



# Investigation of Barriers and Facilitators of Covid-19 Vaccine Injection from the Perspective of People in Yazd in 2022

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## Abstract

**Background:** Vaccination and observing hygienic measures were rendered necessary due to the spread of the Covid-19. Yet, in spite of the effective and immunizing role of vaccines in the past, hesitancy about undergoing vaccination against Covid-19 has become a global issue.

**Objectives:** The present study aimed to investigate the barriers and facilitators of Covid-19 vaccine injections from the perspective of people in Yazd in 2022.

**Methods:** The present study was a population-based cross-sectional study conducted on 572 people over 12 years of age in Yazd, Iran, using cluster sampling (46 head clusters of health centers). To collect data, a researcher-made questionnaire was applied, which measured barriers and facilitators of Covid-19 vaccine injection. The mean score of the questionnaire was above 70, indicating more attitude, trust, and willingness.

**Results:** Based on the findings, 406 (70.7%) participants were female, 457 (79.6%) were married, and 232 (40.4%) were housewives. The mean age of the subjects was  $39.1 \pm 14.7$  years. In total, 277 (48.4%) participants had a positive attitude toward Covid-19 vaccination, 224 (39.2%) had trust in the vaccine, and 21 (3.8%) showed willingness to injection, indicating an overall low attitude, trust, and willingness toward the injection of Covid-19 vaccine. There was a significant relationship between willingness to inject the vaccine and education ( $P=0.048$ ). A strong correlation was also found between attitude and trust in vaccination, with a coefficient of 0.811 ( $P<0.001$ ).

**Conclusion:** A positive attitude and trust in Covid-19 vaccination were observed at an average level, and willingness to be vaccinated was at a low level. Considering the role of the three variables of education, gender, and the type of a person's occupation, planning should be done to improve people's attitude, trust, and willingness to inject the vaccine by focusing on the above variables.

**Keywords:** Attitude, Covid-19, Facilitators, Trust, Vaccination, Willingness

## 1. Background

One of the most important and dangerous pandemics in human history was the outbreak of the Coronavirus in 2019, where the emergence of different types and mutations of this virus affected the lives of billions of people (1) and created new challenges for controlling this pandemic (2, 3). Since Covid-19 has spread beyond borders and is no longer considered a regional epidemic, as declared by the World Health Organization, it can be referred to as an almost new crisis (4).

Although various control measures, such as social distancing, partial and complete quarantine, closing schools and businesses, or wearing masks in public places, were used in all countries to reduce the spread of infection and its health effects, with the passage of time and the prevalence of this disease, public vaccination was stated to be the safest solution to achieve collective immunity and terminate the infection and death caused by this virus (5, 6). In less than 12 months after the outbreak of Covid-19, several research teams accomplished the necessary studies and developed vaccines for SARS-CoV-2 (7).

Public vaccination requires not only the sufficient

capacity of the health system but also efficient strategies to increase acceptance and trust in the vaccine as well as in the manufacturing and distribution organizations (7). Despite sufficient evidence about the benefits of immunization, with the start of vaccine injection against the Coronavirus, doubts about vaccine injection gradually increased and became a complex global problem and threat in need of continuous monitoring (10). The evaluation of vaccine acceptance is one of the factors affecting immunization because the success of any vaccination program depends on people's willingness to inject. Vaccine acceptance or adherence, while a personal decision, is influenced by various environmental and social factors (11). To succeed globally in immunizing billions of people as quickly as possible, governments must prioritize issues related to public trust in vaccines and the institutions that make them (12). The results of a systematic review in 23 countries showed that the acceptance of Covid-19 vaccination was less than 70% (13).

According to the recommendation of the World Health Organization, "Each country should have a strategy to increase the acceptance of vaccination" (14) and take all necessary measures to reduce

people's doubts. At the individual level, one dimension of trust, probably common to Covid-19 and other vaccines, is a general reluctance due to the fear of serious side effects (15). Misinformation and conspiracy theories surrounding Covid-19 vaccines can severely affect vaccine acceptance (16). Considering the opinion of health and medical authorities on the importance of vaccination in controlling infectious diseases and reducing mortality, officials and policymakers should also make plans to increase people's acceptance and improve their attitude, trust, and willingness to receive vaccines.

## 2. Objectives

Therefore, the present study aimed to investigate the attitude, trust, and willingness toward the injection of the Covid-19 vaccine from the perspective of people in Yazd, Iran, in 2022.

## 3. Methods

### 3.1. Study Design and Participants

The current study was a population-based cross-sectional study conducted on 572 people over 12 years of age living in Yazd, in the center of Iran, in 2022. They were selected using cluster sampling. To calculate the sample size, based on the study by Rahimi et al. (17), the mean and standard deviation of the attitude score of the Iranian people regarding Covid-19 vaccination were taken as 3.43 and 1.19, respectively. With a confidence interval of 95% and an accuracy of 0.1 using Cochran's formula, the sample size was calculated as 544 subjects. The sample was selected from among the residents of Yazd, with 46 head clusters of health centers and bases. The inclusion criteria were the completion of the questionnaire by the age group above 12 years and their willingness to answer, and the exclusion criteria were the incomplete completion of the questionnaires or giving incomplete information. The sample size of each cluster was selected according to the population covered by the health center and base. Sampling was conducted using cluster sampling, and the sampling framework was the list of households in comprehensive health service centers and health centers in Yazd, where 46 head clusters were randomly selected based on the list of households in health centers. The paper questionnaires were completed continuously by moving from the right side. Every other household was selected for sampling. In cases where there were several households in a residential complex, the researcher started from the first apartment and continuously referred to the next. If one household did not respond, sampling was continued from the next household.

### 3.2. Measurement Tools and Questionnaires

To survey people's views in Yazd regarding the

Covid-19 vaccine injection, a researcher-made questionnaire was used. This questionnaire included sections on demographic information (7 items), the status of infection and vaccination of Covid-19 (7 items), preferences and attitudes toward the Covid-19 vaccine (20 items), lack of trust in information sources (7 items), and evaluation of the status of Covid-19 and willingness to receive the vaccine (5 items). The items were categorized on a five-point Likert scale (completely agree to completely disagree). To ensure the face validity, the questionnaires were approved by two experts in the fields of public health and clinical psychology. To confirm the content validity of the questionnaire, 10 experts in public health and clinical psychology with at least a master's degree and at least five years of work experience were asked to review it. Each of the items was examined by experts in terms of necessity, with the options being "necessary and useful", "useful but unnecessary", and "not useful". The CVR index was calculated to evaluate the necessity of each item, and based on the Luche Table, items with a CVR<0.59 were confirmed, and the rest were excluded.

$$CVR = \frac{ne - N/2}{N/2}$$

According to the CVR formula, the value of  $N$  represents the total number of experts, and  $ne$  indicates the number of experts who have chosen the "necessary and useful" option. Additionally, the three criteria of simplicity, specificity, and clarity of each item were scored for each item by experts on a four-point Likert scale from "strongly agree=4" to "disagree=1". The CVI index was calculated as the proportion of experts who assigned 3 and 4 points to each item, and each item that obtained a CVI<0.79 was approved; otherwise, it was revised (18, 19). Finally, among the 74 items included in the initial version of the questionnaire, 46 items confirmed the content validity of the questionnaire. Moreover, to measure the reliability of the questionnaire in a pilot project on 40 subjects, Cronbach's  $\alpha$  coefficient was calculated at 0.74, indicating the appropriate reliability of the questionnaire. To analyze the questionnaire, the items in each category were assigned points. After adding up the points, they were divided by the number of items, then divided by the total scores of each category, and finally multiplied by 100, so that the base of the scores of each category was 100. If the scores in the attitude category were less than 70, it was classified as "negative attitude", and for scores of above 70, it was classified as "positive attitude". In the categories of trust and willingness, if it was less than 70, it was placed in the "lack of trust and willingness" category, and with scores of above 70, it was placed in the "existence of trust and willingness" category.

### 3.3. Ethical Considerations

The project was found to be in accordance with

the ethical principles and the national norms and standards for conducting medical research at the School of Public Health, Shahid Sadoughi University of Medical Sciences, Yazd, Iran. Ethical Code: IR.SSU.SRH.REC.1401.003.

### 3.4. Statistical Analysis

All steps of statistical analysis were conducted using the SPSS software (version 24). Descriptive statistics of mean and standard deviation and analytical statistics, including independent t-test, ANOVA, and Pearson correlation coefficient, were used in data analysis.  $P < 0.05$  was considered the

level of significance.

## 4. Results

### 4.1. Demographic Characteristics

Based on the findings, of the 572 people who participated in this study, 406 (70.7%) were female, 457 (79.6%) were married, and 566 (98.6%) were Iranian. The mean age of the participants was  $39.1 \pm 14.7$  years. In addition, 341 (59.6%) had a high school diploma or lower, and 232 (40.4%) were housewives (Table 1).

**Table 1.** Demographic characteristics of subjects participating in the study

Demographic variables		N (%)
Gender	Female	406 (70.7%)
	Male	168 (29.3%)
Age (Mean±SD) (year)		39.1±14.7
Marital status	Single	117 (20.4%)
	Married	457 (79.6%)
Nationality	Iranian	566 (98.6%)
	Non-Iranian	8 (1.4%)
Education level	Primary school	83 (14.5%)
	Secondary school	86 (15%)
	High school diploma	172 (30%)
	Associate degree	55 (9.6%)
	BS/BA	142 (24.7%)
	MSc/MA	36 (6.3%)
Employment status	Unemployed	40 (7%)
	Employed	119 (20.7%)
	Worker	93 (16.2%)
	Healthcare staff	43 (7.5%)
	Student	47 (8.2%)
	Housewife	232 (40.4%)
<b>Total</b>		<b>572</b>

### 4.2. Distribution of Underlying Diseases and Covid-19 Disease

Of the studied population, 85 (14.8%) had one of the underlying diseases, and the most common one was diabetes, affecting 28 (4.9%). According to the results, 290 (50.5%) had a history of being infected with Covid-19, and 67 (11.7%) had a history of hospitalization due to infection with Covid-19. Moreover, 493 (85.9%) had received the Covid-19 vaccine. Of the whole subjects under study, 461 (80.3%) believed that people should be able to choose the type of vaccine by themselves (Table 2).

### 4.3. Barriers and Facilitators of Vaccination and Demographic Characteristics

Based on the findings, a significant relationship was observed between subjects' willingness to be vaccinated and gender in that willingness was higher in women than in men. On the other hand, no significant relationship was observed between age and the three categories of attitude ( $P=0.245$ ), trust ( $P=0.923$ ), and willingness ( $P=0.241$ ). A significant relationship ( $P < 0.05$ ) was observed between the scores of "attitude and trust" and "academic degree",

showing that subjects with a master's degree had a more positive attitude ( $73.6 \pm 12.2$ ), and those with lower/elementary education ( $68.8 \pm 20.5$ ) had more trust. Furthermore, employment had a significant relationship with attitude and trust ( $P < 0.05$ ), indicating that health workers had a more positive attitude ( $71.1 \pm 12.3$ ) (Table 3).

### 4.4. Barriers and Facilitators of Vaccination and Affliction Status

Based on the findings in Table 4, a significant relationship was observed between subjects' attitude toward vaccination and their affliction with underlying diseases ( $P=0.027$ ). A significant relationship was also observed between hospitalization due to Covid-19 and subjects' attitude and trust in vaccination, revealing that hospitalized subjects had a more positive attitude ( $72.8 \pm 12.4$ ) and more trust ( $68.6 \pm 16.7$ ). Additionally, the ability to decide to receive vaccination had a significant relationship with the type of attitude and trust of subjects toward vaccination, showing that subjects who did not have the ability to decide to undergo vaccination had a lower attitude ( $72.4 \pm 12.6$ ) and trust ( $68.9 \pm 18.8$ ).

**Table 2.** Frequency distribution of underlying diseases and Covid-19 disease in subjects participating in the study

Affliction status		N (%)
No		489 (85.2%)
Affliction with underlying disease	Diabetes	28(4.9)
	Hypertension	23(4)
	Pulmonary problems	7(1.2)
	Renal problems	11(1.9)
	Cardiovascular problems	16(2.8)
Yes 85 (14.8%)		
Affliction with Covid-19		290 (50.5%)
Hospitalization for Covid-19		67 (11.7%)
Covid-19 affliction in relatives		508 (88.5%)
Covid-19 affliction in relatives after vaccination		348 (60.6%)
Death of relatives due to Covid-19		213 (37.1%)
Covid-19 vaccination	No	81 (14.1%)
	Iranian	209(36.4)
	Non-Iranian	284(49.5)
Yes 493 (85.9%)		
Decision-making ability for vaccination		461 (80.3%)

**Table 3.** Calculating the mean and standard deviation of the attitude, trust, and willingness of community members to be vaccinated against Covid-19 according to demographic characteristics

Variable		Attitude	Trust	Willingness
		Mean±SD	Mean±SD	Mean±SD
Gender	Female	67.2±13.2	62.8±18.1	45.7±16.1
	Male	69.1±15.3	63.6±22.3	41.8±16
	P-value	0.132*	0.637*	0.048*
Age	<20	68.3±11.7	68±14.3	46.1±17.9
	20-39	66.7±12.9	61.7±17.4	44.2±15.9
	40-59	68.5±15.1	63.9±21.7	45±16.5
	>=60	70.1±15.6	64.8±23.2	45.7±15.8
	P-value	0.245**	0.241**	0.923**
Marital status	Single	68.7±12.7	64.4±18.7	44.8±17.3
	Married	67.5±14.2	62.7±19.5	44.6±15.8
	P-value	0.414*	0.357*	0.945*
Nationality	Iranian	67.8±13.9	63.2±19.4	44.7±16.1
	Non-Iranian	59.1±10.4	51±14.5	43.8±22.9
	P-value	0.078*	0.077*	0.909*
Education level	Primary school	66.3±13.9	68.8±20.5	47.1±17.1
	Secondary school	72.2±13.5	67.9±19.2	45.1±17.9
	High school diploma	66.4±14.6	60.7±20.7	44.8±16.2
	Associate degree	67±15.3	61±21	44.1±15.6
	BS/BA	66.3±12.1	59.6±14.9	43±15.1
	MSc/ MA	73.6±12.2	66±19.6	46.3±15.5
	P-value	0.001**	0.001**	0.835**
Occupational status	Unemployed	62.5±14.6	55.7±18.5	40.4±17.3
	Employed	70.3±13.3	62.5±18.5	43.3±14.5
	Worker	65.8±15.3	58.8±22.5	40.7±16.8
	Healthcare staff	71.1±12.3	66.8±14.2	49.4±14.4
	Student	69.9±11	68.8±17.6	46.9±18.4
	Housewife	67±13.9	64.4±19.2	46.4±15.9
	P-value	0.006**	0.004**	0.085**

\*Independent sample t-test

\*\*ANOVA

#### 4.5. Correlation between Attitude, Trust, and Willingness

Based on the results, a linear correlation coefficient (0.811) was reported between attitude and trust ( $P<0.001$ ) and between attitude and willingness

toward vaccination (0.318) ( $P<0.001$ ). A strong correlation was also observed between trust and willingness for vaccination (0.368) ( $P<0.001$ ) (Table 5).

**Table 4.** Mean and standard deviation of the attitude, trust, and willingness of the community to be vaccinated against Covid-19 in terms of

the status of affliction and vaccination				
Affliction status		Attitude	Trust	Willingness
		Mean±SD	Mean±SD	Mean±SD
Affliction with underlying disease	Yes	70.8±14.1	65.8±21.9	43.5±16.5
	No	67.2±13.8	62.5±18.9	44.9±16.1
	P-value	0.027	0.155	0.583
Affliction with Covid-19	Yes	68.7±13	64.4±19	46.3±15.7
	No	66.7±14.7	61.6±19.7	43.2±16.4
	P-value	0.074	0.080	0.088
Hospitalization for Covid-19	Yes	72.8±12.4	68.6±16.7	47.6±18.3
	No	67.1±13.9	62.3±19.6	44.3±15.8
	P-value	0.001	0.012	0.264
Decision-making ability for vaccination	Yes	66.6±14	61.6±19.3	44.4±16.4
	No	72.4±12.6	68.9±18.8	45.9±15
	P-value	<0.001	<0.001	0.502
Covid-19 affliction in relatives	Yes	67.9±13.9	63.4±19.5	44.6±16.3
	No	66.1±13.6	60.2±18.4	44.9±14.7
	P-value	0.306	0.206	0.915
Covid-19 affliction in relatives after vaccination	Yes	68±14.2	62.7±19.3	44.7±16.4
	No	67.4±13.4	63.6±19.5	44.7±15.7
	P-value	0.610	0.596	0.979
Death of relatives due to Covid-19	Yes	68.4±14.1	63.8±19.2	44.5±15.2
	No	67.3±13.8	62.6±19.5	44.8±16.7
	P-value	0.369	0.477	0.896

P-value from independent sample t test

**Table 5.** Examining the degree of correlation between the scores of subjects participating in the research project in three categories

Variable	Attitude	Trust	Willingness
Attitude	1	0.811 P-value<0.001*	0.318 P-value<0.001
Trust	-	1	0.368 P-value<0.001
Willingness	-	-	1

\*Pearson correlation

## 5. Discussion

In this study, 572 people in Yazd were surveyed to investigate the barriers and facilitators of Covid-19 vaccine injection from their perspective. The results of the study showed a low attitude, trust, and willingness toward the injection of the Covid-19 vaccine and the main role of the three variables of education, gender, and type of occupation in the injection of the vaccine.

### 5.1. Attitude, Trust, and Willingness of People Toward the Injection of the Vaccine

Based on the results of the present study, 48.4% had a positive attitude, 39.2% showed greater trust toward vaccine injection, and 3.8% showed more willingness toward vaccination in the investigated population. Studies show that the level of trust in the Covid-19 vaccine varies from 95% in East Asia to 23% in Arab countries (18). A study conducted in India revealed that 70.44% of subjects were willing to be vaccinated, 29.55% were hesitant to be vaccinated against Covid-19, and only 49.4% believed they could be protected by the vaccine (19). A study in Japan showed that of the 66% of subjects who intended to be vaccinated against Covid-19, 22% were hesitant, and 12% did not intend to be vaccinated at all (20). Based on the reports on

vaccine injection and people's views of injection in different countries, hesitancy in injecting the vaccine is under the influence of cognitive, psychological, social, cultural, and demographic factors.

### 5.2. Barriers and Facilitators of Vaccination and Demographic Characteristics

In the current study, a significant relationship was observed between gender and willingness to inject the vaccine, showing that willingness was higher in women than in men. In the obtained statistics, men showed a more positive attitude and more trust than women. In the study by Tavousi et al., the mean score of attitude toward Covid-19 vaccination was reported at 64.1%, and positive attitude was directly correlated with the male gender (21), which is not consistent with the present study. In Danabal's study in urban and rural communities in Tamil Nadu, India, women were distrustful of the vaccine, which is also inconsistent with the present study (22). In another study by Freeman et al. in the United Kingdom, attitude toward vaccination was correlated with gender (23). On the other hand, in the study by Lathkin et al., it was observed that women had more trust in Covid-19 vaccination, which is consistent with the results of the present study (13). Moreover, in the study by Kashmiri et al., among the demographic

factors, there was only a statistically significant correlation between gender and the acceptance of the Covid vaccine, indicating that men were more willing to be vaccinated, which is not consistent with the present study (24). Since the questionnaires were completed during the peak of the Covid-19 disease, the transmission of the virus was very high, and women might have turned to the vaccine more frequently for the fear of their own infection and death and/or that of their relatives. The study conducted in Malta in Europe showed that more than 50% of the surveyed population declared that they were willing to use the vaccine, and men were more willing, which is not consistent with the results of the present study. There was also hesitancy about the vaccine in the studied population, in that 32.6% were unsure of vaccination, 15.6% declared that they did not want to take the vaccine, and there was more uncertainty among women (25). The difference in subjects' gender has exerted different effects in different studies. Depending on the subjects' point of view, various levels of attitude, trust, and willingness have been reported.

In terms of education, based on the results of this study, there was a positive attitude in subjects with higher academic degrees or postgraduate education, and there was greater trust in vaccines in subjects with lower or primary education. In Hatami et al.'s study, participants with a higher level of education had more trust in receiving the vaccine, which is not consistent with the results of the present study (26). In another study, it was observed that participants with a lower level of education showed more hesitancy toward the vaccine than the group with a higher level of education (25). Participants with an advanced level of education showed more readiness and willingness to accept the vaccine (27), which is not consistent with the results of the present study. Perhaps the reason for the inconsistent results is that the study was conducted retrospectively.

Based on the viewpoint of the target community completing the questionnaire in this study, subjects with lower education levels had more trust in vaccines, manufacturers, and health officials, which depends on the government's trust-building efforts. Furthermore, in terms of employment, subjects working in healthcare centers had a more positive attitude, more trust, and a higher willingness toward vaccination than other occupational groups. Araban et al. reported in their study that the positive attitude toward vaccination was significantly higher in vaccinated health service workers than in non-vaccinated subjects (28).

Based on the results, the level of attitude, willingness, and trust is higher among the healthcare personnel due to their direct knowledge about the efforts of health authorities in the direction of vaccination and its promotion and the possibility of

comparing and observing the complications in the patients receiving the vaccine and those not receiving it. In addition, participants hospitalized due to Covid-19 had a more positive attitude, trust, and willingness to use the vaccine. In their study, Bennett et al. also reported a significant relationship between hospitalization history and attitudes toward vaccination (29). In the study by Tavousi et al., no significant relationship was shown between the attitude toward Covid-19 vaccine and other variables such as vaccination history, history of the affliction of participants and their family members with Covid-19 disease, and history of the death of family members due to this disease (21). Finally, based on the findings of the study, it is possible to promote attitudes, trust, and willingness toward vaccination if there is a history of hospitalization and a fear of the occurrence of similar conditions.

One of the limitations of the study was the lack of presence of citizens at home or their non-participation in completing the questionnaire, which was conducted by repeatedly referring, stating the purpose of the study, and obtaining their consent to complete the questionnaire.

## 6. Conclusion

A positive attitude and trust in Covid-19 vaccination were observed at an average level, and willingness to be vaccinated was at a low level in the population of Yazd. A significant relationship was observed between demographic variables and subjects' attitudes and trust in the use of vaccines. It was found that the three main variables of higher education, female gender, and an individual's employment in health and treatment units play an essential role in improving subjects' attitudes and trust. Therefore, planning to focus on the above target groups is rendered necessary. Healthcare workers can play an effective role in promoting vaccination in their families and the community. Moreover, subjects' inclinations are generally affected by the surrounding environment and its negative atmosphere, and the fear of its possible side effects reduce their willingness for vaccination. Therefore, the government should raise the level of trust by reassuring people. Future studies on Iranian communities using a community-oriented design are recommended for a more detailed investigation by separating target groups, especially high-risk communities such as the elderly and chronically ill patients.

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## Footnotes

**Conflicts of Interest:** The authors declare that they have no conflicts of interest.

**Authors' Contributions:** RA, OS, and NB: concept and study design. FK: data collection. RA, OS, and HJ: data analysis. OS and NH: writing the article. RA, OS, and NB: critical revision of the article. AK: statistical analysis. RA, OS, NB, FK, AK, and NH: final approval of the article

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