

A study on determining the views of people on the COVID-19 vaccine

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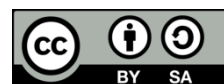
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ABSTRACT

The aim of this study was to determine the views and approaches of the public to the COVID-19 vaccination in Turkey. We conducted a descriptive study using the data collection method which is among quantitative research methods and the screening technic for analysis. The data collection method for the study was an online survey. The 38.4% of participants stated they would consider getting vaccinated, 50.6% stated they were undecided, and 11% stated they would not consider getting vaccinated. There was also a significant correlation between the participants' desire to be vaccinated and their educational level, age, and socioeconomic status. The belief that being diagnosed with COVID-19 creates stigmatization/labeling in society, as well as the belief that the vaccine will have serious side effects, reduce the possibility of getting vaccinated. The study also found that there is a positive correlation between the belief that the vaccine can defeat the virus and the possibility of getting vaccinated. Understanding the causes and effects of vaccine hesitancy and rejection is essential for developing effective immunization programs. Policy makers should inform the public to increase the trust in the vaccine and dispel the misinformation and rumors about COVID-19.

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1. INTRODUCTION

The discovery of coronaviruses dates back to the 1960s [1] A novel coronavirus, SARS-CoV-2 emerged in 2019 in China's Wuhan city [2], [3]. The virus was carried by travelers, resulting in its rapid global spread. As of March 2020, the COVID-19 pandemic and the subsequent global shutdown had profound economic and social consequences. In response to the rapid spread of COVID-19 and the significant mortality rates, authorities have implemented lockdowns and quarantine measures, enacting strict protocols that limit social interactions, disrupt educational activities, and limit occupational functions [4], [5]. While the primary objective of preventive measures is to reduce COVID-19 transmission, these measures have also disrupted the normal functioning of societies, causing destabilization [6], [7]. Healthcare workers worldwide have compared the efforts of healthcare systems to combat the virus to a global war. In

response to the global pandemic, many countries have implemented mandatory lockdown measures to enforce physical isolation practices [8].

The virus's high transmission rates, along with its unprecedented strain on healthcare systems worldwide, and the ongoing challenge of finding effective treatments highlighted the critical need for the development of effective and reliable vaccines [9]. Following the declaration of COVID-19 as a global pandemic by the world health organization (WHO), medical and biotechnology companies, along with major vaccine developers, have collaboratively embarked on a mission to provide therapeutic interventions and develop a vaccine to combat this disease [10].

Non-pharmaceutical intervention including social distancing, turned out to be inadequate to control COVID-19 [11]. Therefore, antiviral medicines and vaccines specific to coronavirus appeared to be an urgent need [12]. The countries first introduced and promoted herd immunity with extensive vaccination campaigns [13]. The vaccines have considerably raised life expectancy, reshaping societies and economies at a fundamental scale. The discovery and widespread use of vaccines have played a significant role in mitigating the negative consequences associated with numerous infectious diseases [14]. Vaccination has proved to be more effective in preventing early deaths, permanent disabilities and heavy pains compared to other medical interventions [15]. Until now, vaccination has appeared to be the most cost-efficient strategy to struggle with infectious diseases [16]. Vaccination is the safest and the most affordable way to help prevent disease and disease-related deaths and it is also considered the best option to cope with the expected future mutants of this virus [17]. A vaccine is essential not only for the care of individual health but also for providing herd immunity in which at least 70% of the total population is to be inoculated. Herd immunity is a key concept to take control of the pandemic, i.e., only a portion of the population must develop immunity to an infectious agent to stop big pandemics. An effective vaccine offers the safest way for herd immunity [18]. The unique side of vaccination is that it decreases the disease incidence among the vaccinated and protects the unvaccinated susceptible indirectly against the infection [19]. In many industrialized nations effective vaccination programs have decreased the prevalence of target diseases to very low levels and they even have eradicated some diseases nationwide. Smallpox was previously a widespread illness with high mortality rates however, it is now a disease of the past [20].

Developing a vaccine, a certified one in particular is a lengthy and expensive process taking years [21]. To protect most of the global population including the high-risk group, there are now more than 300 prospective vaccines being researched on previously developed vaccine platforms. 25 vaccines are being exposed to phase III clinical trials [22]. The biggest barriers to developing a vaccine against COVID-19 can be listed as the difficulty in verifying and reaching the convenient vaccine platform technologies and the failure to provide long-term immunity [23]. Vaccines should be cost-effective, accessible, safe, and efficient [24]. According to the WHO, immunization is among the most effective public health measures. Nonetheless, vaccination rates remained unaltered in the decade preceding the onset of the COVID-19 pandemic. During the years 2020 and 2021, the health systems faced considerable strain due to the COVID-19 pandemic, its related disruptions, and vaccination efforts, leading to significant setbacks [25]. The strain on health systems is compounded by the increasing challenges posed by vaccine hesitancy-related concerns.

In 2019, the WHO identified vaccine hesitancy as one of the ten factors threatening global health. This was attributed to factors such as lack of knowledge, lack of confidence, and challenges related to vaccine accessibility [26]. Vaccine hesitancy causes the re-emergence of diseases such as smallpox and measles, which were previously eradicated by vaccination, primarily due to parental refusal to vaccinate their children [27]. At present, vaccination presents 2-3 million deaths, and it is projected that expanding its global coverage could potentially prevent an additional 1.5 million deaths annually [28], [29]. According to a number of public health specialists, public confidence in vaccines is decreasing gradually [30], [31]. It is crucial to recognize and tackle perceived vaccination barriers while simultaneously reducing skepticism towards institutions and governments in order to improve vaccine acceptance. Research findings emphasize the pivotal role of effective pandemic management by governments, as vaccine hesitancy can rapidly escalate into complete vaccine rejection [32].

Even though vaccines are among one of the few cost-effective medical interventions, there are signs that vaccine hesitancy is growing along with anti-vaccination movement. This movement may lead to great disruptions and even cessation of vaccine programs and may consequently increase morbidity and mortality [33]. Similarly, there is a growing concern in Turkey regarding the increase in vaccine hesitancy [34]. Due to the success of a 2015 lawsuit regarding "requesting parental consent for vaccination administration" and increased media coverage of anti-vaccination rhetoric, previously rare cases of vaccine rejection have increased significantly [35]. Given that vaccine hesitancy is a growing concern and exploring public perceptions may provide evidence for preventive measures against it, this study aimed to explore public perceptions regarding the COVID-19 vaccination practices implemented by Ministry of Health. The lack of reliable information regarding vaccine hesitancy in Turkey prompted this research, which seeks to provide policymakers with a significant amount of quantitative and qualitative evidence.

2. METHOD

Determine the attitudes and perceptions of people in Turkey on the COVID-19 vaccine, which has been introduced as a preventive measure against the COVID-19 disease that originated in Wuhan, China towards the end of 2019, rapidly spread worldwide, and was subsequently declared a pandemic by the WHO. The target population of the study comprised people over the age of 18 living in Turkey. According to the 2019 address-based identity register statistics there are nearly 58 million people over the age of 18 living in Turkey [36]. According to the calculations, the study aimed to reach at least 1,067 people out of a population of 100 million with a 3% sampling error and a 95% confidence interval via the convenience sampling method. We performed the calculations via a sampling calculation method developed by Cronk [37]. According to these criteria 1,731 people over the age of 18 participated in the research. We conducted a descriptive study using the primary data collection method and used the screening technic for analysis (determining the current situation as it is) [38]. We used the survey method to collect the data.

The researchers developed the survey used in collecting the study data on the basis of expert opinion. The survey form included questions to gather demographic information about the participants and 33 questions (statements) of different structures aimed at determining the views of people on the COVID-19 vaccine. The Likert items in the scale were tested for reliability. Open-ended and descriptive statements were analyzed with percentages and no reliability test was performed. Due to the COVID-19 epidemic, we conducted the survey application online. The researchers openly shared the online Google form link to which they transferred the survey questions with the volunteers using the convenience sampling method between 19.02.2021 and 20.03.2021. We applied the surveys in line with the ethics committee approval document of Atılım University dated 19.02.2021.

The statistical package for social sciences (SPSS) for Windows 22.0 program was used to analyze the data collected throughout the study. We used frequency and percentage analyses to identify descriptive characteristics (such as age and sex) of the participants in the study, and correlation, mean, and standard deviation analysis to examine the participants' views on the COVID-19 vaccination. We conducted the study during the pandemic. As social distancing rules and lockdowns are frequently applied in this process, we figured that the best way of reaching the participants was online. As a result, the study only included participants who had access to and used the internet. Ethical approval for this component of the larger study was obtained from the Atılım University (Ankara, Turkey) Human Research Ethics Committee (Document date 09.02.2021 and document number E-59394181-604.01.02-2864).

3. RESULTS AND DISCUSSION

3.1. Results

As shown in Table 1, 40.2% of those who participated in the study were male and 59.8% were female. 59.0% of the participants were aged 35 to 54 years. The 33.4% of participants had an undergraduate degree, 32.0% had an associate degree, 26.4% had a postgraduate degree, and 8.2% had a secondary degree. 36% of the participants had a monthly income of 5,000-7,499 TRY and 11.9% of the participants had a monthly income of 2,499 TRY.

Table 1. Socio-demographic characteristics of the participants

Demographic variable		N:1731	%
Sex	Male	695	40.2
	Female	1,036	59.8
Age	18-34 years	431	24.9
	35-54 years	1,021	59.0
	55 years and older	279	16.1
Marital status	Married	1,228	70.9
	Single	503	29.1
Education	Secondary degree	142	8.2
	Associate degree	554	32.0
	Undergraduate degree	578	33.4
	Postgraduate degree	457	26.4
Monthly income	2,499 TRY and below	206	11.9
	2,500 TRY - 4.999 TRY	486	28.1
	5,000 TRY - 7.499 TRY	628	36.3
	7,500 TRY and above	411	23.7

TRY: New Turkey Lira

Table 2 shows the participants' perceptions on getting COVID-19, vaccination and anti-vaccination. Accordingly, 68% of the participants stated that either themselves or one of their family members had gotten COVID-19 as of 20 March 2021. The rate of those who had been COVID-19 vaccinated as of the

aforementioned date was 41.9%. The rate of the participants who weren't COVID-19 vaccinated on the aforementioned date but considered being vaccinated was 38.3% and the rate of those who were undecided was 50.4%.

Table 2. Status of COVID-19 infection and vaccination

The status of People who participated in the study in relation to COVID-19	Yes	%	No	%	Undecided	%
Have you or anyone in your family or immediate surroundings been infected with coronavirus?	1,181	68.2	550	331.8	-	-
Are you vaccinated against COVID-19?	726	41.9	1,005	58.1	-	-
If you aren't vaccinated against COVID-19, do you consider it?	386	38.3	111	11.3	508	50.4

3.2. Descriptive analysis

Table 3 demonstrates whether the vaccination decision varied according to demographic variables of the participants such as age, educational status and income. As can be seen from the table, there is a positive and very weak relationship between the decision to be vaccinated and age and income status, while there is a very high level of relationship with education level. Accordingly, the study determined that as age, educational status and income increased, the tendency to be vaccinated increased.

Table 3. Correlation between vaccination decision and demographic variables

Demographic variable	Correlation analysis	Thought of being COVID-19 vaccinated N:386
Age	Pearson's Correlation	166**
	Sig. (2-tailed)	000
Educational status	Pearson's Correlation	086**
	Sig. (2-tailed)	000
Income	Pearson's Correlation	129**
	Sig. (2-tailed)	000

Table 4 demonstrates the attitude towards vaccination and the subcategories of age, education, and income status. Accordingly, the increase in all three categories contributed to an improvement in the vaccination decision. For example, while the average of the people aged 18 to 34 years was 2.17 (1 to 5), the average of those aged 65 years and older was 2.66. Concerning educational status, while the average of the high school graduates was 2.26, the average of the postgraduates was 2.33. Also, while the average of the people with an income of 2,499 TL and below was 2.13, the average of those with an income of 7,500 TL and above was 2.45. According to these results, numerous demographic variables including income, educational status and age are positively associated with perceptions towards vaccination.

Table 4. Examining the attitude towards vaccination in relation to specific demographic categories

Age	Mean	Educational status	Mean	Income (TL)	Mean
18-34 years	2.1787	High school	2.2676	2,499-	2.1359
35-54 years	2.2458	Associate degree	2.1679	2,500-4,999	2.2572
55-64 years	2.4795	Undergraduate	2.3253	5,000-7,499	2.2134
65+ years	2.6667	Postgraduate	2.3370	7,500 and above	2.4526

The presence of any chronic illness in the participants has an impact on their decision to be vaccinated, as shown in Table 5 (In this question, participants marked more than one option). As a result, those in the risk group who had a chronic lung or heart diseases, such as asthma, bronchitis, diabetes, or cardiac disease, were more willing to be vaccinated than those who did not have a chronic illness. Those with cancer and other chronic conditions, on the other hand, were hesitant about vaccination.

Table 6 demonstrates the comparison of perceptions of people who contracted and those who did not. While 134 of 1,181 people who contracted COVID-19 or had a family history of the disease did not consider getting vaccinated, 441 stated that they wanted to be vaccinated. The 606 people are undecided about the vaccine. While 223 of the 550 people who did not have the disease or in their family members stated that they wanted to be vaccinated, 57 people stated that they did not want to be vaccinated. The 270 people are undecided. All of these rates are higher in those who have contracted COVID-19 or have a family history of the disease than in those who have not.

Table 7 examines the relationship between perceptions of stigmatization, side effects of COVID-19, if the vaccine would be effective against the virus, and the intention to be vaccinated. According to the correlation analysis conducted between the relevant variables, as the thought that COVID-19 stigmatizes people increased, the tendency to being COVID-19 vaccinated decreased (Pearson's Correlation -.117). Similarly, those who thought that the vaccine has serious side effects had a decreased tendency to being vaccinated (Pearson's Correlation -.313). However, as the thought that the COVID-19 vaccine would overcome the virus increased, the thought of being vaccinated increased in a positive direction (Pearson's Correlation .392).

Table 5. The impact of chronic illnesses on the decision to receive vaccination

Chronic illnesses		If you aren't vaccinated against COVID-19, do you consider it?		
		No	Undecided	Yes
Asthma	Count	12	36	41
	% of Total	1.9%	5.8%	6.6%
Chronic bronchitis/COPD	Count	5	10	10
	% of Total	0.8%	1.6%	1.6%
Chronic heart disease	Count	4	23	34
	% of Total	0.6%	3.7%	5.5%
Diabetes	Count	4	47	52
	% of Total	0.6%	7.6%	8.4%
Cancer	Count	2	10	6
	% of Total	0.3%	1.6%	1.0%
Prescribed drug utilization	Count	13	86	74
	% of Total	2.1%	13.9%	11.9%
Other...	Count	11	87	46
	% of Total	1.8%	14.0%	7.4%
Total	Count	51	299	263
	% of Total	8.4%	48.5%	43.1%

Table 6. The perceptions of those who contracted COVID-19 versus those who did not regarding vaccination

The idea of considering getting vaccinated		Have you or anyone in your family or immediate surroundings got coronavirus?		Total
		Yes	No	
If you aren't vaccinated against COVID-19, do you consider it?	No	134	57	191
	Undecided	606	270	876
	Yes	441	223	664
Total		1,181	550	1,731

Table 7. The correlation of stigmatization and side effects with the decision of being vaccinated

Questions about the COVID vaccine	Correlation analysis	Do you consider being COVID-19 vaccinated?
Do you think the COVID-19 diagnosis causes stigmatize/labeling in the society?	Pearson's Correlation Sig. (2-tailed)	-.117** .000
Do you think the coronavirus vaccine will have serious side effects that may influence human health?	Pearson's Correlation Sig. (2-tailed)	-.313** .000
Do you think the vaccine developed will overcome the COVID-19 virus?	Pearson's Correlation Sig. (2-tailed)	.392** .000

3.3. Discussion

The descriptive study, which sought to determine the decision of people living in Turkey to be vaccinated and their viewpoint on the vaccine, obtained the following results. Among the people who participated in this study on the aforementioned date, the rate of those who weren't COVID-19 vaccinated but considered being vaccinated was 38.4%, the rate of those who didn't consider being vaccinated was 11% and the rate of those who were undecided was 50.6%. Especially the high rate of those who were undecided is a noteworthy indicator of the viewpoint on anti-vaccine.

Vaccine rejection and hesitancy, which are associated with a number of factors, are becoming more common around the world. The rate of COVID-19 vaccination willingness may differ from one country to another. As income, educational status and age increased, the tendency to being COVID-19 vaccinated increased according to the study results. In addition to these, examining the decision of being vaccinated in terms of sex; the study found that the men had a higher tendency to being vaccinated than the women.

It is possible to interpret these results as follows. As age increases, the risk of being affected by chronic illnesses and COVID-19 increases. It is because the data shared by the Ministry of Health shows a higher rate for advanced age people to be hospitalized in intensive care units and have mortality [39]. Older participants

taking the aforementioned situation into consideration had a higher tendency to being vaccinated than younger people. On the other hand, as educational status increases, the capacity of accessing and interpreting relevant scientific and rational knowledge increases. In this context people with a higher educational level trust scientific vaccines more than others. People's activities such as traveling and shopping increase as their income status rises. Within this context, it is possible to state that people with a higher income status consider maintaining these activities in terms of vaccine. In the sex variable, the fact that males had a more positive viewpoint on the vaccine than the females can be explained with the rate of males and females to participate in business life in Turkey. In terms of business life, according to the Turkish Statistical Institute [36]. Household Labor Force research, the rate of employed people in Turkey is 47.4% among those who are aged 15 years and older, 29.4% among women and 65.7% among men. Based on this finding, it can be concluded that males are more involved in business life than females and thus they have a higher rate of being COVID-19 vaccinated than females in order to avoid risk in workplace.

A study performed on healthcare professionals determined that nearly 84.6% of the participants were willing to accept the COVID-19 vaccine. The study also found a significant correlation between the willingness to accept the COVID-19 vaccine and older age, male sex and presence of a chronic illness [40]. The intention of participants to accept presumptive vaccine which hadn't been used yet was examined in another study and was found that 18.2% of them rejected the vaccine [41].

The study results showed that people in the risk group with a chronic illness such as asthma, bronchitis, diabetes, and cardiac disease are more willing to be vaccinated than those without any chronic illness. However, those with cancer and other chronic illnesses are undecided about being vaccinated. This result shows us that people with a chronic illness are aware of the risks; however, uncertainty about the possible impacts of the COVID-19 vaccine on other chronic illnesses like cancer and thyroid causes patients in this group to be undecided about the vaccine. A study conducted in this field have found that adults over 65 years with a chronic illness have higher rates of vaccination that is performed for specific diseases preventable by vaccines [42], [43]. Our study determined that people who contracted COVID-19 themselves or have a family member getting the disease, have a higher tendency to being vaccinated than those who didn't get the disease. A correlation exists between the personal risk perception and experiences and trust in the vaccine in regions most affected by the disease [44].

Our study also found that as the thought that COVID-19 stigmatizes people increased, the tendency to being COVID-19 vaccinated decreased. Similarly, there was a decrease in the tendency to being vaccinated in those who thought that the vaccine might have side effects. However, as the thought that the COVID-19 vaccine might defeat the virus increased, the tendency to being vaccinated increased in a positive direction.

The first three reasons for the participants to not consider being COVID-19 vaccinated or to be undecided about it were not knowing the long-term effects of the vaccine, unproven effectiveness of the vaccine and unknown content of the vaccine in our study. In a study conducted similarly, concerns about the effectiveness of the vaccine were important factors in refusing the vaccine [45]. This result shows us that health authorities should inform the society concerning the vaccine more often and scientific research should enlighten unresolved issues. Finally, the majority of study participants relied on the WHO and Ministry of Health for information and guidance, and they monitored relevant institutions and social media to keep up with COVID-19 developments.

In a study conducted in England, 16% of the people who participated in the survey showed a high level of distrust in the vaccine in one or more areas. A significant correlation existed between the distrustful attitude toward vaccination and lower educational levels, low income, inadequate information about COVID-19 and inadequate compliance to COVID-19 measures taken by the government. While 14% of those who participated in the survey reported unwillingness for the COVID-19 vaccine, 23% were undecided in general. The most common reasons for vaccine hesitancy were unknown side effects of the vaccine, preference of natural immunization and thoughts that the vaccines are marketed with commercial concerns [46]. Another study conducted in England also determined that the COVID-19 vaccine acceptance (83%) is correlated with increasing age, higher educational level and being invited for vaccination. Vaccine rejection is higher among low-income people. The study also found that people with a lower educational level and level of income trust in healthcare services and scientific resources less. People with such qualities trust in the media and their family/friends more [46].

Concerns regarding vaccine safety have impeded attempts to increase vaccination rates among public and key segments of the population in recent years. Because of the advent of uncontrolled new communication channels, such as the internet, the anti-vaccine movement is progressively growing [47]. In a study conducted in Turkey, 16.8% of the participants were considering getting the COVID-19 vaccine, while the majority (48.8%) stated that they would be vaccinated after vaccine safety was ensured, and 10.5 percent stated that they did not want to be vaccinated [48].

4. CONCLUSION

As vaccine hesitancy becomes a growing concern, it is essential to examine public perceptions in order to develop preventative measures. The purpose of this study was to examine public perception regarding the COVID-19 vaccines. According to the study's results, approximately 50.6% of the participants expressed uncertainty regarding vaccination. Among the participants, 38% reported being open to considering vaccination, while 11% stated their unwillingness to be vaccinated. Notably, a significant percentage of those hesitant about vaccination cited concerns over potential long-term side effects. The study highlights the critical importance of addressing the hesitancy of over half of the participants in order to achieve success in the vaccination campaign. Furthermore, the results of the study reveal a higher willingness among individuals in the high-risk group with chronic illnesses to receive vaccination. Moreover, a significant association was observed between participants' inclination towards vaccination and their educational level, age, and socioeconomic status.

Non-pharmaceutical interventions such as social distancing, patient isolation, facial masks and hand hygiene have proven to be effective on controlling the spread of the virus. However, negligence of these rules especially by young people makes it mandatory to vaccinate vulnerable population with chronic illnesses, the elderly and disadvantaged groups. While vaccines are the most important tool in both preventing infectious diseases and decreasing serious health problems and deaths caused by these diseases, they should be used with other evidence-based public health measures in order for them to be effective.




Policy makers should also work on vaccine optimization and connections with new vaccines. Success of COVID-19 vaccination programs depends on the willingness of people to adopt the vaccine. In order to understand the perceptions of the society concerning the COVID-19 vaccine, it is crucial to assess the factors affecting the decision of being vaccinated. We believe that it is necessary for policy makers to investigate the causes of vaccine hesitancy and rejection and establish policies to increase the trust in the vaccine. In order for the COVID-19 vaccine to be accepted by the public during the ongoing epidemic, we need to build trust in it. For the benefit of public health, we must understand the underlying causes of vaccination rejection and plan interventions within the scope of vaccine programs accordingly. In order to increase the trust in the vaccine, all shareholders should adopt a transparent and evidence-based scientific policy and exhibit an open and proper communication to inform the society.

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