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Systematic Review (Pages: 73-86)

Refusing or Accepting the COVID -19 Vaccine in Iranian Society: A Systematic Review

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Abstract

Background: The successful implementation of the COVID-19 vaccination program depends not only on the efficiency and effectiveness of the vaccine but also on public trust and acceptance among the target population. This study aims to review the factors associated with the acceptance and refusal of COVID-19 vaccination in Iranian society.

Materials and Methods: In this systematic review, the online databases Medline, EMBASE, CINAHL, Web of Science, Scopus, and the WHO database were searched for studies on the acceptance and refusal of the COVID-19 vaccine and related factors from December 1, 2019, through January 1, 2023. Two authors independently undertook the screening selection, data extraction, and quality assessment using the STROBE scale.

Results: The acceptance rate for the COVID-19 vaccine ranged from 64.2% to 83.6%. Various determinants influenced the refusal of the COVID-19 vaccine at individual, socio-cultural, and legal-managerial levels. Individual factors included fear of short-term side effects, personality traits, and distrust of vaccines and pharmaceutical companies. Socio-cultural determinants encompassed conspiracy theories, social learning, misconceptions about COVID-19, and fatalism. Legal-managerial factors involved incomplete information, difficult and irregular access to vaccination centers, a lack of restrictions or mandates for vaccination, and insufficient incentives to receive the vaccine. Additionally, higher education levels, older age, male gender, marital status, having chronic diseases or a history of severe COVID-19 infection, as well as respect for the rights of others, were associated with better acceptance of vaccination ($p < 0.05$).

Conclusion: Removing barriers to vaccination related to individual, social, legal-managerial, and vaccination factors, as well as informing people about its benefits, should be a priority for health providers. Factors such as older age, gender, marital status, education level, and comorbidities were associated with higher vaccine acceptance among individuals.

Key Words: Acceptance, COVID-19, Iran, Refusal, Related factors.

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1- INTRODUCTION

Vaccines are among the most successful and cost-effective public health tools, having significantly contributed to the elimination and control of several serious diseases over the last century. During the COVID-19 pandemic, effective vaccination is essential, in addition to public health measures such as social distancing, wearing masks, hand washing, avoiding crowded indoor spaces, and educating the general population, to reduce disease spread and mortality (1-5). The successful implementation of the vaccination program against coronavirus cannot be ensured solely by the efficiency and effectiveness of the vaccine. In addition to a coherent and robust health system, there is an urgent need for public trust and acceptance within the target community regarding the vaccine (6, 7).

Despite the safety and effectiveness of immunization measures, vaccine hesitancy has emerged as a global issue and was identified by the World Health Organization (WHO) as one of the top 10 threats to global health in 2019 (8). Vaccine hesitancy is defined as the delay in accepting or refusing vaccination despite the availability of an effective and safe vaccine (9). Therefore, achieving collective immunity requires widespread acceptance of the vaccine among the general public. In other words, vaccine hesitancy worldwide is one of the primary obstacles to controlling the pandemic (1, 10). Studies show that vaccine hesitancy is influenced by many factors, including a lack of confidence and trust in vaccines (11, 12).

Vaccine refusal due to health and safety concerns is not a recent phenomenon, and it is particularly pronounced in the case of new vaccines (13). According to a global report from 2017, vaccine hesitancy exists in most countries (14). A study found that factors such as the fear of transmitting the disease to relatives, concerns about long-term side effects, and the presence of depressive symptoms significantly affect individuals' willingness to accept the vaccine (15). The general consensus indicates that immunizing a large percentage of the population is essential, and vaccination is one of the best and safest tools to achieve widespread immunity in a short period (16). Immunity can be achieved by vaccinating 50% to 67% of the population (17). Several factors influence people’s willingness to be vaccinated (11, 18), and these factors are nearly as important as the discovery of the vaccine itself (10). Therefore, it is crucial to identify and assess the factors affecting acceptance of the COVID-19 vaccination in order to remove obstacles to vaccination among different segments of society.

Examining the impact of community preferences on vaccination can help health providers develop strategies for vaccine approval, create incentives for vaccination, and inform the population to encourage uptake, ultimately achieving collective safety in society. While some original studies on vaccine acceptability have measured public perception toward vaccination in Iran, there are currently no systematic reviews available that summarize the findings in detail across different regions. The present study aimed to systematically review the factors associated with COVID-19 vaccination acceptance and refusal rates in Iranian society.

2- MATERIALS AND METHODS

The Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) statement was used as the template for this review (19).

2-1. Eligibility criteria

The Participants, Interventions, Comparators, and Outcomes (PICO) framework was used to formulate the review objective and inclusion criteria.

2-1-1. Participants: General Iranian population.

2-1-2. Interventions*:* The included studies were non-interventional; therefore, there was no intervention group.

2-1-3. Comparison: The study did not include a comparison group.

2-1-4. Outcome: COVID-19 vaccination acceptance and refusal rates.

2-2. Included studies: The review included studies of any form—quantitative, qualitative, or mixed—that assessed the reasons for and rates of COVID-19 vaccination acceptance and refusal in Iranian society. These studies were published up to January 2023 and were written in either English or Persian.

2-3. Exclusion criteria: The exclusion criteria included abstracts without full articles, articles not written in English or Persian, review articles, systematic reviews and meta-analyses, letters to the editor, editorials, short reports, commentaries, and case reports.

2-4. Study selection

A database search was conducted to identify suitable studies. The abstracts of the studies were screened to determine eligibility, full-text articles were obtained and assessed, and a final list of eligible studies was compiled. This process was carried out independently and in duplicate by two reviewers, with any disagreements resolved by a third reviewer. References were organized and managed using EndNote software (version X8).

2-5. Information sources

A systematic search of electronic databases, including Medline (via PubMed), EMBASE, CINAHL, Web of Science, Scopus, and the WHO database, as well as the Google Scholar search engine, was conducted for studies on the acceptance and refusal of the COVID-19 vaccine and related factors from December 1, 2019, through January 1, 2023. The search was performed independently and in duplicate by two reviewers, with any disagreements resolved by the supervisor.

2-6. Search

Search terms were combined using appropriate Boolean operators and included subject heading terms with the following keywords, either alone or in combination: “Corona” or “Coronavirus,” “COVID-19,” “Factors Associated,” “Vaccine,” “Vaccination,” “Acceptance,” “Refusal,” and “Rejection.”

2-7. Data items

A data collection form was designed and utilized by two independent authors. The data collected from the selected studies included the authors' names, date of the survey, study type, target population, settings, sample size, and main findings.

2-8. Risk of bias in individual studies

The risk of bias was assessed using the standard STROBE (STrengthening the Reporting of Observational Studies in Epidemiology) guidelines (20). STROBE is a valuable tool for evaluating the quality of observational studies. This checklist consists of 22 items, scored based on the importance of each item as determined by the present study. The maximum score for the checklist was 30, while the minimum score was 15. The assessment was conducted independently and in duplicate by two reviewers, with any discrepancies resolved by a third reviewer.

2-9. Synthesis of results

Due to differences in the included studies, such as study designs, sample sizes, and age groups, a meta-analysis was not conducted. The studies were summarized in a narrative format, providing an overview of their methods and main findings.

2-10. Ethical considerations

Approval from a research ethics committee was not necessary, as the study analyzed only publicly available articles. The research adhered to ethical standards by respecting copyright laws and ensuring transparency in methods and sources.

3- RESULTS

Finally, 14 relevant studies, including a total of 43,079 individuals, were selected (**Figure 1**). All included studies met acceptable quality standards based on the STROBE scale. The main characteristics of the selected studies are summarized in **Table 1** and the following sections:

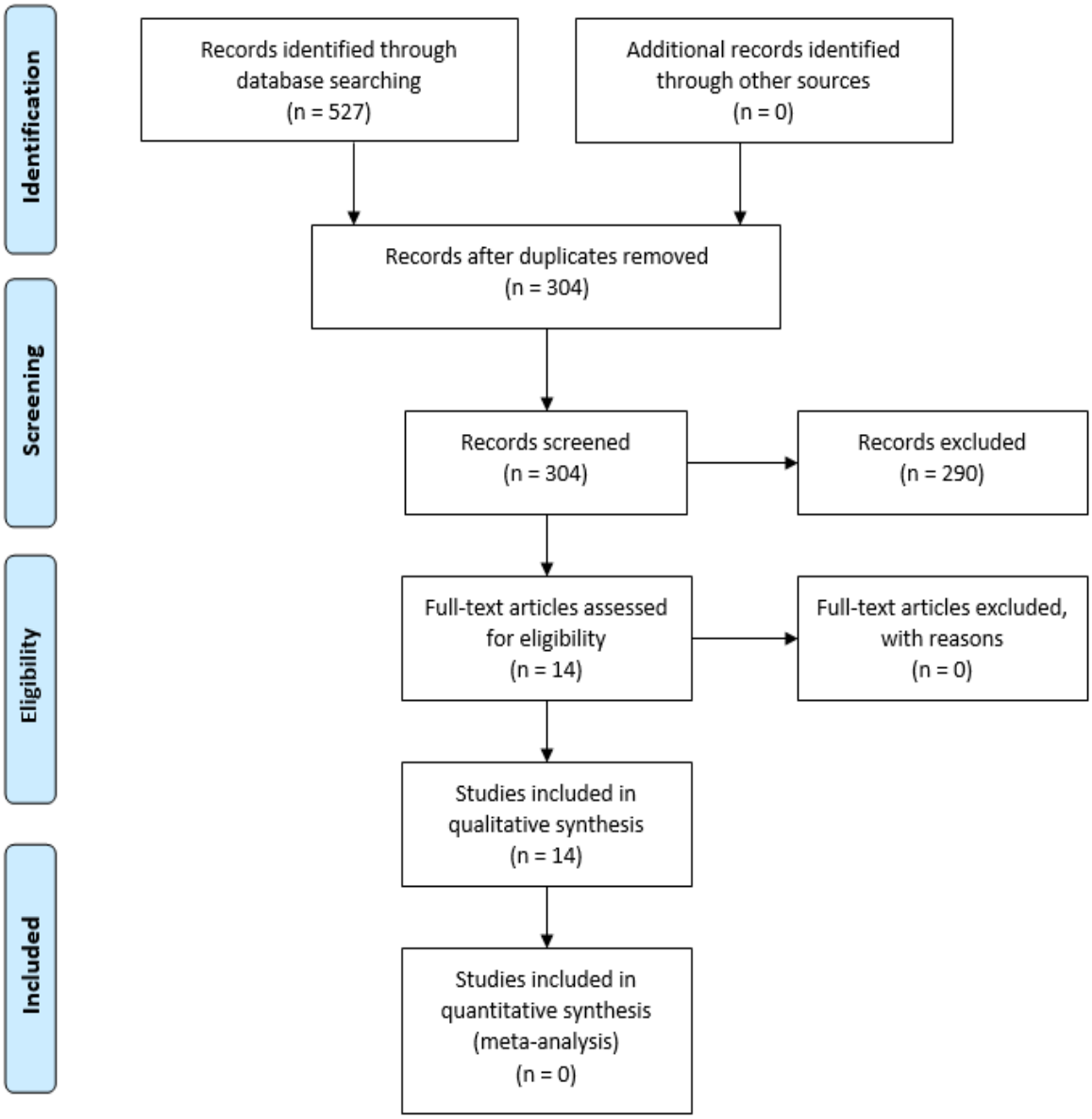

Fig.1: PRISMA flowchart.

1. A phenomenological qualitative web-based study aimed to explore the reasons why people refuse to receive the COVID-19 vaccine despite its availability. The findings identified six main themes: ambiguity, ineffectiveness, mistrust, advertising, fear, and needlessness (21).

2. A cross-sectional study in Bushehr province aimed to determine the role of trust in receiving or refusing the COVID-19 vaccine. The results showed a mean trust score of 3.34 ± 1.08 for vaccine products, 3.12 ± 0.29 for vaccine manufacturers, 3.24 ± 0.38 for government and health officials, and an overall trust score of 3.23 ± 0.48. This indicates that confidence in vaccination was higher than average. Among the respondents, 36% had low trust, while 64% had high trust. A significant relationship between trust and its dimensions with vaccine acceptance or refusal was confirmed ($p < 0.05$) (1).

3. A cross-sectional study in Bushehr province aimed to determine the factors affecting vaccine acceptance based on the Behavioral Change Wheel model and its components: capability, opportunity, and motivation. The results showed that most participants were inclined to receive the Iranian vaccine (65.9%). Among the demographic factors, only gender was associated with vaccination, with men being more likely to accept vaccination ($p = 0.022$). Among the model constructs, the opportunity construct had the greatest impact on vaccine acceptance. This suggests that acceptance of the COVID-19 vaccination can be increased by providing opportunities through social support, behavioral regulation, and assigning a social role to vaccination (22).

4. A cross-sectional study aimed to investigate the factors affecting the acceptance of the COVID-19 vaccine in the general population of Qazvin province. The results indicated that most participants expressed a desire to receive the Iranian vaccine, while 19.4% stated they would not accept any vaccine. Men, individuals with university education, rural residents, and married people were more likely to receive the COVID-19 vaccine. Among those who did not wish to receive the vaccine, 21.1% cited concerns regarding the financing of the vaccine as their reason (23).

5. A mixed-method study in Tehran aimed to investigate the factors influencing acceptance of the COVID-19 vaccine and the associated challenges. The results indicated that the most significant challenges, as perceived by different population groups, included low social trust, a lack of confidence in the effectiveness and composition of the vaccine, a perceived lack of necessity for vaccination, doubts about the fairness of vaccine distribution, disbelief in the existence of the disease, challenges related to access to an effective and acceptable vaccine, and the influence of non-specialists. Overall, 83.6% of participants expressed a willingness to receive the vaccine; among them, 58.3% preferred a foreign vaccine, 25.4% preferred an Iranian vaccine, and 9.6% were open to both types. The assessment of determinants affecting willingness to receive the COVID-19 vaccine revealed that individuals over 60 years of age were 1.7 times more likely to get vaccinated, while single individuals were 46% less willing to receive the vaccine compared to married individuals (24).

6. A population-based cross-sectional study in Tehran and Kermanshah aimed to estimate the acceptance of the COVID-19 vaccine and its related factors. The results indicated that the COVID-19 vaccine acceptance rate was 66.47%. Moreover, 86.02% of the participants stated that they would accept any type of vaccine (Iranian or foreign) approved by the Iranian Ministry of Health. However, 13.98% of the participants expressed a preference for

only foreign-approved vaccines, if available. The variables of age, fatalism, and socioeconomic status were significantly associated with COVID-19 vaccine acceptance (9).

7. A descriptive-analytical study aimed to assess the determinants of COVID-19 vaccine acceptance in Gonabad. The results indicated that the two most important factors for accepting the vaccine were living with individuals at risk (88.5%) and respecting the rights of others (80.9%). However, concerns about the side effects of the vaccine (63%), worries regarding the vaccine's content, and a lack of knowledge about its effectiveness (45.3%) were the primary reasons for not accepting the COVID-19 vaccination (25).

8. A cross-sectional study involving 1,564 individuals aged 18 and older aimed to determine the acceptance rate of COVID-19 vaccination in the Iranian population and the factors influencing it. The results showed that 70% of participants reported accepting vaccines. Ten percent of respondents were opposed to vaccination, while 20% were hesitant to get vaccinated. Risk perception ($p = 0.003$), knowledge of the disease ($p < 0.001$), trust in the health system ($p < 0.001$), attitude towards vaccination ($p < 0.001$), and vaccination literacy ($p < 0.001$) were identified as predictors of vaccine acceptance. Individuals with higher levels of education and those who mistrusted the health system exhibited a lower acceptance rate for vaccination. The study concluded that the vaccine acceptance rate in the Iranian population is 70% (26).

9. A cross-sectional study aimed to evaluate the reasons for vaccination refusal in Ahvaz, Iran. The results showed that lower levels of education and older age contributed to reluctance toward vaccination, while having chronic diseases or a history of severe COVID-19 infection were associated with higher vaccination acceptance. Mistrust in existing vaccines in Iran and the rejection of vaccination were among the top reasons for vaccine refusal (27).

10. A web-based cross-sectional study utilizing a mixed qualitative-quantitative approach aimed to assess the attitudes and confidence of the Iranian population regarding the COVID-19 vaccine, as well as their reasons for accepting or rejecting vaccination. The results indicated that 69% of participants were willing to receive the COVID-19 vaccine. Factors associated with a more negative attitude toward the vaccine included being female, having lower educational levels, following COVID-19 news through sources other than websites and social media, not keeping up with COVID-19 news, and experiencing the loss of a first-degree relative due to COVID-19 ($p < 0.01$) (28).

11. A web-based cross-sectional study aimed to assess the rate of COVID-19 vaccination acceptance among Iranians and identify factors associated with their willingness to vaccinate. The results showed that 64.2% of individuals intended to receive the COVID-19 vaccination. The adjusted odds ratio (aOR) for COVID-19 vaccination intent was higher for individuals with greater exposure to social norms supporting vaccination and higher perceived benefits. Conversely, the adjusted odds of vaccination intent were lower among individuals with greater concerns about COVID-19 vaccine safety. Lower vaccination intent was also associated with increasing age, female sex, and working in healthcare (29).

12. A cross-sectional study in Bushehr province aimed to determine the role of vaccine literacy and hesitancy in the acceptance of the COVID-19 vaccine. The results showed that 64.6% of participants wanted to receive the vaccine. The mean and standard deviation of vaccine hesitancy were 14.9 ± 4.2. It was found

that most vaccine recipients were men (p = 0.013), had higher education levels (p = 0.009), and were either divorced or single individuals (p = 0.044). Age was significantly related to vaccine acceptance (p < 0.001). Critical literacy, attitudes toward vaccines, and vaccine hesitancy were significantly associated with vaccine acceptance (p < 0.001). Based on the logistic regression model, factors such as attitude toward the vaccine (p < 0.001), vaccine hesitancy (p < 0.001), age (p = 0.030), and marital status (p = 0.007) were identified as predictors of vaccine acceptance. Additionally, married individuals had a lower likelihood of accepting the vaccine compared to singles (30).

13. A cross-sectional study aimed to predict the intention to receive the COVID-19 vaccine in four southern provinces of Iran (Hormozgan, Kerman, Bushehr, and Fars). The results showed that 78% of participants were willing to receive the vaccine. Attitude, subjective norms, and the use of social media were significant predictors of the intention to receive the COVID-19 vaccine, with attitude demonstrating the strongest predictive power. This suggests that the Theory of Reasoned Action could effectively predict intentions regarding COVID-19 vaccination, as both attitudes and subjective norms significantly influenced vaccine acceptance (31).

14. In a qualitative study using conventional content analysis in Urmia, determinants of COVID-19 vaccine refusal were identified across three domains: individual factors (fear of short-term side effects, personality traits, distrust of vaccines/pharmaceutical companies), socio-cultural factors (conspiracy theories, social learning, COVID-19 misconceptions, fatalism), and legal-managerial factors (incomplete information, irregular access to vaccination centers, lack of restrictions/incentives, perceived coercion) (32).

Tabale-1: The general characteristics of included studies (n=14).

Authors (Reference)	Date	Study Type	Setting	Population	Sample Size	Main Findings
Sameni Toosarvandani et al. (21)	2022	Phenomenological qualitative	Iran	18-55 years	35	6 themes of refusal: ambiguity, ineffectiveness, mistrust, advertising, fear, needlessness
Hatami et al. (1)	2021	Cross-sectional	Bushehr	>18 years	384	Trust scores: products (3.34±1.08), manufacturers (3.12±0.29), officials (3.24±0.38), overall (3.23±0.48)
Keshmiri et al. (22)	2021	Cross-sectional	Bushehr	>18 years	1,102	65.9% preferred Iranian vaccine
Qazvin Univ. Med. Sci. (23)	2021	Cross-sectional	Qazvin	>18 years	10,843	Higher acceptance: men, university-educated, rural, married
Farrokhi et al. (24)	2022	Mixed-methods	Tehran	>18 years	1,200	83.6% willing; preference: foreign (58.3%), Iranian (25.4%), either (9.6%)
Salimi et al. (9)	2021	Cross-sectional	Tehran/ Kermanshah	>18 years	850	66.5% acceptance; key factors: risk-group cohabitation (88.5%), others' rights (80.9%)
Pourshahri et al. (25)	2021	Descriptive-analytical	Gonabad	>18 years	292	Acceptance facilitators: risk-group cohabitation

						(88.5%), others' rights (80.9%); refusal: side effects (63%), content concerns (45.3%)
Omidvar et al. (26)	2021	Cross-sectional	Iran	>18 years	1,564	70% acceptance; lower among educated/ mistrusting health system
Afshari et al. (27)	2021	Cross-sectional	Ahvaz	>18 years	800	Reluctance: lower education/older age; acceptance: chronic disease/severe COVID history; top refusal: vaccine mistrust
Nakhostin-Ansari et al. (28)	2020 -21	Mixed qualitative-quantitative	Iran (web)	>15 years	1,928	69% willing to vaccinate
Askarian et al. (29)	2020	Cross-sectional (web)	Iran	>18 years	4,933	64.2% vaccination intention
Tamimi et al. (30)	2021	Cross-sectional	Bushehr	>18 years	2,185	64.6% willing; higher among men/ educated/divorced/single
Ezati Rad et al. (31)	2021	Cross-sectional	Hormozgan/ Kerman/ Bushehr/ Fars	>18 years	3,034	78% vaccine willingness
Yoosefi Lebni et al. (32)	2022	Qualitative content analysis	Urmia	>18 years	36	3 domains: individual (side effect fears), socio-cultural (conspiracy theories), legal-managerial (poor info access)

4- DISCUSSION

This study aimed to review the factors associated with COVID-19 vaccination acceptance and refusal rates in Iranian society. The results indicated a vaccine acceptance rate ranging from 64.2% to 83.6%. Various determinants at individual, socio-cultural, and legal-managerial levels contributed to the non-injection of the COVID-19 vaccine. Additionally, higher levels of education, older age, male gender, marital status, having chronic diseases or a history of severe COVID-19 infection, as well as respect for the rights of others, were associated with greater acceptance of vaccination ($p < 0.05$).

Vaccines are among the most successful and cost-effective public health tools, significantly contributing to the elimination or control of several serious diseases over the last century (3). Similarly, controlling the COVID-19 pandemic requires vaccination in addition to effective public health measures to reduce its spread and mortality. However, despite the safety and effectiveness of immunization, vaccine hesitancy has emerged as a global challenge, with the WHO identifying it as one of the top ten threats to global health in 2019 (8).

Vaccine hesitancy is influenced by many factors, with mistrust of the vaccine being a primary reason (11, 12). Trust in vaccination is considered on three levels: trust in the product (the COVID-19 vaccine), trust in the vaccine provider, and trust in policymakers (the government and healthcare system) (33, 34). Previous studies have shown that concerns about vaccine efficacy and safety (18), the spread of fake news on social media and the Internet, and the dissemination of false, misleading, and pseudo-scientific material by anti-vaccine activists can reinforce the widespread belief that vaccines can cause

disease rather than prevent it (11), thereby increasing mistrust toward the vaccine.

Another dimension of trust in vaccines is how vaccine manufacturers are perceived (12). A common negative perception is that vaccine developers are primarily motivated by profit (35). Public trust in vaccines is also influenced by the level of trust (or distrust) that people have in the Ministry of Health and government officials regarding their recommendations for safe and effective vaccines.

Therefore, clear and continuous communication by government authorities is vital for building and enhancing public trust in important initiatives such as vaccination. This communication should include a comprehensive and accurate explanation of how vaccines work and the development process from production to legal approval, emphasizing safety and efficacy (33). A study conducted in June 2020 on potential acceptance of the COVID-19 vaccine revealed that in countries where people have high trust in their government (e.g., South Korea and China), the rate of vaccine acceptance is higher (12).

In the present study, the vaccine acceptance rate ranged from 64.2% to 83.6%. These results are promising because studies indicate that a vaccination rate of 50% to 67% of the population is required to achieve herd immunity (17). The COVID-19 pandemic is a collective experience that affects all citizens, and its control requires the participation of everyone. Hesitancy toward vaccination could hinder the achievement of herd immunity against the disease in society (36).

The results also identified various factors influencing the non-injection of the COVID-19 vaccine at individual (e.g., fear of short-term side effects, personality traits, and distrust of vaccines), socio-cultural (e.g., conspiracy theories, social learning, and misconceptions about COVID-19), and legal/managerial levels (e.g., incomplete information, difficult and irregular access to vaccination centers, lack of restrictions, and compulsion to be vaccinated).

A study by Yoda in Japan (2021) showed that 66% of people intended to be vaccinated against COVID-19, 22% were hesitant, and only 12% did not want to be vaccinated. More than 60% of those who did not intend to be vaccinated expressed concerns about the vaccine's side effects and safety, with these worries being more prevalent among women than men (37). A study on healthcare staff indicated that concerns about safety, effectiveness, and side effects are the three main reasons for hesitancy regarding vaccination (38). Clarifying the vaccine production process and the quality assurance experiments, along with providing a realistic explanation of the benefits of vaccination, can enhance public trust in the COVID-19 vaccine.

The present study showed that higher levels of education, older age, male gender, marital status, having chronic diseases, or a history of severe COVID-19 infection, as well as respect for the rights of others, were associated with greater acceptance of vaccination ($p < 0.05$). Other studies have indicated that factors such as age (37-42), gender (39, 41, 43), marital status (44), and education (45) are related to people's willingness to receive the COVID-19 vaccine. Additionally, several studies have found that factors such as race (45, 46), occupation (29, 41), income (43, 45), having children (47), and vaccination history (41, 44, 48) also influence individuals' willingness to receive the COVID-19 vaccine.

The present study showed that the willingness to receive the vaccine was higher in men than in women. Shaw et al. (2020) found that doubt about vaccination was more prevalent among women, as they

are more likely to seek health-related information; often, they are responsible for caring for family members and make 80% of decisions related to their children's health (46). Education also plays a significant role in obtaining health-related information (49). Additionally, the tendency to receive the vaccine was higher among students than graduates, and vaccine acceptance was generally lower among individuals with less education (45).

In terms of age, older adults often felt a greater sense of responsibility toward themselves and others, leading to a higher willingness to get vaccinated, as they are more exposed to the coronavirus and its complications (50). Married individuals were also more inclined to receive the vaccine due to their sense of responsibility toward their families (16). One of the primary reasons for people's willingness to be vaccinated is to protect their own health and that of others, as vaccination not only provides individual protection but also contributes to collective immunity (25). Furthermore, individuals who had experienced COVID-19 and those concerned about their own health and that of their children were more inclined to get vaccinated (51).

Many people consider the recommendations of friends and family members regarding the vaccine. Additionally, individuals may trust the advice of unfamiliar sources if they perceive that those sources share similar life views, potentially leading them to believe false information disseminated on social media by individuals who are not medically qualified. The presence of anti-vaccine campaigns that spread misinformation online can negatively impact people's willingness to be vaccinated. Therefore, educating and empowering individuals to reject false information about the COVID-19 vaccine through reputable scientific websites, national media, widely circulated newspapers, and healthcare providers can enhance health attitudes and beliefs regarding the COVID-19 vaccine (29, 33, 52).

5- CONCLUSION

The successful implementation of the vaccination program against the coronavirus extends beyond the effectiveness of the vaccine; public acceptance and trust in the vaccine are fundamental elements in achieving this goal. Therefore, in addition to a coherent and robust health system, public trust and acceptance of the vaccine are essential. Based on this review, the acceptance rate for the COVID-19 vaccine ranged from 64.2% to 83.6%. Various factors at individual, socio-cultural, and legal-managerial levels contributed to the non-injection of the COVID-19 vaccine. The acceptability of COVID-19 vaccines depends on many variables and cannot be predicted based on a few alone. Key factors associated with greater acceptance of vaccination include older age, higher levels of education, male gender, marital status, having chronic diseases or a history of severe COVID-19 infection, as well as respect for the rights of others.

To effectively control the pandemic, the public should be informed about the safety, usefulness, and effectiveness of vaccination, and medical research findings should be published accurately. Additionally, reliable information should be made accessible to the public through mass media, and actions should be taken to encourage public participation in vaccination efforts to combat the COVID-19 pandemic.

6- CONFLICT OF INTEREST: None.

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