in this study was higher than the rate of males, it is thought that the result may have been significant for females, and this situation may also constitute a limitation of the study.

A significant difference was found between the fear level for Covid-19 and knowledge level about Covid-19 and thinking being vaccinated in this study ($p<0.05$). The rate of individuals whose fear level and knowledge level about Covid-19 are higher for thinking being vaccinated is higher compared with those whose fear and knowledge levels are lower. Salali and Uysal (2020) found similar results in the study they performed[21]. It can be considered that this fact is resulted from the compliance of fear level for reducing the death risk. The rate of thinking being vaccinated with Covid-19 vaccination is found high in the individuals having access to knowledge sources related with Covid-19 and getting information.

While it was found in this study that 26.2% of the individuals rely on the vaccination selected by the state, it was reported in the study conducted by Lazarus et al.[14] (2020) that 83.7% of the individuals living in China, 27.1% of the individuals living in Russia rely on the vaccination selected by the state. Thoughts saying that vaccinations have been developed quickly, vaccinations have much more adverse effects, the Covid-19 virus is an artificial-sourced virus and therefore vaccinations are not effective lead the individuals to think not being vaccinated in this study. Similarly, Guidry et al.[25] (2021) found in their study that political features of individuals, anti-vaccination states and ideas regarding that vaccinations have been approved quickly adversely affect the state of being vaccinated with Covid-19 vaccination. According to these results from the study, it is thought that the negative thoughts of individuals about the vaccine negatively affect their confidence in the vaccine. In addition, it can be thought that the low level of confidence of individuals in the vaccine chosen by the state is due to the health policies followed by the states during the Covid-19 process.

There are studies in the literature pertaining to the factors affecting the thought of individuals not thinking being vaccinated, however, it could not be discussed since there is no study in the literature about the vaccination the individuals consider to be vaccinated and the reasons for preferring this vaccination. This condition constitutes the unique aspect of the study.

Conclusion

While the rates of the individuals thinking to be vaccinated in Türkiye was high at the beginning of the pandemic, it has gradually decreased in the forthcoming process of the pandemic and in our present day. According to the results obtained from this study conducted with individuals between the ages of 18 and 67, more than half of the individuals consider to be vaccinated, this rate is higher in the individuals whose fear and knowledge levels about Covid-19 are higher, those with chronic disease, those who are vaccinated with routine vaccinations and in females. For many participants, the religious belief is not an obstacle for being vaccinated. Some participants believe that Covid-19 vaccination will terminate the pandemic. While the half of individuals prefer Sinovac vaccination, the most important reasons for preferring this vaccination are that state has selected this vaccination, it has small number of adverse effects, its reliability is high and the pandemic has decreased in China.

The knowledge level of the individuals about Covid-19 should be increased. Public information studies about the importance, impact of the vaccination and the place in the struggle against the pandemic and awareness studies which will increase the knowledge level of individuals about the vaccinations should be carried out in order to increase the acceptance of Covid-19 vaccination. The Covid-19 vaccination preferences of individuals should be

taken into consideration and studies in which vaccination preferences of individuals in different cultures and communities are examined should be conducted.

Ethics Committee Approval: Ondokuz Mayıs University, Social Sciences and Humanities Ethical Committee (2021/84, January 29, 2021.

Peer-review: Externally peer-reviewed.

Authorship Contributions: Concept: İ.İ.A, Ö.Ö.Y.; Desingn: Ö.Ö.Y., D.Ç.E., M.K., İ.A.A.; Supervision: İ.A.A.; Data collection or Processing: Ö.Ö.Y., D.Ç.E., M.K.; Analysis or Interpretation: Ö.Ö.Y., İ.A.A.; Literature search: Ö.Ö.Y., D.Ç.E., M.K.; Writing: Ö.Ö.Y., D.Ç.E., M.K.; Critical review: Ö.Ö.Y., D.Ç.E., M.K., İ.A.A.

Conflict of Interest: None declared.

Financial Disclosure: The authors declared that this study received no financial support.

References

1. Coronaviridae Study Group of the International Committee on Taxonomy of Viruses. The species Severe acute respiratory syndrome-related coronavirus: Classifying 2019-nCoV and naming it SARS-CoV-2. Nat Microbiol 2020;5:536–44. [CrossRef]
2. Morgantini LA, Naha U, Wang H, Francavilla S, Acar Ö, Flores JM, et al. Factors contributing to healthcare professional burnout during the COVID-19 pandemic: A rapid turnaround global survey. PLoS One 2020;15:e0238217. [CrossRef]
3. Mukaetova-Ladinska EB, Kronenberg G. Psychological and neuropsychiatric implications of COVID-19. Eur Arch Psychiatry Clin Neurosci 2021;271:235–48. [CrossRef]
4. Nicola M, Alsafi Z, Sohrabi C, Kerwan A, Al-Jabir A, Iosifidis C, et al. The socio-economic implications of the coronavirus pandemic (COVID-19): A review. Int J Surg 2020;78:185–93. [CrossRef]
5. Worldometter. COVID-19 Coronavirus Pandemic. Available at: https://www.worldometers.info/coronavirus/. Accessed Jan 15, 2021.
6. Hodgson SH, Mansatta K, Mallett G, Harris V, Emary KRW, Pollard AJ. What defines an efficacious COVID-19 vaccine? A review of the challenges assessing the clinical efficacy of vaccines against SARS-CoV-2. Lancet Infect Dis 2021;21:e26–e35. [CrossRef]
7. Conte C, Sogni F, Affanni P, Veronesi L, Argentiero A, Esposito S. Vaccines against Coronaviruses: The state of the art. Vaccines (Basel) 2020;8:309. [CrossRef]
8. Trackvaccines. Available at: https://covid19.trackvaccines.org/vaccines/2021. Accessed Jan 15, 2021.
9. Harrison EA, Wu JW. Vaccine confidence in the time of COVID-19. Eur J Epidemiol 2020;35:325–30. [CrossRef]
10. Sallam M, Dababseh D, Eid H, Al-Mahzoum K, Al-Haidar A, Taim D, et al. High rates of COVID-19 vaccine hesitancy and ıts association with conspiracy beliefs: A study in Jordan and Kuwait among other Arab countries. Vaccines (Basel) 2021;9:42. [CrossRef]
11. Fisher KA, Bloomstone SJ, Walder J, Crawford S, Fouayzi H, Mazor KM. Attitudes toward a potential SARS-CoV-2 vaccine: A survey of U.S. Adults. Ann Intern Med 2020;173:964–73. [CrossRef]
12. Harapan H, Wagner AL, Yufika A, Winardi W, Anwar S, Gan AK, et al. Acceptance of a COVID-19 vaccine in Southeast Asia: A cross-sectional study in Indonesia. Front Public Health 2020;8:381. [CrossRef]
13. La Vecchia C, Negri E, Alicandro G, Scarpino V. Attitudes towards influenza vaccine and a potential COVID-19 vaccine in Italy and differences across occupational groups, September 2020. Med Lav 2020;111:445–8.
14. Lazarus JV, Ratzan SC, Palayew A, Gostin LO, Larson HJ, Rabin K, et al. A global survey of potential acceptance of a COVID-19 vaccine. Nat Med 2021;27:225–8. [CrossRef]
15. Sarasty O, Carpio CE, Hudson D, Guerrero-Ochoa PA, Borja I. The demand for a COVID-19 vaccine in Ecuador. Vaccine 2020;38:8090–8. [CrossRef]
16. Wang J, Jing R, Lai X, Zhang H, Lyu Y, Knoll MD, et al. Acceptance of COVID-19 Vaccination during the COVID-19 pandemic in China. Vaccines (Basel) 2020;8:482. [CrossRef]
17. Wong LP, Wong PF, AbuBakar S. Vaccine hesitancy and the resurgence of vaccine preventable diseases: The way forward for Malaysia, a Southeast Asian country. Hum Vaccin Immunother 2020;16:1511–20. [CrossRef]
18. Detoc M, Bruel S, Frappe P, Tardy B, Botelho-Nevers E, Gagneux-Brunon A. Intention to participate in a COVID-19 vaccine clinical trial and to get vaccinated against COVID-19 in France during the pandemic. Vaccine 2020;38:7002–6. [CrossRef]
19. Neumann-Böhme S, Varghese NE, Sabat I, Barros PP, Brouwer W, van Exel J, et al. Once we have it, will we use it? A European survey on willingness to be vaccinated against COVID-19. Eur J Health Econ 2020;21:977–82. [CrossRef]
20. Zhang KC, Fang Y, Cao H, Chen H, Hu T, Chen YQ, et al. Parental acceptability of COVID-19 vaccination for children under the age of 18 years: Cross-sectional online survey. JMIR Pediatr Parent 2020;3:e24827. [CrossRef]
21. Salali GD, Uysal MS. COVID-19 vaccine hesitancy is associated with beliefs on the origin of the novel coronavirus in the UK and Turkey. Psychol Med 2020:1–3. [CrossRef]
22. İkiışık H, Akif Sezerol M, Taşçı Y, Maral I. COVID-19 vaccine hesitancy: A community-based research in Turkey. Int J Clin Pract 2021;75:e14336. [CrossRef]
23. Pogue K, Jensen JL, Stancil CK, Ferguson DG, Hughes SJ, Mello EJ, et al. Influences on attitudes regarding potential COVID-19 vaccination in the United States. Vaccines (Basel) 2020;8:582.
24. Reiter PL, Pennell ML, Katz ML. Acceptability of a COVID-19 vaccine among adults in the United States: How many people would get vaccinated? Vaccine 2020;38:6500–7. [CrossRef]
25. Guidry JPD, Laestadius LI, Vraga EK, Miller CA, Perrin PB, Burton CW, et al. Willingness to get the COVID-19 vaccine with and without emergency use authorization. Am J Infect Control 2021;49:137–42. [CrossRef]