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Exploring enablers and barriers toward COVID-19 vaccine acceptance among Arabs: A qualitative study

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ARTICLE INFO

Keywords:
Vaccine acceptance
Vaccine hesitancy
Arab Countries
Qualitative
SAGE
SARS-CoV-2
COVID-19

ABSTRACT

Background: With the emergence of the coronavirus disease 2019 (COVID-19) and rapid vaccine development, research interest in vaccine hesitancy (VH) has increased. Research usually focuses on quantitative estimates which largely neglected the qualitative underpinnings of this phenomenon. This study aimed to explore the beliefs and views towards COVID-19 vaccination among Arabs in different countries. Furthermore, we explored the effect of confidence in the healthcare system, misinformation, and scientific approaches adopted to mitigate COVID-19 on how individuals are following the recommended preventative actions including vaccination.

Methods: This study was based on the Strategic Advisory Group of Experts (SAGE)-VH Model: A qualitative design that utilized in-depth, online interviews. The study was conducted in seven Arab countries (Egypt, Qatar, Kingdom of Saudi Arabia, Libya, Sudan, United Arab Emirates and Jordan) from June 2020 to December 2021. Transcripts were analyzed using NVivo 12 Software.

Results: A total of 100 participants, 44 males and 56 females, of different age groups (37.1 ± 11.56 years) were interviewed. Findings revealed six themes as enablers and barriers to COVID-19 vaccination. Many participants indicated trusting the vaccines, the healthcare systems, and the vaccination policies were the main driver to get the vaccine. Participants showed concerns...
International Journal of Disaster Risk Reduction 82 (2022) 103304

1. Introduction

Vaccinations simultaneously achieve dual outcomes: disease avoidance at the individual level and community protection through the prevention of transmission of infectious diseases. The latter, known as “herd immunity”, demands significant levels of vaccination coverage in a population to efficiently prevent pandemics [1]. Extensive research has been taking place to produce vaccines against the coronavirus disease 2019 (COVID-19) to mitigate its spread [2–4]. The desire to receive a vaccine is affected by numerous factors, such as misinformation, lack of confidence in health authorities, and lack of trust in the effectiveness of vaccines, leading to a phenomenon termed vaccine hesitancy (VH) [5,6]. VH is identified as one of the ten greatest threats to the global health [7]. VH was described by the Strategic Advisory Group of Experts on immunization (SAGE) as the delay in acceptance or rejection of vaccines even though the availability of vaccines is maintained [8]. The decision to get vaccinated is affected by various factors such as risk perceptions, general attitudes toward vaccination, social and cultural barriers, complacency, convenience, and confidence or trust in the healthcare system [8,9]. A primary challenge faced by governments during the current COVID-19 pandemic is to address and develop the trust of populations to reach the maximum number of vaccinations and subsequent herd immunity [10].

Misinformation occurs when erroneous or imprecise information is provided regardless of the intention to mislead [11]. The availability of social media-led misinformation can have serious harmful repercussions since some people are not only misled but are also less able to believe in scientific facts and trust experts [12,13]. Growth and dissemination of misinformation are linked to political and economic turmoil and present serious threats to public health in the current COVID-19 pandemic [11]. Some research found that people with low health literacy are the perfect targets for such messages [14]. Confidence in the government, scientists, and health workers is considered necessary to prevent the spread of COVID-19 and to develop successful vaccination programs [15]. Yet, the dissemination of COVID-19 misinformation has helped to create a so-called ‘crisis of trust’ [16]. This decrease in confidence was accentuated by genuine criticism of official actions against the pandemic and by increasing suspicion of governments and healthcare services, especially among the outcasts [17].

Although low vaccine uptake is reported in regions where there are limited resources and vaccine availability by the healthcare system, failure of the system to provide vaccination is not always the predominant reason for low vaccine uptake, rather VH among individuals persists regardless of the failure of systems. In such situations, measuring VH is difficult as priority is given to the healthcare system not being able to provide vaccinations [18,19]. Determinants of VH can be assigned to four main categories/factors. The first is sociological hesitancy where some studies showed that people with higher socioeconomic status might not vaccinate, while other studies reported that people with low socioeconomic status might also be hesitant. The second category is epistemological hesitancy, where people perceive that the harm of vaccines outweighs their benefits. The third factor is the culture, with some people having cultural conceptions of how the ingredients used in vaccines come from cells obtained from terminated fetuses or animals. The fourth factor contributing towards VH is psychological; hesitant people are aware of the benefits of vaccination yet tend to not vaccinate due to irrational reasons [19,20].

The Arab world comprises a large population of over 440 million individuals residing in 22 countries including Algeria, Bahrain, the Comoros Islands, Djibouti, Egypt, Iraq, Jordan, Kuwait, Lebanon, Libya, Morocco, Mauritania, Oman, Palestine, Qatar, Kingdom of Saudi Arabia (KSA), Somalia, Sudan, Syria, Tunisia, the United Arab Emirates (UAE), and Yemen [21]. Since the start of the COVID-19 pandemic in February 2020, the total number of confirmed cases of COVID-19 in the Arab world as of December 31, 2021 is reported to be over 16.7 million, with more than 308,000 deaths [22]. Full vaccination rates are reported to be under 10% in seven of the 22 Arab countries and around one third are reported to be fully vaccinated [22]. With the spread of the Omicron variant, the director-general of the World Health Organization-Eastern Mediterranean Regional Office (WHO-EMRO) warned of the increase in Omicron-infected cases in more than 15 of the 22 Arab countries due to the low COVID-19 vaccination rates even with the decrease in mortality rates [23].

VH among Arabs aggravates the existing disparities in health and increases vulnerability to COVID-19 [24]. COVID-19 VH was reported to be prevalent among the Arab population [20,25,26]. In a large survey of 36,220 eligible individuals, VH rates were 83% and 81%, respectively, among Arab people inside and outside the Arab region [20]. Furthermore, VH among Arab healthcare workers (HCWs) residing in and outside Arab countries was 25.8% and 32.8%, respectively [24]. Other studies identified high VH among HCWs in Arab and non-Arab countries [27,28]. This finding poses a severe hurdle to achieving herd immunity and control of the pandemic.

Interventional public health programs for individuals refusing vaccination have demonstrated effectiveness in promoting attitudes and behavioral changes. However, such programs must be adapted to the unique characteristics of how a particular audience perceives a specific issue [29]. Compared with quantitative research, qualitative research provides a deeper explanation of the interviewees’ thoughts, views, and experiences and interprets the meaning of their actions [30].

This study aimed to explore the enablers and barriers toward vaccine acceptance among Arabs. It investigates the effect of factors like confidence in the healthcare system, misinformation, and scientific approaches adopted to mitigate COVID-19 vaccination among Arabs in different countries.
1. Theoretical framework

The study was based on the SAGE-VH Model that identified contextual, collective, and individual influences as determinants of VH [8,31]. Historic, socio-cultural, environmental, health system/institutional, economic, or political factors, and vaccination availability, access, safety, and effectiveness are among the group and system influences affecting VH. Individual influences such as mistrust, health behavior, age, education, socio-economic status, personal beliefs, religious, and community or norm beliefs were the major factors that may affect people’s willingness to get vaccinated or to vaccinate their children. Consequently, the risk of becoming part of the hesitant group for a person who had no previous concerns with vaccination is high due to these extensive factors and influences. The European Centre for Disease Prevention and Control (ECDC) technical report warned against the risk of the formation of vaccine-resistant clusters if enablers and barriers are not properly addressed by health professionals and authorities [31]. Peretti-Watel et al., [32] argued that the idea of a continuum might not be appropriate when discussing VH as people may choose to take certain vaccines and others may not, based on their circumstances and informed choices. This may indicate that individuals or groups may be at risk of moving forward and backward on the VH continuum especially in the era of the COVID-19 pandemic if they do not have enough resources to make an informed choice. Countries with conflicts, and unsettled political environments with weaker healthcare systems may be unable to face the challenges of VH in the community. A strong health education-oriented system which reduces barriers to vaccination and enables people to make an informed decision with maximized access and equity creates a better environment for COVID-19 acceptance. Before conducting the current study, the research team conducted a cross-sectional survey in 13 different Arab countries, and found that the level of confidence, constraints, and complacency varied significantly across the studied population [25]. These findings encouraged the team to conduct a qualitative study to obtain in-depth information on the causes of VH in the Arab region.

2. Methods

This study is being reported according to the Consolidated Criteria for Reporting Qualitative Research (COREQ) [33].

2.1. Study design

A qualitative research method using an inductive approach was used. Online, in-depth interviews were conducted by different researchers in seven Arab countries (Egypt, Qatar, KSA, Libya, Sudan, UAE, and Jordan) between June 2020 and December 2021. The team included researchers from 13 Arab countries; however, due to time constraints and the COVID-19 pandemic impacts on communication, only researchers from the seven countries mentioned above participated in the data collection.

2.2. Data collection

2.2.1. Sampling

Participants were recruited via convenience and via a snowball sampling technique. Each researcher initially contacted the people they knew, introduced the research objectives to them, asked them to voluntarily participate in the study, and then asked them to forward the invitation to participate in the study to other people. Phone, Zoom, and WhatsApp were the methods of contact between the researchers and the participants. A sample of 100 participants—44 males and 56 females—of different age groups (mean 37.1 ± 11.56 years) and different Arab nationalities were interviewed (Table 1). Another mix of participants from different countries were recruited conveniently through networking by the researchers. Countries included in the study are representative of the Arab countries by region as there were countries from both the Gulf region and Africa.

2.2.2. Setting and ethics

All interviews were conducted online due to COVID-19 restrictions. Each interview lasted for 30–45 min. Ethical approval was obtained from the Ethics Committee of the Faculty of Medicine, Alexandria University, Egypt (IRB No: 00012,098). All participants received full information about the study aims and goals, the possibility to withdraw from the research at any time, and the confidentiality of their identifiable information. Interviewees provided oral consent to participate. For confidentiality and privacy purposes, all participants were coded by country and by number. For example, a participant from Jordan was given the code (JOR.1), Egypt (EGY.2), etc.

2.2.3. Interview guide (suppl. 1)

An interview guide was created based on the SAGE working group that identified contextual influences affecting people’s stances towards vaccines. Three major contextual influences were categorized: 1. Political, social, economic, and environmental influences; 2. Collective and individual media influences; and 3. Vaccination issues. Based on these influences, interview questions related to the COVID-19 virus and available vaccinations were developed (Supplementary Table 1).

The interview guide was developed in both Arabic and English languages and was reviewed by the research team who agreed on the final draft of questions and concepts to be addressed through interviews. Each researcher added extra questions to fit the context of their country as well as questions on childhood and Influenza vaccines. The interview guide was piloted by the principal investigator (PI) in the UAE. The research team then revised the interview guide and finalized it for use by all participating countries. All interviews
| Gender | Age | Education | Occupation | Country of Residence | Nationality | Marital Status | No. of children | Urban or Rural |
|--------|-----|-----------|------------|----------------------|-------------|----------------|----------------|----------------|
| USA    | Male | 37        | University/Postgraduate | Assistant Professor | USA | Syrian | Married | None |
| OMA    | Male | 48        | University/Postgraduate | Teacher | Oman | Oman | Married | 4 |
| CAN    | Male | 45        | University/Postgraduate | Teacher | Canada | Libya | Married | 3 |
| USA    | Male | 29        | University | Instructor | USA | Egypt | Single | None |
| USA    | Male | 24        | University | Student/Investor | USA | Egypt | Single | None |
| USA    | Male | 21        | University | None | USA | Egypt | Married | 1 |
| USA    | Male | 26        | University/Postgraduate | Student | USA | Egypt | Married | 1 |
| MOR    | Male | 37        | University/Postgraduate | Teacher | Morocco | Morocco | Single | None |
| MOR    | Male | 45        | University/Postgraduate | Teacher | Morocco | Morocco | Married | Yes |
| IRA    | Male | 35        | University/Postgraduate | Assistant Professor | Iraq | Iraq | Married | 2 |
| JOR    | Female | 26       | University | Housewife | Jordan | Jordanian | Married | Urban |
| JOR    | Male | 40        | University | HR Recruiter/Private Company | Jordan | Jordanian | Married | Urban |
| JOR    | Female | 44       | College | Head Of Accounting Division | Jordan | Jordanian | Married | Urban |
| JOR    | Female | 39       | University | Teacher/Private School | Jordan | Jordanian | Married | Urban |
| JOR    | Male | 68        | College | Retired Communication | Jordan | Jordanian | Married | Rural |
| JOR    | Female | 44       | University | Translator | Jordan | Jordanian | Married | Urban |
| JOR    | Male | 35        | University | Customer Services Officer | Jordan | Jordanian | Married | Urban |
| JOR    | Female | 41       | University | Secretary | Jordan | Jordanian | Married | Urban |
| JOR    | Male | 52        | Secondary school | Retired | Jordan | Jordanian | Married | Urban |
| JOR    | Male | 37        | University | Computer Laboratory Supervisor | Jordan | Jordanian | Single | Urban |
| JOR    | Female | 51       | University | Teacher | Jordan | Jordanian | Married | Urban |
| JOR    | Male | 38        | High school | Security Man | Jordan | Jordanian | Married | Urban |
| JOR    | Female | 65       | College | Retired Teacher | Jordan | Jordanian | Married | Rural |
| JOR    | Male | 48        | University | Director Of Financial Department | Jordan | Jordanian | Married | Urban |
| JOR    | Female | 43       | High school | Receptionist At Laundry | Jordan | Jordanian | Married | Urban |
| JOR    | Male | 31        | University | Salesman In Mall | Jordan | Jordanian | Married | Urban |
| JOR    | Female | 41       | College | Programmer | Jordan | Jordanian | Married | Yes |
| JOR    | Male | 44        | University | Teacher | Jordan | Jordanian | Married | Yes |
| JOR    | Female | 78       | High school | Retired Teacher | Jordan | Jordanian | Married | Yes |
| UAE    | Male | 46        | University/Postgraduate | Head Of Auditing And Accounting | Jordan | Jordanian | Married | Yes |
| UAE    | Female | 25       | University | Researcher | United Arab Emirates | Jordanian | Married | Yes |
| UAE    | Female | 25       | University | Housewife | United Arab Emirates | Palestinian | Married | Yes |
| UAE    | Female | 24       | University | Unemployed | United Arab Emirates | Palestinian | Single | None |
| UAE    | Female | 47       | High school | Housewife | United Arab Emirates | Palestinian | Single | None |

(continued on next page)
| Gender | Age | Education                                  | Occupation                   | Country of Residence | Nationality       | Marital Status | No. of children | Urban or Rural |
|--------|-----|--------------------------------------------|------------------------------|----------------------|-------------------|----------------|----------------|----------------|
| UAE6   | Male| 62 University/Postgraduate                 | School Director              | United Arab Emirates | Jordanian         | Single         | None           | Urban          |
| UAE7   | Female| 44 High school                             | Housewife                    | United Arab Emirates | Emirati           | Married        | 3              | Urban          |
| UAE8   | Male| 43 University/Postgraduate                 | Teacher                      | United Arab Emirates | Palestinian      | Married        | 3              | Urban          |
| UAE9   | Female| 29 University/Postgraduate                 | Housewife                    | United Arab Emirates | Emirati           | Married        | 4              | Urban          |
| UAE10  | Female| 28 University                              | Unemployed                   | United Arab Emirates | Jordanian         | Married        | Pregnant       | Urban          |
| UAE11  | Female| 29 University                              | Teacher                      | United Arab Emirates | Jordanian         | Married        | 1              | Urban          |
| UAE12  | Female| 30-40 University/Postgraduate              | Doctor/Phd Student           | United Arab Emirates | Nigeria           | Single         | None           | Urban          |
| UAE13  | Female| 30 University                              | Office                       | United Arab Emirates | Syrian            | Married        | 3              | Urban          |
| UAE14  | Female| 29 University                              | Teacher                      | United Arab Emirates | Syrian            | Married        | 1/Pregnant     | Urban          |
| UAE15  | Female| 25 High school                             | Unemployed                   | United Arab Emirates | Palestinian      | Single         | None           | Urban          |
| UAE16  | Female| 30 University                              | Unemployed                   | United Arab Emirates | Syrian            | Married        | 2/Pregnant     | Urban          |
| UAE17  | Female| 26 University                              | Researcher                   | United Arab Emirates | Palestinian      | Single         | None           | Urban          |
| UAE18  | Female| 45 University/Postgraduate                 | Teacher                      | United Arab Emirates | Emirati           | Married        | 6              | Urban          |
| UAE19  | Female| 37 Secondary School                       | Housewife                    | United Arab Emirates | children of female citizen | Married        | 4              | Urban          |
| UAE20  | Female| 22 High school                             | Un-Employed                  | United Arab Emirates | Syrian            | Single         | None           | Urban          |
| EGY1   | Male| 35 University                              | Media Producer               | Egypt                | Egypt             | Married         | Yes            | Urban          |
| EGY2   | Male| 40 University/Postgraduate                 | Assistant Professor          | Egypt                | Egypt             | Married         | 1              | Urban          |
| EGY3   | Female| 38 University/Postgraduate                 | Instructor                   | Egypt                | Egypt             | Single          | None           | Urban          |
| EGY4   | Male| 27 University/Postgraduate                 | Instructor                   | Egypt                | Egypt             | Married         | 1              | Urban          |
| EGY5   | Male| 35 University                              | Politician                   | Egypt                | Egypt             |                |                | Urban          |
| EGY6   | Female| 41 University/Postgraduate                 | Journalist                   | Egypt                | Egypt             |                |                | Urban          |
| EGY7   | Male| 24 University                              | Engineer                     | Egypt                | Egypt             |                |                | Urban          |
| EGY8   | Female| 31 University                              | Publisher and Owner of Publishing House | Egypt            | Egypt             |                |                | Urban          |
| EGY9   | Female| 35 University                              | Psychologist                 | Egypt                | Egypt             |                |                | Urban          |
| EGY10  | Male| 25 University                              | Engineer                     | Egypt                | Egypt             |                |                | Urban          |
| EGY11  | Female| 30 University                              | Programmer                   | Egypt                | Egypt             |                |                | Urban          |
| EGY12  | Female| 29 University/Postgraduate                 | Academic Director            | Egypt                | Egypt             |                |                | Urban          |
| EGY13  | Male| 26 University                              | Engineer                     | Egypt                | Egypt             |                |                | Urban          |
| EGY14  | Female| 25 University                              | Teacher                      | Egypt                | Egypt             |                |                | Urban          |

(continued on next page)
| Gender | Age  | Education             | Occupation                  | Country of Residence | Nationality | Marital Status | No. of children | Urban or Rural |
|--------|------|-----------------------|-----------------------------|----------------------|-------------|----------------|----------------|----------------|
| EGY15  | Female | 60  | University             | Housewife              | Egypt        | Egypt          |                |                |
| EGY16  | Male   | 30  | University             | Employee               | Egypt        | Egypt          |                |                |
| EGY17  | Male   | 18  | Secondary School       | Student                 | Egypt        | Egypt          |                |                |
| EGY18  | Male   | 30  | University graduate    | Employee               | Egypt        | Egypt          |                |                |
| EGY19  | Male   | 63  | Secondary School       | Retired                 | Egypt        | Egypt          |                |                |
| LIB1   | Female | 21  | College                | Receptionist            | Libya        | Libyan         |                |                |
| LIB2   | Female | 29  | College                | Receptionist            | Libya        | Libyan         |                |                |
| LIB3   | Female | 38  | College                | Accountant              | Libya        | Libyan         |                |                |
| LIB4   | Male   | 36  | University/Postgraduate| Employee               | Libya        | Libyan         |                |                |
| LIB5   | Male   | 50  | University             | Police                  | Libya        | Libyan         |                |                |
| SUD1   | Male   | 25  | University/Postgraduate| Engineer               | Sudan        | Sudanese       | Single         |                |
| SUD2   | Female | 37  | University             | Director Marketing     | Sudan        | Sudanese       | Divorced       |                |
| LIB6   | Female | 37  | College                | Technicians            | Libya        | Libyan         | Yes            | urban          |
| LIB7   | Female | 32  | University/Postgraduate| Teacher                | Libya        | Libyan         | Yes            | urban          |
| LIB8   | Female | 26  | College                | Sales                   | Libya        | Libyan         | Yes            | urban          |
| LIB9   | Male   | 33  | College                | IT Manager              | Libya        | Libyan         | 2              | urban          |
| LIB10  | Female | 31  | college                | Technician             | Libya        | Libyan         | 2              | urban          |
| LIB11  | Male   | 25  | University             | Technician             | Libya        | Libyan         | Yes            | urban          |
| LIB12  | Female | 28  | College                | Accountant             | Libya        | Libyan         | 2              | urban          |
| LIB13  | Male   | 60  | University/Postgraduate| Assistant Teacher e    | Libya        | Libyan         | Yes            | urban          |
| LIB14  | Female | 36  | College                | Lab Technician          | Libya        | Libyan         | 2              | urban          |
| LIB15  | Female | 39  | University/Postgraduate| Owner Pharm Company     | Libya        | Libyan         | 2              | urban          |
| LIB16  | Female | 54  | University/Postgraduate| Assistant Teacher       | Libya        | Libyan         | Yes            | urban          |
| LIB17  | Male   | 29  | College                | Translator              | Libya        | Libyan         | 2              | urban          |
| KSA1   | Male   | 43  | University             | Pharmaceuticals Sales Manager | KSA | Egyptian |                      |                |
| KSA2   | Female | 33  | University             | Science Teacher         | KSA          | Egyptian       |                |                |
| KSA3   | Female | 42  | University/Postgraduate| Assistant Prof Of Biomechanics | KSA | Egyptian |                      |                |
| KSA4   | Female | 36  | University             | Housewife              | KSA          | Jordanian      |                |                |
| KSA5   | Female | 42  | University/Postgraduate| Arabic Teacher          | KSA          | Saudi          |                |                |
| KSA6   | Female | 37  | University/Postgraduate| Dentist                | KSA          | Egyptian       |                |                |
| QAT1   | Male   | 38  | University             | News Editor             | Qatar        | Egyptian       |                |                |
| QAT2   | Female | 45  | University/Postgraduate| Journalist/News Anchor  | Qatar        | Qatari         |                |                |
| QAT3   | Male   | 40  | University             | Journalist              | Qatar        | Egyptian/Menofia|                |                |
| QAT4   | Male   | 23  | University             | Medical Doctor/News Anchor | Qatar | Qatari |                |                |
| QAT5   | Male   | 34  | University             | Masjid Imam/Religious   | Qatar        | Egyptian/Atswan |                |                |
| QAT6   | Female | 36  | University/Postgraduate| Teacher                | Qatar        | Egypt          |                |                |
were recorded then transcribed. The PI collected all transcribed interviews from all participating researchers, and a research assistant then helped review all the transcripts and translated those in Arabic to English.

### 2.2.4. Data saturation

Data saturation was reached in some countries; however, some researchers did not reach data saturation due to time limitations and logistics. The final sample showed similarities, which indicated that data saturation was reached at a much earlier stage. To check different perspectives around the Arab world, more participants were invited when possible.

Some of the researchers in a few countries sent some of their transcribed interviews to participants for review, validation, and bias minimization. All interviews were transcribed and uploaded to NVivo 12 software for analysis [34] Each researcher from each country reviewed their transcripts. The two experienced qualitative researchers, IE and MY, subsequently divided the interviews between themselves and identified nodes. The research team then met online and discussed the emerging themes.

### 3. Data analysis

The analysis team used the SAGE contextual influences as a guide for the analysis. However, as the approach was inductive, all themes identified were coded. Due to the high volume of data, the original coding identified more than 70 themes; the researchers looked for similarities to shrink and merge the emerging themes. A coding tree was created for all final themes included in the findings.

### 4. Results

As the study included different countries that may have specific political, social, and socioeconomic contexts, the most common themes are presented. General themes that are not particular to a specific country or geographical area of all the participating countries are presented. The main themes included in the study are listed in Table 2. Each theme is discussed in terms of both enablers and barriers to vaccination (see Table 3).

**Themes.** Six themes were identified that enable or hinder Arabs to accept the COVID-19 vaccination; these are: 1) Trust, 2) Fear of COVID-19 and its Vaccine, 3) Social/Religious and Public Health Responsibility, 4) Educational and Media Influences, 5) Access and Availability, and 6) Anecdotal Evidence. Each of these themes is discussed below.

1. **Trust.** Trust as a sub-theme is an enabler to vaccination while mistrust is a major barrier. While some participants expressed their mistrust in the vaccine, most of the participants in different Arab countries indicated their trust in the vaccines, the healthcare system of their country, and the policies initiated to vaccinate people. Trusting authorities, HCWs, vaccine efficacy and safety, and enacted policies were among the identified enablers in most of the studied countries. Many of the participants from specific countries expressed their trust. For example, (JOR.8) said: ‘I trust the healthcare system in Jordan. Since most people have medical insurance, the healthcare system is accessible to all people, and we have good skilled specialists’, (JOR.4) expressed a similar opinion: “The healthcare system in Jordan is excellent and has good skilled doctors”. In Egypt, (EGY.2) indicated that “Egypt will have it, so the vaccine is safe then why wouldn’t we take it?”, and then continued, “I think when the government says it is safe, so it is safe, and we saw the Minister of Health taking the Chinese vaccine, so I think it is safe”. (EGY.2) also said: “The private system I trust them too, but I think our country will not take a risk to say on anything and cause harm as the Egyptian society is not suitable for taking risks”.

Many of the study participants also agreed on the importance of getting vaccinated, believing that vaccines are effective and safe. For instance, (KSA.1) expressed his trust in the healthcare system in KSA indicating that he trusts vaccines and vaccine administration in his country. (UAE.7) said: “UAE is one of the best countries in the world in the way they handled COVID-19, in terms of measures, vaccine, and treatment. So, I trust the health system in UAE”. Agreeing with participant UAE 7, (UAE.3) stated: “I want to take the vaccine here in the UAE, not in Palestine, as in UAE I trust the vaccine and there are options of different types; however, in Palestine it is only one type and you read

| Table 2 | Major themes. |
|---------|---------------|
| Beliefs about COVID-19 |  |
| Confidence in media |  |
| Conspiracy theory |  |
| Efficacy of COVID-19 vaccine |  |
| Implications of COVID-19 |  |
| Interaction with COVID19 vaccine |  |
| Peer discussions about vaccine rejection |  |
| Physician recommendation effect |  |
| Preferred vaccine type |  |
| Preferred way of taking the vaccine |  |
| Prevention of COVID-19 without vaccine necessary |  |
| Protecting others |  |
| Refusal to take the vaccine |  |
| Readiness to take the vaccine |  |
| Social media role |  |
| Trust in local health authority |  |
| The role and type of trust |  |
A lot of risks, starting from symptoms making persons unable to perform his duties and work and going up to mortalities for elderly people or chronic disease or respiratory tract problems for those who have had asthma. The problems range from symptoms to mortality. It is very dangerous."

In contrast, fear is considered a strong barrier to vaccination. Fears such as fear of side effects, fear of complications and long-term effects of vaccines (such as changes in Deoxyribonucleic acid (DNA), immune system effects, and decreased fertility), and fear of injection were discussed by our participants. Others reported fear for their family members. (JOR.4) said: “I believe in the efficacy and safety of vaccines including COVID-19 vaccines, and I received it to convince my father by its safety to encourage him for receiving it”. Although some have expressed doubts about the clinical trials conducted and the speed of rolling out the vaccines, others believed in the efficacy and safety of COVID-19 vaccines distributed within the Arab world. It was obvious from the interviews that some people have already developed a more robust trust in the vaccinations and the vaccination programs due to their trust in their governments and policymakers. (JOR.13) said: “It is excellent in Jordan; all hospitals and HCWs are qualified. Our government here in Jordan did excellent management starting from lockdowns and ending with providing free vaccines for anyone who wants to receive it”. (JOR.13) also stated: “They did a great job in Jordan, in comparison with our limited resources like building field hospitals". Moreover, (QAT.5) indicated his trust in Qatar health authorities and his pride in being among the residents of Qatar. In contrast, (EGY.1) said: “I don’t trust the healthcare system in Egypt or HCWs. How can I take a vaccine from a system or persons I do not have trust in”. For some, HCWs were giving contradictory messages which led some participants to reject having the vaccine. (UAE.4) said: “he doctor said yes [to take it]. However, the nurse told me not to take it; if I took it, I would die”. (JOR.3) said: “I don’t trust the health system in Libya as since the past few years medical staff, quality of devices and supplements have gotten worse, as well as lack of thinking for the interest of the patients”. In addition, (LIB.8) remarked: “Actually, I don’t trust the health system in Libya because unfortunately, they don’t think of the patient health as the priority; instead, they think more about using the money dedicated to serve the patients for their own interests”. (LIB.10)

2. Fear of COVID-19 and Fear of its Vaccine. Another important theme that is an enabler and a barrier simultaneously is fear. Fear as an enabler includes fear of short-term and long-term effects of COVID-19, fear of harming others (such as loved ones or the public), and fear of becoming excluded. Many participants have referred to their willingness to be vaccinated as they feared the effect of COVID-19 on their health, especially after reports of people dying or hospitalization and being on ventilators. (JOR.18) said: “This virus may cause respiratory problems as I mentioned, which is a burden on the healthcare system in all countries and some infected cases ended up with death”. (JOR.18) continued, “This virus may leave some problems for those who were infected and recovered, like respiratory problems’’. The fear of getting sick and the fear of the stigma of being a COVID-19-positive patient were also common themes reported by several participants. Another important factor of fear was the fear to harm others, especially loved ones. Participants’ social role as fathers, mothers, children, or even grandchildren were reported by many as a motive to vaccinate to protect their vulnerable family members. (EGY.16) said: “Regarding my family, my decision to get the vaccination will make a difference as no-one will get the infection or have the complications”. (KSA.1) said: “A lot of risks, starting from symptoms making persons unable to perform his duties and work and going up to mortalities for elderly people or chronic disease or respiratory tract problems for those who have asthma. The problems range from symptoms to mortality. It is very dangerous".

Some participants did not believe that the vaccines were effective and safe. (JOR.9) said: “I heard that some of those who received it got the infection”. (JOR.4) commented: “I heard about a person who got the infection after receiving the vaccine”. Furthermore, (EGY.1) said: “I personally know people who took the COVID-19 vaccine and got infected by the disease, so it has no prevention against it”. (EGY.1) also expressed a concern regarding the safety of a particular type of vaccine: “if I had to choose a vaccine, I will choose the vaccine for the East countries (China or Russia) not the liberal countries (America and Europe) because human beings are less valuable in East countries so a large number of people will be under experimentation either by their wish or not”. To interpret what EGY.1 meant, it is a general belief that vaccines for the Eastern countries have undergone extensive experiments on people and have proven to be effective. However, Western countries value people’s lives and will not do enough experiments on people using the vaccines, so EGY.1 is not sure that Western vaccines will be effective or safe.

3. Social/Religious/Economic and Public Health Responsibility. This theme includes patriotism, public health duty, and economic/social and religious responsibility. Several of our participants in countries like UAE, KSA, and Qatar, where political systems reinforce patriotic feelings and encourage a sense of belonging and respect for rules and laws, have reported the importance of following orders and respecting regulations. These participants in comparison to other Arab participants also showed more willingness to vaccinate as this is highly recommended by their policymakers and governments.
Patriotic feelings, social responsibility, and commitment were important themes identified by three participants in the UAE (UAE.4 UAE.5, and UAE.12). All three mentioned that they had the vaccine only because they were in the UAE and that they would not have taken it if they had been in other Arab countries. They indicated that they believe and respect what the policymakers say and trust their decisions and the vaccines they allow. Similar feelings were shared by (KSA.12) who said: “Deep within me, I am so proud how my country leaders care for Saudi citizens’ health. When I compare with other countries, I feel I am so proud of my country leaders”. The same held true for participants from Qatar who expressed their patriotic feelings and willingness to follow rules and guidelines. (QAT.6) said: “I did not take the vaccine yet as I am pregnant and so far, it is not recommended to take it, but I will follow rules and I am willing to take it if it is recommended by authorities. While such views of the participants (KSA.12 and QAT.6) also fit under the “Trust” theme, they were placed here because trust leads to action. Trust in these policymakers’ decisions leads to the participants taking an action, which is to accept the vaccines because they feel it is a responsibility, and if other people see them (i.e., these participants) getting the vaccine, they will do the same. Hence, they are fulfilling their responsibility and duty toward their countries and policymakers’ decisions. However, in other countries, like Jordan, Egypt, Sudan, and Libya, there was a strong individual belief among many participants that the health systems of their country are poor, and they cannot take an action regarding the COVID-19 vaccine based on what the policymakers and leaders of their country are saying. Therefore, they will not get the vaccine. However, some participants from these countries reported their willingness to be vaccinated due to being responsible individuals who would like to protect those around them. Their readiness and willingness to get vaccinated did not originate from their political views; it was more from their social and religious views. (LIB.3) said: “Most of my friends live outside Libya so they will receive it but for me, I’m still refusing it”, and then continued by saying, “We all agree that vaccines should be given to high-risk groups only and our role is mainly to stay restricted to the preventive measures”. (EGY.10) said: “If I don’t take it and others don’t take it, the Coronavirus would remain and it would continue to have precautionary measures that affect the movement, economy, study, and everything”. (EGY.11) said: “I am afraid for my father and my mother who are old, and they have hypertension and diabetes diseases so the disease would cause them more complications”. Furthermore, (EGY.6) said: “I don’t know, I feel I can’t decide at the moment if I will take the vaccine or not, but surely the family will be a part of the decision”.

Participants’ economic struggles were reported by many to be a great motive to get vaccinated. They wanted the wheel of the economy to run again. (JOR.20) said: “It is better to take it to decrease the number of infected cases and resume a normal life. I tried the vaccine myself and my experience is excellent, I like life and I think those who received the vaccines are brave people and like life”. (UAE.15) said: “Economy is going down because of COVID-19”.

Some participants reported having medical and research experience. (EGY.6) said: “The studies on the Chinese and Pfizer vaccines were done on thousands of people and their efficacy were documented to be more than 90% and the side-effects reported and are simple like what happened with me and my wife”. So, such a participant took an informed decision.

On the contrary, some participants were reluctant to have the vaccine because they did not know who or what to believe regarding COVID-19 news. They expressed their frustration about the misinformation chaos (UAE.2) said: “I stopped reading anything about COVID-19 and do not watch TV nor follow its news on social media”. In addition to social views on vaccines, many participants indicated that vaccination is a religious responsibility. Moreover, participants’ own religious beliefs and faith to protect themselves and others were found to be a persistent theme in the findings. (KSA.2) said: “God ordered us to care for ourselves and care for others as well”, while (KSA.9) said: “We stay away from people’s gathering, take precautions and pray and depend on God”. (KSA.12) recognized the role of their own beliefs, “Maybe the decision is affected by my own religious and/or cultural beliefs. We must care for ourselves and each other”.

4. Education/Media Influence. Education and media influence are enablers to vaccination but can sometimes be classified as barriers. Being educated was a factor for some participants to accept the vaccine with no hesitation. Education status was, for many participants, an enabler to accept the vaccine; these participants trust science, medicine, and research. Concurrently, some participants were influenced by media reports, especially those issued by governmental agencies and/or posted on official social media accounts that can be trusted. The participants indicated that media can be harmful; however, it is a great enabler if properly controlled. (JOR.14) said: “I read about COVID-19 vaccines news on a website then decided to receive it”. (JOR.3) said: “I received it because my friends who are physicians received it, and I have received the seasonal flu vaccine for the past 4 years; it was safe and effective”. (JOR.12) seemed to have obtained information about COVID-19 vaccines from the internet. Speaking of the side effects, (JOR.12) said: “It may cause hypersensitivity at the site of injection and may cause shortness of breath that’s all that I know from internet”. (JOR.12) also said: “I heard on TV that some people who received it developed simple side-effects like pain at site of injection”. (JOR.8) stated: “I will not receive it because I got the virus. Whoever got the infection is excluded from receiving the vaccine, as they said on TV”.

Responding to a question about the role of social media on people choosing to accept or reject the vaccine, (UAE.15) said that among her family, there were different views, “I am sending, for example, for my family about the COVID-19 vaccine and awareness about this issue, but they send me back more about anti-vaccine and the adverse effect of the vaccine like dying and clotting, and now I have to explain to them why and the right thing. So, social media have good and bad sides”.

Several participants who indicated their hesitancy to get vaccinated alluded to the fact that social media and media reports were their main sources of trusted information against the vaccines. Hearing or reading news about the side effects of the vaccines and the conspiracy theories was a major influence on their decision to not have the vaccine. (JOR.10) said: “Generally, the media was giving fake information, way of showing events like deaths scared people, number of infected cases and deaths are real; no benefits of falsifying numbers, on the other hand, I think the media should make more efforts to educate people about vaccines and about the COVID-19 virus itself”.

Going to the extreme, (EGY.1) accused the media of spreading false news, “Talking about the media, they are big liars. They take their orders from governments and try to affect them with their lies over the people”. (EGY.1) then further explained that the media is carrying out
the agenda of the government. “The official number of COVID-19, it does not represent 20% of the real number of infected cases or death cases. I think the media plays a great and dirty role in guiding the population to a certain type of vaccine”.

Claims on 5G controlling human minds, and an aim to reduce human population numbers were reported by many participants in different regions as reasons why they cannot trust vaccines. (JOR.1) said: “I think it was produced at the laboratory as I told you to decrease the number of people in the world and destroy the economics of some weak countries”. (JOR.15) said: “If all people in the world advise me, I will not receive any one of the COVID-19 vaccines, I told you I don’t believe in them, this virus is a conspiracy”. (JOR.2) insisted that the whole story of COVID-19 is a conspiracy for some political purposes, “I think some countries developed it to get rid of some weak countries, especially Arab countries, it is highly obvious for me”. (JOR.2) also accused the governments of rich countries of using COVID-19 as a cause to get rid of people from poor countries. (JOR.11) believed in the conspiracy another angle, “I am sure that the vaccine is the conspiracy from pharmaceutical companies because these companies are the only ones making money these days”. (EGY.2) said: “I think the vaccine had a political side.”

When it comes to the role of media, (UAE.7) voiced that: “Media has two sides. It exacerbates numbers to promote vaccine and people make noise on it to be famous. There is a need for the regulation of social media, such as anti-vaccine Snapchat groups”. (KSA.2) said: “Media always participates in illustrating the image for the public. I believe in our leaders. I believe the number of cases is correct; we can all see how the situation is stable”. The WHO was mentioned as part of the conspiracy. (EGY.1) said: “I got my information mainly from the CDC site as I do not trust the WHO since it hides all the information about the pandemic from the beginning for more than two months for the favor of China”. (OMA.1) said: “I think the WHO has become a tool that is led by politicians and some powerful countries”.

Education seemed to play another role. For instance, (EGY.5) said: “I don’t know if it is effective or not, we need more time to know. It is new, and people received the first shot of it; I think after the second shot the efficacy will be clearer”. (EGY.5) continued, “I think they are not effective 100% like old vaccines because this virus is new, and I think researchers need more time to study the efficacy”. In addition, (EGY.6) said: “I will wait a little while to see if it is tested on many people and that people will have taken it will know and what are its effects”.

Several participants indicated that poor or non-existent education and awareness campaigns by authorities are a major influence on why people are refusing vaccination. (LIB.4) said: “About 70% of people here in Libya refuse to follow these measures, firstly because of the lack of awareness, and secondly due to the absence of law enforcement.” Some educated participants seemed to think critically of their decision on whether to take the vaccine or not. (UAE.4) reported that she did not take the vaccine, but her father did, “I did not take vaccine but I am relieved that my dad took it so I will not worry about him. However, I advised him not to take it, but he took it behind my back”. This provides additional insight into how people perceive vaccines and decisions when it comes to loved ones. In addition, (UAE.8) said: “I took the vaccine because I am scared for my kids if they take it and will take it to be in the same boat with them”.

5. Access and Availability. Another enabler is the fact that vaccines are available and accessible for everyone. For some countries, having various vaccines was also a good indicator of their willingness to vaccinate. (JOR.1) said: “I have no problem with the choice of the vaccine, any vaccine is effective and safe as documented by studies as many types are available here in Jordan”. (LIB.10) said: “I didn’t take it yet as its still not available in Libya, but once introduced by the government I will take it”. (JOR.6) said: “I have no problem in the choice of vaccine, I am totally convinced by the concept itself, any one is good”. (EGY.12) said: “It is not available in my country yet” but indicated a desire to take it had it been available. For some, the unavailability of vaccines to all age groups and in all cities and regions was a big barrier to vaccination.

In some countries where only one or two kinds of vaccines were available, participants preferred to wait for a widely approved vaccine option such as Pfizer, Moderna, etc. Participants from Sudan indicated that they were willing to take the vaccine if it becomes available. (SUD.1) said: “If the price was symbolic and within the reach of the citizen, of course, I would buy it, but the price is high, especially with the deterioration of economic conditions and the financial situation in Sudan, the issue may be a little difficult”. Finally, few participants referred to the notion that vaccines are personal choices, but they were pushed to get vaccinated, which is against human rights.

6. Anecdotal Evidence. Finally, an important theme that was found to be both an enabler and a barrier simultaneously is the participants’ own, unique experiences. For example, a certain experience or situation of a certain person with COVID-19 played a role for many participants when it came to their decision to take the vaccine. For instance, (JOR.15) said: “My uncle told my father that he developed severe headache after the shot, I need to know more about safety to decide”.

Other factors influencing participants’ decisions to be vaccinated or not included that many participants did not want to stay in lockdown and wanted to return back to their normal life, others wanted herd immunity to be achieved, and some participants believed that the longer the current situation continues, the greater the economic and financial losses. (UAE.3) (UAE.3) said: “My life has stopped I felt I am dead”. Participants (UAE.4) and (UAE.8) agreed that vaccines should be mandatory for those who do not follow the rules. Participant (EGY.6) said: “If the vaccine is agreed upon to reduce the infection rate, the morality, and the morbidity, I will feel that it is a duty to take it so that I am no longer at least carrying disease”. In contrast, (JOR.7) said: “There is no need for vaccines. It is not something important”. Furthermore, (JOR.5) said: “When immunity increases, chances to get the virus decreases, so no need to be vaccinated; we can increase immunity by eating dates, pomegranates, and onions”.

5. Discussion

COVID-19 vaccines could be effective in securing herd immunity only if a significant portion of the population receives the vaccine or gets infected. However, this also poses a question of obligatory or non-obligatory vaccinations for citizens especially if vaccines are readily available for everyone. With the availability of COVID-19 vaccines, individuals tend to choose their own costs and benefits of getting vaccinated as opposed to caring for the wider community [35].
While VH is a global phenomenon, the factors that influence it vary by country [36]. Serious adverse events of COVID-19 vaccination, such as thrombosis, thrombocytopenia, and other severe vascular adverse outcomes have been reported to cause controversy among the public and slowed vaccination campaigns [37]. For instance, some European countries reported higher levels of VH, possibly because of a lack of confidence in the safety of vaccines [38]. In the United States (US), concerns about side effects and safety of vaccines, lack of trust in government, and concerns about rapid development of vaccines are the main reasons for delaying vaccination [39].

5.1. COVID-19 VH in the Arab world

COVID-19 vaccine acceptance, coverage rates, and the reported number of COVID-19 cases and deaths are not symmetric among Arab countries. Political, social, and economic factors are the predominant drivers behind these discrepancies. While some countries have gone through political unrest and witnessed the Arab spring, such as Syria, Egypt, and Libya, others have witnessed a fragile economic climate, given the increased number of refugees fleeing wars. Furthermore, other countries such as Yemen have witnessed recent civil conflicts. Such politico-economic unrest may be considered a player in VH in general.

5.2. Determinants of COVID-19 VH

Income. Income can effectively influence vaccine acceptance. Residents in areas with a higher per capita Gross Domestic Product (GDP) tended to receive more social support and have more trust in the benefits and function of vaccines in disease prevention as opposed to their counterparts from areas with a lower per capita GDP [40]. Conversely, Arce et al., [41] found that COVID-19 vaccine acceptance across 15 survey samples covering 10 low- and middle-income countries (LMICs) in Asia, Africa, South America, Russia, and the US had a higher willingness to take a COVID-19 vaccine. Vaccine acceptance in LMICs was primarily explained by an interest in personal protection against COVID-19, while concerns about side effects are the most common reasons for VH. In addition, while other studies found that sociodemographic factors can influence the decision to take or reject the vaccine, there was no evidence of this in the current study.

Ethical Dilemma. While vaccinations are seen as the greatest weapon against various infectious diseases, their administration poses an ethical dilemma of individual choice versus the protection of the community at risk or the obligatory vaccination policies. Many utilitarianism theory followers (an ethical group of people that determine right from wrong by focusing on outcomes) accept vaccines based on the “harm principle” the vaccine forbids. These individuals believe that anyone opposing vaccination is harmful since they are a threat to the community’s wellbeing. However, such ethical interests among pro-vaccinators and anti-vaccinators can be reduced if public health authorities properly communicate with the concerned public [42].

Misinformation. VH might be linked to safety concerns, unpleasant anecdotes, and personal knowledge, all of which can be exacerbated by recent exposure to disinformation through social media. The participants were more likely to be reluctant to accept COVID-19 vaccination if they were confused, disturbed, or mistrustful during the COVID-19 pandemic. Local policymakers can combat disinformation by establishing tailored local solutions. To effectively and rapidly accomplish this, thorough monitoring of the spread of misinformation on social media is required. Participants’ faith in national government and health professionals appeared to have waned throughout the pandemic, but there is evidence that people tend to trust individuals whom they have frequent contact with, such as teachers, nursery workers, and advice workers [43]. The ECDC launched an online technical report that aims to counter online misinformation and help countries to develop strategies to improve vaccine literacy, which stems from the lack of information about how vaccines work [44]. Findings from the current study mandate similar strategies in the Arab world to counter and defeat the spread of misinformation that is leading to VH movement and growth.

Health Messages. When discussing or presenting information on the COVID-19 pandemic and vaccinations, particular phrasing is preferred. Minor modifications in wording can create more favorable impressions [45]. For example, government control terminology such as “mandate” or “orders” was perceived as intimidating and unlikely to be successful; instead, those polled preferred phrases such as “protocols” [45].

5.3. Strengths and limitations

To the best of our knowledge, this study is the first qualitative research conducted in the Arab countries to explore enablers and barriers of VH among Arabs. However, like any qualitative study, one of the first limitations is that qualitative methods and approaches cannot extrapolate and generalize the findings to the whole population. Nevertheless, this study can be used to design a quantitative tool to reach generalizability. Another limitation is that the study was conducted by different researchers in different countries using their own interview skills and styles. However, inter-researcher variability was minimized by conducting unified training sessions. Another limitation was that the interviews were conducted online, limiting the ability to see participants’ body language and fully use the complexity of face-to-face interviews. Despite this limitation, online interviews have been endorsed and utilized by many researchers during the COVID-19 pandemic.

6. Conclusions

Despite the efforts of authorities and the availability of vaccines, COVID-19 vaccination rates remain low in many Arab countries. Trust, fear of COVID-19 and its vaccines, social/religious/economic and public health responsibilities, educational and media influences, vaccine access and availability, and anecdotal evidence were identified as the key determining themes that influenced COVID-19 VH among Arabs in the current study. While some participants expressed their fear to get vaccinated, most participants were willing to have the vaccine, if they had not already done so, to protect themselves and their loved ones. The findings from this study can
be used to guide policymakers and health authorities in developing informed and tailored plans that could improve education and uptake of COVID-19 vaccines and other vaccinations within the Arab world.

Author contributions

IE and RMG conceived the idea. IE, MY, RMG, OR, NA, BFA, BAH, KK, MSA, HA, YAE, and MT conducted the interviews, collected the data, and performed the analysis. IE, MY, and RMG reviewed and agreed on the final themes and drafted the manuscript. All authors reviewed and agreed on the final manuscript.

Fund

This study received no funding

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Data availability

No data was used for the research described in the article.

Acknowledgment

We would like to acknowledge the participants from the different Arab countries who participated in the interviews. Also, we would like to acknowledge researchers and research assistants who helped in facilitating recruitment, interviews, and the transcription process.

Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.ijdrr.2022.103304.

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