

RESEARCH PAPER

## COVID-19 vaccine hesitancy in Iraq: a growing concern

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### Abstract

**Background:** COVID-19 pandemic has made vaccination more of a necessity than a choice as it continues to spread. The need to combat vaccine hesitancy is more relevant now than ever, given the availability of effective and safe vaccines.

**Aims:** To assess the acceptance rate of COVID-19 vaccines in Iraq, and to identify the reasons for hesitancy.

**Methods:** A cross-sectional online survey of 1100 Iraqi citizens was conducted in October 2021. Sociodemographics, willingness to get COVID-19 vaccine and a list of reasons for refusal or hesitancy were collected. These factors were compared across basic demographics.

**Results:** The acceptance rate for COVID-19 vaccine was 46.1%. Females, older adults and those with higher education had higher acceptance rates for COVID-19 vaccine. The most common concern about the COVID-19 vaccine involved fear about side effects (24.6%).

**Conclusion:** To achieve effective immunizations, it is vital to develop strategies that encourage vaccinations and ensure optimal coverage.

**Keywords:** COVID-19, Vaccine hesitancy, Vaccine acceptance, Iraq.

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### Introduction

Vaccine hesitancy is defined by the World Health Organization Strategic Advisory Group of Experts (SAGE) as “delay in acceptance or refusal of vaccination despite availability of vaccination services<sup>1</sup>, and it was listed by the World Health Organization (WHO) as one of the top ten threats to world health.<sup>2</sup>

There is a continuum of vaccination views, ranging from cautious acceptors to outright deniers, with vaccine hesitancy falling somewhere in the middle.<sup>3</sup> Vaccine hesitancy can affect both individuals (an increased risk of having the disease) and the community (a greater likelihood of virus transmission).<sup>4</sup> Vaccines against COVID-19 has been developed in a record time<sup>5</sup>, and there is mass vaccination efforts under way in many countries, including Iraq. However, vaccine hesitancy could derail these efforts if it continues.<sup>6</sup> Also the development and rollout of vaccines does not put an immediate end to the health crisis, as achieving herd immunity will require vaccination of a substantial proportion of the population, which poses a significant challenge.<sup>7</sup> As of 29 October 2021, Iraq had registered 2 million confirmed cases of

COVID-19 with 23,083 deaths. As of 23 October 2021, a total of 8.9 million COVID-19 vaccine doses have been administered.<sup>8</sup> Only 8.4% of Iraq's population is fully vaccinated.<sup>9</sup> In order to identify the root causes of vaccine hesitancy during this pandemic, we must understand its magnitude and setting<sup>10</sup>, studies have shown that vaccine hesitancy is a common phenomenon worldwide with reasons for refusal of vaccination varying widely.<sup>11-13</sup> The aim of this study was to determine the scope of this problem by assessing the levels of acceptance of COVID-19 vaccines in Iraq, and by describing the reasons for vaccine hesitancy.

## Methods

### *Study design*

This cross-sectional study was conducted using a web-based anonymous questionnaire from October 2021 to November 2021, participants were recruited through advertising on social media platforms (Facebook, Twitter). Google Forms (Google, Mountain View, CA) was used to collect data. Eligibility criteria include being 18 years or older, living in Iraq, being able to read Arabic, as well as having internet access.

### *Measurements*

COVID-19 vaccine acceptance was assessed using established questionnaires,<sup>14-16</sup> however, the questionnaire was shortened to keep it simple and understandable.

### *The questionnaire contained two main sections:*

(1) sociodemographic data, including age, gender, occupation, educational level, marital status and residence; (2) willingness to accept COVID-19 vaccination, along with reasons for refusal or hesitation. COVID-19 vaccine acceptance was assessed by asking: "Do you intend to take the COVID-19 vaccine". The responses included, "Yes (accept)", "No

(refuse)" and "Undecided". Respondents were asked to identify the reasons for vaccine refusal and hesitancy by answering the following question: "What is the main reason you would not take the vaccine? or have not decided yet?". They were then asked to choose one main reason from a list of possible answers including "Concerns about risks and side effects", "I'll wait until it seems safe to get the vaccine", "Because I have chronic diseases (high blood pressure, diabetes, asthma, others) that may interfere with the vaccine", "There are other ways to prevent COVID-19 other than the vaccine", "The virus is a hoax", "Immunization access is not convenient in location", "I don't need a vaccine after getting infected with COVID-19", "The vaccine cause infertility", "I am young and in good health and do not need a vaccination", "The vaccine moved through clinical trials too quickly", "One of my acquaintances took the vaccine and later got infected with COVID-19", "Because the vaccine changes the genes" and "The vaccine causes death two years after taking it".

### *Statistical analysis*

Statistical analysis was performed using IBM SPSS version 26. A two-tailed  $p < 0.05$  was considered statistically significant. The sample's sociodemographic characteristics and COVID-19 vaccine acceptance were calculated as frequencies and percentages. Chi-square analysis was used to identify associations between vaccine acceptance and participant characteristics.

## Results

### *Sample characteristics*

The survey was completed by 1100 participants with 742(67.5%) were males. In terms of age groups, distribution varied. Most of the participants 522(47.5%) were between 25 and 34

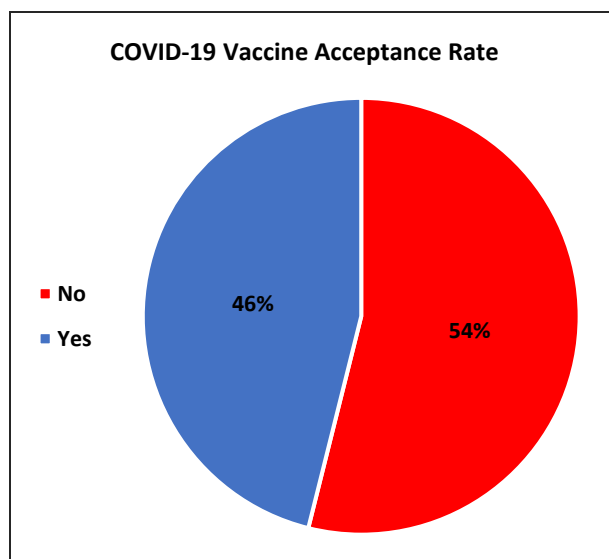
years. Over half of them were married 626 (56.9%), there were 729 (66.3%) of them who lived in urban areas, and 592(53.8%) were unemployed,711(64.6%) of them had either attended university or achieved a higher degree (Table-1).

**Table 1.** Description of the Study Population  
(N = 1100)

Sociodemographic Characteristics	No. (%)
<b>Age</b>	
18-24	111 (10.1)
25-34	522 (47.5)
35-44	273 (24.8)
45-54	67 (6.1)
55-65	116 (10.5)
65+	11 (1.0)
<b>Gender</b>	
Male	742 (67.5)
Female	358 (32.5)
<b>Marital status</b>	
Married	626 (56.9)
Unmarried	474 (43.1)
<b>Place of residence</b>	
Urban	729 (66.3)
Rural	371 (33.7)
<b>Educational level</b>	
Just read and write	39 (3.6)
Elementary	110 (10)
Secondary	116 (10.5)
High school	124 (11.3)
College and higher education	711 (64.6)
<b>Employment</b>	
Employed	508 (46.2)
Unemployed	592 (53.8)

**Prevalence of vaccine hesitancy**

Of the 1100 participants surveyed, 53.9% were hesitant about the vaccine (Figure-1), the proportion of males who are hesitant to get vaccinated was higher than females, 60% compared to 41.3% of females (Table-2). Vaccine hesitancy was also higher among younger age groups, with 80.2% of those aged 18-24 hesitant versus 42.2% for those aged 55-64. Unmarried individuals (57.6%), unemployed (62.7%), and those living in urban areas (58.6%) were found to be more vaccine hesitant. Educational level influenced vaccine hesitancy. Those with degrees showed the least vaccination hesitancy (42.3%), and those who can only read and write showed the highest vaccination hesitancy (100%).



**Fig 1.** COVID-19 vaccine acceptance rate in Iraq

**Table 2.** Association between respondents characteristics and COVID-19 vaccine acceptance (N=1100)

Variables	COVID-19 vaccine acceptance		P- value
	Yes, No. (%)	No No. (%)	
<b>Age</b>			
18-24	22 (19.8)	89 (80.2)	< 0.001
25-34	283 (54.2)	239(45.8)	
35-44	101 (37.0)	172 (63.0)	
45-54	23 (34.3)	44 (65.7)	
55-64	67 (57.8)	49 (42.2)	
65+	11 (100.0)	0 (0.0)	
<b>Gender</b>			
Male	297 (40.0)	445 (60.0)	< 0.001
Female	210 (58.7)	148 (41.3)	
<b>Marital status</b>			
Married	306 (48.9)	320 (51.1)	0.03
Unmarried	201 (42.4)	273 (57.6)	
<b>Place of residence</b>			
Urban	302 (41.4)	427 (58.6)	< 0.001
Rural	205 (55.3)	166 (44.7)	
<b>Educational level</b>			
Just read and write	0(0.0)	39 (100.0)	< 0.001
Elementary	60 (54.5)	50 (45.5)	
Secondary	25(21.6)	91 (78.4)	
High school	12 (9.7)	112 (90.3)	
College and higher education	410 (57.7)	301 (42.3)	
<b>Employment</b>			
Employed	286 (56.3)	222 (43.7)	< 0.001
Unemployed	221 (37.3)	371 (62.7)	

**Reasons for vaccine hesitancy**

Concerns about potential side effects was the main reason for COVID-19 vaccine hesitancy, with 24.6 % of participants citing this as their main reason (Figure-2). Also,13.9% of them relied on a “Wait and see “approach,10.9% of participants stated that they don’t have access to the vaccine. While 8.5% of them mentioned that getting the vaccine will make them sick with COVID-19. A total of 7.3% of participants believed that the vaccine will cause death after two years and 7.1% of them believed that the vaccine will lead to infertility. Additionally, 5.6% of participants stated that the vaccine will alter their DNA, also the vaccine was deemed unnecessary by 4.5% of them, 3.4% of participants stated that they don’t need to get vaccinated because they had COVID-19. While 3.2% of participants indicated that they have chronic diseases that might interfere with the vaccine, 3.2% of them also had concerns about the speed at which COVID-19 vaccines were developed. “The virus is a hoax” was the reason for vaccine hesitancy to 2.2% of participants. Also “Only old people need the vaccine” was cited as the reason for 2.2% of them.

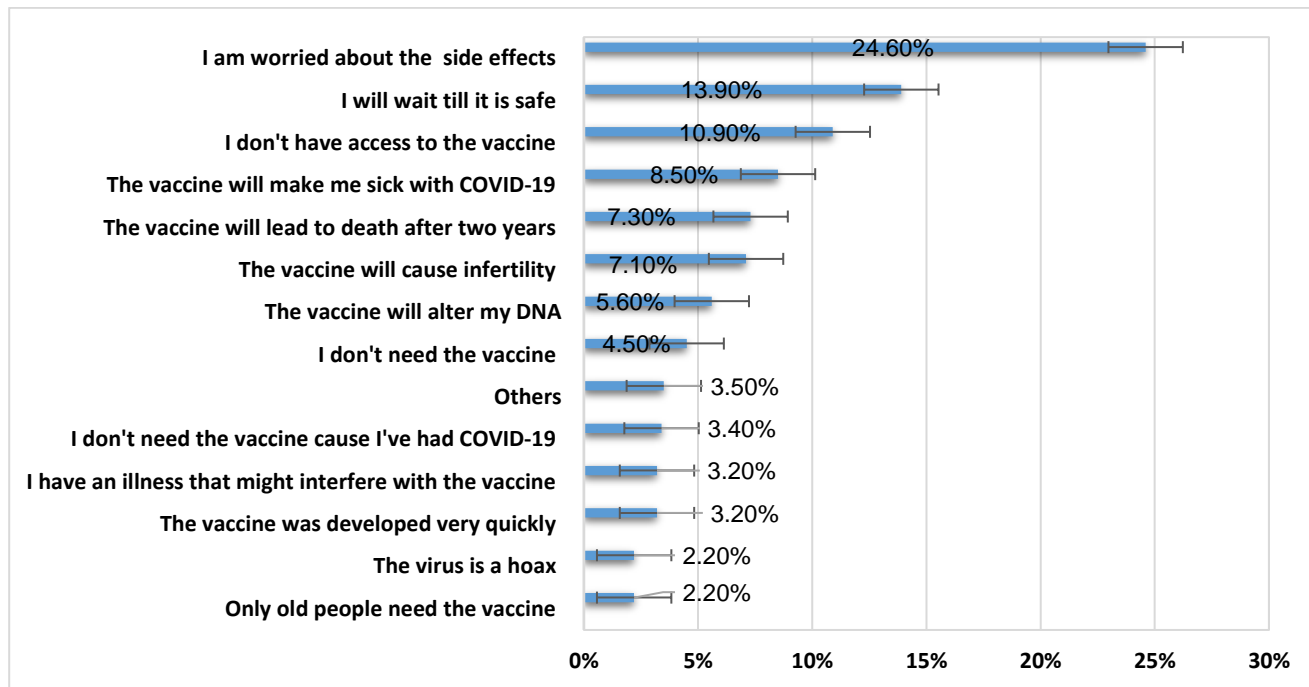


Fig 2. Reasons for vaccine hesitancy

## Discussion

The development of an effective and safe COVID-19 vaccine within a short period of time was unprecedented. However, vaccine hesitancy persists. This study showed that 53.9% of Iraqi adult's participants are hesitant to take up COVID-19 vaccine, while 46.1% intend to take up COVID-19 vaccine if it is offered to them, however, there are marked differences among population sample subgroups. Furthermore, stated intentions may not always translate into actual vaccination.<sup>17</sup> A lower acceptance rate was seen in a recent study surveyed<sup>18</sup> Arab countries with 31.8% acceptance rate in Saudi Arabia, 28.4% in Jordan and 23.6% in Kuwait<sup>14</sup> A global survey by Lazarus et al. found that the acceptance rate in Russia was less than 55% and 90% in China. There is also a relatively high acceptance rate of over 80% in Asian countries, as well as high rates in South Africa, India and Brazil.<sup>18</sup> In Europe, COVID-19 vaccine hesitancy rates were 41% in Italy and 26% in France.<sup>19,20</sup> The rate of

COVID-19 vaccine acceptance was higher among female respondents compared to males (58.7% vs.40%), this. This could be due to the fact that women are often the gatekeepers when it comes to decisions concerning their families' health. Also, women might be more empathetic toward the safety of their families and communities and to the needs of the most vulnerable. Higher acceptance of vaccines by women has also been noted in other countries such as France, Germany, Sweden, and Russia<sup>21</sup> Nevertheless, it may become a significant priority in the near future to design and disseminate messages aimed at a more hesitant male audience. Hesitancy was higher among young adults as compared to those aged > 65. This could be explained by the fact that older people might be more likely to receive the vaccine since they have a greater risk of severe COVID-19 infection. This is in line with recent studies on vaccinations against SARS-CoV-2,<sup>18</sup> In the

current study, higher education was associated with a higher rate of vaccine acceptance. This is consistent with findings from countries as the UK,<sup>6</sup> France<sup>22</sup> and Italy.<sup>23</sup> This study found that those who are employed are more likely to accept the vaccine than those who are unemployed, indicating there ought to be similar efforts to increase vaccination uptake among those who face socioeconomic disadvantage and are more vulnerable to COVID-19.<sup>24</sup> The complexity of vaccine hesitancy cannot be addressed through a single approach; that is why coordinated efforts are needed to address population concerns, and allow for effective uptake.<sup>25</sup> As vaccine communication policies move forward, it is important for future policies to consider the level of literacy, scientific knowledge, and health status of subgroups of the population, identify trusted sources, and then tailor interventions based on those findings, and go beyond merely saying vaccines are effective and safe.<sup>26</sup> It is imperative that vaccine literacy and acceptance strategies address community concerns, correct misconceptions, work on issues that lead to distrust and be aware of the religious and philosophical convictions of the community. This messaging approach may assist not only in consolidating those who are willing to receive vaccinations, but may also encourage those who are hesitant.<sup>27</sup> Based on existing research for vaccine hesitancy, perceived efficacy, concern about adverse effects and safety appear to be key drivers for uptake.<sup>28,29</sup> This study also found fear over adverse effects to be the main reason given for vaccine hesitancy among respondents. It is therefore necessary that health authorities and organizations enhance the dissemination of information about vaccine safety, which is as important as vaccine efficacy and effectiveness.<sup>30</sup> Additionally, primary care providers should be involved in health education to promote

vaccination.<sup>31</sup> There is a pressing need to build confidence in COVID-19 vaccines based on the estimate that the threshold for SARS-CoV-2 herd immunity is between 55% and 82%<sup>32</sup> and this study found that 46.1% of the respondents would accept the vaccine. Furthermore, it is possible that the number of Iraqis who actually receive a COVID-19 vaccine may be lower than those who claim to be planning to receive it. Thus, COVID-19 vaccination strategies must need to be implemented locally, and new interventions must need to be undertaken to ensure herd immunity against COVID-19 in Iraq. There are some limitations in this study, including the fact it is cross-sectional in nature and was conducted at a particular period of time this type of survey is merely a snapshot taken at a specific point in time. Thus, it was unable to take into account how attitudes towards COVID-19 vaccine may change as the prevalence of COVID-19 and political discourse change. Also, using an online questionnaire might lead to selection bias and accessibility problems.<sup>33</sup> Another limitation is the limited sample size, which precluded the generalizability of the results. In addition, in terms of age, the sample might have not been representative. Younger adults' predominance in the study sample could have been a source of bias, in relation to the higher rates of vaccine hesitancy seen in this group. Finally, because younger adults dominated the study sample and elderly opinions were minimal, the findings cannot be generalized. It is necessary to conduct further studies to see if attitudes towards COVID-19 vaccines have changed and if these results can be generalized.

Conclusion, the results of this study show high level of COVID-19 vaccine hesitancy among respondents. This hesitancy is driven by the people's fear over the adverse effects. The study examined the determinants of COVID-19



vaccine acceptance and offered an insight into people's attitudes toward the vaccine and their associated hesitancy. These findings can be used to develop campaigns to encourage behavior change.

### Statements & Declarations

### Competing Interests

The author has no relevant financial or non-financial interests to disclose.

### Ethics approval

Approval was granted by the Ethics Committee of College of Medicine, University of Basrah.

### Consent to participate

Informed consent was obtained before participants were given access to the questionnaire, which they completed voluntarily.

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### التردد في اخذ لقاح فايروس كورونا في العراق: قلق متزايد

*خلفية الدراسة:* لقد جعلت جائحة كورونا التطعيم ضرورة أكثر من كونه خياراً مع استمرار انتشار الفايروس. إن الحاجة إلى مكافحة التردد بشأن اللقاحات أصبحت أكثر أهمية الآن من أي وقت مضى، نظراً لتوافر لقاحات فعالة وآمنة.

*الهدف:* هدفت هذه الدراسة إلى تقييم معدل قبول لقاحات فايروس كورونا في العراق، وتحديد أسباب التردد.

*الطريقة:* تم توزيع استبيان الكتروني عبر الإنترنت على عينة عشوائية من ١١٠٠ مواطن من العراق في أكتوبر ٢٠٢١، تم جمع المعلومات الاجتماعية والاستعداد لقبول اللقاح وكذلك سبب عدم اخذ اللقاح او التردد في اخذه.

*النتائج:* كان معدل قبول اللقاح ٤٦,١ ٪ ، كان لدى الإناث وكبار السن وذوي المستويات التعليمية العليا معدلات أعلى لقبول اللقاح.

*الاستنتاج:* ان السبب الأكثر شيوعاً لعدم اخذ اللقاح هو الخوف من الآثار الجانبية ٢٤,٦ ٪. لتحقيق التطعيمات الفعالة من الضروري تطوير استراتيجيات تشجع على التطعيمات وتضمن التغطية المثلى.