



PATTERNS OF COVID 19 VACCINES HESITANCY AMONG HEALTH CARE WORKERS

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Abstract

Background: best approach to fight the disease. However, rising vaccine hesitancy can make widespread vaccine application difficult. Considering the role of healthcare workers (HCW) in promoting vaccine uptake and previously recorded hesitancy among HCW, understanding factors that cause vaccination hesitancy against COVID-19 is crucial to address barriers to widespread vaccination acceptance.

Keywords: COVID, COVID-19, COVID-19 vaccine, Hesitancy, Vaccine, Vaccine Hesitancy, Healthcare workers

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Introduction

Coronavirus disease 2019 (COVID-19) has now spread worldwide. To date, it has infected more than 174 million people, of whom 3.7 million have died, and these numbers continue to rise [1].

To curb this pandemic, apart from effective public health measures such as social distancing, wearing face masks, hand washing, and avoidance of crowded indoor spaces, educating the general population, efficacious vaccination is emerging as essential to mitigating disease and death [2].

Since the beginning of the COVID-19 pandemic, there has been a worldwide race to develop vaccines against this disease. By the end of February 2021, more than 40 countries and regions were working on developing COVID-19 vaccines, and at least half of these countries have had one or more vaccines in clinical trials, based on the analysis of vaccine development data from the World Health Organization [3].

Health care workers (HCWs) are at high risk of occupational SARS-CoV-2 exposure and transmission, which prioritizes them for early COVID-19 vaccination. In addition, different communities treat HCWs as role models in their attitudes towards vaccination and refer to them for vaccine information [4].

For this reason, vaccine hesitancy among HCWs can impede the widespread implementation of vaccination and contradict the efforts for circumventing the ongoing COVID-19 pandemic; thus, assessing the size of hesitancy, in addition to addressing its root causes, is important [5].

Vaccine hesitancy

WHO defined vaccine hesitancy as the delay in acceptance or refusal of vaccines despite the availability of vaccine services [6].

Vaccine-hesitant individuals are a heterogeneous group with varying levels of indecision and

concerns in the middle of this continuum [7]. This group is of particular interest to public health services, as many vaccine-hesitant individuals may be amenable to changing their vaccination attitudes and behaviors if their concerns are adequately addressed and systemic barriers in access to health services are removed (for example, discrimination, stigmatization, racism, and gender barriers). By contrast, individuals who are vocal vaccine refusers are unlikely to change their decision not to be vaccinated [8].

Factors affecting vaccine acceptance and hesitancy.

Factors that affect the attitude towards acceptance of vaccination include complacency, convenience, and confidence [9]. **Complacency** denotes the low perception of the disease risk; hence, vaccination was deemed unnecessary. **Confidence** refers to the trust in vaccination safety, effectiveness, besides the competence of the healthcare systems. **Convenience** entails the availability, affordability, and delivery of vaccines in a comfortable context [10].

The complex nature of motives behind vaccine hesitancy can be analysed using the epidemiologic triad of environmental, agent and host factors [11].

Environmental factors include public health policies, social factors and the messages spread by the media [12].

The agent (vaccine and disease) factors involve the perception of vaccine safety and effectiveness, besides the perceived susceptibility to the disease [13].

Host factors are dependent on knowledge, previous experience, educational and income levels [14].

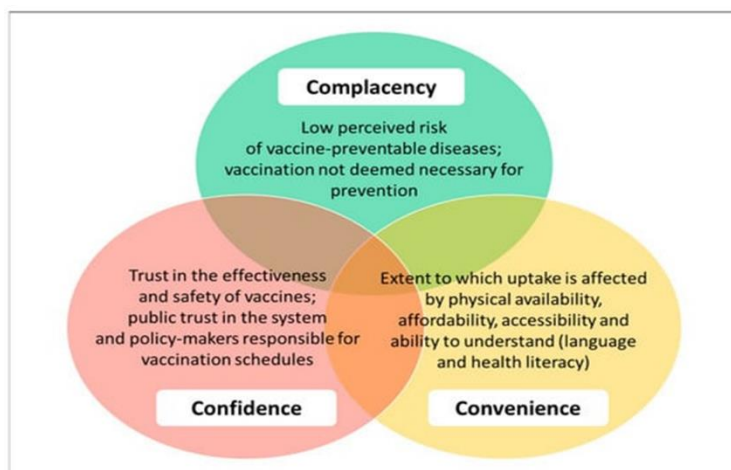


Figure 1. The 3Cs of vaccine hesitancy [10].

*Causes of Hesitancy regarding COVID-19 vaccines:

Studies have shown that there is no single set of factors responsible for vaccine hesitancy. Instead, there is a wide range of contextual (i.e., communication and media, historical influence, religion, culture, gender, politics, geographic barriers), individual and group (i.e., personal, family experience with vaccination, beliefs, knowledge), and vaccine-specific factors (i.e., risk and benefit, costs) that can affect vaccine acceptance [15].

The cost of the vaccine may also affect willingness to be vaccinated because, in some countries, the cost is related to a person's monthly income [16]. The factors affecting vaccination intention vary across countries, socioeconomic groups, demographic variables (i.e., ethnicity, gender), and types of infectious diseases [17].

Conspiracy theories and fake news propagating across social media have flourished during the COVID-19 pandemic. In February 2020, when the pandemic rapidly grew worldwide, the WHO warned of an *infodemic*, a wave of fake news and

misinformation on social media regarding COVID-19[18].

After the approval of COVID-19 vaccines, misinformation about the vaccinations also started to disseminate quickly. The conspiracies frequently seen on social media include claims that COVID-19 vaccines change the human genome, that a microchip is implanted in the human body through the syringe, that the vaccination causes COVID-19 infections [19].

YouTube, Facebook, and Twitter announced working together to combat the problem. This misleading information may have affected the acceptance of COVID-19 vaccinations. Studies have also shown that rumors can have a negative effect on willingness to accept COVID-19 vaccines [20].

Analysis of such factors is needed to address COVID-19 vaccine hesitancy, following the assessment of the scope and magnitude of this public health threat [21]. This can help in guiding interventional measures aimed at building and maintaining responses to tackle this threat [22].

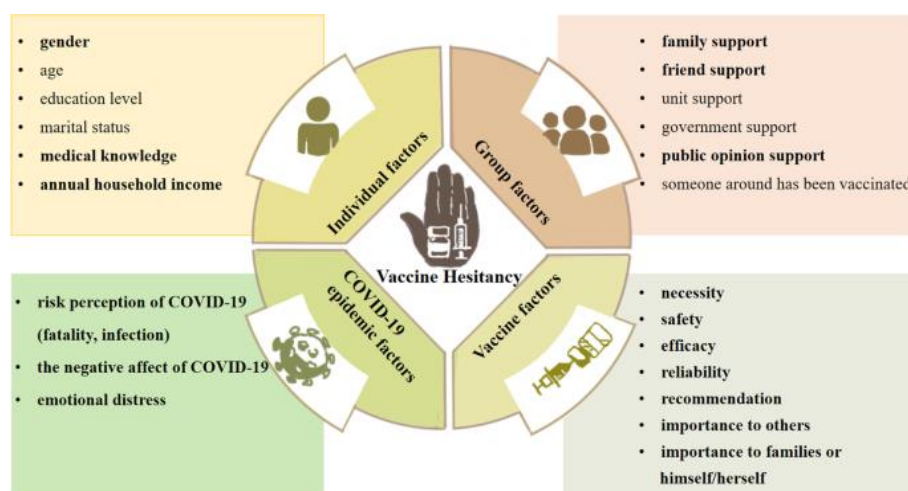


Figure 2. The Vaccine Hesitancy Determinants Matrix (VHDM) Model of Vaccine Hesitancy. The VHDM model defined four categories of factors associated with vaccine hesitancy, including individual factors, group factors, vaccine factors, and COVID-19 epidemic factors.[23].

*Historical background of vaccine hesitancy among HCWs

Vaccine hesitancy among HCWs is not new. Many pre-COVID-19 studies have examined HCW vaccine hesitancy, with most of this work focusing on seasonal influenza vaccination [24].

Before COVID-19, vaccine-hesitant HCWs expressed many concerns like those observed during the pandemic, including concerns about safety, mistrust of employers and government authorities, and violation of personal autonomy [24]. Intervention programs to encourage HCW vaccination, as well as vaccine mandates, have been previously studied and employed [25].

Vaccine hesitancy historically may be influenced by both the relative familiarity with and perceived personal risk from diseases. For example, HCWs typically have better uptake of vaccines for diseases less common in the general population, such as measles, tetanus, and hepatitis B [26].

In contrast, the vaccine against the more familiar influenza virus has commonly been involved in HCW hesitancy. A survey of HCW influenza vaccination attitudes and behaviors noted that the main reason HCWs cited for receiving influenza vaccinations was the perception of a risk to themselves and not necessarily consideration of risks to their patients [27].

This could simply be because HCWs are not confident the vaccine will protect patients. However, the idea that a disease would not likely pose a personal risk to HCWs may outweigh the potential for protecting vulnerable patients from harm when HCWs make decisions about influenza vaccinations [28].

***Factors facilitated or prevented COVID-19 vaccination among HCWs:**

The ability, opportunity, and motivation of healthcare workers to receive the COVID-19 vaccine are examined below [29]:

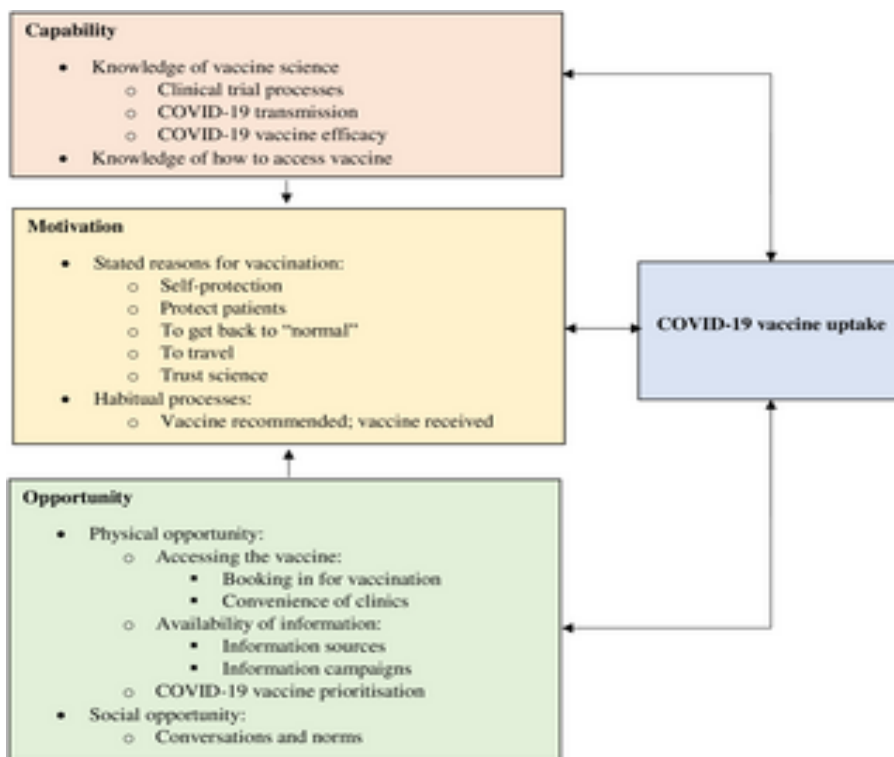


Figure 3. Health care workers capability, opportunity, and motivation to be vaccinated against COVID-19 [29].

***Role of HCWS to increase COVID-19 vaccination among population**

Maximizing the COVID-19 vaccination rate among healthcare workers (HCWs) is an evidence-based, reasonable approach to public health priorities [30].

Healthcare workers’ awareness of the significance of vaccination programs influences their attitudes towards public health preventive measures, especially when considering a long-term anti-COVID-19 strategy requiring future doses of booster vaccinations [31].

Furthermore, healthcare practitioners serve as the general public’s guide and trusted source of vaccination information. They can guard against false and confusing information. As a result, their attitude will influence their own and others’ health [32].

Healthcare workers (HCWs) are strong advocates for better dissemination of vaccine knowledge and boosting vaccine acceptance among the general population [33].

If HCWs are hesitant about the vaccine, patients are likely also hesitant. Finally, greatly publicized

resistance in a small group of highly visible individuals in healthcare professions may also contribute to vaccine hesitancy in the general population [34].

***Acceptance rates of COVID-19 vaccines of HCWs in Egypt and the world**

When vaccines did become available, many healthcare workers were quickly vaccinated. Long-term care facilities were also prioritized, and by 17 January 2021, a median of 37.5% of staff members, and an astonishing 77.8% of residents in long-term care facilities had received at least one dose of the vaccine [35].

Surveillance data from over 2000 US healthcare facilities found at least 50% of workers across facilities were vaccinated by mid-March 2021[36]. Eventual acceptance varied across the different professions, from vaccination rates as high as 75% among doctors to the lowest rate of vaccine acceptance among a cohort of nurses (56.7%) and nursing aides (45.6%) [37].in March 2021.

According to WHO, until May 2022, Egypt had 513,790 confirmed COVID-19 cases, including

24,641 deaths, and a total of 82,017,392 vaccination doses were delivered [38].

When the COVID-19 vaccine became available in Egypt, the Egyptian Ministry of Health (MOH) prioritized healthcare workers. They were the highest risk population for being infected with the new virus. The earliest vaccinated HCWs were given the Oxford–AstraZeneca COVID-19 vaccine until the all-available doses ran out, then they received the Sinopharm and Sinovac vaccines [32].

In a previous study in Egypt founded that among HCWs, the acceptance rate was 58.2%. Physicians were the most accepting group (67.6%), whereas technicians were the least (45.8%) ($p=0.062$). Higher acceptability was among those working in COVID-19 isolation hospitals (66% vs 51.6%; $p=0.001$), and at high-risk departments (60.2% vs 58.2%; $p=0.069$) [39].

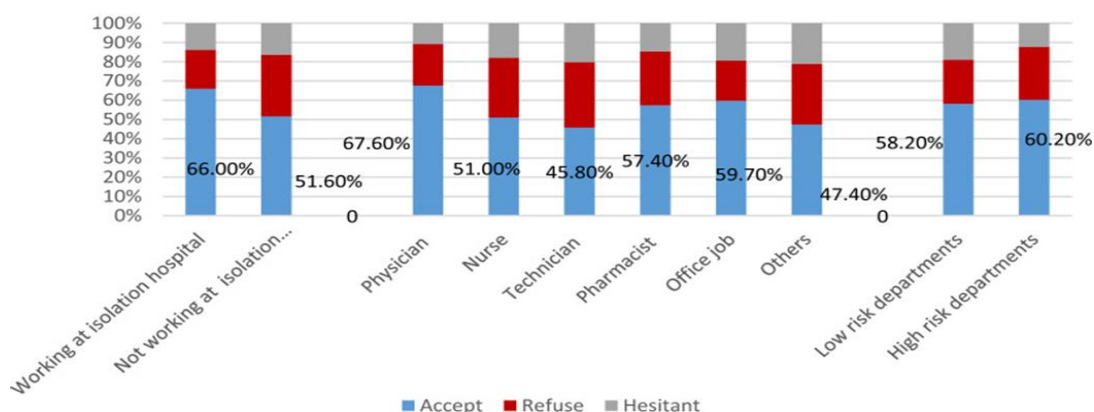


FIGURE 3: The acceptance of COVID-19 vaccines among HCWs according to job task, type of hospital and department [39].

***Efforts should be done to increase acceptance rates among HCWs:**

General Communication Principles	Supporting HCW Vaccination Decision Making	Supporting HCWs Once They Have Decided to Get Vaccinated
1 One size does not fit all	4 Understand and validate emotions	7 Support motivated HCWs while they wait
2 Distinguish messenger, channels, and message	5 Address short- and long-term susceptibility and severity	8 Make it as easy as possible to get both doses
3 Information is important but not enough	6 Build positive social norms through social comparison	9 Address the gap between intentions and action by creating clear plans

Figure 4. Nine Principles for Supporting Vaccination Confidence and Uptake in Health Care Workers [40].

Conclusion

Given the continued threat of an evolving SARS-CoV-2 virus, the issue of vaccine hesitancy will remain an ongoing concern. The reasons for COVID-19 vaccination hesitancy among HCWs are complex and varied. Thus, it is important to address these reasons for better intervention.

Since HCWs influence the general public's attitude, it is urgent to create interventions to alleviate the fear and misunderstandings about the COVID vaccines among health professionals.

Unless this is done, poor uptake of vaccination for this once-in-a-century global pandemic is expected.

Conflicts of Interest: The authors declare no conflict of interest.

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