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# Health Misinformation on Social Media and its Impact on COVID-19 Vaccine Inoculation in Jordan

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Abstract

**It is vital to understand the nature of misinformation disseminated online regarding the COVID-19 vaccination. This understanding will enhance governments' efforts and strategies to combat the factors which hinder vaccine uptake. Vaccine hesitancy has always been a challenge which has accompanied vaccine rollouts. Misinformation regarding the COVID-19 vaccination, along with the ambiguous narratives around the origin of the virus, has played a role in vaccine hesitancy among Jordanians. The online activity generated by social media during the pandemic, due to people's fear of the virus, their general anxiety and curiosity, and their desire for updates, made social media an even more fertile environment for misinformation than ever before. During the COVID-19 pandemic in Jordan, misinformation on social media platforms amplified the scale of fears around the safety of the vaccination programme. Therefore, this study offers an exploration of, and insight into, the thoughts and experiences of a sample of 30 Jordanian citizens who are hesitant about COVID-19 vaccination. This study uses a qualitative approach in order to further understand vaccine hesitancy and the nature of misinformation surrounding it, using semi-structured, face-to-face interviews with participants. It found that low levels of information about health, misconceptions about the COVID-19 vaccine, and the spread of misinformation on social media were all causes of vaccine hesitancy in Jordan. Facebook and WhatsApp were the principal social media networks identified in this study as spreading misinformation about the vaccine. The study sample reported that they believed in the conspiracy theories discussed on these two platforms. Furthermore, videos of influencers and anti-vaccination medical doctors from overseas played a part in misleading individuals regarding inoculation against COVID-19. Additionally, other factors were also identified and are discussed in this study.**

Keywords
**E Misinformation, social media, health Information, infodemic, COVID-19, vaccine hesitancy.**

## 1. Introduction

In February 2020, the World Health Organization (WHO) warned of large-scale waves of misinformation globally, which it defined as an "infodemic" (Zarocostas 2020; WHO, 2020). According to the WHO, the term infodemic refers to a surplus of information available either

on- or offline, and involves intentional efforts to propagate false information to weaken and damage public health efforts against the COVID-19 virus, while also spreading an alternative stream of agendas belonging to certain groups or individuals (WHO, 2020). The WHO warning served as a recognition that the fight against COVID-19 would be complex, and that governments were obliged to instruct their citizens to follow strict health precautions against the virus and to remain vigilant of misinformation. Social media networks are at the heart of this battle, as they facilitate a positive environment for fake news and misinformation (AL-Jalabneh & Safori, 2020).

Media scholars such as Ahmed (2020, p. 6) has also linked the infodemic to misinformation. Ahmed defined it as "an overload of (mis)information about a problem or crisis that makes finding a solution to the problem more challenging." This definition is particularly relevant to the discussion of misinformation during times of crisis, such as the global pandemic. The constant unfolding of information about the virus, its transmission from person to person, its impact upon individuals' health and safety, alongside uncertainty of what post-pandemic life would look like, all facilitated and fuelled the surge of misinformation about the pandemic and its ramifications (Lovari, 2020). The spread of misinformation that supports anti-vaccination versus the efforts made by governments and their health institutions to push for vaccinations created confusion among people, which would eventually endanger the potential health gains of vaccination and individuals' responses to it (Lovari, 2020). Consequently, addressing misconceptions around the vaccine takes time and effort, which slows the progress made by governments and global health institutions to curb the spread of the pandemic.

The widespread adoption and use of social media have also exposed users and news consumers to an immense amount of information (Ahmed, 2020). This uses up much of consumers' attention, as it requires effort to process this amount of information (Lee, Son & Kim, 2016). Moreover, it exposes them to many sources and news items that have not been fully verified (Bermes, 2021), including a vast amount of unreliable health information (Dube, Vivion & MacDonald, 2015). The online sphere constantly bombards individuals with different perspectives and streams of information, which they are unable to properly digest (Norderson, 2008). Social media networks have amplified the amount of information people access daily (Cinelli *et al*., 2020), the magnitude of which can negatively influence their decisions and behavioural responses (Bawden & Robinson, 2009; Bermes, 2021). Consequently, health institutions and governments could face challenges in communicating official messages directly to the public, as they try to fight a pandemic that has never been mediated on such a scale (Rathore & Farooq, 2020; Rodgers & Massac, 2020). Vaccine hesitancy remains the greatest health threat to humanity (Wiysonge *et al*., 2021). Regarding the relationship between misinformation and vaccine hesitancy, Carrieri, Madischolarshipo and Principe (2019) examined the impacts of social media and the internet on health outcomes i.e., vaccine hesitancy. They found that misinformation has a causal link with vaccine hesitancy.

Jordan is regarded as a developing country in the Arab region with an estimated population of 10 million (Department of Statistics, 2019). Most Jordanians are educated, with literacy rates reaching 98.2 per cent in 2018 (UNESCO, 2018). Understanding how Jordanians consume news information about COVID-19 and vaccinations is crucial, particularly now that social media networks are being used as information tools to keep citizens informed and connected (WHO, 2020). Therefore, this paper explores the kind of misinformation Jordanians have encountered on social media networks during the COVID-19 pandemic and its impact on vaccination uptake among citizens. This study represents the views of a sample taken from the population of Jordan who are anti-COVID-19 vaccine.



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## 2. Social media impact on the gatekeeping of health information

Since its inception, social media's popularity, accessibility, and the scale of its usage have sharply increased (Brems *et al*., 2017). Social media platforms now facilitate a high proportion of people's daily communication (e.g., Ahmed, 2020; Aggarwal, 2019; Ngai, Tao & Moon, 2015). Mainstream media institutions are no exception, as they have also had to adapt to these speedy changes to communication and news dissemination (Brems *et al*., 2017). Researchers have identified many examples of changing newsroom practices due to the impact of social media's gatekeeping of the news, including the verification of news sources and other practices (e.g., Broersma and Graham, 2013; Willnat & Weaver, 2018; Tandoc & Vos, 2016). In the past, health experts used to mediate health information to audiences through reputable mainstream media channels. Now, however, digital advancements have opened up a higher number of online spaces for non-experts to disseminate health information (Dube, Vivion & MacDonald, 2015), with the huge scale of information this generates leaving no room for proper gatekeeping. Pandemics always bring challenges to health institutions (Strekalova, 2017). During a pandemic, people's reaction to the news is likely to increase anxiety in individuals (Strekalova, 2017). Therefore, people must be given precise information about any possible health threats (Strekalova, 2017).

Social media's adoption, in general, continues to grow, and so do online news consumers. In 2017, for example, Pew research centre indicated that 43 per cent of all Americans consume their news online compared to 50 per cent who consume news from television (Bialik & Matsa, 2017). Subsequently, another survey conducted by Pew research in 2020 reported that 53 per cent of American adults stated that they "often" or "sometimes" consume news from social media (Shearer & Mitchell, 2021). This data reflects the scale of usage and adoption of social media networks, not only in America but worldwide. In Jordan, social media penetration is as high as 94 per cent (Mohammed Bin Rashid School of Government, 2017). Therefore, this percentage could indicate that Jordanians may encounter news constantly on social media, since news is now ubiquitous online. These changes and shifts in consumption come at a time when social media corporations are struggling to cope with the sheer amount of misinformation during a global pandemic, where people are frequently turning to social media platforms to connect with others and to seek clarification and updates about the virus (WHO, 2020).

Scholarship on misinformation, fake news and anti-vaccination movements has long existed. Fake news has gained attention from western academics, especially after 2016, when two significant world events took place: the United States presidential elections and the United Kingdom's referendum to leave the European Union (e.g., Guess, Nyhan & Reifler, 2018; Bovet & Makse, 2019). Social media networks such as Facebook and Twitter were used directly by political campaigners to reach out to voters (Grover *et al*., 2019; Liberini *et al*., 2020). The subject of anti-vaccination regained its footing at this critical time. Significantly, vaccine hesitancy was observed by governments and health institutions and there was a resurgence of anti-vaccination movements (e.g., Carrieri, Madio & Principe, 2019; Kricorian, Civen & Equils, 2021; Armitage, 2021). Anti-vaccination movements have a long history and can always impact individuals' decisions on vaccination and immunisations (Dube, Vivion & MacDonald, 2015).

## 3. Health misinformation and COVID-19 vaccine hesitancy

Misinformation sought from different online sources such as social media could be a factor in vaccine hesitancy (Puri *et al*., 2020; Wilson & Wiysonge, 2020). Contrary to traditional mainstream media institutions, social media allows individuals to circulate any information, whether it be pro- or anti-vaccination content, without any gatekeeping or editorial management (Puri *et al*., 2020; Park, 2019). Thus, urgent actions are needed to address the



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impact of people's exposure to misleading information online regarding vaccine acceptance (Dib *et al*., 2021).

Research has emphasised the importance of spreading informed health messages regarding the safety and efficacy of inoculation in the fight against the COVID-19 virus (Allen *et al*., 2021), and misinformation must also be fought in the process to overcome any challenges while reaching out to people (Depoux *et al*., 2020). The scale of the risks and threats that COVID-19 poses to our lives, along with the sheer amount misinformation about it, is colossal (Chowdhury, Khalid & Turin, 2021; Jakovljevic *et al*., 2020). Many false stories circulate online, from stories about the true origins of the virus and how it swept across the world to the use of many unsubstantiated cures to fight it. The more worrying rumours were about the vaccine and its false impacts on people's future health.

The threat of misinformation to public health is apparent when people are viewing false content online, and several empirical studies in different parts of the world have highlighted some aspects of this threat to public health and vaccination. For example, a content analysis study investigated the most watched COVID-19 related videos in English on YouTube and found that more than 25 per cent of the video clips had misleading content and had been viewed by millions of users across many countries (Li *et al*., 2020). Likewise, a survey conducted in the United Kingdom by Ofcom uncovered the fact that nearly half of adults in the country had come across false or deceptive information about COVID-19 on social media (Ofcom, 2021). The more worrying part of the survey results was that 66 per cent of the adults who saw false news about the virus had seen it at least once every day (Ofcom, 2021). This finding is of particular concern as repetitive exposure to misinformation is reported to increase belief in false information (Pennycook, Cannon & Rand, 2018).

In the same vein, a quantitative study sampled in five countries, namely the United Kingdom, Ireland, United States, Spain and Mexico, proved a connection between misinformation and vaccine hesitancy (Roozenbeek *et al*., 2020). The study revealed that viewing misinformation could lead to negative compliance with public health and safety measures (Roozenbeek *et al*., 2020). This corresponds with the results of another study conducted in the United States and the United Kingdom, which demonstrated that misinformation leads to an intent not to accept a COVID-19 vaccine (Loomba *et al*., 2021). These studies reflect the impact of health misinformation regarding people's hesitancy towards the COVID-19 vaccination programme.

## 4. The Role of the Jordanian Government

The Jordanian government has sought to increase its efforts through various channels to push for an increase in vaccination uptake against COVID-19, a necessary intervention due to the country's increasing infection rates during the past months. Evidently, the insistence that people receive the COVID-19 vaccine in Jordan is driven by the epidemiological setbacks that countries worldwide have been facing, alongside the heavy burden on their health services. In Jordan, some people doubt the vaccine's safety and decide not to be vaccinated. All these issues have led the government to take decisions that have been described by some Jordanians as heavy-handed, and ultimately aimed to enforce vaccination.

These decisions are based on Jordan's defence law, which gives the prime minister wide-ranging powers. Article 124 of the Jordanian constitution states that "if something happens that calls for defending the homeland in the event of an emergency, a law shall be issued in the name of the defence law." The law is considered a declaration of a state of emergency, which means broad, unrestricted, and unwritten powers for the prime minister. Based on this, the Jordanian Prime Minister Bishr Al-Khasawneh issued Defence Order No. 32, which contained several firm resolutions that were widely criticised as a government's attempt to impose vaccination. The most prominent and debatable decision in this order was making it compulsory for any public sector employee who has not been vaccinated to produce a negative



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COVID-19 test on Sundays and Thursdays each week, in order to be allowed into the workplace. In addition, any absence from work resulting from a failure to produce a negative test will be deducted from their annual leave. In any case in which a person exceeds their annual leave, their salary and bonuses will be deducted.

It has not stopped here: another Defence Order, No. 34, was also issued regarding the push for vaccination. It indicated four decisions, the most relevant of which have stated that firstly, no individual is permitted to enter any of Jordan's ministries, government units, or public organisations unless they show a certificate to prove that they have received their first shot of the COVID-19 vaccine, and also that they have booked an appointment for the second shot or acquired a negative PCR test that is valid for 72 hours. Secondly, "Educational institutions are required to prohibit any student's entry over 12 years old to engage in any extracurricular school activities unless he/she is permitted to do so in accordance with the Sanad app green status." *Sanad* is the application that Jordan uses to monitor the spread of the virus (Petra News Agency, 2021).

## 5. Method

This paper follows an inductive approach to explore the beliefs and experiences behind vaccine hesitancy, and whether this is linked to misinformation regarding the COVID-19 vaccination that they may have seen on social media. The selection criterion of the respondents was made using a purposive sample of individuals who have a firm conviction not to accept the vaccine, have not ever had the vaccine, intend not to have it and were completely against it. The data presented in this paper is based on 30 in-depth, semi-structured interviews that were conducted in-person by the researcher via face-to-face conversations with all the participants, to explore their experiences and thoughts about the COVID-19 vaccine. The 30 participants had a mean age of 31.4, of whom 43 per cent were females and 57 per cent were males. Participants have a variety of occupations including teachers, beauticians, and others.

### 5.1. *Data collection*

The interviews took place during the three months of May, June, and July of 2021. The participants were identified among adults who were hesitant towards the vaccine. The researcher stopped after interviewing 30 respondents due to his belief that he had reached a saturation point, and was now receiving repetitive information. According to the researcher's knowledge at the point of conducting the research, none of the chosen participants were inoculated. This was double-checked when taking the respondent's approval to be interviewed. All participants were given a consent form checklist indicating confidentiality, anonymity, and permission. Before the start of the interview the researcher verbally indicated that participants had the freedom to withdraw from the process at any time during the interview and up to a month from the time of the interview. All interviews were conducted in either Arabic or English, providing the interviewees with the freedom and comfort to use whatever language they preferred. All interviews were recorded then transcribed into a Microsoft word file non-verbatim in order to improve their readability. The Arabic interviews were translated by a specialist translator, then double checked by the researcher. Table (1) shows the respondents' profiles.



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**Table 1**. Profile of all study participants.

| Number | Occupation | Age | Sex |
|---|---|---|---|
| 1 | Jobless | 29 | Female |
| 2 | Accountant | 24 | Male |
| 3 | Beautician | 22 | Female |
| 4 | Lawyer | 42 | Male |
| 5 | Data analyst | 33 | Male |
| 6 | Shop owner | 52 | Male |
| 7 | Architect | 25 | Female |
| 8 | Taxi driver | 24 | Male |
| 9 | Office secretary | 24 | Female |
| 10 | Nurse | 44 | Female |
| 11 | Teacher | 37 | Female |
| 12 | Builder | 31 | Male |
| 13 | Journalist | 33 | Male |
| 14 | Teacher | 23 | Female |
| 15 | Teacher | 27 | Male |
| 16 | Construction worker | 27 | Male |
| 17 | Cleaner | 25 | Male |
| 18 | Engineer | 24 | Male |
| 19 | Jobless | 27 | Female |
| 20 | Barber | 35 | Male |
| 21 | Beautician | 25 | Female |
| 22 | Jobless | 21 | Female |
| 23 | Carpenter | 56 | Male |
| 24 | Electrician | 40 | Male |
| 25 | Gym Trainer | 30 | Female |
| 26 | Jobless | 26 | Female |
| 27 | Cleaner | 21 | Female |
| 28 | Lorry driver | 40 | Male |
| 29 | Engineer | 32 | Male |
| 30 | Engineer | 43 | Male |

Source: Own elaboration.

### 5.2. *Data analysis*

After the data were collected from the interviews, which lasted at least 30 minutes, they were transcribed into a Microsoft word file. The researcher then manually coded and analysed the data by following a thematic analysis style. Thematic analysis is a method for "identifying, analysing, and reporting patterns (themes) within data. It minimally organizes and describes your data set in (rich) detail" (Braun & Clarke, 2006, p. 79). The themes in this study were extracted based on what emerged from the data analysis as being the major reasons for vaccine hesitancy, as observed by the researcher. The relevant views and experiences reported by the participants were then laid out according to each major theme underlined by the researcher as a primary reason for vaccine hesitancy. To make sure the induction process was sound, the researcher invited a fellow researcher to review and analyse the data. They then got together to address the minor issues that had arisen. Finally, the results for each theme were discussed in line with previous studies. Table (2) demonstrates a sample from the codification process.



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**Table 1**. Illustration taken from the coding process leading to the emerged themes (N=30).

| Stage 1 | Stage 2 codes | Major themes | Frequency | Percentage |
|---|---|---|---|---|
| The vaccine aims to reduce the population | Shared false online conspiracies & the belief that the vaccine is harmful | ***Social media misinformation leads to vaccine hesitancy*** | **26** | **86.6%** |
| My friend sent me a video of an old man explaining that this is the end of our lifetime, and that the authorities are trying to end more lives by enforcing the vaccine | | | | |
| A video says they have rushed to develop a vaccine to get rid of us, Arabs | | | | |
| The vaccine is a game to kill as many people as possible | | | | |
| [influencers]… are promoting their decision not to take the vaccine among themselves | Influencers & celebrities | | | |
| announcements from Donald Trump made someone not want to be vaccinated | | | | |
| foreign health experts showed us actual evidence of the harmful impacts of the vaccine | Online foreign doctors & health experts & scientists | | | |
| I don't want to take the vaccine now because I want to get pregnant again and have more children | Safety concerns i.e., pregnancy, fertility and kidney | ***Poor knowledge of health-related information and education*** | **21** | **70%** |
| it will decrease women's fertility | | | | |
| it affects the kidneys and could cause kidney failure | | | | |
| It will cause a slow death for the person as some people will have heart attacks | | | | |
| I'm young, I'm healthy, I play football, I go to the gym, the vaccine is for old people | Healthy adults don't need a vaccine | | | |
| the vaccine is an unconvincing lie because I know many people who have been infected again | Vaccine does not prevent further infections | | | |
| why are the authorities insisting we take the vaccine, it must be our choice and not theirs | Forced on people | ***Low trust in the vaccine*** | **19** | **63.3%** |
| official television channels presented a case of a man who had the vaccine and then had permanent problems with his speech | Seeing the side effects of the virus | | | |
| all drug companies came up with a vaccine at almost the same time. I doubt their reliability | Reliability | | | |
| I was watching the news every day…when I see the news on COVID now I skip it straight away. We are so bored and fed up with it of it. If we are going to pass away, then that's our fate, but enough of the fear and intimidation | Heavy coverage/ News overload | ***COVID-19 news fatigue*** | **23** | **76.6%** |
| Now, when I hear any conversation about COVID I keep quiet, or I just leave, I cannot believe that COVID has to be at the center of all conversations | Avoidance | | | |

Source: Own elaboration.



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## 6. Findings

This section outlines the participants' individual experiences of vaccine hesitancy, their beliefs about it, and how they perceive social media content that promotes anti-COVID-19 immunization. At the time of the research's execution, none of the research subjects had received a dose of the COVID-19 vaccination. The findings of this study are presented in four sections (a) Social media misinformation leads to vaccine hesitancy, which is a theme that covers the false personal assumptions that are fuelling vaccination scepticism and (b) Poor knowledge of health-related information and education, a theme that presents the participants' lack of medical knowledge regarding how the vaccination affects people as a whole. Then (c) Low trust in the vaccine, a theme that represents the participants' mistrust about their social worlds during the pandemic and how that mistrust impacts vaccine acceptance. Finally, (d) COVID-19 news fatigue, a theme that presents the participants' experiences of avoiding any news about COVID-19 and the vaccination because they are so tired of everything COVID-19 related. This then leads to missing out on much relevant and useful information about the individual and collective health benefits of the vaccine

### 6.1. *Social media misinformation leads to vaccine hesitancy*

A number of participants who were interviewed shared some of the stories that they had encountered on Facebook and WhatsApp. They also shared the fact that many of these stories were disseminated by people whom they trusted, reporting that they found them difficult to ignore. Some of these stories were directly linked to the sheer amount of misinformation online. Several participants highlighted their beliefs in the conspiracies disseminated on social media and instant messaging applications, namely Facebook and WhatsApp. A 35-year-old male barber, who expressed himself firmly, said: "I strongly oppose vaccination as it is trying to end more lives and does not want to save humanity at all." He then went on to say: "I reject taking the vaccine because there is a conspiracy behind everything that is happening around us." Therefore, he believes that "The vaccine will kill us all and reduce the population on earth." Likewise, A 24-year-old male accountant stated: "I'm not convinced by the vaccine, and I think it is a global conspiracy." He then added: "Its goal is to control the public minds." He then stressed: "let me tell you something, what you all do not know, Bill Gates is behind all of this, and he wants to inject a microchip inside us; he just thinks we are his rats to manipulate and control."

Additionally, social media influencers, who are considered celebrities both in the Arab world and globally, also played a role in the anti-vaccination information stream. One of the participants elaborated: "I followed a lot of influencers on social media throughout the pandemic; they are promoting the idea of not taking the vaccine among themselves, and they consider it a conspiracy against humanity" (31-year-old male, builder). Yet another participant mentioned announcements from Donald Trump, which made him decide against being vaccinated. He stated: "In my opinion these remarks have contributed to widen the gap between people and their trust in the vaccine." He then went on to add that "As an ordinary Jordanian I do not have any trust in anyone anymore, because I feel it is all political, a kind of game between strong and powerful countries which has then resulted in a chaos that has made the whole world suffer" (33-year-old male, journalist). He also added:

> Well, I follow Trump on the news and social media, and since the start of the pandemic, he has said it is a Chinese-made virus. He is always honest and speaks his mind. He does not hide facts. He always speaks clearly to the world, and early this week, he said the virus leaked from a lab in Wuhan. All these assertions from Trump make me not want to be vaccinated, as it is clear now that there is something behind it (33-year-old male, journalist).



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Doctors who appeared in videos that were widely shared on WhatsApp also played a role in some of the participants' decision not to have the vaccine. These doctors were unknown to the respondents, who were unable to identify their medical specialism or level of expertise. However, what the participants were able to remember, and what they mentioned, was that these apparent online health experts advised them not to get vaccinated against the virus, as it would be dangerous to their health. One of the participants showed a belief in what he heard. He stated: "I saw it with my own eyes, foreign health experts showed us with actual evidence the harmful impacts of the vaccine. They give you very detailed knowledge with visual explanations from inside of our bodies of how the vaccine may kill you, it's all explained in the video." When he was challenged for further information he went on to say: "Don't ask me about their identities, go watch these videos, their names are written in these videos, they are all wearing medical gowns so why should I not believe them?" (42-year-old male, lawyer).

Almost all the participants were asked a follow-up question about how and where they viewed these videos. They stated that they either viewed them on Facebook themselves, received the link from a Facebook friend, received a link from a friend via WhatsApp or found them via some of the WhatsApp group pages they viewed.

### 6.2. *Poor knowledge of health-related information and education*

Many of the concerns around the COVID-19 vaccine were based on uninformed ideas about health, sickness, and vaccinations, which appeared to have been caused by exposure to false information and not being sufficiently social media literate. Several female participants highlighted their concerns about the long-term health impacts of the COVID-19 vaccination as they believed that it would prove harmful to their future fertility. A 22-year-old female beautician reported: "I saw videos on social media of scientists saying that the vaccine is a slow death for the person as some people will have heart attacks, and for women, it will decrease their fertility, so I think the whole thing is to reduce the populations in poorer countries," while, also on the theme of health, a 27-year-old male teacher reported: "I did not take the vaccine because I heard about complications that occur after the vaccine. I heard that it affects the kidneys and could cause kidney failure, and my colleague at work said the same."

Equally, another participant stated:

> No one needs to convince me it affects the genes. My mother advised me not to risk taking the vaccine as it is not safe for my future unborn children. All women have the right to have children. I am just so afraid, I don't know why some people even think of taking it. I think it is committing suicide in simple terms (25-year-old female, architect).

Another reason for vaccine scepticism repeatedly observed in this study was a participant's age. Many of the younger age group reported a belief that their youth would protect them against the virus more than the vaccine, and that because of this they did not need to be vaccinated. This belief was reflected by a respondent who stated: "I see no point in having the vaccine. I'm young, I'm healthy, I play football, I go to the gym; the vaccine is for old people, if I take it then it will probably shorten my life" (27-year-old male, construction worker).

Likewise, another reason shows a lack of knowledge regarding the purpose of the vaccine. Numerous respondents echoed their belief that the vaccine would not prevent further infections. One of the participants outlined: "For me the vaccine is an unconvincing lie because I know many people who have got infected again with the virus after taking the vaccine" (33-year-old male, data analyst).

### 6.3. *Low trust in the vaccine*

Participants felt that the government's reaction to the COVID-19 vaccination's side effects was conflicting, which encouraged a lack of trust and made them uncertain about whether to get the vaccine. One participant argued: "Why should I take the vaccine when our official television channels present a case of a man who had the vaccine and then immediately had



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problems and found he wasn't able to speak properly anymore?" He then went on to say: "The whole world must see the case of this man. I do not want to be in that position. Why is the government insisting on it? This is a piece of actual evidence that it is not good, I could be that man, and anybody could be that man" (52-year-old male, shop owner). In the same vein, one interviewee mentioned: "I'm not a health expert to judge whether the vaccine is safe. I don't know who created it. We are not experiments for profit-driven companies. We all know that some people died because of the vaccine, so why take the risk. I'm not convinced" (37-year-old female, teacher).

The same respondent also referred to WhatsApp, stating: "I received many videos and messages on WhatsApp which are basically showing the dangers of the vaccine and why we should not take it" (37-year-old female, teacher), while other interviewees showed low trust in drug companies and the speed in which the vaccines were offered to people, as one reported:

> I'm not silly enough to believe in COVID vaccines. All drug companies came up with a vaccine nearly at the same time. I doubt their reliability. They said in the news that vaccine making takes years to be completed, then they all came up with different vaccines within a year. I feel it is a conspiracy, and I don't know who stands behind it (24-year-old male, taxi driver).

### 6.4. *COVID-19 news fatigue*

The deluge of information around COVID-19 left many of the participants feeling disoriented and overwhelmed. This tendency was echoed by numerous respondents throughout the interviews, as one stated: "I made up my mind on vaccines and I don't want to follow the news anymore as it is too much for me" (40-year-old male, electrician). This trend was also demonstrated by other respondents who lost interest in keeping up with the daily updates regarding the virus. One interviewee indicated: "Now, when I hear any conversation about COVID I keep quiet, or I just leave. I cannot believe that COVID has to be at the centre of every conversation" (24-year-old male, engineer).

Likewise, another participant mentioned: "I stopped following the news on COVID it is too much for me, there are new updates about the virus every single day and it is now over a year and a half I am tired of it" (21-year-old female, jobless). Similarly, another participant said that:

> Honestly, we do not know what is right and what is wrong anymore. I used to follow the updates [COVID-19] every single day, but I got to a point where I feel there are many contradictions between the government news releases and what I hear from people I meet (24-year-old female, office secretary).

This sentiment towards COVID-related news was mirrored by another participant, who mentioned feeling too "bored" to keep following the news about COVID, as he stated:

> I was watching the news every day to find out more about the epidemiological situation in the country and the number of infection cases, and the death toll, but I reached a point where I stopped completely watching the news. I now see the news on COVID then I skip it straight away. We are so bored of it. We are fed up with it. If we are going to pass away, then that's our fate but enough of the fear and intimidation (40-year-old male, lorry driver).

## 7. Discussion

This study aimed to investigate the underlying beliefs and experiences of people in Jordan regarding vaccine hesitancy, and whether this is related to the spread of misinformation online that fosters anti-COVID-19 attitudes. This study found that participants showed concerns regarding the safety of the COVID-19 vaccine, such as the fear of kidney failure. Some of the participants also expressed the belief that they did not need the vaccine due to



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being healthy and young. Some of these beliefs demonstrate a lack of knowledge and awareness about COVID-19 as a disease and the necessity of the vaccination itself. However, some pertinent studies have revealed that the COVID-19 vaccination does affect the menstrual cycle, which may cause additional health concerns (Edelman *et al*., 2022). According to research supported by the National Institutes of Health, women who received one dose of the COVID-19 vaccination during a single menstrual cycle saw nearly a one-day increase in cycle duration compared to those who did not have the vaccine (National Institute of Health [NIH], 2022).

The danger to people's health presented by COVID-19 coincided with widespread use of social media among the participants and a heavy stream of misinformation and anti-vaccination conspiracies. The study findings revealed that participants were exposed to a variety of false stories via social media. These false stories were mainly shared via Facebook and WhatsApp according to the participants. Contrary to traditional media, participation across social media networks is still without proper editorial oversight (Puri *et al*., 2020). This leaves the door wide open to misinformation not only spreading but thriving, which causes uncertainty, anxiety, and mistrust in government organizations and health-care providers. These results have been contextualised within the perspective of vaccine hesitancy, and previous empirical studies have proven a link between exposure to misinformation and vaccine hesitancy (Roozenbeek *et al*., 2020; Loomba *et al*., 2021). There is no doubt that COVID-19 vaccine hesitancy poses a threat, both to those who do not wish to be vaccinated and to the wider community (Wiysonge *et al*., 2021). In the case of Jordan, a report indicated that 94 per cent of Jordanians use social media (Arab social media report, 2017), demonstrating that a significant number of Jordanians are connecting to networks that potentially expose them to misinformation. Although Facebook and WhatsApp's management company has made an effort to combat misinformation and fake news (Hutchinson, 2021), research suggests that a more holistic approach, involving a collaboration between the company itself, governments, and the network users, is needed to combat misinformation (Bode & Vraga, 2017; UNDP, 2020; Hutchinson, 2021). Although vaccination is a remarkable historical medical accomplishment (Killeen, 2007), it appears that some people are losing faith in immunization. Participants in this study expressed reservations about the vaccine's reliability, seeming particularly sceptical about the fact that drug companies developed a vaccine almost simultaneously. Prior research found that mistrust in vaccinations in general is significantly linked to vaccine hesitancy (Willis *et al*., 2021).

The results of this study can also be contextualised within the framework of social media literacy. The concept of media literacy entails that all online and social media users should be equipped with all the necessary knowledge and skills to deal with online content. Media literacy is defined as the "active inquiry and critical thinking about the messages we receive and create" (National Association for Media Literacy Education, 2007). Social media literacy is increasingly associated with the ability to critically view online messages and refute misinformation (Levitskaya & Fedorov, 2020). Previous research has found that the subject of social media literacy is still an under researched field (Manca, Bocconi & Gleason, 2021). Thus, research suggests that further work, greater levels of insight and better educational tools and strategies are needed to foster the development of social media literacy among online users (Manca, Bocconi & Gleason, 2021). Thus, social media literacy around the subject of health can be achieved through developing people's knowledge and ability to obtain and understand reliable information about health, to enable them to make informed decisions (Abdel-Latif, 2020). Jordan certainly has a high social media literacy rate among both males and females (UNESCO, 2018). However, limited knowledge about COVID-19 and vaccination is still prevalent there. My study results are indicative of the low health education in Jordan, and corresponds with a previous study that indicated that health literacy in Jordan is insufficient (Karasneh *et al*., 2020). Tackling this challenge is vital, as individuals with inadequate health



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literacy are more likely to misinterpret health information and take insufficient precautions against the virus, which may lead to a lack of awareness about the nature of the virus and its treatments (Karasneh *et al*., 2020; Baker *et al*., 1998; DeWalt *et al*., 2004). In order to help ordinary people, detailed information to improve knowledge of specialist health issues, greater media coverage, health campaigns and government policies are required. It is not enough to expect ordinary citizens to know about such matters without further education, particularly when living through a crisis on the scale of a pandemic. It is now vital that governments and media institutions take on this role and intensify their efforts to educate and reassure the public in order to overcome this pandemic.

## 8. Conclusion

Understanding the determinants behind COVID-19 vaccine hesitancy is essential in guaranteeing wider uptake of the COVID-19 vaccine in Jordan. Vaccine hesitancy remains a worldwide struggle in combating the spread of the COVID-19 virus. COVID-19 vaccine reluctance endures due to widespread misunderstanding regarding the health benefits of vaccination, along with poor knowledge of health-related information. In addition, misinformation on social media has solidified mistrust in the vaccine. These factors have hindered Jordan's response and its efforts in combating the virus. This study indicates that these are the determinants that lie behind vaccine hesitancy in Jordan. Therefore, this study suggests that vaccine reluctance should be countered through wider media literacy campaigns and better educational strategies directed at the public about the safety and benefits of the vaccine. This study also recommends that misinformation on social media be fought through more robust government health campaigns which speak directly to online users, particularly those on Facebook and WhatsApp. Media institutions are also at the heart of this concerted effort and can be vital in combating misconceptions about vaccines through the promotion of reputable health experts. Health institutions and the media could also collaborate to create a more comprehensive, cohesive narrative in the fight against vaccine hesitancy. The media role is pivotal in combating conspiracy theories and building trust around the vaccine and the government's endeavours in combating the virus.

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