RESEARCH ARTICLE

Barriers and drivers for receiving the COVID-19 vaccine in Baghdad

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ABSTRACT

Introduction: COVID-19 vaccination is one of the most effective ways to reduce disease spread and complications. Maintaining high equitable vaccination uptake across all populations is not straightforward.

Objective: To discover the barriers, drivers and beliefs among Iraqi people toward COVID-19 vaccination.

Methods: A cross-sectional study done in 5 low coverage districts in Baghdad. From each district, two health centres were selected. The personal and socio-demographic variables, beliefs toward the vaccine, and potential barriers were determined.

Results: we enrolled 503 participants; 247 (49.1%) did not receive the vaccine: 114 (46.1%) because of apprehensions about its complications, and 33 (13.4%) because they thought the vaccine did not work. 74 (29.9%) among non-vaccinated had fears of dying after 2 years of taking it. We found that 187 (73%) of those vaccinated received it to protect themselves or their relatives from the disease, while 64 (25.1%) were forced to take it. Of participants, 275 (54.7%) obtained their health information from social media, and 156 (30%) from TV.

Conclusion: COVID-19 vaccination coverage in Baghdad was still low. Most of the unvaccinated people had fears about its future harms. Social media were the most common source of health information. Sex, age, occupation, educational status, type of living area, having a drug allergy and previous COVID-19 infection were significantly associated with the immunisation status.

Key words: COVID-19, Vaccine, Barriers.

INTRODUCTION

Coronavirus disease (COVID-19) is a highly contagious disease caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2). On January 30, 2020, the World Health Organisation (WHO) declared a public health emergency of international concern.[1] Despite using many drugs and protective measures to prevent and treat this disease, the global demand for a vaccine is inevitable. Vaccination is one of the most effective ways to prevent the spread of disease and reduce its complications. Vaccine acceptance and maintaining high, equitable vaccination uptake across all populations are not straightforward.[2] The protection provided by vaccination can either prevent infection or attenuate the microorganism's pathogenicity, reducing the disease's infectiousness and, in some cases, its severity.[3] Many studies have shown that deciding to be vaccinated with available vaccines depends on societal beliefs and perceptions.[4] It is evident that worldwide concern about public acceptance of an eventual COVID-19 vaccine has been increasing.

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[4] The development of COVID-19 vaccines is occurring at unprecedented speed, but requires high coverage rates to be successful.[5] Recent research suggests that the willingness to vaccinate against COVID-19 might be systematically underestimated.[3] Vaccination is one of the most effective interventions to control the ongoing pandemic, but COVID-19 vaccination acceptance rates vary greatly globally. Effective and comprehensive vaccination strategies require an up-to-date understanding of the perceptions that drive COVID-19 vaccine hesitancy and the common characteristics of people who are less likely to accept a vaccine, or to accept a vaccination requirement or mandate.[6] Experience from prior infectious disease outbreaks and pandemics has identified many barriers that can impede vaccine uptake, worsening disease control. These barriers can be broadly divided into two categories: **(1) Structural barriers**: Systemic issues may limit the ability of individuals to access vaccinations. Common structural barriers include the cost of the clinical visit and vaccine; physical access, including geographic and functional proximity to vaccines; limited job flexibility or caregivers of children or older adults unable to take time off to be vaccinated; and supply chain disruptions such as constraints on the production, distribution, and delivery of vaccines. **(2) Attitude-related barriers**: Individuals' beliefs or perceptions may also reduce their willingness to seek or accept vaccination. These barriers include the low perceived risk of contracting the disease or its severity; lack of trust towards vaccines, regulatory agencies that monitor vaccine development and distribution, healthcare workers who deliver vaccines, or companies that develop and produce vaccines; scepticism surrounding the need for or use of the data collected related to the administration of vaccinations (e.g., address, ID, insurance forms); misinformation that creates fear and uncertainty around vaccines; misconceptions due to lack of knowledge about vaccines and vaccine recommendations; and past experiences with other vaccines. Vaccine attitudes may be seen on a continuum, ranging from total acceptance to complete refusal, with vaccine-hesitant individuals, who may be persuadable, depending on the circumstances, somewhere in between.[7] Background vaccine hesitancy has been a major challenge in controlling preventable diseases, including COVID-19, so it is vital to understand their acceptance rates among the masses.[8] Studies have shown fluctuating acceptance levels for COVID-19 vaccination, and primary care physicians could play a crucial role in increasing vaccine uptake.[9] Research showed that addressing barriers to COVID-19 vaccination and building trust in the vaccine's safety and efficacy could reduce hesitancy. [10]

Although the Ministry of Health provides COVID-19 vaccines free of charge in Iraq, barriers and hesitancy may prevent some people from taking them. This study aims to determine the barriers to receiving the COVID-19 vaccine and the drivers of vaccination among visitors to primary healthcare centres in low-coverage districts in Baghdad, and to understand the beliefs those people hold regarding the vaccine.

METHODS

Study design and setting: A cross-sectional study was conducted in Baghdad, specifically in Al-Karkh and Al-Rasafa, from March to June 2023.

Ethical considerations: The ethical research committees of the Al-Karkh and Al-Rusafa Health Directorates approved the study protocol. An agreement was also obtained from the administrations of the primary healthcare centres to conduct the study at their facilities. All participants provided verbal consent after the study's objectives were explained, with assurance that their data would remain confidential.

Study Population: We included any visitors to the enrolled healthcare centres who were over 18 years of age, regardless of sex. Those who refused to participate were excluded from the study.

Sample Size and Sampling Technique: The health districts with low COVID-19 vaccination coverage (defined as a low proportion of vaccinated individuals relative to the total population served) were selected. Three districts were from the Rusafa Health Directorate: Sadr, Shaab and Madaen. And two districts from the Karkh Health Directorate: Taji and Abu Ghraib. We conveniently chose two primary health care centres from each district. The sample was collected using a convenient method over three months until the required sample was obtained.

The questionnaire: Based on similar studies, the authors designed a questionnaire and translated it into Arabic.[4, 5] Four experts in the Public Health Directorate reviewed and discussed the research and its questionnaire to suit the Iraqi community.

The questionnaire included questions about personal and socio-demographic variables, beliefs toward COVID-19 vaccination, drivers for receiving the vaccine and the potential Attitude-related barriers that may prevent participants from being vaccinated.

Data collection: Six health employees were responsible for collecting the data; they work in the Immunisation Department/Public Health Directorate and have been briefed about the study and trained to complete the questionnaire. They visited the enrolled centres to collect the data by themselves.

Statistical analysis: The gathered data were analysed statistically, using frequency and percentage to describe the qualitative data and the chi-square test to assess any significant statistical association between the data summarised in tables and figures.

RESULTS

This study included 503 participants. **Figure 1** shows the immunisation status of participants who received the COVID-19 vaccine. Of them, 247 (49.1%) did not receive any dose, and 31 (6.2%), 194 (38.6%), 27 (5.4%), and 4 (0.8%) received one, two, three, and four doses, respectively.

The most common Attitude-related barriers to vaccination were apprehension about future harms (67; 27.1%), side effects of vaccination (47; 19%), and the belief that vaccines do not
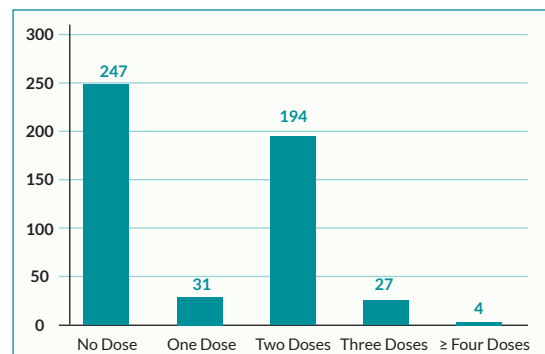

Figure 1 | The status of COVID-19 vaccination among the participants, Baghdad, 2023, N=503.

Table 1 | The barriers for getting COVID-19 vaccine among the non-immunised participants, Baghdad, 2023, n=247.

The barrier	No.	Percent
I am afraid of the vaccine's future harms	67	27.1%
Because of its side effects	47	19%
Because vaccines do not work	33	13.4%
I am already taking the required preventive measures	26	10.6%
I don't want to answer	22	8.9%
Because I am pregnant	21	8.5%
I have chronic diseases which do not allow me for immunisation	15	6.1%
I am afraid of injections	10	4%
I have an allergy	3	1.2%
I don't need it because my family and relatives took it	2	0.8%
Because I am lactating	1	0.4%
Total	**247**	**100%**

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work (33; 13.4%), as illustrated in Table 1.

The drivers for participants to get the COVID-19 vaccine among immunised participants are illustrated in Table 2: 95 (37.1%) were vaccinated to protect themselves, and 92 (35.9%) to protect their families and others from the disease. Table 3 shows the participants' health information sources; social media was the source for 275 (54.7%), and television was the source for 156 (30%).

Table 4 shows some demographic features of the participants; 295 (58.6%) of the participants were females, 369 (73.4%) aged below 45 years, 408 (81.1%) were married, 236 (46.9%) were housewives, 185 (36.8%) had primary school graduation, 397 (78.9%) lived in urban areas, 393 (78.1%) had no chronic diseases, 445 (88.5%) had no drug allergy, and 280 (55.7%) were not previously infected with COVID- 19.

Table 4 also shows the association between the immunisation status and some demographic features. Sex, age, occupation, level of education, type of living area, having a drug allergy and previous history of getting infected with COVID-19 were shown to have a statistically significant association with the immunisation status of the participants.

DISCUSSION

The study involved 503 participants. Nearly half of them (247, 49.1%) had not received any dose of the COVID-19 vaccine, and the majority (114, 46.1%) expressed concerns about potential current or future complications associated with the vaccine. A smaller group, 33 (13.4%), believed that the vaccine was ineffective. A study conducted in Iran found that 70% of participants were willing to receive the COVID-19 vaccine. Similarly, 67% of participants in the Hong Kong study agreed to be vaccinated. [11, 12] This variation can be attributed to concerns about the COVID-19 vaccine among our participants, in addition to the sampling design of our study, in which we took only the low-coverage districts rather than the entire population, as the two mentioned studies did. Moreover, those studies measured willingness to receive the vaccine rather than actual immunisation, which may explain their higher reported percentage.

Many studies clarified that the suboptimal COVID-19 vaccine uptake is associated, at the individual level, with various socio-demographic

Table 2	The drivers of participants to get COVID-19 vaccine among the immunised ones, Baghdad, 2023, n=256.		
The drivers	No.	Percent
To protect me from the disease	95	37.1%
To protect my family and others from the disease	92	35.9%
I was forced at my job	26	10.2%
I was forced to attend the government institutions	26	10.2%
Because I was travelling (as required a travel document)	12	4.7%
To control the pandemic and return to normal life	5	1.9%
Total	256	100%

Table 3	The media sources for health information among all the participants, Baghdad, 2023, N=503.		
Media source	No.	Percent
Social media	275	54.7%
Television channels	156	30%
Nothing	33	6.6%
Health promotion posters and folders	17	3.4%
Sites of international health organisations	12	2.3%
Magazines and newsletters	7	1.4%
Radio	3	0.6%
Total	503	100%

Table 4 | The frequency distribution and percentage of socio-demographic and medical characteristics of the participants, in addition to the association between getting the COVID-19 vaccine and those characteristics, Baghdad, 2023, N=503.

Variable		Total No. (%)	Immunisation status against COVID-19		Chi square	P-value
			Vaccinated n=247	Not vaccinated n=256		
Gender	Male	208 (41.4%)	75	133	24.1	0.000 *
	Female	295 (58.6%)	172	123		
Age	< 45	369 (73.4%)	193	176	5.6	0.02 *
	≥ 45	134 (26.6%)	54	80		
Marital status	Single	71 (14.1%)	35	36	7.2	0.06
	Married	408 (81.1%)	204	204		
	Divorced	11 (2.2%)	1	10		
	Widowed	13 (2.6%)	7	6		
Occupation	Governmental	151 (30%)	29	122	90.1	0.000 *
	Private	2 (0.4%)	1	1		
	No job	8 (1.6%)	4	4		
	Housewife	236 (46.9%)	160	76		
	Self-employed	69 (13.7%)	36	33		
	Retired	14 (2.8%)	4	10		
	Student	23 (4.6%)	13	10		
Education	Illiterate	34 (6.8%)	23	11	41.3	0.000 *
	Read-write	10 (2%)	2	8		
	Primary	185 (36.8%)	107	78		
	Secondary	159 (31.6%)	85	74		
	University &+	115 (21.5%)	30	85		
Living area	Rural	106 (21.1%)	41	65	5.8	0.016 *
	Urban	397 (78.9%)	206	191		
Having chronic diseases	Yes	110 (21.9%)	60	50	1.6	0.19
	No	393 (78.1%)	187	206		
Drug allergy	Yes	54 (10.7%)	31	23	6.01	0.04 *
	No	449 (89.3%)	216	233		
Past infection with COVID-19	Yes	194 (38.6%)	71	123	20.1	0.000 *
	No	280 (55.7%)	161	119		
	Don't know	29 (5.8%)	15	14		
Total		503 (100%)				
*: Significant						

characteristics, e.g., age, gender, socioeconomic status and geographical location, in addition to many other factors, for example, low perceived risk of vaccine-preventable diseases, concerns regarding vaccine safety or effectiveness, belief in alternative preventive measures for vaccine-preventable diseases or negative past experiences with health services. [13] The types of concerns are probably culture-related; for example, the three most common issues regarding the COVID-19 vaccine among people in Greece were unknown remote complications, thrombosis, and myocarditis. [14]

In the current work, most vaccinated participants (187, 73%) reported receiving the COVID-19 vaccine to protect themselves or their relatives and families from the disease. However, about one-quarter (64; 25.1%) admitted they were forced to take the vaccine at their jobs, at governmental institutes, or while travelling outside the country. Multiple studies demonstrated that people who believed the COVID-19 vaccine was unsafe were less willing to receive it, knew less about the virus, and were more likely to think the COVID-19 vaccine is a myth. [15] A similar Japanese study found that the most common drives for getting the COVID-19 vaccine were to protect their families, relatives, and themselves. In contrast, the most common barriers to getting the vaccine were fears of adverse reactions and concerns about the vaccine's ineffectiveness. [16] A similar Saudi study found that 60% of participants were

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concerned about the vaccine's side effects, and 40.3% thought it might be unsafe.[17]

In our study, more than half of the participants (275, 54.7%) relied on social media for health information, while less than a third (156, 30%) turned to television. Regarding the relationship between COVID-19 vaccination and various factors, our findings showed that gender, age, occupation, educational level, type of living area, history of drug allergy, and history of past infection were significantly associated with vaccination status. Specifically, females, housewives, individuals with only a primary school education, and those with no previous COVID-19 infection were less likely to be vaccinated. A similar Japanese study also found a significant link between COVID-19 vaccine refusal and being female, aligning with our results. [16] However, a Brazilian study found no such association.[18] Likewise, a Saudi study reported that females had higher rates of vaccine refusal.[17] While our study identified associations between educational status and occupation with vaccination, these factors did not show significant links in the Japanese and Brazilian studies.[16,18] In contrast, the Saudi study found that individuals with higher education levels (university or beyond) were more likely to refuse vaccination.[17] Regarding prior COVID-19 infection, our study found that those without prior infection had lower vaccination rates, a finding consistent with the Saudi study but in contrast to a similar study conducted in England.[17,19]

CONCLUSION

The COVID-19 vaccination coverage in Baghdad in the current sample was still low. Most of the unvaccinated people had concerns about the vaccine's future harm. Social media were the participants' most common media source of health information. Sex, age, occupation, educational status, living area, drug allergy, and previous COVID-19 infection were significantly associated with COVID-19 vaccination status.

REFERENCES

1. Narapureddy BR, et al. COVID-19 vaccine acceptance: Beliefs and barriers associated with vaccination among residents of KSA. *J Multidiscip Healthc*. 2021;14:3243–52.

2. Altulahi N, et al. Willingness, beliefs, and barriers regarding the COVID-19 vaccine in Saudi Arabia: A multiregional cross-sectional study. *BMC Fam Pract*. 2021;22(1):247. doi: 10.1186/s12875-021-01606-6. PMID: 34911441; PMCID: PMC8674018.

3. Jonathan L, Andree H. Cognitive barriers to COVID-19 vaccine uptake among older adults. *Front Med* (Lausanne). 2021;8:756275.

4. Magadmi RM, Kamel FO. Beliefs and barriers associated with COVID-19 vaccination among the general population in Saudi Arabia. *BMC Public Health*. 2021;21:1438.

5. Burke PF, Masters D, Massey G. Enablers and barriers to COVID-19 vaccine uptake: An international study of perceptions and intentions. *Vaccine*. 2021;39(36):5116–28.

6. Lazarus JV, Wyka K, White TM, et al. Revisiting COVID-19 vaccine hesitancy around the world using data from 23 countries in 2021. *Nat Commun*. 2022;13(1):3801.

7. Gonzales A, Lee E, Grigorescu V, et al. Overview of barriers and facilitators in COVID-19 vaccine outreach (Research Report No. HP-2021-19). Washington (DC): Office of the Assistant Secretary for Planning and Evaluation, U.S. Department of Health and Human Services; 2021 Aug.

8. Kashif M, Fatima I, Ahmed AM, et al. Perception, willingness, barriers, and hesitancy towards COVID-19 vaccine in Pakistan: Comparison between healthcare workers and general population. *Cureus*. 2021;13(10):e19106. doi: 10.7759/cureus.19106. PMID: 34868757; PMCID: PMC8627421.

9. Day P, Strenth C, Kale N, Schneider FD, Arnold EM. Perspectives of primary care physicians on acceptance and barriers to COVID-19 vaccination. *Fam Med Community Health*. 2021;9(4):e001228.

10. Alghamdi AA, Aldosari MS, Alsaeed RA. Acceptance and barriers of COVID-19 vaccination among people with chronic diseases in Saudi Arabia. *J Infect Dev Ctries*. 2021;15(11):1646–52. DOI: https://doi.org/10.3855/jidc.15063

11. Omidvar S, Firouzbakht M. Acceptance of COVID-19 vaccine and determinant factors in the Iranian population: A web-based study. *BMC Health Serv Res*. 2022;22:652. https://doi.org/10.1186/s12913-022-07948-w

12. Smith DJ, et al. COVID-19 mortality and vaccine coverage—Hong Kong Special Administrative Region, China, January 6–March 21, 2022. *MMWR Morb Mortal Wkly Rep*. 2022;71(15):545–8.

13. Dubé E, MacDonald NE. COVID-19 vaccine hesitancy. *Nat Rev Nephrol*. 2022;18(7):409–10.

14. Ioannou P, Tzalis S, Pasparaki E, Spentzouri D, Konidaki M, Papakitsou I, et al. COVID-19 disease and vaccination: Knowledge, fears, perceptions and feelings of regret for not having been vaccinated among hospitalised Greek patients suffering SARS-CoV-2 infection. *Infect Dis Rep*. 2022;14:587–96. doi:10.3390/idr14040063.

15. Kricorian K, Civen R, Equils O. COVID-19 vaccine hesitancy: Misinformation and perceptions of vaccine safety. *Hum Vaccin Immunother*. 2022;18(1):1950504.

16. Okubo R, et al. COVID-19 vaccine hesitancy and its associated factors in Japan. *Vaccines* (Basel). 2021;9:662.

17. Altulahi N, et al. Willingness, beliefs, and barriers regarding the COVID-19 vaccine in Saudi Arabia: A multiregional

cross-sectional study. *BMC Fam Pract*. 2021;22:247.

18. Nery N Jr, et al. COVID-19 vaccine hesitancy and associated factors according to sex: A population-based survey in Salvador, Brazil. *PLoS One*. 2022;17(1):e0262649.

19. Hall VJ, et al. COVID-19 vaccine coverage in healthcare workers in England and effectiveness of BNT162b2 mRNA vaccine against infection (SIREN): A prospective multicentre cohort study. *Lancet*. 2021;397(10286):1725–35.