



# The Reasons of Avoiding Vaccination Against COVID-19 in Eligible Population of Fars Province, Iran



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## ABSTRACT

**Aims** The new coronavirus disease (COVID-19), as a second epidemic of the 21st century, causes severe acute respiratory syndrome in patients. This study was designed to determine the causes of not vaccinating against COVID-19 in the eligible population of Fars province.

**Instruments & Methods** This cross-sectional study was carried out in December 2021 to March 2022 on unvaccinated people of Fars province, Iran. The data of 12889 individuals were added to the study. The data collection tool was a researcher-made checklist with closed-ended questions that were completed through a telephone interview. Data were analyzed using SPSS 22 software through descriptive statistics and a Chi-square test.

**Findings** The largest age group was 25 to 35 years old (19.8%). The percentage of unvaccinated females was significantly higher than males ( $p < 0.001$ ). Homemakers and college and school students were the occupational groups with the highest frequency of not receiving the vaccine. The considerable reasons for not being vaccinated are the side effects anxiety, and lack of belief in the vaccine conspiracy.

**Conclusion** The women of reproductive age and college and school students are the most frequent unvaccinated groups. Having an underlying disease and the lack of follow-up by the healthcare staff are the most frequent reason for not being vaccinated.

**Keywords** COVID-19; Vaccination; Side Effects

## CITATION LINKS

[1] Genomic characterization of the 2019 novel human-pathogenic coronavirus isolated from a patient with atypical pneumonia after visiting Wuhan [2] Differential diagnosis of illness in patients under investigation for the novel coronavirus (SARS-CoV-2), Italy, February 2020 [3] Covid-19: Moderna vaccine is nearly 95% effective, trial involving high risk and elderly people shows [4] COVID-19 vaccines: comparison of biological, pharmacological characteristics and adverse effects of Pfizer/BioNTech and Moderna Vaccines [5] Oxford-AstraZeneca COVID-19 vaccine efficacy [6] Covid-19: European countries suspend use of Oxford-AstraZeneca vaccine after reports of blood clots [7] What scientists do and don't know about the Oxford-AstraZeneca COVID vaccine [8] The Johnson and Johnson Vaccine for COVID-19 [9] Covid-19: US suspends Johnson and Johnson vaccine rollout over blood clots [10] Sputnik v: Is the Russian vaccine safe [11] Inactivated COVID-19 vaccine BBV152/COVAXIN effectively neutralizes recently emerged B. 1.1. 7 variant of SARS-CoV-2 [12] Covid-19: Novavax vaccine efficacy is 86% against UK variant and 60% against South African variant [13] Covid-19: China's CoronaVac vaccine offers 83.5% protection against symptomatic infection, interim analysis finds [14] What do we know about China's covid-19 vaccines? [15] Study of vaccine production abroad and scientific and research challenges of COVID-19 vaccine production in Iran [16] Vaccine optimization for COVID-19: Who to vaccinate first? [17] Rapid COVID-19 vaccine development [18] The role of trust in the likelihood of receiving a COVID-19 vaccine: Results from a national survey [19] Factors influencing COVID-19 vaccine acceptance based on the behavioral change wheel model in Bushehr province in 2021: A web-based study [20] Key guidelines in developing a pre-emptive COVID-19 vaccination uptake promotion strategy [21] Trust in a COVID-19 vaccine in the US: A social-ecological perspective [22] COVID-19 vaccine hesitancy worldwide: A concise systematic review of vaccine acceptance rates [23] COVID-19 vaccine acceptance among health care workers in the United States [24] Factors affecting COVID-19 vaccine acceptance: An international survey among low-and middle-income countries [25] Women's views on accepting COVID-19 vaccination during and after pregnancy, and for their babies: A multi-methods study in the UK [26] The nature and extent of COVID-19 vaccination hesitancy in healthcare workers [27] Willingness to receive COVID-19 vaccination in Japan [28] Public trust in healthcare system and its correlates during the COVID-19 Epidemic in Iran [29] The role of trust in receiving or not receiving COVID-19 vaccine [30] COVID-19 vaccination: Challenges and opportunities

## Introduction

The new coronavirus, called COVID-19, is the second epidemic of the 21<sup>st</sup> century, and causes severe acute respiratory syndrome in patients. The virus quickly spread from the city of Wuhan (China) to the whole world, which was known as an epidemic by the World Health Organization (WHO) [1]. Although in terms of symptoms, COVID-19 is similar to other known respiratory infections, its transmission ability is significantly higher than H1N1 influenza and Sars [2]. In such a way that it spread rapidly and was quickly recognized by the World Health Organization (WHO) as a pandemic. In the early stages, COVID-19 affected large populations around the world, considering the lack of treatment options. However, despite some medical advances compared to the beginning of the pandemic, the disease is still unknown and causes the illness and death of thousands of people every day. Scientists consider vaccination as the most effective solution to deal with this disease, vaccination of a majority of people in a specific and short time (70% to 90% of the population). Therefore, most countries started researching vaccine production after the emergence of the virus. So far, several types of vaccines is produced such as Pfizer Biotech, Moderna, AstraZeneca-Oxford, Johnson & Johnson, Sputnik V, Kovaxin, Novavax, Sinovac, and Sinopharm at the global level and Koviran Barkat, Pastovak, Kupars Razi, Spygen, Fakhra and is known and produced at the national level [3-15].

People were vaccinated in different countries after the development and production of vaccines. In the first stage, due to the limitation in the preparation of the vaccine, its injection was prioritized, which initially included special patients and the elderly [16]. Whereas, almost all the population over 12 years of age became eligible to receive the vaccine, due to the increase in vaccine production in Iran. Although the number of vaccinated people is increasing, the prevalence of COVID-19 is still high in most parts of the world. One of the reasons is people's refusal to inject vaccines. It seems that as much as this disease is unknown, the mechanism of produced vaccines is also unknown [17]. So that some people refuse to inject the vaccine for this reason. A study that includes information about the acceptance of the COVID-19 vaccine, indicated that the acceptance of the COVID-19 vaccination was less than 70%. Also, the low rate of vaccine acceptance has been reported in the Middle East, Russia, Africa, and several European countries [18].

A study in Bushehr province between February 16-28, 2019, using a multi-stage sampling method, showed that among the demographic factors, only gender was related to vaccine acceptance, and men had more acceptance ( $p=0.022$ ) for vaccination [19].

In a study on people who had refused the COVID-19 vaccination, the role of factors such as age, gender, lack of confidence in the effectiveness, anxiety about

side effects of vaccination, underlying and physical diseases, and lack of access to the vaccine has been shown to non-vaccine injection [20-22]. The results of a survey study showed that 14.2% of the country's citizens over 18 years of age do not intend to be vaccinated at all. Also, the unwillingness to receive the vaccine is different among different groups. Reluctance to vaccination in men (17.2%) was more than in women (11.3%). Unwillingness to be vaccinated in the age group below 50 years (17%) is significantly more than in the age group above 50 years (7%). Unwillingness to be vaccinated in singles (17.8%) is more than in married (13.4%). Unwillingness to be vaccinated among people without a university education is 15.7% and among people with a university education is 11.3%. Lack of trust in the vaccines (30.1%), vaccination consequences anxiety (29.4%), personal problems (4.9%), feeling no need to be vaccinated (1.6%), physical problems (6.3%), not having time (3.6%), unavailability of the preferred vaccine in the country (2.2%), and other reasons such as lack of interest, personal reasons, etc. (10.1%) are the reasons for unwillingness of citizens to be vaccinated. One of the important reasons that may be as effective as the vaccine is trust in the vaccine. Another study in Iran showed a direct relationship between trust in the vaccine and its injection or non-injection ( $p<0.05$ ) [20-22].

Since this is a considerable problem in the country and every day the possibility of a pandemic and the re-invasion of the COVID-19 disease with different variants has existed, immunization against COVID-19 is critical. Due to the possibility of weak vaccination, the World Health Organization (WHO) has proposed effective strategies to increase the acceptance of vaccination in countries. In this regard, it's necessary to know the factors affecting the acceptance of the COVID-19 vaccination as a preventive behavior. These factors may also be different in different cultures. Therefore, this study was designed aiming the determination of the causes and effective factors of non-vaccination of people, so that using its results, health policymakers can take more practical steps to solve the problem or reduce it.

## Instrument and Methods

This cross-sectional study was carried out in December 2021 to March 2022 on unvaccinated people of Fars province, Iran.

The minimum needed samples were 385 individuals according to the Cochran formula, but due to the large number of study population and the diversity of the centers, the sampling was done in a large scale by stratified sampling method. Therefore, based on the list of non-vaccinated people from urban and rural health centers, health databases, and health centers based on the database of the Sib system (integrated health system that was designed and implemented in

order to record, maintain and update the electronic health record of Iranians), the healthcare workers started entering their names in the telephone interview until the sample size determined for that center is exhausted (urban and rural areas as well as gender were considered as classes and the subjects were selected equally from both genders and each rural and urban areas). It was decided that if the mentioned person did not answer the phone for any reason, they would call again after a few hours and continue for three days. If the subject doesn't answer the phone call 6 times after 3 days will be excluded from the study. If the participant answers the phone call, the health care provider will first introduce her/himself and then describe the plan and if the person declares satisfaction, the interview would be continued. Also, if the selected subject was not included in the sample population for any reason, the next subject would be replaced. On the other hand, the list of subjects who did not respond at this stage was also recorded. At last, the data of 12889 individuals were added to the study.

The data collection tool was a researcher-made checklist with closed-ended questions that were completed through a telephone interview. This questionnaire included demographic characteristics and 21 reasons for avoidance of vaccinating. the content validity of the questionnaire was measured using a panel of experts, and the required questions were modified. The reliability of the questionnaire was confirmed using Cronbach's alpha coefficient (0.94). The questionnaire was filled out by trained healthcare workers.

Data were analyzed using SPSS 22 software through descriptive statistics and a Chi-square test.

## Findings

This study was carried out on 12889 eligible participants in the age range of 12 to 110 years. The mean age of the subjects was  $20.63 \pm 39.60$  and 50.6% were females. The largest age group was 25 to 35 years old (19.8%). The percentage of unvaccinated females was significantly higher than males ( $p < 0.001$ ; Table 1).

**Table 1.** Frequency of unvaccinated eligible people according to age and gender (Number in parentheses are percentages)

Age group	Male	Female	Total
12-18	1251 (20.3)	1087 (17.3)	2338 (18.8)
19-24	506 (8.2)	571 (9.1)	1077 (8.7)
25-34	1084 (17.6)	1383 (22.0)	2467 (19.8)
35-44	1084 (17.0)	1070 (17.0)	2117 (17.0)
45-54	648 (10.5)	548 (8.7)	1196 (9.6)
55-64	781 (12.7)	687 (10.9)	1467 (11.8)
65-74	487 (7.9)	575 (9.1)	1062 (8.5)
75-84	192 (3.1)	193 (3.1)	385 (3.1)
>85	153 (2.5)	172 (2.7)	325 (2.6)

Homemakers and college and school students were the occupational groups with the highest frequency of not receiving the vaccine. The highest frequency of

unvaccinated people was high school and diploma students (Table 2).

**Table 2.** Distribution of occupational groups and education level

Parameter	Number (Percentage)
<b>Occupation</b>	
Laborer	462 (3.6)
Farmer and rancher	498 (3.9)
Homemaker	4226 (32.8)
Freelance and unemployed	2280 (17.7)
Retired	609 (4.7)
School and college students	3292 (25.5)
Employed	468 (3.6)
Trader- shopkeeper	221 (1.7)
Technical and professional jobs	137 (1.1)
Driving	194 (1.5)
Soldiering/militarism	98 (0.8)
Clergymen	22 (0.2)
Healthcare staff (public or private)	108 (0.8)
Disable/elderly	98 (0.78)
Unknown	151 (1.2)
Working abroad in the country	27 (0.2)
<b>Education level</b>	
Illiterate	2515 (19.5)
Elementary	1840 (14.30)
Middle school	3121 (24.2)
High school and diploma	3640 (28.2)
University	1745 (13.5)
Seminary	28 (0.2)

About 15% of people stated that the reason for not receiving the vaccine was their underlying disease. 94.9% of the subjects stated that they were contacted to receive the vaccine but they didn't accept it. 38.6% of the subjects also mentioned a history of corona infection as the reason for not injecting the vaccine. They mentioned the possible side effects of the vaccine, which are the most common cause is physical complications and death. 80.5% of the subjects stated that they are willing to be vaccinated if the mentioned obstacles are removed (Table 3).

**Table 3.** Distribution of the underlying diseases and the frequency of possible complications of coronavirus in the subjects

Parameter	Number (percentage)
<b>Underlying diseases</b>	
No disease	10789 (83.7)
Diabetes	294 (2.3)
Hypertension	835 (6.5)
Diabetes and hypertension	36 (0.3)
Heart and brain diseases	221 (1.7)
Mental diseases	104 (0.8)
Allergies and sensitivity	56 (0.4)
Blood fat	31 (0.2)
Rheumatism and MS	24 (0.2)
Cancer and other tumors	72 (0.6)
Another disease	10 (1.3)
Unknown	166 (2.0)
<b>Possible side effects</b>	
Death	651 (26.0)
Physical problems	813 (32.4)
Corona infection	136 (5.4)
Pregnancy and fertility complications	281 (11.2)
Stress and injection anxiety	171 (6.8)
Complications due to young age or old age	33 (1.6)

The considerable reasons for not being vaccinated are the side effects anxiety, and lack of belief in the

vaccine conspiracy. It is noteworthy that about 13.8% of our study population had received the vaccine in another city or province, whose statistics were not recorded and 6.9% of people had died. Also, a

significant number of people were from abroad who seemed to have received the vaccine. Some of the subjects mentioned the side effects of the vaccine as the reason for not being vaccinated (Figure 1).



**Figure 1.** Percentage of different reasons for not being vaccinated based on the report of eligible people who didn't receive vaccine

## Discussion

This study aimed to the determination of the causes of non-vaccination of people against COVID-19 among 12,889 eligible people of Fars province who were not vaccinated. The largest age group was related to women of childbearing age, the reason for which was the concern about the side effects of the vaccine on the fetus and fertility. The highest frequency of not receiving the vaccine was observed in college and school students.

The process of vaccination and immunization of people against Coronavirus is known as one of the greatest achievements of public health. Immunization programs have led to a significant reduction in the death rate and the spread of infectious diseases, including the eradication of the polio virus at the global level. Therefore, immunization programs should be combined with the national vaccination process to reduce the prevalence and treatment of preventable diseases through vaccines.

During the outbreak of the COVID-19 virus, after approving a clinical trial of several vaccines, some people were skeptical about the injection of the vaccine. However, after the positive effects of the

vaccine on reducing the hospitalization and death rate, many people showed a positive view towards the vaccines approved by the Ministry of Health. In this regard, Shekhar *et al.* studied the level of people's acceptance of the COVID-19 vaccine. The results showed that 36% of people were willing to be vaccinated. 56% of the subjects had doubts about being vaccinated despite the availability of the vaccine; indeed, they remained for more results, and only 8% of people did not accept the vaccine injection. 40% of the subjects stated that injection anxiety and concerns about side effects as the reason for not being vaccinated. 28.6% of the subjects weren't believed in the vaccination and other subjects don't have enough time (16.4%), were vaccinated at another site (12.9%), were infected by Coronavirus (12.1%), and other reasons [23]. In another study, Bono *et al.* investigated the factors influencing people's acceptance of the COVID-19 vaccine. The results showed that people's acceptance rate for vaccines with 90 to 95% immunity was 76.4% and 88.8%, respectively. Among the investigated countries, only Brazil had a low acceptance of the vaccine. Fear of side effects (42.2%) and uncertainty about the effectiveness of the vaccine

(51.1%) caused hesitation and resistance to vaccination [24].

Some subjects stated that the reason for not injecting the vaccine was having an underlying disease. Some subjects mentioned the lack of follow-up by the health staff as the reason for not injecting the vaccine. Some subjects were vaccinated in other cities or provinces, but their names were not registered in the vaccine system of Fars province. There was also a significant number of people from outside the country, who appeared to have received the vaccine. Among those who stated vaccine complications as the reason for not being vaccinated, complications such as death, physical problems, coronavirus, fertility problems, injecting syringes anxiety, believing in traditional medicine and the ineffectiveness of vaccines, the advice of some doctors and some other people, virtual space, and young age or old age were mentioned. Although about 80% of people admitted that if these problems are solved, they will inject the vaccine.

Also, the results of a survey study showed that 14.2% of citizens over 18 years of age do not want to be vaccinated at all, which was inconsistent with the present study; because this research showed that the age group of 25 to 34 years old was the most unvaccinated group. Also, the unwillingness to receive the vaccine is different among different groups. The unwillingness to receive the vaccine was more in men (17.2%) than in women (11.3%), which is consistent with this study. Unwillingness to receive the vaccine in the age group below 50 years (17%) is significantly more than in the age group above 50 years (7%). Unwillingness to receive the vaccine in singles (17.8%) was more than in married (13.4%). Unwillingness to receive the vaccine is 15.7% among people without a university education and 11.3% among people with a university education. Not trusting corona vaccines (30.1%), concerns about the consequences of vaccination (29.4%), personal problems (4.9%), reluctance for no particular reason (6.1%), physical problems (6.3%), lack of enough time (6.3%), inaccessibility of the desired vaccine (2.2%), and other reasons such as no reason, not interested, personal reasons, etc. (1.01%) were the reasons for citizens' reluctance to receive vaccines. One of the most important reasons is trust in the vaccine. Another study in Iran showed a direct relationship between trust in the vaccine and its injection or non-injection [20-22]. One of the strong points of this study was finding the system and software problems of the vaccine registration program. The results showed that there are errors in the registration system and this study led to the modification of the software and the reduction of registration errors. In another study in 2019, in Bushehr province in Iran, gender was the only demographic feature related to vaccine acceptance, and men had more acceptance for being vaccinated ( $p=0.022$ ) [19].

In this study, the most common reason for unvaccinated people is anxiety about side effects and lack of belief in the vaccine's effectiveness. It seems that the false advertisements about the side effects of the vaccine made people hesitant to vaccinate. To solve the problem of people's lack of trust in the vaccine, it is necessary to understand the elements that define trust among the vaccine-reluctant groups and make interventions based on them. Also, clear policies and communication are needed to increase vaccination literacy and confidence in the vaccine, and on the other hand, conspiracy theories do not cause mistrust. Anti-vaccine activists are the reason for the lack of trust in manufacturers. Indeed, with the advent of social media, it is easy to spread potentially false information about vaccines. Therefore, according to the current conditions that it is not possible to carry out face-to-face programs, the media and the Internet play an active role in informing. Therefore, according to the conditions that it was not possible to carry out face-to-face programs, the media and the Internet played an active role in informing. Therefore, a serious effort is needed to maintain and increase the feeling of mutual trust and cooperation between scientists and citizens. In addition to clarification, the authorities should take measures to resolve people's concerns. For example, involving people and their participation is important for the development of vaccination and making confidence. In general, to strengthen public trust in the government; competence (providing quality goods and services including two indicators of responding to people's needs and trustworthiness) and value are vital as honesty and accountability in vaccine development (coherence, openness, fairness) [19]. Therefore, it is necessary for health information departments to make more efforts in this regard. For example, a significant part of females of childbearing age has mentioned the anxiety of vaccine side effects as the effect of the vaccine on pregnancy, fertility, and adverse effects on the fetus and breastfeeding. It is necessary for health experts to prepare special educational programs for this group of people. The findings by Skiro *et al.* in England in 2020, showed low acceptance of the COVID-19 vaccine during pregnancy. In this regard, safety information about COVID-19 vaccines should be provided to pregnant women in order to create confidence and facilitate an informed decision about pregnancy vaccines. The largest age group was 25 to 34 years old (19.8%) which in females (22%) is more than males (17.6%) [25]. The findings of our study are inconsistent with the study by Biswas and Yoda, the reason for this difference may be the lower perceived risk or threat of the disease in these people or the low level of confidence in the COVID-19 vaccine in these people [26, 27].

In terms of the history of being infected by COVID-19, some of the people with a history of coronavirus infection avoided the injection of the vaccine. The



findings of this study are not consistent with Hatami & Hatami [28]. The reason for this may be that the people who got infected with Coronavirus refuse to get the vaccine because they have antibodies caused by the virus in their bodies and consider themselves safe.

Considering that there is still exist the cause of COVID-19 disease in the world, it is important to mention that all preventive measures and defined protocols are aimed to help stop or reduce the spread of this disease and despite the distribution of the vaccine in the world and the start of vaccination, it is important and necessary to observe all these measures until the situation returns to normal.

According to the results, there is a need to conduct more research on the complications and consequences of the COVID-19 vaccination and to educate people based on this evidence. In addition, creating social support and interpersonal relationships requires confidence and trust to accept the vaccination for COVID-19 in order to prevent the disease and break the chain of transmission among people. It is also suggested that strong international coordination and cooperation between vaccine manufacturers, regulators, policymakers, health organizations, and governments should be conducted to increase trust at the community level. Reforms should be made in the information registration system and the statistics of vaccinated people should be recorded at the national level. Deceased people should be removed from the population in the province to increase vaccination coverage in the province.

Among the strengths of this study, we can mention the large sample size and the fact that this research was conducted based on the population. In addition, one of the strong points of this study was finding the system and software problems of the vaccine registration program. The results showed errors in the registration system and this study led to the modification of the software and the reduction of registration errors.

One of the limitations of this study was the failure of people to answer the research questions at the first contact. In order to solve this problem and increase the response rate, healthcare workers should have made three phone calls to the subjects. If the person did not respond, the call was postponed to another time, which delayed data collection. It is suggested that the study be designed in two groups (vaccinated group and non-vaccinated group) for future studies to be able to perform more statistical analysis and examine the factors related to non-vaccination. Also, the lack of an integrated national and international registration system to record people's vaccination information was a fundamental limitation, it is suggested to create an integrated national and even international registration system for the registration of COVID-19 vaccination.

So, based on the findings of this study and research background, it suggested holding training courses to increase awareness levels and change the attitude of people toward vaccination [29]. Also, making new opportunities is suggested through environmental changes (social support and environmental background) and interpersonal relationships (mental norm and descriptive norm), to increase the acceptance of COVID-19 vaccination. In other words, the motivation for vaccination and acceptance of the vaccine should be increased by creating communication campaigns, marketing and showing vaccine injection by policymakers, doctors, and health care workers, and making the vaccine available in public offices and centers.

## Conclusion

The women of reproductive age and college and school students are the most frequent unvaccinated groups. Having an underlying disease and the lack of follow-up by the healthcare staff are the most frequent reason for not being vaccinated.

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