COVID-19 Misinformation on Social Media: A Study of the Understanding, Attitudes and Behaviors of Social Media Users

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Article Info	Abstract
	The dissemination of information via social media is important, particularly during a public health emergency. However, while it is undoubtedly useful in the targeting of genuine health communications, social media may also be used to spread health-related misinformation at times of disease outbreak or pandemic. The study presented here researches the spread of COVID-19 misinformation in Saudi Arabia, by exploring the relevant understanding, attitudes, and behaviors of Saudi Arabian citizens. The current study comprises a survey of 318 adults in Saudi Arabia, of all age groups and educational backgrounds, and from all Saudi Arabian provinces. This study highlights the significance of COVID-19 misinformation and concludes that, despite risks to public health and wellbeing, Saudi Arabian citizens do not consider COVID-19 misinformation to be a significant problem. Participants in this study were relatively aware of such misinformation and its dangers, but it did not greatly concern them, and generally they declined to tackle it proactively.

Introduction

Social media technologies are maturing, becoming important platforms for the communication of health information that can usefully target specific audiences. However, social media platforms may also facilitate the production, propagation, and spread of misinformation. During a disease outbreak, there is an increased demand for information, along with a general desire to share news and experiences. The current COVID-19 pandemic has seen social media platforms at the forefront of pandemic-related communications, and consequently, hosting enormous quantities of COVID-19-related content. In the context of a health emergency, however, misinformation is potentially dangerous, as it may steer people away from the most suitable course of action, thus generating failures to protect themselves and others (Han et al, 2014). Furthermore, as Ahmed et al. (2020) have pointed out, misinformation may prompt behaviors that enhance spread of the disease, or encourage participation in other undesirable activities.

Whilst the concept of misinformation is generally (informally) understood, in an academic context its definition remains ambiguous. Chou et al. (2018) define health misinformation as a "health-related claim of fact that is currently false due to a lack of scientific evidence". Often, scholars differentiate between misinformation and disinformation. Some academics define science and health misinformation as information that contradicts the

scientific community's epistemic consensus about a phenomenon; under this definition, "true" and "false" are continuously evolving states, which alter as new evidence arises and as practices and procedures advance. Disinformation, on the other hand, is defined by Swire-Thompson and Lazer (2020) as a synchronized or calculated attempt to knowingly spread misinformation for the purpose of gain, be that financial, reputational, or by acquisition of power. Al Khaja et al. (2018) suggest that, essentially, misinformation is accidental false information, and contrasts with disinformation, which is deliberately inaccurate or false information, consciously published for the purpose of deception. However, there is no universal definition across all academic disciplines.

Some academics classify fake news and conspiracy theories as forms of misinformation. Tandoc et al. (2017) maintain that in numerous circumstances, both fake news and conspiracy theories are deliberately published, as they either misinform or attract attention (largely in the form of "click bait") and their value may be transformed into profit via advertising. Wardle and Derkhshan (2017) differentiate between misinformation and disinformation by defining misinformation as false or incorrect information that is distributed without any ambition to cause harm, whereas disinformation is also false or incorrect information, but is intentionally distributed for the purpose of causing harm. However, Jimenez- Sotomayor et al. (2020) point out that to make this distinction it is necessary to judge the intention of the distributor, which brings its own challenges and issues. In the current paper, the term 'misinformation' is thus employed as a general term, representing false or incorrect information, regardless of intention.

Lehmann and Ahn (2018) maintain that typically, misinformation circulates in elaborate contexts that comprise confirmation bias, information excess and functional illiteracy. During a pandemic in particular, the spread of misinformation has greater speed and scope than normal because the public is highly sensitive to epidemics and events with a strong impact upon society. According to Han et al. (2014), in such settings the public perpetually seeks various forms of information about possible ensuing risks, which provides ample opportunity for the spread of misinformation.

Studies have identified various factors that may influence the spread of health misinformation. Rosnow (1988) proposed four elements that can promote the "journey" of misinformation, as follows: (1) general uncertainty; (2) outcome-relevant involvement; (3) personal anxiety; (4) credulity. Uncertainty is essential for the propagation of misinformation because for misinformation to be widely shared by the public, an ambiguous information setting is required. Additionally, there is a link between the belief by the public in [what purports be be] information, and the significance of that (mis)information to their lives or public wellbeing. As Fung et al. (2016) point out, in the midst of a pandemic, personal anxiety may cause the sharing of misinformation to increase exponentially.

Anxiety is defined by academics as a negative affective state that is created by nervousness about a potentially negative and imminent outcome. Rosnow et al. (1988) examined the correlation between anxiety and personal belief, and found that fundamentally, the degree of anxiety is significantly correlated to the belief in misinformation. Pezzo and Beckstead (2006) highlight credulity as another factor that may predict the spread of

misinformation. In the context of public health, two key factors influence people's credulity. The first of these is health literacy, which according to Freedman et al. (2009) is the extent to which people and/or groups can acquire, process, comprehend, assess, and act upon information required to make public health decisions for the good of the community. In general, members of the public find public health issues to be complex. Those members of the public that are not very health literate tend to trust misinformation and in addition, to frequently misunderstand accurate information and transfer/convey it as misinformation. The second factor is that, as Zhang et al. (2020) note, health-related behavior is significantly affected by social and cultural factors.

The rapid progression of social media technologies has facilitated global health communication which, Zollo and Quattrociocchi (2018) claim, enables the intense and rapid dissemination of health information. Simultaneously, social media facilitates the sharing of health-related misinformation, and several elements or qualities of social media exacerbate this. For instance, social media makes it easy to spread any form of information, whether accurate or not. There is minimal effort involved in forwarding messages or information to numerous recipients; it frequently takes just one click. Hence, as Meer and Jin (2019) have explained, misinformation on social media can reach vast numbers of people rapidly, potentially instigating confusion and needless anxiety amongst large sections of the public.

It is evident from the ongoing pandemic that along with the upsurge of the spread of inaccurate medical information, the reach of other messages, including conspiracy theories and reports of death tolls, have also greatly increased. Social media facilitates the magnification of such messages, to the point that they "go viral". From the perspective of an information receiver, in such a context it is hugely challenging to identify and filter misinformation and disinformation amidst the mass of information and a highly complex media–user network. The importance of the research presented in the current paper is that it quantifies the dangerous and harmful nature of COVID-19 misinformation, and reveals that Saudi Arabians typically do not consider misinformation to be a serious problem, calling on a range of stakeholders to take action to address this potentially lethal issue.

Literature Review

Gabarron et al. (2021) reviewed the literature relevant to COVID-19-related misinformation on social media that emerged during the initial stages of the pandemic. Their search encompassed the PubMed®, Scopus, Embase®, PsycInfo, and Google Scholar databases for 2020, and they determined that COVID-19-related misinformation on social media is a significant concern in terms of both the quantity of circulating misinformation and the implications for public health and citizens' behaviors. These researchers stressed that, although there is growing interest in the area of misinformation amongst the scientific community, studies that examine the issue and related factors—such as reasons for the spread of misinformation, the effect it has, and the optimum approach to addressing it—are limited. Gabarron and colleagues have proposed that the influence of COVID-19-related misinformation could be reduced by both social media users and social media platforms, and that social media users should consciously try to avoid spreading misinformation, while social media platforms should at least identify and label misinformation and/or proactively remove it. Additionally, they recommended that public

health authorities and health providers should raise their profiles on social media and increase their COVID-19-related activities online.

Chen et al. (2021) have detailed features of misinformation on social media posted throughout the COVID-19 public health emergency in China, showing the evolution of misinformation as the pandemic proceeded. Additionally, they discussed the consequences for health communicators in terms of averting and censoring misinformation during a public health crisis. These scholars found that the production and dissemination of misinformation associated with a public health crisis comprises a thematic core, various social and cultural factors, and a developmental course. They recommended the deployment of management strategies to tackle misinformation on social media, to address the ongoing COVID-19 global pandemic and form a guide for future health risk communications and misinformation research. Chen and colleagues (2021) emphasized that the counteracting of misinformation on social media should not be considered a standalone technique to correct misinformation or to avert its dissemination; rather, academics, journalists, educators, and the public must work together to recognize and rectify any misinformation they encounter. Furthermore, as a source of information, social media operators have a duty to be more responsible in their operations. The researchers pointed out that social media platforms can avoid using conventional "gatekeepers" such as professional editors and peer reviewers, and this feature of the medium greatly facilitates the spread of misinformation.

Al-Zaman (2021) conducted research in India to elucidate the five most important characteristics of COVID-19-related fake news, as posted on social media. This study analyzed 125 items of fake news published in an Indian context. There were five primary findings in accordance with five research questions. Seven themes were identified within the sampled fake news in India, namely: (1) health; (2) religiopolitical; (3) political; (4) crime; (5) entertainment; (6) religious; (7) miscellaneous. It is notable that health-related fake news accounted for 67.2% of the whole, and that this theme encompassed medicine, medical and healthcare facilities, viral infection, and issues between doctors and patients.

The fake news studied in this research took seven forms: (1) text; (2) photo; (3) audio; (4) video; (5) text and photo; (6) text and video; (7) text and photo and video. Text and video was the most prevalent form, at 47.2%. The study noted a huge disparity between the volumes of fake news produced by or within online media, and that in mainstream media, which accounted for for 94.4% and 5.6%, respectively. It is notable that most, if not all, mainstream media outlets use some form of "gatekeeping" or quality assurance process.

Most fake news appeared on one or more of four social media platforms: (1) Twitter; (2) Facebook; (3) WhatsApp; (4) YouTube. Non-domestic fake news accounted for 54.4% of the total, which may be explained by the COVID-19 pandemic being a worldwide issue. Finally, the majority of the COVID-19-related fake news studied was negative in nature (63.2%), which is potentially dangerous for public health if it leads those who believe it to relax their vigilance around sanitization, mask wearing, and other practices designed to prevent illness.

Amobi et al. (2021) studied the individual and collective impact of conspiracy theories, misinformation, and knowledge of COVID-19 in a Nigerian context, by evaluating the extent of public adoption of the Nigerian government's containment policies. The researchers identified attitudes about COVID-19 amongst the survey and focus group participants that included suspicions of conspiracy. These participants were aware of misinformation and conspiracy theories being circulated on social media. Most participants knew about the containment policies for COVID-19 implemented by the Nigerian government, and had adopted the advised safety measures. They attributed this knowledge and compliance primarily to opinion leaders and to a lesser extent, mainstream media, but not to the government or social media.

The onset of COVID-19 has added a sense of urgency to endeavors to tackle misinformation on social media. For example, the World Health Organization (WHO) created and published shareable infographics to debunk myths about COVID-19 (World Health Organization, 2021). Vraga and Bode (2021) tested the effectiveness of these infographics in the US and determined that viewing such a graphic on social media reduced confusion about the science behind one inaccurate COVID-19 prevention strategy, but did not enhance understanding off the facts of disease prevention. The reduction in confusion lasted for more than a week. Similar outcomes were observed when the infographic was shared by the WHO and by an unspecified Facebook user; there were no material differences observed whether the infographics were shared in advance or following misinformation (Vraga and Bode, 2021). It seems, therefore, that benefits are likely to accrue if health organizations develop and broadcast shareable infographics to enhance public knowledge.

Method

Aims and Objectives of the Current Research

The research presented here was designed to evaluate the knowledge, attitudes and practices of Saudi Arabian people with regard to COVID-19 misinformation on social media. Accordingly, the following objectives were identified:

- O1: To analyze knowledge about COVID-19 misinformation in social media.
- O2: To study attitudes toward fake news about COVID-19.
- O3: To analyze the practices whereby respondents access COVID-19-related fake news.
- O4: To study the practices whereby respondents try to combat COVID-19 misinformation and access appropriate understanding.

Research Hypothesis

The following hypotheses were developed:

- H1: The Saudi population has a relatively high degree of knowledge about COVID-19 misinformation.
- H2: People have negative attitudes towards COVID-19-related fake news.
- H3: People combat COVID-19 misinformation by reporting false news and double-checking information before sharing it with others.

Sampling and Pilot Survey

The survey targeted the adult population of Saudi Arabia (i.e., those aged 18 and above) both male and female. The sample group comprised individuals regularly active on specific social media platforms; Twitter, Facebook, Instagram, Snapchat, TikTok. Overall, 318 respondents were interviewed nationwide. Respondents were chosen using the probability sampling method; more specifically, simple random sampling, meaning that every member of the general population had the same chance of being selected. In order to develop the final questionnaire, a pilot survey was conducted with 5 respondents. All remarks and errors were documented, and changes were incorporated into the final questionnaire in accordance with these.

Data Collection

The survey utilized a quantitative data collection method, via a structured questionnaire completed online and disseminated via several social media platforms. This approach was chosen for the following reasons:

(i) Anonymity was guaranteed, allowing respondents to be honest.

(ii) There was no "interviewer effect", i.e., no risk of respondents' answers being influenced by the interviewer.

(iii) It was not necessary to reach out to each respondent individually, which saved a great deal of time and human/financial resources.

(iv) This technique made it easy to reach respondents throughout the country.

Data Analysis

When all fieldwork had been completed, the survey database was created in Statistical Package for the Social Sciences (SPSS) software. At the initial stage, the dataset was cleaned and compiled, which served to identify and correct logical errors in the database. Statistical analysis was performed using descriptive statistics (frequency analysis, cross-tabulation), and the results were interpreted and incorporated into the final survey report, along with the statistical tables and graphs.

Scientific and Practical Significance of the Research

The study adds significant information to the body of research about COVID-19-related misinformation on social media. It will also contribute to the development of larger-scale and multi-faceted studies. This study is significant, because it discusses false narratives about coronavirus as depicted in social media, which in turn influences the overall wellbeing of society. The research facilitates the development of recommendations and appropriate measures to limit the spread of misinformation about COVID-19 on social media.

The use of an online data collection method restricts the study sample to people with internet access: those without access to the internet or appropriate digital knowledge were unable to participate in the survey; consequently, the sample studied may not accurately represent the population as a whole.

Results

The sample survey comprised adults at or above the age of 18, from Saudi Arabia. Of all respondents, 69% were male and 31% female. The sample included people from all educational backgrounds, but most (60%) had a bachelor's degree. The survey was conducted in 11 provinces, although it is not representative by region. Figures 1 to 4 show the distribution of respondents by age, gender, education and location.
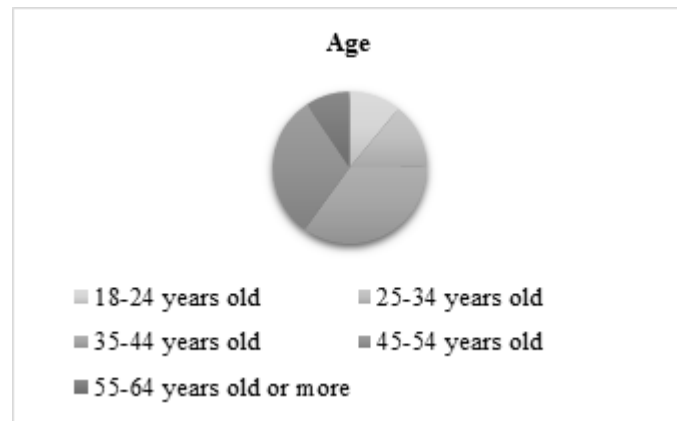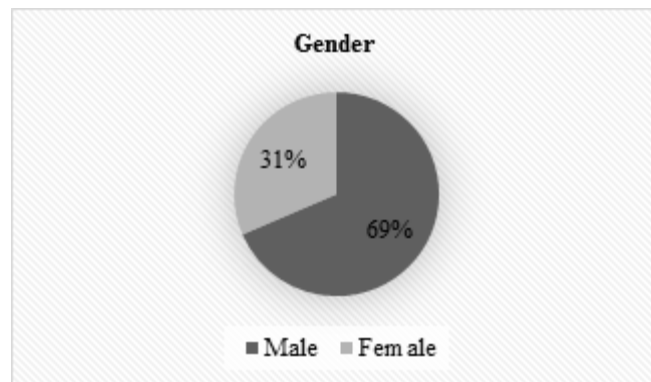

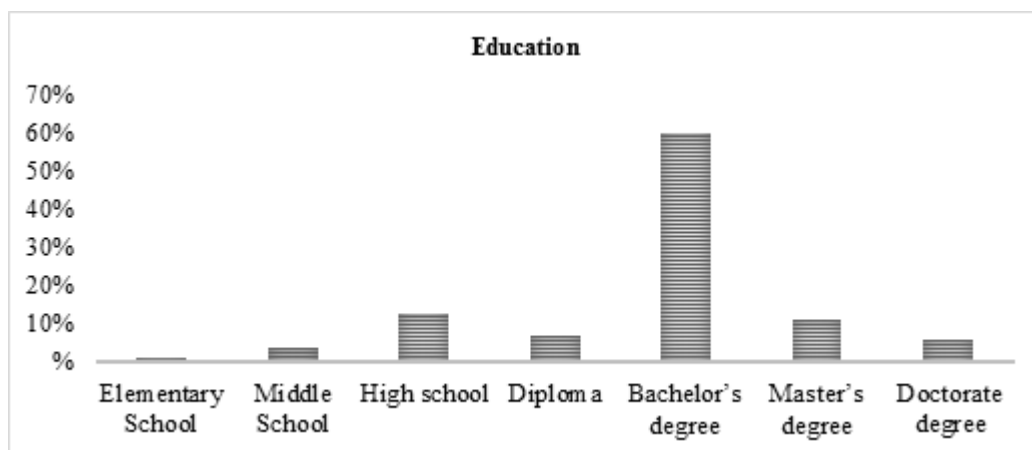Figure 1. Respondents by Age

Figure 2. Respondents' Gender

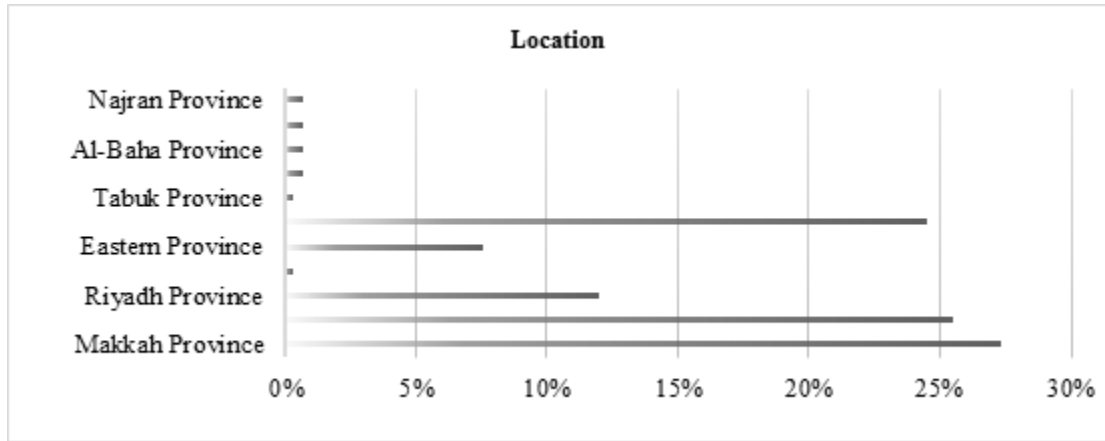Figure 3. Respondents by Level of Education

Figure 4. Respondents by Location

Social Media Usage

The substantial majority of respondents used social media on a daily basis. Young people (18–24 years old) used social media most frequently, while older people (55–64 years old or above) used it the least of all age groups; however even in this age cohort, 90% of respondents used social media every day. Full details are given in Figure 5.
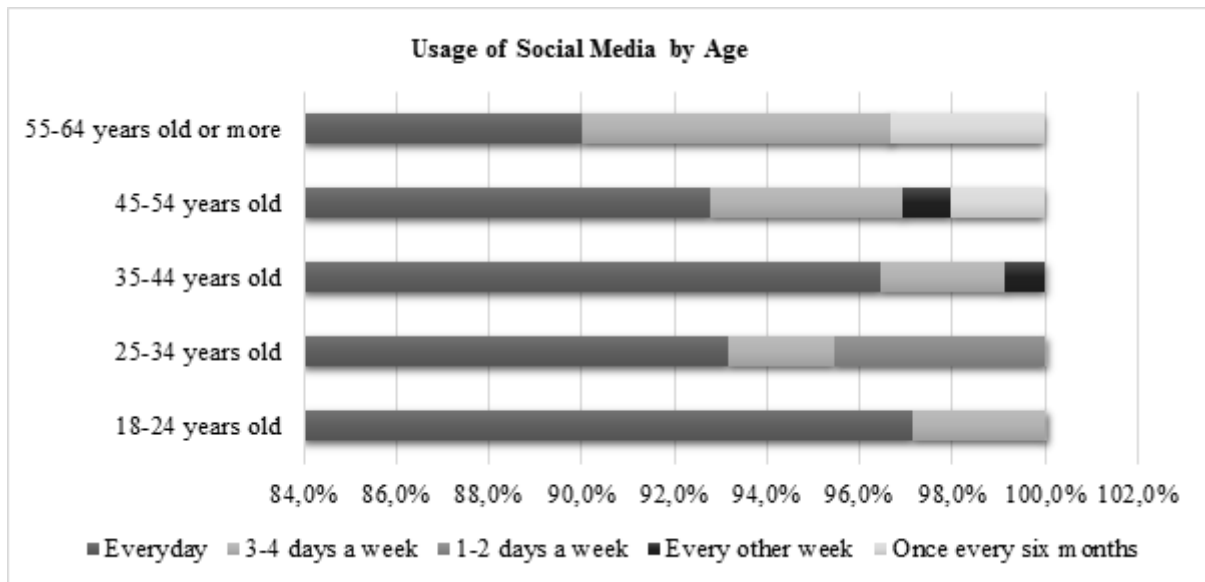

Figure 5. Respondents' Social Media Use by Age

The most popular social media platform was Twitter, which almost half of respondents used most frequently. Twitter was followed by Snapchat, used by 32% and Instagram, which had a 12% usage rate. The least popular social media sites were TikTok and Facebook, with 5% and 4% usage rates respectively. Figure 6 provides further details. Most respondents (70%) used social media to access health-related information and an even larger majority (76%) had used social media to find COVID-19 related information within the previous 6 months.

Social Media Platforms

TikTok 5%
Snapchat 32%
Instagram 12%
Facebook 4%
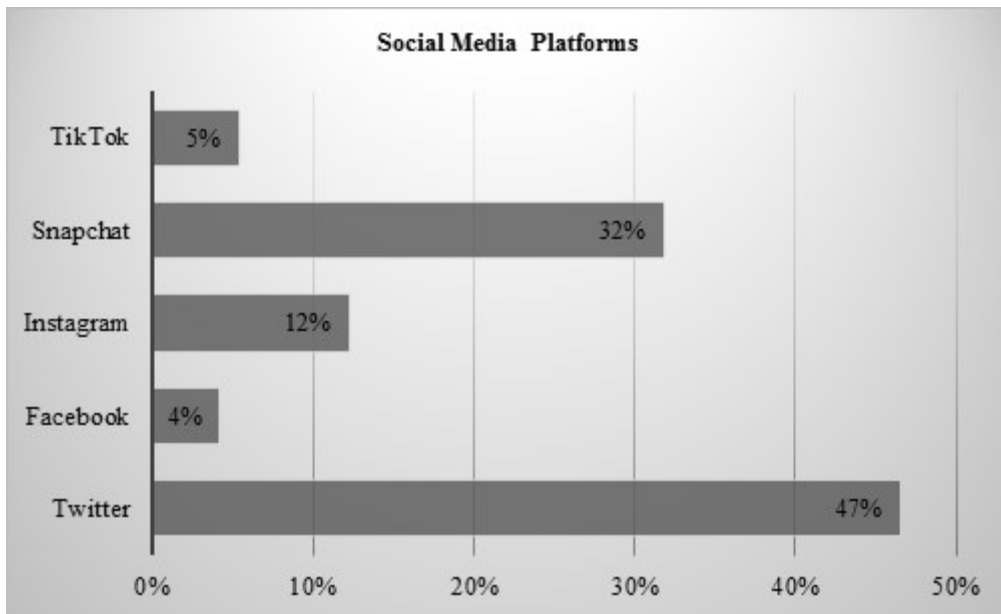Twitter 47%

0% 10% 20% 30% 40% 50%

Figure 6. Respondents' Use of Social Media Platforms

Reliance on COVID-19 Information on Social Media

Most respondents (63%) relied on COVID-19 information posted on social media to some extent: the proportion of people who completely relied on such information (19%) was slightly higher than the proportion that did not rely on it at all (18%). Respondents, who stated that they had used social media to access COVID-19-related information in the previous 6 months, relied more on that information than people who didn't use social media to look for COVID-19 information. Table 1 illustrates the results.

Table 1. Respondents' Use and Reliance on COVID-19 Information on Social Media

In the past six months, have you used social media to get COVID-19-related information?	Yes, and I completely relied on it	I relied on it to some extent	No, I haven't relied on it at all
Yes	25%	68%	7%
No	0%	47%	53%

Most respondents said they checked the source of information when looking at COVID-19 news in social media; 28% of respondents checked the source every time they saw COVID-19-related news on social media, and the same number of respondents said they checked the source somewhat frequently. The number of respondents who said they checked it occasionally was slightly lower (27%); one in ten respondents checked it somewhat infrequently and just 6% of respondents said that they never checked the source of the information when looking at COVID-19 news on social media. These results are presented in Figure 7. The majority of respondents (73%) looked up other, reliable, sources of information online when looking at COVID-19 news in social media: a fifth of respondents said they sometimes looked up other sources of information and only 8% said they did not look up other reliable sources when looking at COVID-19 news.
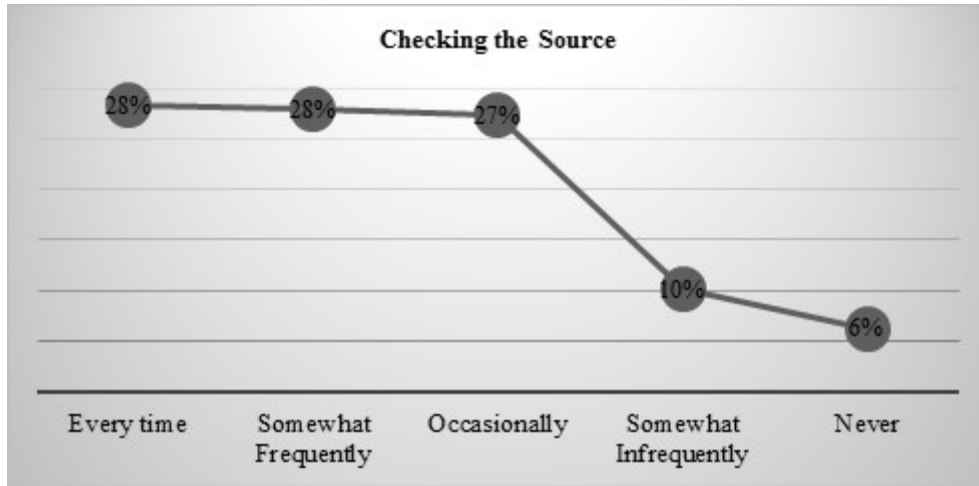
Figure 7. Frequency with which Respondents Checked Sources

Information about False COVID-19 News

Table 2 shows that most respondents (63%) said they had heard that social media was being used to spread false COVID-19-related news. A majority of respondents (69.4%) who had used social media to access COVID-19 information knew about false COVID-19 news, as opposed to 43.4% who had not used social media to get COVID-19 information.

Table 2. Use of Social Media to Access COVID-19 Information

In the past six months, have you used social media to get COVID-19 related information?	Have you been informed about false COVID-19 news on social media?	
	Yes	No
Yes	69.4%	30.6%
No	43.4%	56.6%

Three-quarters of respondents claimed to be aware of COVID-19 misinformation risks, nearly one in 5 was partially aware of the risks and only 5% said that they did not know of COVID-19 misinformation risks. These answers were analyzed and plotted with regard to respondents' education and gender. As Figure 8 shows, this revealed that respondents with the highest level of degree (doctorate) were more aware of misinformation risks than others. The awareness levels more or less correlated with respondents' educational status, although those who had completed only elementary and/or middle school said that they were more aware than respondents who had completed high school and had diplomas. The proportion of male respondents who claimed to be aware of misinformation risks (74.8%) was slightly higher than the corresponding figure for female respondents (71%). However, considerably more female respondents said that they were not aware of COVID-19 misinformation risks (12%) than male respondents (just 1.8%) (see Figure 9). Most respondents (79%) claimed that if a friend sent them information about COVID-19 from a social media source they would not believe it without checking, while almost a fifth of respondents said that they would probably believe it without checking. Just 2% would definitely believe it without checking (see Figure 10).
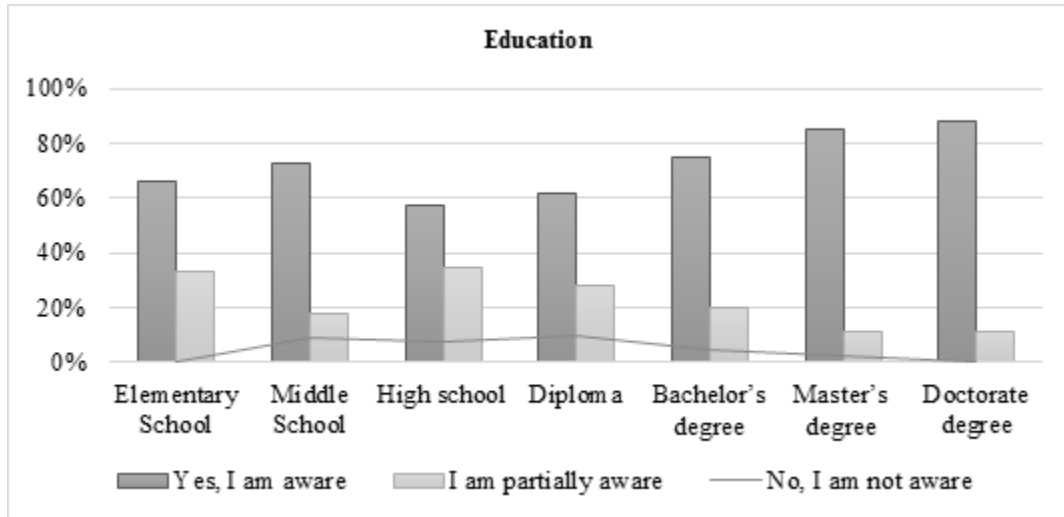
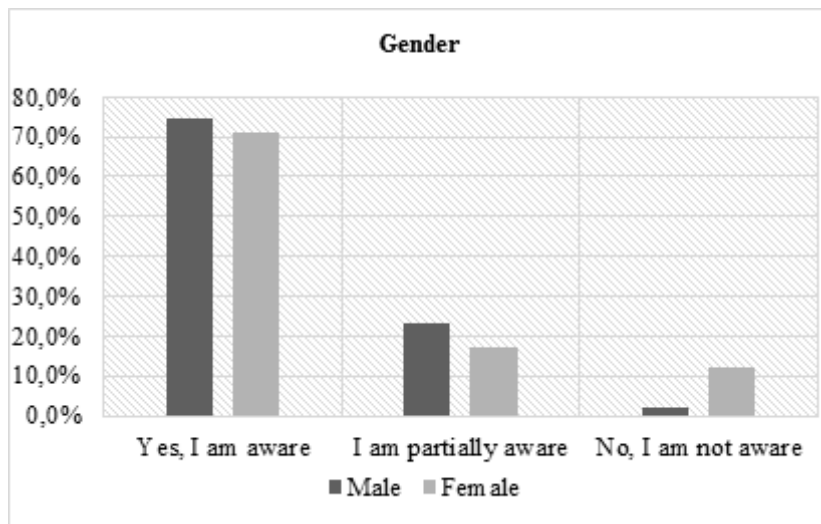Figure 8. Awareness of Misinformation by Education Status
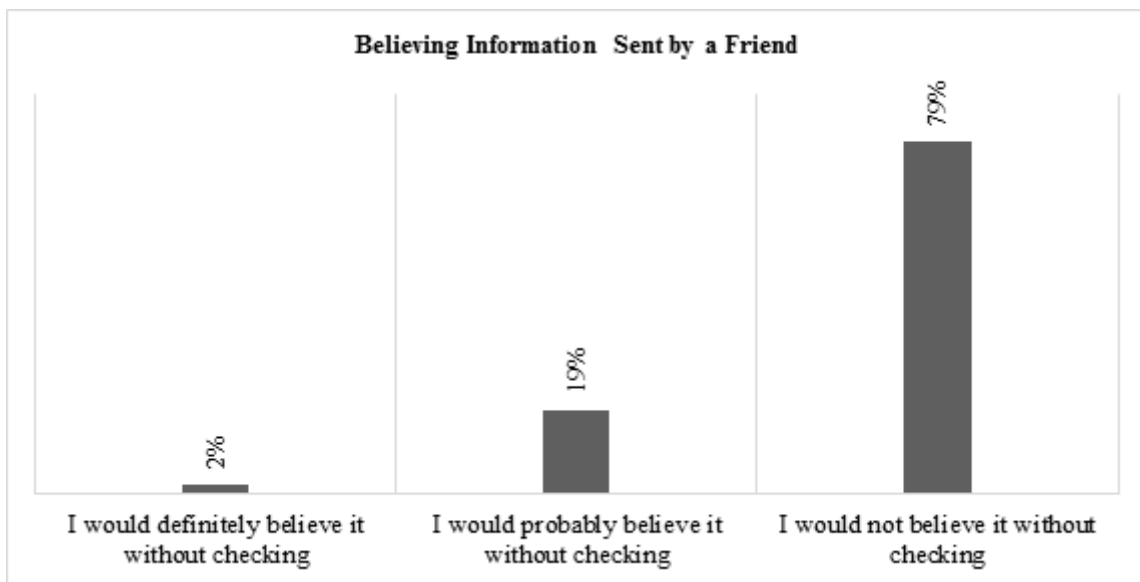

Figure 9. Awareness by Gender

Figure 10. Willingness to Believe Social Media-sourced Information from Friends

Respondents were also asked if they had encountered fake COVID-19 news. They were given some of the examples and had to state if they saw it and if they believed it or not. Of the seven examples shown, a majority of respondents had seen four: claims that vaccines are used to insert computer chips into people, that COVID-19 can be treated with home remedies, that vaccines contain harmful substances, and that COVID-19 is a hoax. Half had seen claims that wearing face masks to help stop the spread of Covid-19 would cause children to have physical and psychological problems. However, two examples had not been seen by a majority, namely claims that drinking water can prevent coronavirus and that black people are more resistant to coronavirus than others. Most respondents did not believe these claims. Levels of belief in claims ranged from, 42% who believed that COVID-19 can be treated with home remedies to just 10% who believed that black people are more resistant to coronavirus. Table 3 presents these findings in full.

Table 3. Claims seen/not seen on Social Media and Believed/disbelieved by Respondents

Since the pandemic started, have you come across these items of information on social media?

Vaccines are used to chip people		COVID-19 can be treated with home remedies		Wearing face masks to help stop the spread of Covid-19 will cause children physical and psychological problems		Vaccines contain harmful substances		COVID-19 is a hoax		Drinking water can prevent coronavirus		Black people are more resistant to coronavirus	
Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No
66%	34%	79%	21%	50%	50%	75%	25%	75%	25%	30%	70%	25%	75%

Did you believe the information?

Vaccines are used to chip people		COVID-19 can be treated with home remedies		Wearing face masks to help stop the spread of Covid-19 will cause children physical and psychological problems		Vaccines contain harmful substances		COVID-19 is a hoax		Drinking water can prevent coronavirus		Black people are more resistant to coronavirus	
Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No
16%	84%	42%	58%	26%	74%	37%	63%	28%	72%	14%	86%	10%	90%

Attitudes toward COVID-19 Misinformation on Social Media

Figure 11 shows that more than half of the respondents (56%) claimed that if someone sent them an item of false information about COVID-19 from social media, they would not care, 16% would be angry, 12% would be disappointed, 11% would find it funny and laugh at it and 6% would not know how to react. Respondents were asked to evaluate the importance of sharing genuine COVID-19 information in social media on a 5-point scale,

where 5 means "very important" and 1 means "very unimportant". The average answer was 3.786 with a standard deviation of 1.3866. A substantial number (46%) of respondents indicated 5 points, while 13% indicated 1 point. The full range of responses is shown in Figure 12.
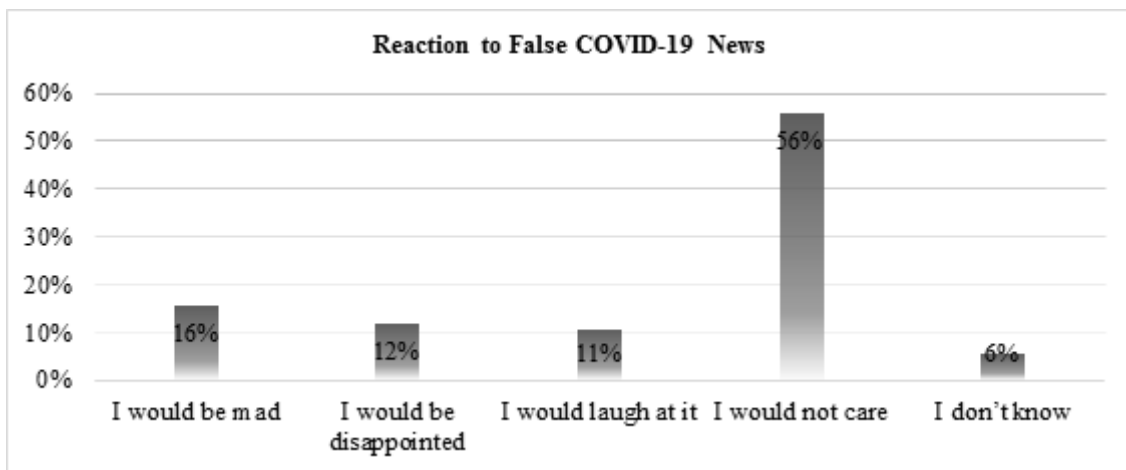

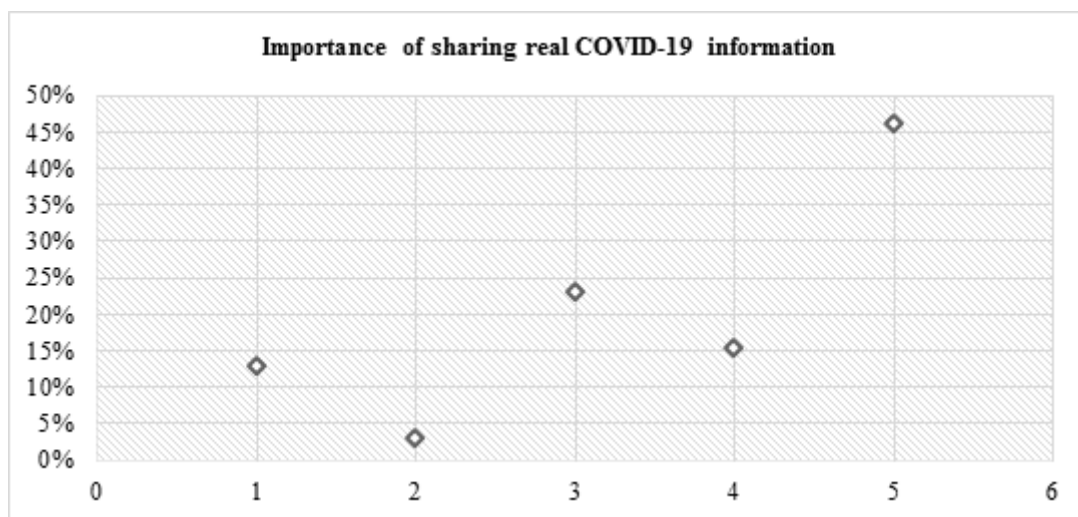Figure 11. Likely Reactions to being sent COVID-19-related Fake News

Figure 12. The Importance of Sharing Genuine, Factual COVID-19 Information

Coming Across False COVID-19 "Information"

Most of the respondents (84%, *n* = 266) had come across false claims about COVID-19 on social media. Of those 266 respondents, 31% determined that the "information" in question was false by checking the source, which turned out to be unreliable, 24% determined it was false because it "sounded fake", 23% checked other sources and found out that the claim was false, 10% asked their doctors, 6% asked their family or friends and the remaining 6% used other methods to determine that the "information" was false. Almost half of the respondents who had encountered such fake news (46%) informed their family and friends when they saw it, 47% ignored it. Only 7% reported fake news to the social media platform hosting it. Figures 13, 14 and 15 present these findings in more detail.
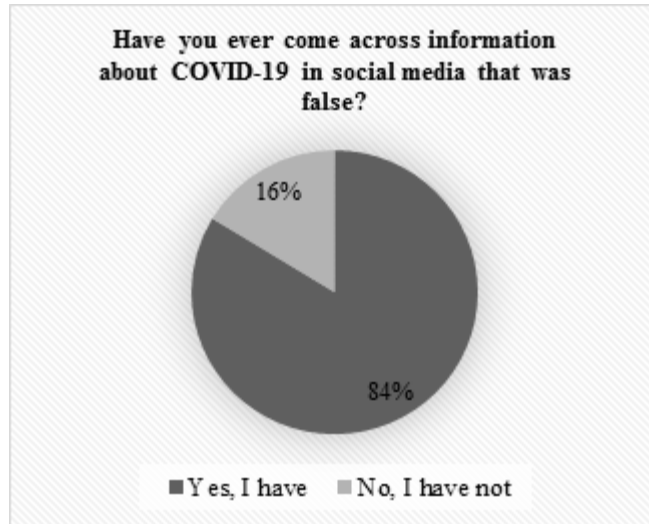
Have you ever come across information about COVID-19 in social media that was false?

16%

84%

■ Yes, I have   ■ No, I have not

Figure 13. Proportion of Respondents Encountering Fake News

How did you know it was false?

31%   23%   6%   10%   24%   6%

I checked the source and it was unreliable | I checked other sources | I asked my friends/family | I consulted with my doctor | It just sounded fake | Other
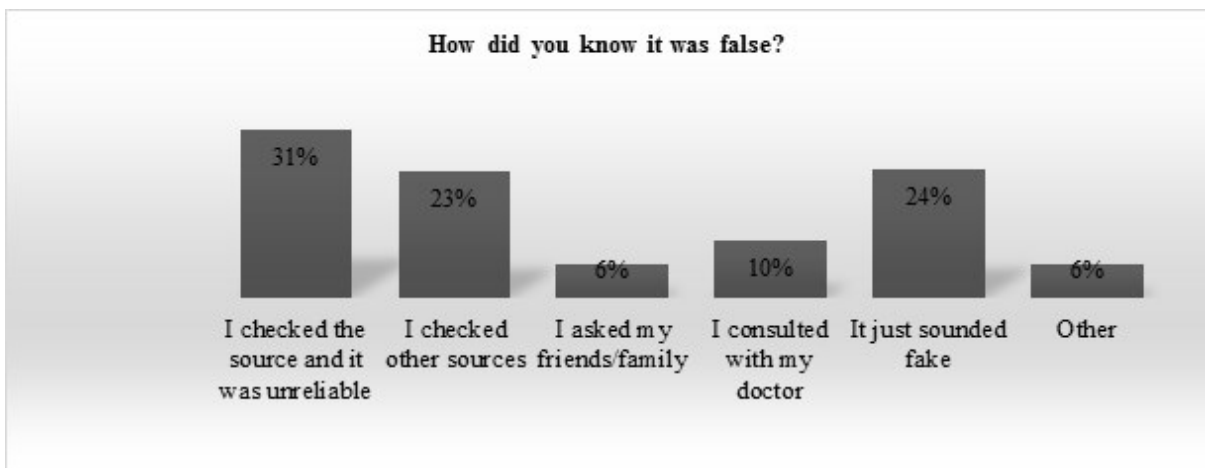
Figure 14. Means of Detecting Fake News

What did you do when you saw the false information about COVID-19?

I ignored it — 47%

I informed my friends/family about it — 46%

I reported it — 7%

0% 5% 10% 15% 20% 25% 30% 35% 40% 45% 50%
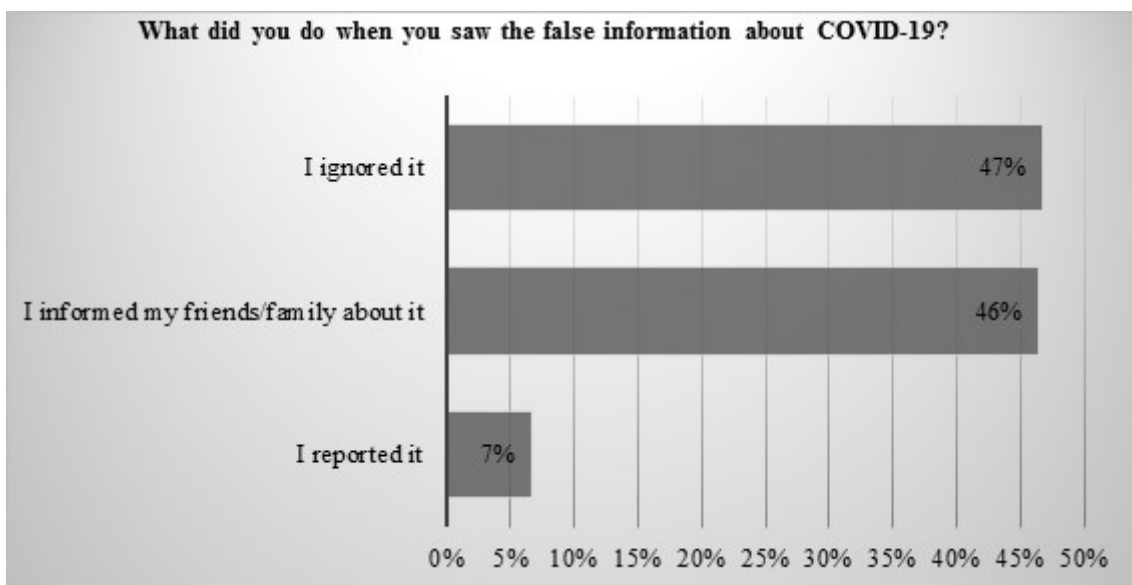
Figure 15. Actions taken in Response to Fake News

A majority of the respondents (73%, *n* = 231) claimed to have received false information about COVID-19 from family or friends. Of those 231 respondents, 63.2% told them it was false after receiving the information, almost a quarter ignored it, 5.7% shared it on social media and informed others that it was false, 3.8% reported it to the hosting social media platform and the remaining, 2.7% did something else. Figures 16 and 17 show these findings in detail.

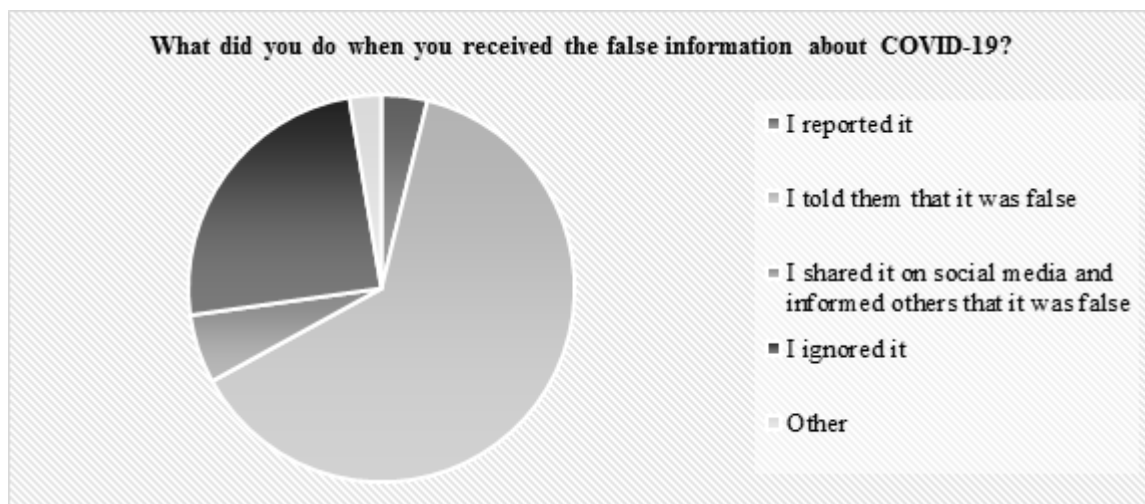Figure 16. Respondents who have/have not received Fake News from Friends/family.

Figure 17. Responses to Receipt of Fake News from Friends/family

Most of the respondents (60%) said they had not shared information about COVID-19 on social media, but of 40% who did, most (68%) checked its validity before sharing it; however, 32% of respondents who had shared such information on social media did not check if that information was true or not before sharing it. More than half of the respondents said their decision-making had not been affected by claims made by anti-vaccination movements on social media, and stated that they were going to get vaccinated anyway. However, 23% of the respondents said their decision-making had been affected by anti-vaccination movements and it had taken some persuasion for them to get vaccinated. For 11% of the respondents, the anti-vaccination posts on social media had affected their decision and persuaded them not to get vaccinated, and 8% of respondents chose not to get

vaccinated but that decision was unaffected by anti-vaccination posts on social media, they would not have been vaccinated, regardless. The data was analyzed in relation to respondents' education, age and gender. The groups most affected by anti-vaccination movements comprised people with lower levels of education, although these were ultimately persuaded to have the vaccination. However, more than half of the respondents with a doctorate were persuaded, by the social media posts of such movements, to decline vaccination. Figure 18 illustrates. Older people were more likely to be persuaded that they should get the vaccination, whereas respondents aged 25 to 35 were the most likely of all age cohorts to be persuaded by social media content not to get vaccinated. Figure 19 shows the distribution of responses by age. There was relatively little difference between responses according to gender, although female respondents were somewhat more likely to be persuaded against vaccination than male respondents, as Figure 20 shows.
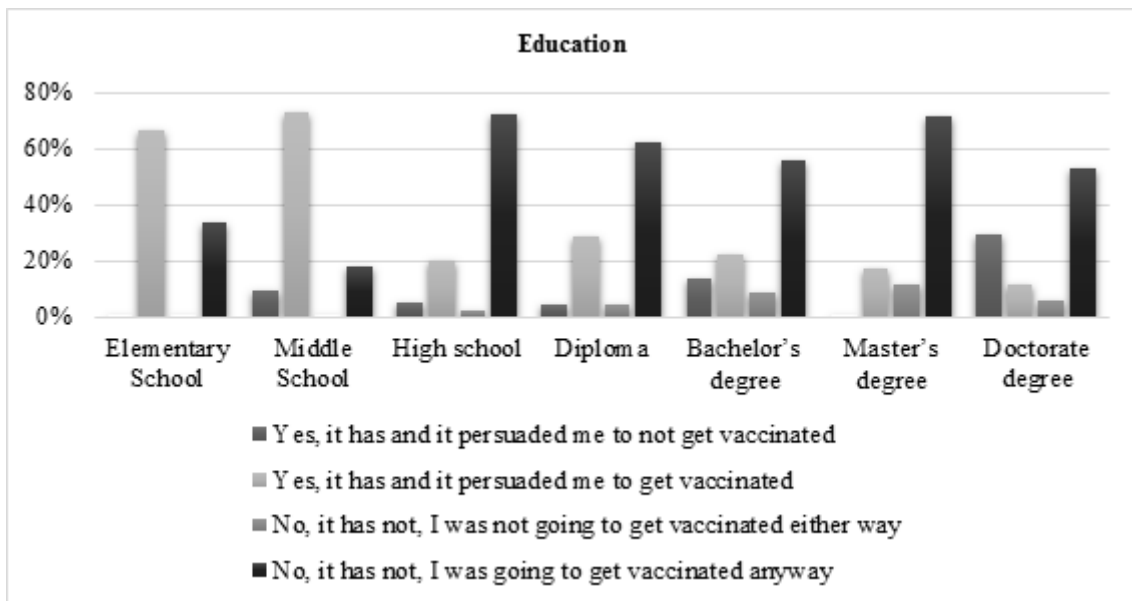

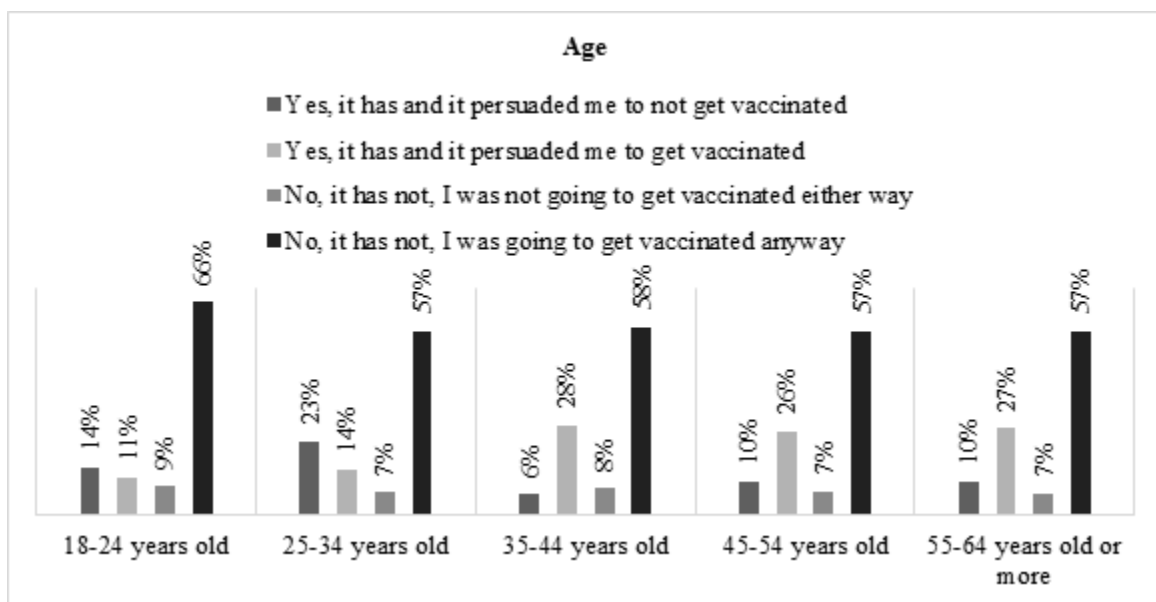Figure 18. Responses to Fake News by Level of Education

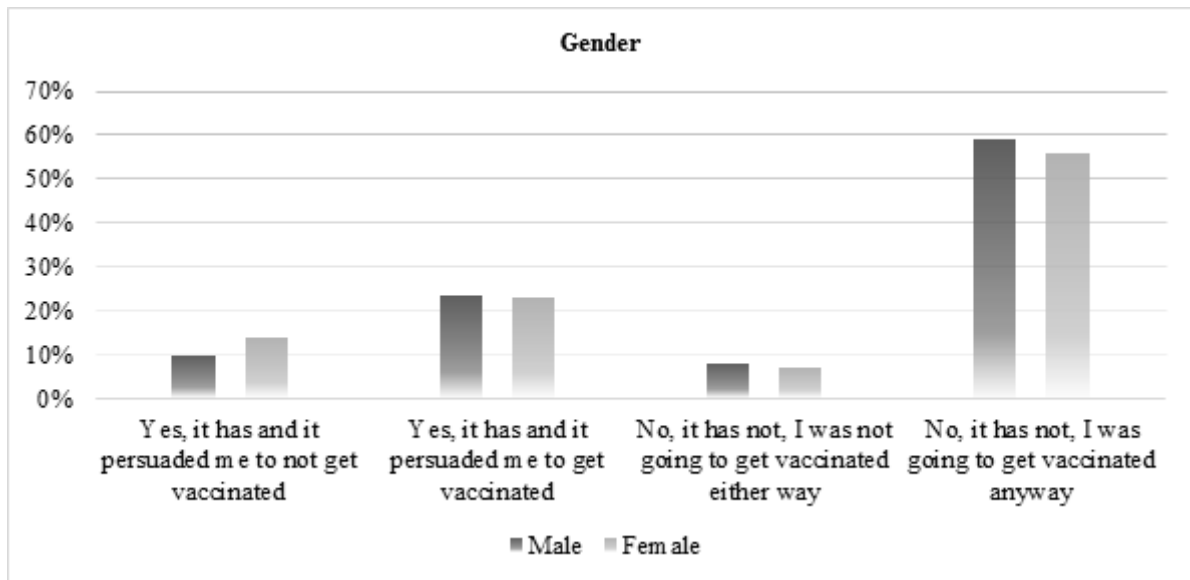Figure 19. Responses to Fake News by Age Cohort

Figure 20. Responses to Persuasion by Gender

Discussion

The current study has found that most members of Saudi Arabia's adult population use social media on a daily basis; specifically, they use media platforms such as Twitter and Facebook, where an abundance of health-related misinformation is published and distributed every day. During the recent (and, at time of writing, ongoing) COVID-19 pandemic, the use of social media to access information about COVID-19 has become a common and important behavior with many ramifications. In light of this, some of the survey from the study presented here is concerning: a substantial section of the population relies on the COVID-19-related information (and/or misinformation) they glean from social media. This may be alarming, considering the amount of fake news known to be spread via multiple and various social media platforms. Furthermore, people who search for COVID-19-related items and interact with them seem to be more inclined than others to trust such items, increasing the probability that COVID-19-related fake news will be shared and disseminated.

Most of the respondents to this survey claimed to check the sources of information or cross-reference with other reliable sources to check the validity of content related to COVID-19 on social media. However, at times this seems to contradict a previous statement where a respondent or group of respondents has said they trust COVID-19 news on social media. Looking for proof that an item of what purports to be news is true is not necessarily a sign that trust is lacking, rather it may reflect a healthy skepticism. However while not trusting news blindly can be perceived as a positive thing, failure to check items' authenticity is a cause for concern. The issue should be examined in greater depth, in order to elucidate this apparent contradiction.

Although most respondents to this survey knew about COVID-19-related fake news, a substantial number did not. This suggests that a substantial number of people do not know how to identify false news/misinformation, nor do they know how to combat or respond to it. This considerably increases the chances of potentially harmful misinformation being spread and negatively affecting health and health-related behaviors. However, the

majority is aware of COVID-19 misinformation risks, although some who know about the risks of COVID-19 misinformation may choose not to find out more or take part in combating it.

Respondents seem to be particularly skeptical of COVID-19 items they receive from people close to them. It may seem reasonable to assume that if a person double-checks information sent by their friends, they are likely to double-check information they receive from an unfamiliar source. However, this study suggests that is not the case. Fewer respondents claimed they would check the source of information when looking at COVID-19 news than claimed they would check information from friends and family. This suggests that they trust information of unknown origin on social media more than they trust their friends, which is surely an indication of the power of social media to suggest authority and inspire trust, even where neither is warranted.

The fact that most respondents had seen most of the examples of fake news shown to them in this study is an indication of how quickly and easily fake COVID-19 information can spread on social media. Fake news that vaccines are used to microchip people and/or that they contain harmful substances can be dangerous because such claims may persuade some people not to get vaccinated. Other fake news, such as claims that COVID-19 can be treated with home remedies and that wearing face masks will cause children to have physical and psychological problems, can have serious health implications because they may dissuade people from taking sensible anti-COVID precautions and help to spread the virus. Thus fake news and the spread of misinformation can be tangibly harmful, especially in a pandemic, when people are particularly vulnerable and perhaps more ready to believe what they are told, however apparently unlikely. Yet, most of the respondents in this study had seen such stories and some were inclined to believe them.

In this study, further concerns are prompted by the attitude of some respondents to COVID-19 misinformation. More than half of the respondents said they would not care if they received false information about the virus, and one in every ten would laugh about it. This is particularly alarming given that most declared themselves to be aware of misinformation risks. It can be concluded that people do not perceive the COVID-19 misinformation as a serious and important issue; they know of it, but do not really care about it or about taking part in combating it. This is evidenced by the fact that only 7% of respondents said they would report false COVID-19 news when they came across it on social media and more than half would just ignore it. The remaining respondents said they would tell only those in their immediate circle, suggesting that they did not think it sufficiently important for them to act to prevent the wider public from seeing it. In a similar way, some respondents that received fake news from their friends or family did not even inform them that the information was false and just ignored it; very few cared enough to alert people or to report it. Finally, of those respondents who shared COVID-19 news, some that did not check its validity before sharing and therefore, might have taken part in the dissemination of false information. The current study has also shown how powerful messages on social media, either true or false, can be. The anti-vaccination propagandists have influenced respondents' choices around vaccination and so it may be argued that information, news and messages seen on social media can have a major impact on people's decisions and health-related behaviors. In short, misinformation about COVID-19 can have serious implications for human health and the overall wellbeing of society.

Conclusions

The COVID-19 pandemic has generated an abundance of information/misinformation, and it has become difficult for consumers of such information to distinguish reliable sources. However, it is vitally important to have correct information during a health emergency such as the COVID-19 pandemic in order to stay protected and avoid illness. COVID-19 has prompted the creation of an entire ecosystem of misleading and dubious (mis)information from which it is hard to escape. Every individual plays an important role in fighting the proliferation of this ecosystem. One of the ways to do this is for everyone to take responsibility and be very cautious about what they share and communicate through social media. Being skeptical and aware of fake news on social media is an important step in combating the spread of misinformation.

The survey presented in this paper has demonstrated how little people have involved themselves in the fight against COVID-19 misinformation. It has uncovered a need for immediate action, aimed at preventing the further spread of fake news around COVID-19. The following recommendations arise from the current study:

- There is a need to raise awareness of the importance of COVID-19 misinformation risks; relevant campaigns should tell audiences about the serious health implications and other negative effects, as well as giving the public the skills and knowledge required to help combat the spread of COVID-19-related false news on social media.
- Stakeholders should be informed how to prevent the dissemination of false information in social media.
- National awareness-raising campaigns about COVID-19 misinformation, published in all media formats, should be considered.

The ecosystem of COVID-19 misinformation is growing bigger and becoming more dangerous every day. If people can be convinced of their role in the fight against it, the exit from the web of pandemic fake news may be opened.

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