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Original Article

Attitudes and Levels of Concern and Trust Towards COVID-19 Vaccination Among Patients Hospitalized at Shahid Beheshti Hospital in Kashan, Iran

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A B S T R A C T

Introduction: This study aimed to explore hospitalized patients' attitudes, concerns, and trust regarding Coronavirus disease 2019 vaccination.

Materials and Methods: This descriptive-cross-sectional study was conducted on 128 patients hospitalized at Shahid Beheshti Hospital in Kashan, Iran, in 2022. Participants were selected using simple random sampling. The questionnaire included questions about demographic information, attitudes towards vaccination (7 items), levels of concern (14 items), and trust (15 items). Data were analyzed using SPSS 26 software. Descriptive statistical analysis and chi-square tests applied.

Results: Fifty-three (41.4%) of cases had a history of two vaccinations. Sinopharm was used in 28.12% of patients. The average attitude score was 8.21 ± 2.88, significantly associated with age (p = 0.02), nationality (p = 0.01), education (p = 0.01), and vaccination history (p = 0.02). The mean concern score was 35.41 ± 11.87, significantly linked to gender (p = 0.01) and vaccination history (p = 0.02). The average trust score was 40.50 ± 13.64, significantly associated with age (p = 0.04), gender (p = 0.01), vaccination history (p = 0.01), hospitalization history due to COVID-19 (p = 0.03), and COVID-19 infection history (p = 0.03).

Conclusion: The vaccination rate among participants was acceptable. However, concerns about vaccination and its complications were the primary reasons for vaccine hesitancy. Given that vaccine acceptance across various community groups is as crucial as vaccine development, it is recommended that health organizations provide information on vaccine benefits and address concerns about potential side effects.

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Introduction

After the emergence of the new coronavirus in December 2019 in Wuhan, China, the virus spread around the world within a few weeks. In March 2020, the World Health Organization (WHO) announced the outbreak of a pandemic and called it severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2). This disease caused a huge scientific, medical, and social challenge. According to the latest statistics from the WHO, more than 402 million cases of Coronavirus Disease 2019 (COVID-19) and about 5.7 million deaths have been reported worldwide [1].

Vaccination reduces morbidity and mortality associated with COVID-19. Therefore, from the beginning of the pandemic, intensive efforts were made for the rapid development of safe and effective vaccines [2]. In late 2020 and early 2021, COVID-19 vaccines were approved for use by the general population in various countries [3, 4]. In addition to vaccine discovery, the vaccination acceptance rate is critical. The results of a systematic review showed that people's acceptance of the vaccine was relatively good. In this study, more than 90% of the population in Ecuador, Malaysia, Indonesia, and China have been injected with the COVID-19 vaccine. However, in the countries of Kuwait, Jordan, Italy, Russia, Poland, the United States, and France, less than 60% have been injected with the vaccine [5].

The acceptance rate of COVID-19 vaccination varies based on the severity of COVID-19 infection and several socio-demographic characteristics such as gender, age, education, income, and occupation [6, 7]. The rate of vaccine acceptance on the European continent, especially in Great Britain and Denmark, was low due to reasons such as low socioeconomic status, some political beliefs, and negative attitudes toward medical professionals [8]. In the Asian continent, factors such as a low education level, lack of knowledge about the benefits of vaccination, low level of income and lack of trust between people have been mentioned as the reasons for the low level of vaccination acceptance [9].

A high level of acceptance and coverage are important and the main elements in the success of immunization programs [9-11]. However, there are concerns and doubts about vaccination among some people in different countries [12]. In a pandemic situation, hesitancy to accept the COVID-19 vaccine could seriously affect global efforts to control the pandemic and impose a greater economic and life burden on human societies. This issue increases the problems in countries with limited resources. After the start of the universal vaccination of COVID-19, people's attitudes, concerns and confidence in the vaccine have been expressed as one of the main factors for accepting or refusing to receive the vaccine [13]. In the study of [2]. Nakhostin-Ansari et al., the willingness among Iranian people to inject a COVID-19 vaccine is similar to the international average. However, it is still below the level required to achieve public immunity [2]. There are serious challenges in planning and carrying out vaccinations, such as the lower willingness of older people to receive vaccines

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and the lack of accurate information on receiving these vaccines among the Iranian population, which points to the importance of providing reliable information to the people and even the medical staff in this field [2, 14]. Some reports have indicated that many healthcare workers were hesitant or delaying getting a COVID-19 vaccine [3]. Some reports estimate that the level of skepticism about the COVID-19 vaccination among healthcare workers may be similar to that of the general population [7]. So far, many studies have been conducted in this field, but examining the attitude, level of trust and concern of patients who, after the national call for vaccinations due to COVID-19, are hospitalized in medical centers whose staff are suspicious of vaccinations is very important. Given the fragmented scientific evidence and a flurry of media reports, it is still unclear to what extent people are hesitant or refuse to receive the COVID-19 vaccination and why.

Materials and Methods

This is a descriptive cross-sectional study that was conducted in 2022 at Shahid Beheshti Hospital, Kashan, Iran. Shahid Beheshti is the largest teaching hospital of Kashan University of Medical Sciences, which is the central facility for admitting patients with COVID-19. Based on a similar study [2], the COVID-19 vaccine acceptance rate among Iranians is 69%. Thus, with a confidence level of 95% (Z1 = 1.96), 80% power (Z2 = 0.84), an estimated correlation coefficient between variables of 0.3, and accounting for 10% sample dropout, the required sample size to investigate COVID-19 vaccination prevalence was estimated to be 128 people. The sample selection was a simple random sample of hospitalized patients in all clinical wards of the hospital. The criteria for entering the study are being hospitalized for any reason, being over 18 years of age, having stable physical and mental conditions, and having an immunodeficiency disease or a history of vaccine sensitivity.

Data collection tool

After obtaining informed consent, the questionnaire of Nakhostin-Ansari's study with confirmed reliability and validity was used [2]. The questionnaire consisted of four parts. The first part collected demographic information about the patients, such as age, sex, nationality, place of residence, underlying disease, occupation, vaccination history, type of vaccine received, and hospitalization ward. The second part had seven items to evaluate people's attitudes about the COVID-19 vaccine. Each question can be answered with "agree," "disagree," and "neither agree nor disagree." Each of the questions was scored from 0 to 2, with two points for the correct answer and no points for the wrong answer. The total score of all items varied from 0 to 14. The third part of the questionnaire included 15 items to evaluate people's confidence in the COVID-19 vaccine. Each item can be answered on a Likert scale from 1 (strongly disagree) to 5 (strongly agree). Higher scores indicated less confidence in the COVID-19 vaccine, except in two cases where the scoring was reversed. The total score was the sum of the scores of all the items and ranged from 15 to 75, where higher scores indicate less confidence in the COVID-19 vaccine. The fourth part of the questionnaire included 14 items about

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people's concerns about the COVID-19 vaccine, each of which can be answered on a Likert scale from 1 (strongly disagree) to 5 (strongly agree), with higher scores indicating greater concerns about the safety of vaccines. The total score was calculated as the sum of all items with potential scores from 14 to 70.

Data analysis

The data were entered into SPSS software version 26. Descriptive statistics, including frequency and percentage for qualitative variables and central and dispersion indices for quantitative variables, were used. Chi-square test with a significant p-value of less than 0.05 was used for data analysis.

Results

The mean age of the participating patients was 51.87 ± 9.92 years. Seventy-two cases (56.25%) were female. Fifty-four of the participants (42.24%) were over 50 years old. Of the 128 people, 88 (68.52%) lived in the city, and their education level of 62 (48.44%) was diploma. Forty-two cases (32.48%) had hypertension which was the most common underlying disease. Fifty-three cases (41.40%) had a history of two COVID-19 vaccinations. Forty-four cases (34.37%) had received the Sinopharm vaccine. Of they forty five cases (35.16%), it was reported that they had faced COVID-19 at least once before (Table 1).

Table 1. Demographic and individual characteristics of participants

Variable		Frequency (%)	Variable		Frequency (%)
Gender	Female	72(56.25)	**Occupation**	Freelancing job	33 (25.78)
	Male	56 (43.75)		Employee	10 (7.81)
Age	< 40 year	21 (16.41)		Unemployed	13 (10.16)
	40-50 year	53 (41.41)		Retired	11 (8.59)
	> 50 year	54 (42.19)		other	61 (47.65)
Nationality	Iranian	125 (97.66)	**Underlying disease**	No	25 (19.53)
	Foreigners	3 (2.34)		Diabetes	33 (25.78)
Type of vaccine	Sinopharm	36 (28.12)		Hypertension	42 (32.81)
	Barkat	26 (20.31)		Cardiovascular disease	26 (2031)
	AstraZeneca	6(4.69)		Other	57 (44.53)
	Sputnik	4 (3.12)	**Clinical Ward**	Infectious	5 (3.90)
	Baharat	14 (10.94)		Cardiology	4 (3.12)
	Other	42 (32.81)		Surgery	22 (17.18)
Place of residence	Urban	88 (68.75)		Neurology	10 (7.81)
	Rural	40 (31.25)		Internal medicine	26 (20.31)
Education	Illiterate	8 (6.25)		Obstetric and gynecology	13 (10.15)
	Elementary	19 (14.84)		Other	48 (37.5)
	Under diploma	24 (18.75)	**History of COVID-19**	No	44 (34.37)
	Diploma	62 (48.44)		One	45 (35.16)
	Academic	15 (11.71)		Two	19 (14.84)
History of vaccination	No	36 (28.12)		Three and more	20 (15.62)
	One dose	18 (14.06)	**History of hospitalization due to COVID-19**	Yes	9 (7.03)
	Two doses	53 (41.40)		No	119 (92.07)
	Three doses and more	21 (16.41)			

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The mean score of attitudes towards vaccination among participating patients was 8.21 ± 2.88, which is considered an average score. There was a statistically significant correlation between the patients' attitude score and age (p = 0.02), nationality (p = 0.04), education (p = 0.01), and vaccination history (p = 0.02). Thus, Iranian people with a younger age, history of previous vaccinations, and higher education had significantly higher attitude scores than others (Table 2).

The mean score of participant's concern about vaccination was 14.87 ± 4.98, which is relatively low. Chi-square test results showed that gender (p = 0.01) and history of vaccination (p = 0.02) had a statistically significant correlation with the patient's level of concern. Hence, women and people who had no history of previous vaccination had a significantly higher concern score than others (Table 2). The mean score of patients' trust in vaccination against COVID-19 among participating patients was 35.41 ± 11.87, which is considered an average level of confidence. The results of the chi-square test showed that age (p = 0.04), gender (p = 0.01), history of vaccination (p = 0.01), history of hospitalization due to COVID-19 (p = 0.03), and history of being infected with COVID-19 (p = 0.03) had a statistically significant correlation with the patients' trust level. There was more trust among older adults, women, those who had no history of hospitalization due to COVID-19, and those who had been vaccinated more times (Table 2).

Discussion

The results of this study showed that about 71% of the patients participating in the study had a history of receiving two injections of the vaccine. The score of patients' attitudes towards vaccination was average, at 8 out of 14 points. Iranian people with younger age, previous vaccination history, and higher education significantly had a higher attitude score regarding vaccination than others. Participating patients with a score of 35 out of 70 had little concern about side effects after vaccination. In this study, women and people without previous vaccination histories were significantly more worried than others. Patients had moderate trust in vaccination with a score of 40 out of 75, so older women, patients without a history of hospitalization due to COVID-19, and a significantly higher number of vaccinations had more confidence in vaccination than others. About 71% of the patients participating in the study had a history of two injections of the vaccine. The results of Keshmiri et al.'s study [14] showed that 65.9% of the participants were willing to be injected with the Iranian vaccine, and men were more receptive to vaccination than women. Similar to the results obtained, in the study by Nakhostin-Ansari et al. [2], the rate of acceptance of the vaccine among the people was 69%. In the study by Tamimi et al. [15], 1417 people (64.6%) were willing to receive the vaccine. Also, the results showed that the recipients of the vaccine were mostly men, people with higher education, and divorced and single people. The results of the two studies above, which were conducted in Iran, were very similar to our study.

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Table 2. Attitudes, trust, and concerns toward COVID-19 vaccination among study participants

Variable		Attitude score		Trust score		Concern score	
		Mean ± SD	P-value	Mean ± SD	P-value	Mean ± SD	P-value
Gender	Female	8.34 ± 3.25	0.64	32.85 ± 12.7	0.01	17.97 ± 4.48	0.01
	Male	8.16 ± 3.64		48.46 ± 13.68		13.01 ± 4.77	
Age	< 40 year	8.96 ± 3.12	0.02	47.52 ± 15.44	0.04	14.56 ± 4.11	0.07
	40-50 year	8.27 ± 3.43		38.63 ± 13.08		16.71 ± 4.39	
	> 50 year	7.54 ± 3.10		35.64 ± 14.63		17.43 ± 4.66	
Nationality	Iranian	8.66 ± 3.31	0.04	39.87 ± 14.69	0.14	14.56 ± 4.75	0.13
	Foreigners	7.13 ± 3.19		42.90 ± 12.75		15.69 ± 4.78	
Type of vaccine	Sinopharm	8.12 ± 3.06	0.14	41.75 ± 13.85	0.26	17.11 ± 4.64	0.09
	Barekat	8.94 ± 3.25		38.15 ± 12.88		16.35 ± 4.72	
	Astra Zeneca	8.16 ± 3.64		39.75 ± 14.68		15.6 ± 4.61	
	Sputnik	8.34 ± 3.11		34.64 ± 12.63		16.63 ± 4.69	
	Baharat	8.16±3.77		34.85±12.94		14.88±4.52	
	Other	7.88 ± 3.43		42.86 ± 13.60		18.27 ± 4.38	
Place of residence	Urban	8.56 ± 3.68	0.06	39.53 ± 13.34	0.58	15.35 ± 4.57	0.06
	Rural	7.86 ± 3.09		41.80 ± 12.64		15.06 ± 4.65	
Education	Illiterate	7.35 ± 3.57	0.01	42.84 ± 12.49	0.29	13.58 ± 4.85	0.68
	Elementary	7.47 ± 3.60		41.85 ± 13.26		14.47 ± 4.45	
	Under diploma	7.85 ± 3.31		41.31 ± 12.80		14.21 ± 4.75	
	Diploma	8.44 ± 3.90		40.52 ± 15.50		14.88 ± 5.41	
	Academic	9.68 ± 3.04		38.64 ± 18.61		12.88 ± 4.21	
History of vaccination	No	6.30 ± 3.14	0.02	47.42 ± 13.85	0.01	18.39 ± 4.55	0.02
	One dose	8.57 ± 2.47		43.69 ± 12.63		15.45 ± 5.25	
	Two doses	8.90 ± 2.90		36.61 ± 13.42		14.13 ± 4.41	
	Three doses and more	9.10 ± 3.31		32.85 ± 15.68		12.77 ± 4.91	
Occupation	Freelancing job	8.5 ± 2.66	0.08	41.98 ± 14.58	0.44	15.52 ± 4.34	0.08
	Employee	8.78 ± 3.40		42.82 ± 16.53		13.37 ± 5.30	
	Unemployed	7.12 ± 4.19		39.60 ± 12.94		15.86 ± 5.11	
	Retired	7.91 ± 3.42		36.84 ± 12.04		16.18 ± 4.95	
	Other	8.20 ± 3.11		35.63 ± 13.51		14.66 ± 4.50	
Underlying disease	None	8.46 ± 3.11	0.12	35.42 ± 12.30	0.15	13.81 ± 4.66	0.12
	Diabetes	8.09 ± 3.76		39.63 ± 11.66		15.15 ± 4.48	
	Hypertension	8.19 ± 3.32		38.31 ± 12.47		13.77 ± 5.41	
	Cardiovascular disease	7.61 ± 3.18		41.64 ± 13.34		15.07 ± 4.33	
	Other	8.15 ± 3.64		40.41 ± 12.24		16.17 ± 4.88	
Clinical ward	Infectious	8.13 ± 3.08	0.25	38.57 ± 12.48	0.31	15.77 ± 4.23	0.27
	Cardiology	8.29±3.04		39.76 ± 11.50		12.32 ± 4.99	
	Surgery	8.08 ± 3.28		38.08 ± 12.59		13.89 ± 4.45	
	Neurology	7.58 ± 3.33		45.68 ± 13.47		13.75 ± 4.95	
	Internal medicine	7.49 ± 3.25		42.47 ± 13.49		16.63 ± 4.43	
	Obstetric and gynecology	8.31 ± 3.14		41.78 ± 12.50		14.41 ± 3.83	
	Other	8.30 ± 2.85		40.67 ± 13.85		16.22 ± 4.97	
History of COVID-19	No	7.95 ± 2.88	0.16	34.24 ± 13.78	0.03	15.03 ± 4.98	0.23
	One	8.29 ± 2.48		39.29 ± 11.48		14.40 ± 4.82	
	Two	8.17 ± 3.11		41.17 ± 13.12		15.19 ± 12.11	
	Three and more	8.28 ± 3.46		49.44 ± 15.78		39.79 ± 5.08	
History of hospitalization due to COVID-19	Yes	8.56 ± 3.64	0.23	45.86 ± 10.98	0.03	14.52 ± 4.61	0.09
	No	8.19 ± 2.95		32.88 ± 11.90		15.86 ± 4.99	
Total mean score		8.21 ± 2.88		35.41 ± 11.87		14.87 ± 4.98	

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However, the results of Chua's study [16] in 2022 showed that the vaccine acceptance rate was 80.6%, and 69.2% were willing to be revaccinated. The results of Kwok et al.'s study [17] showed that only 37% of people believed in vaccination. Worrying about the effectiveness and believing that the vaccine is unnecessary has been one of the most important reasons for not accepting the vaccine among people. In 2021, Salimi et al. assessed the willingness to accept the COVID-19 vaccine as moderate [18]. The results of the present study and the reviewed studies, except for the study by Kwok et al., showed that the acceptance rate of vaccination among the participants is at an acceptable level [17]. It is recommended that in order to improve the acceptance of the vaccine, doubts about the vaccine should be removed and a positive attitude towards the vaccine should be created.

The score of patients' attitudes towards vaccination was an average 8 out of 14 scores. Iranian people with younger age, previous vaccination history and higher education significantly had a higher attitude score regarding vaccination than others. In the study by Nakhostin-Ansari et al. [2], the attitude score of the participants towards the COVID-19 vaccine was 9.94. Also, the participants had a more negative attitude towards the immunity caused by vaccination. Also, unlike the current study, there was no significant relationship between age and place of residence with people's attitudes. Still, in this study, there was a significant relationship between people's attitudes toward gender, marital status, education level, occupation, salary, hospitalization history due to COVID-19, and death of close relatives due to COVID-19, which was similar to the current study in terms of education level. Similar to the findings in the study by Pourshahri et al. [19], the level of education of the patients was related to their level of attitude regarding the COVID-19 vaccine. In this study, gender, place of residence, history of underlying disease, and marital status affected the attitude of patients toward vaccination, which was not proven in our study. The results of Papagiannis et al.'s study in 2021 [20] showed that insufficient knowledge and awareness about vaccines is the main cause of non-acceptance of vaccines. It was also stated in this study that factors such as male gender, higher education degree, and higher knowledge about COVID-19 are the main factors in accepting vaccination, and only higher education in the present study indicates a higher attitude of people towards vaccination. According to the results of this study, it is recommended to use people with higher health education to educate and encourage people to get vaccinated against COVID-19.

Participating patients with a score of 35 out of 70 had little concern about side effects after vaccination. In this study, women and people without previous vaccination histories were significantly more worried than others. People's fear of vaccines and worries about short-term (such as fatigue, sensitivity, headache) or long-term (such as infertility) side effects, along with fear of infection and its consequences, have been the main concerns affecting the non-acceptance of vaccination. In the study by Nakhostin-Ansari et al. [2], there was concern about the

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development of autism spectrum disorders in children and sudden infant death among the participants. There was a significant relationship between people's concern about vaccine safety with gender, marital status, education level, jobs, income, and media news sources, and there was no relationship between worry and residence and history of COVID-19 infection in themselves or their first-degree relatives. The study showed that men were more worried about the vaccine than women. In the study by Rossen et al. [13], their concerns about the safety of vaccination were expressed as one of the main factors in non-acceptance and refusal to receive the vaccine. According to the findings, the gender and socioeconomic level of people have been factors that influence the acceptance of vaccination. In the present study, women were more worried than men. Kwok's study [17] showed that concern about the effectiveness of the vaccine and the belief that it is unnecessary were among the most important reasons for people not to accept it. In his study, factors such as male gender, history of influenza, and other chronic diseases were among the factors that led to the use of the COVID-19 vaccine. In the investigation of factors related to people's worry, other things, such as the history of receiving vaccines and confirming the safety and effectiveness of vaccines in preventing infection, have also been effective, and in the present study, gender and vaccination history have been effective on the level of people's worry.

Patients had moderate trust in vaccination with a score of 40 out of 75, so older women, people with no history of hospitalization due to COVID-19, and a greater number of vaccinations had more trust in vaccination than others. According to the findings of this study, among the social factors, the belief that the spread of this disease is a conspiracy, the overcrowding of medical centers and the impossibility of providing vaccination services are among the reasons for not accepting vaccination. Trust in hospitals and health centers, having a positive experience with these centers, and the recommendation of trusted and expert doctors to carry out vaccination have been some of the reasons for trusting vaccination. In the study by Nakhostin-Ansari et al. [2], there was a significant relationship between people's trust in vaccines and age, gender, marital status, and education level, similar to the present study.

The study has several limitations, including failure to investigate other factors affecting the non-acceptance of the vaccine, such as socioeconomic status and religious beliefs. Further research should explore how these factors influence decisions to get vaccinated. In the meantime, education and information campaigns at the community level could help address individual, social and vaccine-related concerns. Governments, health policymakers and media sources, including social networks, should collaborate to share accurate information about the benefits of vaccination in reducing COVID-19 incidence and mortality. Additionally, as this study was conducted in a single hospital, the results may be limited in generalizability. It is recommended that future research utilize a larger sample size across multiple hospitals and healthcare settings to better understand COVID-19 vaccination perspectives among hospitalized patients.

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Conclusion

Based on the findings, the vaccination rate among the participants was at an acceptable level. The most common reason for refusing vaccination was fear of complications rather than other factors. Given the COVID-19 pandemic, it is necessary to address barriers to vaccine acceptance based on individual, social and vaccine-related concerns. Educating people about the benefits of vaccination should be a priority for health organizations, institutions and the media.

Ethical Considerations

This study has been approved by the ethics committee of Kashan University of Medical Sciences with code IR.KAUMS.MEDNT.REC.1401.210 After obtaining informed consent, the patients were included in the study.

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Conflict of Interest

The authors have no conflict of interest to declare.

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Authors' Contributions

M. Momen-Heravi and M. A. Arabzadeh designed the study. M. Momen-Heravi supervised the project. R. Farrahi and H. Fathizadeh collected data. M, A. Arabzadeh, H. Fathizadeh analyzed the data. All authors discussed the results and reviewed and approved the final manuscript. R. Farrahi wrote the final manuscript.

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