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ORIGINAL ARTICLE

Predicting COVID-19 Vaccine Acceptance Based on Mental Status, Trust in the Government, and Demographics among the Iranian

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KEYWORDS

Covid-19;
Vaccine;
Acceptance;
Anxiety;
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Mental status

ABSTRACT: Adherence to vaccination and trust in the authorities' may vary between urban and rural areas due to social norms, the influence of culture, and the level of education. The study aimed to predict COVID-19 vaccine acceptance based on mental status, trust in the government, and demographics among the Tehran population in Iran. This study was conducted in Tehran from June 2021 and December 2021. Data were obtained by an electronic questionnaire through professional groups of social networks (Google form). Information regarding demographic characteristics, marriage status, employment status, and monthly income in Iranian Rial, trust in government, anxiety, depression, psychological well-being, and psychological distress were collected. Moreover, participants were asked how strongly they accepted COVID-19 vaccine acceptance. Also, trust in Iranian and foreign vaccines- two questions evaluated the extent of trust in Iranian and foreign Covid-19 vaccine Of the 1209 participants surveyed, 792 (66.56%) reported that they would accept a COVID-19 vaccine if it is recommended for them. Then, 46.03% and 26.99% of participants reported that they preferred an Iranian vaccine and a foreign vaccine respectively. The strongest predictor of COVID-19 vaccine acceptance was trust in government, income, gender, well-being, and education. The strongest predictors of Iranian COVID-19 vaccine acceptance were "trust in government", income, well-being, and education. The strongest predictors of Iranian COVID-19 vaccine acceptance were "trust in government", gender and education. The results of the present study showed that a majority of participants (66.56%) from across Tehran would like to accept a COVID-19 vaccine; however, this level of acceptance may not be adequate based on some of the estimates COVID-19 herd immunity. The herd immunity point for COVID-19 is evaluated to be between 55% and 82% (32). Actual complete vaccination until February 2022 was 65% in Iran. The current estimation is very close to the real condition. However, acceptance was high, with 46.03% and 26.99% having to intend to have the Iranian and foreign vaccine respectively.

INTRODUCTION

The COVID-19 crisis continues to adversely influence the world that causes morbidity and mortality as well as severely disrupting societies and economies worldwide [1, 2].

There were more than 100 different COVID-19 vaccines, undergoing clinical trials or approved for use in some regions [3]. According to the successful clinical efficacy, several vaccines are currently approved or authorized for emergency usage [4-7]. Although, new variants and mutations in the Covid-19 virus decreased the clinical effectiveness of the authorized vaccines[8]. Vaccines effectively can prevent Covid-19 deaths and severe

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diseases more than other medical technology [9]. Herd immunization programs can be successful when there are high rates of acceptance and coverage [10]. In the context of vaccination, general acceptance is essential as vaccine discovery [11]; the benefits of vaccination depend on the tendency of individuals to vaccine [12]. However, anti-vaccination beliefs and conspiracy have become developed [13]. Vaccine hesitancy is one of the main threats to health in global [14].

Distrust toward vaccines is existing until now and decreased the percent of the vaccination [15, 16]. Trust in the COVID-19 vaccine is necessary because of the possibility of the new mutations and pandemic surging [17]. But, emergency vaccine development for the Covid-19 disease increased the vaccine hesitancy [12].

There are diverse reports on the rate of COVID-19 vaccine acceptance around the world. A variety of components are correlated to the trust in the COVID-19 vaccine. Sociodemographics, voting behavior, and the levels of trust in the government can affect Covid-19 vaccine acceptance [17]. WHO reported six determinants of vaccination trust: Objectivity, competence, fairness, sincerity, consistency, and faith [18]. Also, studies reported that effective, proper, more localized, specific, and relevant public education could build more confidence in the COVID-19 vaccine [19]. Lack of trust in vaccines can be influenced by the political conspiracy [20]. The most trusted sources for COVID-19 information are experts and the government [21]. It is necessary for governments and managers that first try to building the trust of the general population to the vaccination, and then trigger the vaccination. One of the main components of hesitancy and confidence for vaccine acceptance is paying attention to the effect of people's emotions. Attention to emotions can help to complement other aspects of the dissemination and education of vaccines. Such as developing credibility and trust to scientific experts and health agencies, building safety as well as high standards during the production of it, and equitable injection of it. There are some reasons for refusal or hesitancy about distrust in COVID-19 vaccination such as fear and anxiety [22]. Covid-19 pandemic imposed the most large-scale public health crisis worldwide. In addition to physical health, global psychological health is also affected by COVID-19 [23]. Some of the emotional reactions to the pandemic are anxiety, fear, anger, and that is paired whit negative attitudes and uncertainty like xenophobia and racism [24].

Also, higher vaccine hesitancy was reported in the individuals with some psychological profiles. Vaccine hesitancy correlated to motivation, beliefs, awareness, and knowledge [25]. The type of vaccine can influence the determinants [26].

For designing suitable vaccination programs, knowledge about whether or not individuals are eager to get a vaccine against COVID-19 is essential [11]. In addition to developing an approved vaccine, it is also very important that it will receive vastly or not [27].

The present study aimed to evaluate the acceptance of a COVID-19 vaccine among the general population in Iran.

MATERIALS AND METHODS

This cross-sectional study was conducted in Tehran from June 2021 and December 2021, during the COVID-19 pandemic . Data were obtained by an electronic questionnaire through professional groups of social networks (Googleform). The samples were gathered by a simplified-snowball sampling method where requested candidate members were invited to pass the requests to their WhatsApp contacts. From 2050 records participants, 1208 participants agreed to complete forms and were included in the study. The object of the sampling was to be an agent of the Iran general population according to sex, age, education, income, and ethnicity. Inclusion criteria were age over 18 years, being literate, and had a Telegram and WhatsApp account with access to the internet using a computer or smartphone.

The protocol was approved by the Institutional Review Board (IRB) of Alzahra University.

Information regarding demographic characteristics, marriage status, employment status, and monthly income in Iranian Rial, trust in government, anxiety, depression, psychological well-being, and psychological distress were collected. Moreover, participants were asked how strongly they accepted with the following statement (5-point Likert Scale: 1 = strongly disagree to 5 = strongly agree): “If a vaccine becomes available and is recommended for me, I would get it”; this variable was

dichotomized to COVID-19 vaccine acceptance (0 = strongly disagree/disagree/neutral; 1 = agree/strongly agree). Also, trust in Iranian and foreign vaccines- two questions evaluated the extent of trust in Iranian and foreign Covid-19 vaccine.

A cover letter was provided containing the objectives of the present study, expectations, confidentiality, rights, voluntary participation, anonymity, and introduction of the researcher and scale provider. All participants signed an electronic consent form, and the questionnaire answers were kept anonymous. Participants were informed that they could stop answering questionnaires at any time. The survey was notified to the general population of Tehran through professional groups of social networks (Telegram and WhatsApp).

Anxiety symptoms were evaluated by the self-rating screening tool the GAD-7 questionnaire. It is a 7-item question, ranging from 0 (not at all) to three (nearly every day). The severity of extreme anxiety disorders (generalized anxiety disorder or panic disorder) is shown based on its total score: minimal (0-4), mild (5-9), moderate (10-14), and severe (15-21) [28].

Symptoms of depression were evaluated by self-rated screening tool PHQ-9 scale. It is a 9-item question based on depression symptoms scaled from 0 (not at all) to three (nearly every day). The participants report the frequency of symptoms experienced within the last two weeks. The severity of depression is classified into minimal (0-4), mild (5-9), moderate (10-14), moderately severe (15-19), and severe (20-27) [29].

The mental health of individuals was assessed using the Mental Health Inventory (MHI-28; [30]) that is a short form of the 34-item Mental Health Scale [31]. It has 28-items that measure psychological well-being and psychological distress in a 5-Likert scale ranging from 1 (completely disagree) to 5 (completely agree).

A single item evaluated the Trust in government: “To what extent do you trust in the government for Covid-19 vaccination of the society?” The responses were in a Likert scale ranged from 1 (none) to 7 (completely).

Statistical analysis

Data were analyzed using SPSS-20 software. Frequency, percent, means, Standard Deviation were presented for data description. Chi-2 test was used for assessing the relationship between qualitative variables. T independent test was used for comparing the mean of well-being and distress according to vaccine acceptance and refusal responses. To evaluate the relationship (odds ratios) of factors with COVID-19 vaccine acceptance as a dependent variable, logistic regression models were applied. A P-value less than 0.05 was considered statistically significant.

RESULTS

Overall, from 2050 invited records, 1208 participants (completion rate: 58.9%) completed the survey. Sample characteristics are shown in Table 1. The mean age of participants was 32.80±12.37 years and 70.7% of them were female. 34.2% of the participants were between 18–24 years, and 24.1% were between 24-34 years. 56.0% of the participants were currently married. 68.7% of the samples were employed. Those with bachelor’s degrees represented 35.6% of the sample, and 23.84% had a master's degree. 26.7% of all participants earned Between 40 to 70 million Rial per month. 36.8% of participants completely trusted in government (Table 1).

Also, participants’ generalized anxiety disorder, patient health questionnaire, mental health inventory are outlined in Table 1. 11.7% and 7.2% of the participants had severe anxiety disorder and patient health disorder. The mean well-being of samples was 49.54±11.51. The mean Distress of samples was 36.39±12.66 (Table 1).

Table 1. Sociodemographic characteristics, generalized anxiety disorder, patient health questionnaire, mental health inventory.

Items	N (%)	COVID-19 Vaccine Acceptance n (%)	Iranian COVID-19 Vaccine Acceptance n (%)	Foreign COVID-19 Vaccine Acceptance n (%)
Sex				
Female	854(70.7%)	541 (63.3%)	168 (48.6%)	112 (32.4%)
Male	346(28.6%)	247 (71.4%)	385 (45.1)	213 (24.9%)
P-Value		0.008	0.274	0.009
Age				
18-24	413 (34.2%)	256 (62.0%)	174 (42.6%)	121 (29.3%)
25-34	291 (24.1%)	195 (67.0%)	139 (47.8%)	68 (23.4%)
35-44	249 (20.6%)	166 (66.7%)	111 (44.6%)	77 (30.9%)
45-54	174 (14.4%)	114 (65.5%)	84 (48.3%)	44 (24.3%)
55+	70 (5.8%)	55 (78.6%)	41 (58.3%)	15 (21.4)
P-Value		0.031	0.038	0.349
Highest education				
Finished mandatory schooling	91(7.53%)	54 (59.3%)	38 (41.8%)	25 (27.5%)
High school/Diploma	214 (17.72%)	121 (56.3%)	91 (42.5%)	44 (20.6%)
Some college	60 (4.97%)	39 (65.0%)	27 (45.0%)	14 (23.3%)
Bachelor degree	432 (35.76%)	300 (69.4%)	140 (48.6%)	122 (28.2%)
Master degree	288 (23.84%)	198 (68.8)	211 (48.8%)	79 (27.4%)
Ph.D.	123 (10.18)	80 (65.0%)	49 (39.8%)	42 (34.1%)
P-Value		0.019	0.326	0.132
Married status				
Married	676 (56.0%)	449 (66.4%)	336 (49.7%)	158 (23.4%)
Single	499 (41.3%)	323 (64.7%)	209 (41.9%)	159 (31.9%)
Widow	24 (2.0%)	16 (66.7%)	7 (29.2%)	9 (37.4%)
P-Value		0.829	0.007	0.003
Employment status				
Employed	831 (68.7%)	558 (67.1%)	395 (47.5%)	218 (26.2%)
unemployed	309 (25.5%)	187 (60.5%)	124 (40.1%)	96 (31.1%)
Retired	47 (3.8%)	36 (76.6%)	29 (61.7%)	9 (19.1%)
P-Value		0.031	0.008	0.119
Anxiety disorder				
minimal	354 (29.3%)	228 (64.4%)	184 (52.0%)	70 (19.8%)
mild	479 (39.7%)	314 (65.6%)	222 (46.3%)	127 (26.5%)
moderate	239 (19.8%)	160 (66.9%)	98 (41.0%)	81 (33.9%)
severe	136 (11.3%)	90 (66.2%)	52 (38.2%)	48 (35.3%)
P-Value		0.933	0.013	<0.001
Depression				
Minimal	409 (33.9%)	268 (65.5%)	218 (53.3%)	72 (17.6%)
Mild	387 (32.0%)	244 (63.0%)	172 (44.4%)	105 (27.1%)
Moderate	189 (15.6%)	133 (70.4%)	84 (44.4%)	65 (34.4%)
Moderately severe	136 (11.3%)	92 (67.6%)	51 (37.5%)	52 (38.2%S)
Severe	87 (7.2%)	55 (63.2%)	31 (35.6%)	32 (36.8%)
P-Value		0.479	0.002	<0.001
Monthly income (Iranian Rial)				

<10 million		199 (16.5%)	124 (62.3%)	90 (45.2%)	48 (24.1%)
10-30 million		146 (12.1%)	87 (59.6%)	61 (41.8%)	33 (22.6)
40-70 million		323 (26.7%)	215 (66.6%)	152 (47.2%)	81 (25.1%)
80-110 million		175 (14.5%)	122 (69.7%)	78 (44.6%)	62 (35.4%)
>120 million		98 (8.1%)	76 (77.6%)	52 (53.1)	38 (38.8%)
P-Value			0.028	0.501	0.004
Trust in government					
None		173 (14.3%)	123 (71.1%)	19 (11.0%)	120 (69.4%)
Very low		36 (3.0%)	21 (58.3%)	8 (22.2%)	19 (52.8%)
low		39 (3.2%)	24 (61.5%)	9 (23.1%)	20 (51.3%)
Moderate		110 (9.1%)	64 (58.2%)	36 (32.7%)	44 (40.0%)
High		136 (11.3%)	68 (50.0%)	41 (31.6%)	36 (26.5%)
Very high		268 (22.2%)	171 (63.8%)	144 (53.7%)	51 (19.0%)
Completely		445 (36.8%)	321 (72.1%)	297 (66.7)	36 (8.1%)
P-Value			<0.001	<0.001	<0.001
Mental health inventory					
Well-being		49.54±11.51	No	49.17±11.33	47.40±11.75	51.13±11.00
			Accept	49.73±11.60	52.04±10.69	45.22±11.76
P-Value			0.420	<0.001	<0.001
Distress		36.39±12.66	No	36.33±12.66	38.33±12.93	34.84±12.36
			Accept	36.42±12.68	34.12±11.96	40.59±12.55
P-Value			0.911	<0.001	<0.001

Acceptance of COVID-19 vaccine

Of the 1209 participants surveyed, 792 (66.56%) reported that they would accept a COVID-19 vaccine if it is recommended for them. Then, 46.03% and 26.99% of participants reported that they preferred an Iranian vaccine and a foreign vaccine respectively (Figure 1).

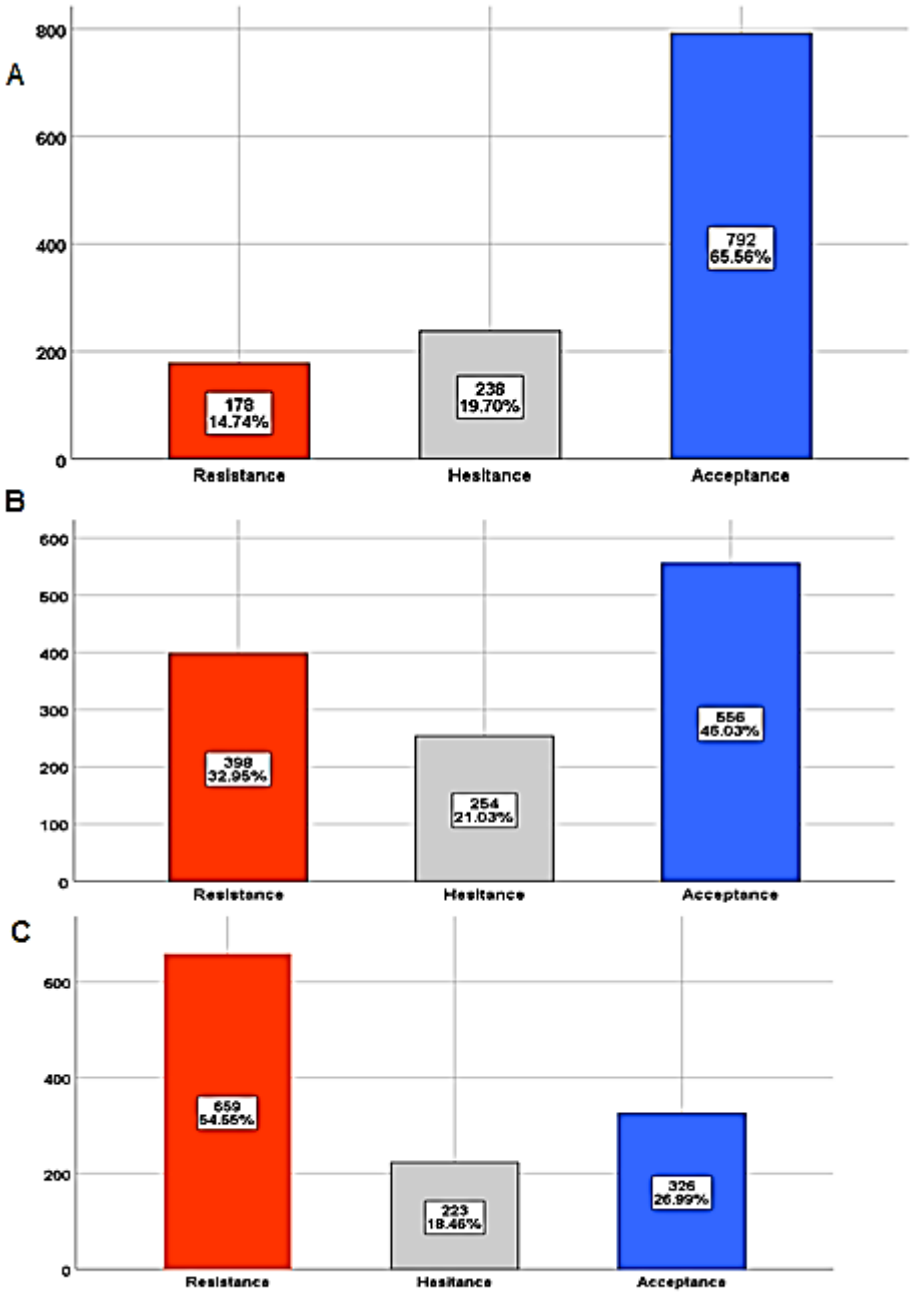

Figure 1. A) Distribution of rates of COVID-19 vaccine acceptance, hesitance, and resistance; B) Distribution of rates of Iranian COVID-19 vaccine acceptance, hesitance, and resistance; C) Distribution of rates of foreign COVID-19 vaccine acceptance, hesitance, and resistance

Male participants were more likely to accept the vaccine compared to females (71.4% vs. 63.3%), older adults (>55 years; 78.6%) compared to younger adults, retired participants (81%) compared to other participants groups, and college and/or graduate degree holders (>65%) compared to people with less than a college degree more likely to accept the vaccine, participants with more income per month (>120 million Rial) had more vaccine acceptance rate (77.6%) compared to other participants groups, participants who said that they completely trusted their government had more vaccine accept rate (72.1%) compare to others participants.

The Iranian vaccine acceptance in psychological characteristics was greater in the minimal anxiety disorder group (52.0%) compared to other participants groups, but, in those who said that they would accept a foreign COVID-19 vaccine if it is recommended for them in the severe anxiety disorder group (35.3%) was

greater compared to other participants groups. Also, the Iranian vaccine acceptance was highest in the minimal patient health group (53.3%) compared to other participants groups, but, in those who said that they would accept a foreign COVID-19 vaccine if it is recommended for them in the severe anxiety disorder group (36.8%) was greater compared to other participants groups.

The mean well-being score in the accepted Iranian vaccine was greater than those who refused it (P<0.001), but, and the mean well-being score in the accepted foreign vaccine were less than those who refused it (P<0.001). The mean distress score in accepted Iranian vaccine was less than those who refused it (P<0.001), but, and the mean distress score in the accepted foreign vaccine were higher than those who refused it (P<0.001).

Additional investigation by multiple logistic regression was accomplished to determine predictors of COVID-19 vaccine acceptance among participants. Table 2-4 summarizes the results for the logistic regressions. The regression model was completely described between 7% (Cox and Snell R Square) and 9.7% (Nagelkerke R Square) of variance in COVID-19 vaccine acceptance and correctly classified 70.0% of the samples.

As revealed in Table 2, only five variables made a statistically significant impact on the model. The strongest predictor of COVID-19 vaccine acceptance was trust in government, income, gender, well-being, and education.

The regression model for as a complete described between 20% (Cox and Snell R Square) and 27% (Nagelkerke R Square) of variance in Iranian COVID-19 vaccine acceptance and correctly classified 68.9% of the samples.

Table 2. Logistic regression outputs for vaccine acceptability and demographics and phycology characteristics.

	Items	B	S.E.	Wald	P-value	Exp (B)	95% C.I. for EXP(B)	
							Lower	Upper
	Gender	.407	.163	6.184	0.013	1.502	1.090	2.069
	Age			1.583	0.812			
	18-24	-.290	.452	.413	0.521	.748	.308	1.814
	25-34	-.334	.420	.631	0.427	.716	.314	1.632
	35-44	-.464	.411	1.278	0.258	.629	.281	1.406
	45-54	-.420	.407	1.064	0.302	.657	.296	1.459
	Married status			.801	0.670			
	Single	.155	.221	.497	0.481	1.168	.758	1.800
	Widow	.320	.514	.387	0.534	1.377	.503	3.767
	Education			12.30	0.031			
	Finished mandatory schooling	0.017	0.481	0.001	0.971	1.017	0.396	2.610
	High school/Diploma	-.124	.380	.106	0.745	.884	.420	1.860
Vaccine	Some college	.582	.346	2.82	.093	1.789	.907	3.528
	Bachelor degree	.343	.355	.933	.334	1.409	.703	2.826
	Master degree	.020	.392	.003	.958	1.021	.474	2.199
	Job			2.25	.323			
	unemployed	-.312	.240	1.693	.193	0.732	0.457	1.171
	Retired	.337	.461	.534	.465	1.401	.567	3.461
	Income Level			11.89	0.018			
	10-30 million	-.462	.261	3.121	.077	.630	.378	1.052
	40-70 million	.066	.228	.083	.773	1.068	.683	1.668
	80-110 million	.079	.266	.088	.766	1.082	.642	1.824
	>120 million	0.661	0.327	4.07	.043	1.936	1.019	3.678
	Trust In Government			18.56	.005			
	None	.079	.262	.091	.763	1.082	.648	1.808

Very low	-.456	.413	1.217	.270	.634	.282	1.425
low	-.522	.417	1.563	.211	.594	.262	1.345
Moderate	-.366	.272	1.802	.179	.694	.407	1.183
High	-.920	.240	14.66	<0.001	.398	.249	.638
Very high	-.355	.195	3.30	.069	.701	.478	1.028
Anxiety			1.006	.800			
minimal	-.340	.373	.831	.362	.712	.343	1.478
mild	-.329	.331	.987	.320	.720	.376	1.377
moderate	-.233	.313	.55	.456	.792	.429	1.462
Patient Health			3.89	.420			
minimal	-.296	.439	.455	.500	.744	.315	1.758
mild	-.275	.392	.491	.483	.760	.353	1.637
moderate	.172	.384	.202	.653	1.188	.560	2.522
moderately severe	.105	.375	.078	.780	1.111	.532	2.318
Well-being	.025	.011	5.22	.022	1.025	1.004	1.048
Distress	.011	.011	.927	.336	1.011	.989	1.033
Constant	-.733	.852	.740	.390	.481		

Table 3. Logistic regression outputs for Iranian vaccine acceptability and demographics and phycology characteristics

Items		B	S.E.	Wald	Sig.	Exp(B)	95% C.I.for EXP(B)	
							Lower	Upper
	Gender	.284	.165	2.944	.086	1.328	.960	1.837
	Age			3.534	.473			
	18-24	.327	.438	.556	.456	1.386	.587	3.272
	25-34	-.013	.403	.001	.974	.987	.448	2.175
	35-44	-.206	.394	.273	.602	.814	.376	1.762
	45-54	.025	.390	.004	.949	1.025	.478	2.200
	Married status			.989	.610			
	Single	.063	.228	.076	.782	1.065	.682	1.664
	Widow	-.537	.575	.871	.351	.585	.189	1.805
	Education			14.916	0.011			
	Finished mandatory schooling	.038	.497	.006	.939	1.038	.392	2.751
	High school/Diploma	.404	.397	1.035	.309	1.497	.688	3.259
Iranian Vaccine	Some college	0.755	0.358	4.460	0.035	2.128	1.056	4.288
	Bachelor degree	.528	.366	2.073	.150	1.695	.827	3.475
	Master degree	-.131	.406	.104	.747	.877	.395	1.946
	Job			3.265	.195			
	unemployed	-.310	.249	1.550	.213	.733	.450	1.195
	Retired	.559	.437	1.635	.201	1.749	.742	4.118
	Income Level			8.796	.066			
	10-30 million	-.241	.273	.781	.377	.786	.460	1.341
	40-70 million	.065	.231	.078	.780	1.067	.678	1.679
	80-110 million	.196	.272	.516	.473	1.216	.713	2.073
	>120 million	.707	.317	4.957	.026	2.028	1.088	3.777
	Trust In Government			111.34	<0.001			
	None	-2.822	0.327	74.46	<0.001	0.059	0.031	.113

	Very low	-1.821	0.448	16.51	<0.001	0.162	0.067	.389
	low	-2.590	0.566	20.89	<0.001	0.075	0.025	.228
	Moderate	-1.183	0.272	18.92	<0.001	0.306	0.180	.522
	High	-1.507	0.250	36.31	<0.001	0.222	0.136	.362
	Very high	-.567	0.188	9.068	<0.001	0.567	0.392	.821
	Anxiety			.349	.951			
	minimal	-.073	.377	.037	.847	.930	.445	1.945
	mild	-.146	.336	.188	.665	.865	.448	1.670
	moderate	-.144	.319	.203	.652	.866	.464	1.617
	Patient Health			1.291	.863			
	minimal	-.128	.458	.078	.780	.880	.359	2.158
	mild	-.171	.412	.172	.678	.843	.376	1.890
	moderate	.111	.398	.078	.780	1.118	.513	2.437
	moderately severe	-.074	.403	.033	.855	.929	.421	2.047
	Well-being	.024	.012	4.110	.043	1.024	1.001	1.047
	Distress	.002	.012	.038	.846	1.002	.979	1.026
	Constant	-2.168	.931	5.419	.020	.114		

As revealed in Table 3, only four variables made a statistically significant impact on the model. The strongest predictors of Iranian COVID-19 vaccine acceptance were "trust in government", income, well-being, and education.

The regression model for as a complete described between 26% (Cox and Snell R Square) and 38% (Nagelkerke R Square) of variance in Iranian COVID-19 vaccine acceptance and correctly classified 80.0% of the samples.

As revealed in Table 4, only three variables made a statistically significant impact on the model. The strongest predictors of Iranian COVID-19 vaccine acceptance were trust in government, gender and education.

Table 4. Logistic regression outputs for foreign vaccine acceptability and demographics and phycology characteristics

	Items	**B**	**S.E.**	**Wald**	**Sig.**	**Exp(B)**	**95% C.I. for EXP(B)**	
							Lower	**Upper**
	Gender	0.470	0.191	6.047	0.014	1.600	1.100	2.328
	Age			1.938	.747			
	18-24	-.017	.547	.001	.975	.983	.336	2.871
	25-34	-.074	.500	.022	.882	.928	.349	2.472
	35-44	.200	.479	.174	.676	1.221	.478	3.121
	45-54	-.170	.478	.126	.723	.844	.331	2.156
	Married status			1.806	.405			
	Single	.121	.274	.195	.659	1.128	.660	1.929
Foreign Vaccine	Widow	.789	.603	1.713	.191	2.200	.675	7.167
	Education			13.662	.018			
	Finished mandatory schooling	.457	.606	.570	.450	1.579	.482	5.176
	High school/Diploma	-.736	.525	1.970	.160	.479	.171	1.339
	Some college	.232	.457	.259	.611	1.261	.515	3.086
	Bachelor degree	.174	.469	.137	.711	1.190	.474	2.985
	Master degree	.653	.502	1.692	.193	1.921	.718	5.140
	Job			.523	.770			
	unemployed	.120	.288	.173	.677	1.127	.641	1.981

Retired	-.315	.537	.343	.558	.730	.255	2.092
Income Level			7.002	.136			
10-30 million	-.503	.343	2.149	.143	.605	.308	1.185
40-70 million	.013	.284	.002	.963	1.013	.580	1.770
80-110 million	.185	.320	.335	.563	1.204	.643	2.255
>120 million	.467	.367	1.626	.202	1.596	.778	3.274
Trust In Government			134.375	<0.001			
None	3.396	.319	113.087	<0.001	29.845	15.960	55.809
Very low	2.858	.451	40.171	<0.001	17.434	7.203	42.198
low	2.951	.466	40.149	<0.001	19.121	7.676	47.634
Moderate	2.230	.332	45.076	<0.001	9.298	4.849	17.826
High	1.693	.321	27.815	<0.001	5.433	2.897	10.191
Very high	1.228	.282	19.012	<0.001	3.413	1.966	5.927
Anxiety			1.100	0.777			
minimal	-.427	.436	.958	0.328	.652	.277	1.535
mild	-.340	.372	.835	0.361	.712	.344	1.475
moderate	-.172	.342	.253	0.615	.842	.431	1.646
Patient Health			2.383	0.666			
minimal	-.637	.518	1.511	0.219	0.529	0.191	1.461
mild	-.354	.454	.606	0.436	0.702	0.288	1.710
moderate	-.249	.431	.335	0.563	0.779	0.335	1.813
moderately severe	-.050	.420	.014	0.904	0.951	0.417	2.167
Well-being	.003	.013	.053	.817	1.003	0.978	1.029
Distress	.008	.013	.391	.532	1.008	0.982	1.035
Constant	-.617	1.003	0.379	0.538	0.540		

DISCUSSION

The results of the present study showed that a majority of participants (66.56%) from across Tehran would like to accept a COVID-19 vaccine; however, this level of acceptance may not be adequate based on some of the estimates COVID-19 herd immunity. The herd immunity point for COVID-19 is evaluated to be between 55% and 82% [32]. Actual complete vaccination until February 2022 was 65% in Iran. The current estimation is very close to the real condition. However, acceptance was high, with 46.03% and 26.99% having to intend to have the Iranian and foreign vaccine respectively. There are several COVID-19 vaccines to achieve herd immunity through substantial vaccination, the acceptance and hesitancy of a COVID-19 vaccine must comprehend to improve evidence-based interventions. This will permit health administrators to progress messaging to best address concerns and inform all people.

There are diverse reports on the rate of COVID-19 vaccine acceptance around the world. One study in seven European nations reported that the resistance or hesitancy to the COVID-19 vaccine was 26% [11], and delay in vaccination and refusal it is contributing to decreasing immunization rates [33]. In a study in Germany, 64.5% were reported that they will accept the COVID-19 vaccine, 13.8% reported will rather accept it, 10.4% reported they have no decision, and 5.2% reported they will rather not, and 6% reported they absolutely will not get the vaccine [34]. Vaccine hesitancy percent in Ireland and the United Kingdom were 35% and 31% respectively [16]. Only 36.1% of Australians declared that they were likely to get the COVID-19 vaccine [17]. Also, a noticeable percentage of the United States general population showed refuse or be unsure about getting the COVID-19 vaccine, and the hesitancy percent was 33% [35]. In another study, 69% of the United States population were eager to get a COVID-19 vaccine [36]. In Arab countries, the rate of acceptance of vaccines was 62.4% [37]. The largest survey in South Africa on

individual's willingness to get a COVID-19 vaccine showed that 67% of people will take a vaccine, 18% will not take the vaccine, and 15% had no decision about the vaccine [38]. An international study showed that the percent of vaccine acceptance was 76.4% (for 90% vaccine effectiveness) to 88.8% (for 95% vaccine effectiveness) [39]. Another global survey study reported that the potential acceptance of the COVID-19 vaccine was well (55-89%) [40]. The vaccine acceptance rate in the different regions was almost similar. A high acceptance rate in a community suggests vaccination can be effective and successful; however, recognizing factors in hesitant people is a priority for developing interventions. Demographic variables have been studied in the present study due to their undeniable effects on vaccine trust. The results of the current study showed that COVID-19 vaccine acceptance can be predicted with relatively high accuracy by readily available demographic characteristics. The acceptance rate increased with age and education level, and male sex. It increased with financial income, and among retired and employed participants. Clinical and scientific evidence was most accepted, with sociodemographic differences for different sources. According to some studies, demographic variables affect the degree of trust in the vaccine. Compared to participants accepting of a COVID-19 vaccine, females were more expected to be vaccine-hesitant, a finding consistent with several studies identifying sex-related differences in vaccine acceptance [17, 37, 39, 41, 42]. Consistent with previous studies, reluctance to vaccinate is higher between low age [17, 38, 41, 42]. The vaccine hesitancy was higher between lower-income people in another study [16].

The present study showed that the acceptance of the Covid-19 vaccine and Iranian Covid-19 vaccine increased among those with the highest trust in government. But, between those who did not trust in the government, the foreign Covid-19 vaccine was more acceptable.

Political dependency can have an impact on trust in the vaccine [43]. Lack of trust in vaccines influenced by the political conspiracy [20]. Disillusionment with authorities is a strong predictor of attitudes about the vaccine [44]. Great trust in government sources of information about COVID-19 is correlated to obedience in social distancing and exact COVID-19 knowledge [45]. The information coming from political officials has an impact on responses to orders of government [46]. There was a strong correlation between distrust in authorities and distrust in the vaccine [17]. Having higher conspiracy beliefs is associated to lower adherence to containment-related behavior via a reduced political trust [47].

In the results of the current study, the well-being score was higher in those who had vaccine acceptance. One of the essential components of the hesitancy and trust in the vaccine is the function of emotions such as anger, fear, and happiness. Attention to emotions can help to complement other important aspects of the dissemination and education of vaccines. There are some reasons for refusal or hesitancy in COVID-19 vaccination such as fear and anxiety [16, 22, 34, 39, 48, 49].

The current results about Iranian Covid-19 are consist with vaccine hesitancy is higher in people that are suffering from depression and anxiety [50]. Poor health behaviors, depression, stress, and loneliness can weaken the immune system's response to the vaccine [51]. Generally, given that investigating the psychological stems of vaccine hesitancy is very important for reaching large vaccination rates [52], researching how various ideological groups behave in contact to disease threat is very important for both practical and theoretical reasons, and there are few guiding theories about the interface of disease outbreaks and ideology [53], understanding the ways to can have effective orders for peoples is important for governments [46]. A study showed that social and religious leaders can pose as agents of transformation [54].

In the current study, trust in an Iranian Covid-19 vaccine was higher than a foreign vaccine. Community leaders' views on vaccination can influence people's opinions [55]. Leaders can change people's opinions. One of the important ways for increasing the acceptance of vaccines is the engagement of religious leaders [56]. The frequent and early engagement of community and religious leaders is the key to the readiness of the COVID-19 vaccine. Authorities that voluntarily get the COVID1-19 vaccine increase the trust level among the general population [57]. On June 25, 2021, the Supreme Leader of Iran, Ayatollah Khamenei has received the first

vaccine dose of COVID-19. The Vaccine was produced by Iranian Scientists inside Iran (COV-Iran Barekat vaccine). He also stated that he did not want to use the foreign vaccine and preferred to wait for the Iranian vaccine to be made to use.

Many studies suggest that the political attitudes affect apolitical outcomes [58], but the knowledge about it is few [59], and the findings of the vaccine hesitancy in Western countries may be different from non-Western countries [16].

The outcomes of the current study have implications for the vaccination programs. Subgroups were identified that are more possible to refuse or delay vaccination, thus improving the importance of providing details that the people perceive as obvious and comprehensible by various channels. Vaccine acceptance and hesitancy should be regularly surveyed and assessed to change strategies as considered essential. Targeted data should be discharged by trusted individuals, which may vary according to the subgroup.

It is necessary for governments and managers that first try to building the trust of the general population to the vaccination, and then starting the mandatory vaccination. Two strategies for building public trust in vaccination are educational programs that are localized and a modelling system that pre-figures honesty. The said steps can somehow increase authorities' strategic communication actions in building public trust that is important in facilitating vaccination against COVID-19 [57]. More studies are required to better understand the cultural and spiritual factors contributing to the variations in willingness to COVID-19 vaccines [12].

Strengths and limitations

Strengths include the large probability-based representative sample in Iran. The research has limitations. The study cannot infer causality due to the cross-sectional study type; however, the study included variables likely to be necessary for vaccine trust. A study may reach different outcomes when COVID-19 cases and mortality rate are low, and without lockdown, might yield different results. The study did not include participants who are institutionalized (e.g. prisoners), prominently tough to access (e.g. homeless), or those illiterate; specific studies are required for these people. The study examined vaccination trust. Actual uptake may be different, however, it is possible that representatives correlated with trust will affect uptake. We used the WhatsApp platform, and so it may miss people from lower socioeconomic classes such as farmers, those with lower educational attainment, and those who were illiterate. But, according to IndexMundi, the literacy rate of adults in Iran (aged 15 and above) was 85.5%.

CONCLUSIONS

COVID-19 vaccination acceptance is high in Iran and also, trust in an Iranian Covid-19 vaccine is higher than a foreign vaccine. The people with the most trust in government, high income, male gender, high well-being, and education have more acceptance of the Covid-19 vaccine. The strongest predictors of Iranian COVID-19 vaccine acceptance were "trust in government", income, well-being, and education. The strongest predictors of Iranian COVID-19 vaccine acceptance were "trust in government", gender and education.

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Conflict of interests

There is no conflict of interest in this research.

ETHICAL CONSIDERATION

This research has succeeded in obtaining the code of ethics from the Islamic Azad University of Tehran West Branch with IR.IAU.WT.REC.1402.006 ID.

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