Knowledge and awareness of community toward COVID-19 in Jordan: A cross-sectional study

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ABSTRACT

Background: The behavior of the general public in Jordan will likely have an important effect on the how the coronavirus disease 2019 (COVID-19) epidemic spreads. Human behavior is influenced by people's knowledge and awareness. The aim of the study is to determine the knowledge and awareness of COVID-19 among the general public in Jordan.

Method: Cross-sectional online survey conducted between March 17 and March 23, 2020. A sample of 3,791 adults in Jordan who were representative of the general population by gender, age, occupation, marital status, employment status and educational level. Measurements: Response to 23 survey questions.

Results: Participants generally had satisfactory knowledge of the main mode of disease transmission and the common symptoms of COVID-19, as half of the participants confirmed that transmission is via droplets from sneezing or coughing and from contaminated surfaces. In addition, most (77%) of the respondents stated that more than one category could be at high risk of complications from COVID-19, including the elderly, people with weak immune systems, those with heart problems, and diabetic patients. However, a substantial proportion of participants had misconceptions about how to prevent infection. For instance, about 80% of participants thought that wearing a mask was effective in protecting them from acquiring COVID-19.

Conclusion: These findings can guide government information campaigns that will be covered by media. Rapid online surveys could be an important tool in tracking the public's knowledge and misperceptions of COVID-19 over time.

Keywords: COVID-19; awareness; knowledge; community; Jordan.

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Introduction

A pneumonia outbreak associated with a novel coronavirus, termed severe acute respiratory coronavirus 2 syndrome (SARS-CoV-2), was first documented in Wuhan, China, in December 2019 ¹. Since then, the infection has spread across China and then to numerous countries around the world ²⁻⁴. At the begining of June 2020, more than 7.676.209 confirmed new cases were reported, with more than 426.158 deaths attributed to the coronavirus infection ⁵. This novel virus was declared a public health emergency of international concern by the World Health Organization (WHO) on January 30, 2020 ⁶. The disease caused by the novel coronavirus was identified by WHO on February 12, 2020 as Coronavirus Disease 2019 (COVID-19) ⁷.

While early studies have documented a correlation between a single local fish and wild animal market and most infection cases, suggesting possible animal-tohuman transmission, an increasing number of studies have demonstrated human-to-human transmission of COVID-19 via droplets or direct contact ⁸. In addition, according to one study, 41 per cent of patients were suspected of being infected by COVID-19 via hospitalrelated transmission ⁹. Based on evidence of an increasing occurrence of infections and the likelihood of transmission by asymptomatic carriers, COVID-19 can be effectively transmitted among humans and has high pandemic potential. In addition to COVID-19's high transmission capacity, the extent and intensity of global travel can further increase and accelerate its spread around the world 10 .

As the COVID-19 virus is rapidly spreading, scientists are working to find drugs that can successfully treat the virus, with multicenter clinical trials being performed across the world. Remdesivir and chloroquine have been shown to be effective in controlling COVID-19 in vitro ¹⁰. Chloroquine phosphate, an established malaria prevention drug, was reported to be an effective and acceptable protection against COVID-19-related pneumonia ¹¹. To date, however, there is no proven drug that can treat or prevent the novel COVID-19.

In the absence of approved vaccines or antivirals effective against COVID-19, non-pharmaceutical approaches remain key to dealing with the virus. If the situation shifts to a much wider community transmission across multiple countries, the WHO containment strategy for elimination may need to be changed. Steps should be taken to isolate patients and persons testing positive for COVID-19, and there should be contact tracing and health monitoring, strict healthcare facility prevention and control of infections, and the implementation of other active public health control interventions with ongoing active monitoring and containment at all sites where outbreaks occur ^{12, 13}. Moreover, in order to control the spread of the disease, knowledge and awareness of the virus should be disseminated among the public from official sources, including WHO. Reliable and authoritative information will be vital in preventing and suppressing this disease. Hence, in this study we measure the knowledge and awareness of this disease within the Jordanian community.

Materials and Methods Sampling participants

A cross-sectional online survey was conducted to assess the public's knowledge and awareness of COVID-19 in Jordan. The survey used a questionnaire written in Arabic, which is the official language of Jordan. The questionnaire consisted of 23 questions divided into three sections.

In the first section, the following socioeconomic variables were included: gender, age, occupation, marital status, employment status and educational level. The second and third sections consisted of a set of multiple-choice questions relating to the Jordanian population's knowledge and awareness of COVID-19. The questions in the second section asked participants about their knowledge of COVID-19, and the questions in the third section were designed to measure the extent of community awareness of the preventive measures and proper procedures in relation to the COVID-19 virus.

Data collection

Between March 17 and March 24, 2020, the online survey was distributed via social media networks in order to gain a random sampling of the Jordanian population. Data collection took place during the aforementioned period, since information about COVID-19 was then at the forefront of media attention in Jordan.

A total of 3,791 people across the country participated voluntarily in the online survey. Once data were collected, all questionnaires were exported to Microsoft Excel. Double entry verification was performed on randomly selected questionnaires (n = 50).

Data analysis

The data from each of the returned questionnaires were coded and entered in the Statistical Package for the Social Sciences (SPSS, version 21, Chicago, IL, USA) software, which was used for statistical analysis. Descriptive statistics, including percentages and frequency distribution, were calculated for each of the questions. A descriptive and univariate correlation analysis with the Pearson correlation coefficient (r) was used to find the correlation at the 5% significance level. A p-value of <0.05 represented a significant difference.

Results

Characteristics of the study sample

A total of 3,791 participants completed the survey questionnaire; nearly three quarters of respondents were female (73.2%), with male respondents making up just over a quarter (26.8%). Most study respondents were aged 18–29 years and 30–39 years (43.3% and 33.3%, respectively). Almost half of the respondents had a bachelor's degree (57.7%), and 15.2% had a postgraduate degree. A third (33.1%) of the study sample were employees in non-healthcare sectors, while 16.8% worked in a health field. More than half (61.2%) of the sample were married and 57.8% had children. Most (51.7%) of the

study sample lived in Amman, the capital of Jordan, with the rest living in other areas of Jordan (Table 1).

Participants' knowledge regarding COVID-19

Interestingly, most of the study participants thought that COVID-19 is either a virus that had been genetically modified in a laboratory or that it came from animals (38.1% and 29.5%, respectively). There was no significant association (p-value > 0.05) between education level or residential level and knowledge regarding the source of COVID-19 (Table 2).

When participants were asked about the main source of information about COVID-19, 16.5% responded that media was their main information source, followed by 9.7% who identified social media as their primary source for information. However, almost half of the study population (50.4%) reported that they used more than one source in order to know more about COVID-19. Analysis of whether the selection of information source might be affected by a participant's age found no significant difference. Almost all participants (90.0%) reported that COVID-19 had many symptoms. Nearly half of the sample (46.4%) selected dry cough, fever and shortness of breath as symptoms, while 16.2% added diarrhea and vomiting to these symptoms. Residential area had a statistically significant (p-value <0.001) effect on knowledge about the symptoms of COVID-19 (Figure 1). Participants responded similarly when asked about virus transmission methods: 78.1% reported that the virus can be transmitted by different methods, with almost half of them (47.9%) answering that COVID-19 is transmitted via droplets from sneezing or coughing and from contaminated surfaces, while 18% added the breathing process to those transmission methods.

About a third of the study population (36.6%) reported that the virus can remain alive outside the host for 5-9 days, followed by 20.1% who thought the virus can survive for 5-6 hours. Just over three quarters (77.0%) of respondents stated that more than one category of person is at risk from COVID-19. In more detail: 16.6% of respondents confirmed that high-risk people are the elderly and people with weak immune systems, 22.8% added those with heart problems and diabetic patients to this high-risk category, and 19.4% indicated pregnant women as a high-risk group in addition to those previously mentioned. Furthermore, about a third of the study participants reported that the rate of recovery rate from COVID-19 is 0–20%, just over a third (35.8%) stated that the recovery rate is 21-50%, and 16.2% reported that the recovery rate is more than 95%. Most participants (82.3%) agreed that a healthy person can be a carrier of the virus.

In suspected cases of coronavirus, 75.5% reported that they should go into domestic isolation, follow sterilization and safety procedures and, if symptoms worsened, go to the nearest hospital. Almost a quarter (24.0%) of participants stated that they would go directly to the nearest hospital or medical center. Education level (pvalue = 0.007) and residential area (p-value = 0.000) had an effect on the level of the information about what to do if COVID-19 virus is suspected (Figure 2).

The extent of community awareness of the preventive measures and proper procedures toward COVID-19 virus

The majority of participants (92.2%) responded that there is more than one method to protect themselves from COVID-19. Nearly half (45%) of participants confirmed

that they were aware of all the proper methods to prevent infection: hand washing with water and soap, wearing masks, drinking plenty of hot fluids and taking vitamins, using hand sanitizers, avoid touching mouth/nose/eyes, and avoiding crowds. However, 19.7% of the sample population excluded the wearing of masks from that list. In relation to the best way to control the spread of COVID-19, 87.9% of participants agreed on the importance of all methods: isolation of infected person, isolation of people coming from an infected area, isolation of people close to an infected patient, curfew and preventing people from going out unless necessary, and closing schools and universities. To investigate participants' awareness further, they were questioned about the most appropriate sterilization method to eliminate the virus from contaminated surfaces, with the results showing that more than a third of them (39.1%) preferred to use alcohol alone, and that 41.1% preferred more than one method, especially a combination of chlorine and alcohol (32.4%). Respondents were asked about their expectation of when COVID-19 would disappear from Jordan. About a third of them (32%) chose "at the beginning of summer", and 23.8% agreed on that and added "after discovering of treatment/vaccine". Moreover, more than 40% of the sample population stated that Jordanian society has enough awareness to face the COVID-19 pandemic, even though two thirds of them (66.6%) were worried about the outbreak.

Discussion

On March 3, 2020, Jordan reported its first confirmed case of COVID-19. By March 16, the number of cases had increased to six, and cases continued to increase over the following days, reaching 915 cases by June 12¹⁴. As a precautionary measure, the Jordanian government imposed a public quarantine on March 21, 2020. This step was taken in order to suppress the spread of the virus, but it can only work with public cooperation. The knowledge and awareness of the Jordanian population about this disease is essential for this cooperation.

Our study finds that approximately 40% of the participants thought that COVID-19 resulted from the genetic modification of a virus in a laboratory, which contradicts studies that have found COVID-19 to be 96% the same at the whole-genome level to a coronavirus detected in bats from Yunnan province in China ¹⁵.

Nevertheless, the Jordanian public is in possession of some accurate information about COVID-19. Almost all of the participants knew that COVID-19 has many symptoms, and half of them had chosen at least one of the symptoms of dry cough, fever and shortness of breath, while only a few of participants thought that diarrhea and vomiting may be symptoms of COVID-19. This aligns with studies that have found fever and cough to be the dominant symptoms and gastrointestinal symptoms to be uncommon ¹⁶; ¹⁷; ¹⁸; ¹⁹. Most participants agreed that healthy people can be carriers of the virus. In addition, more than three quarters of participants thought that the elderly and people with underlying health conditions (low immunity, diabetes and/or heart problems) are at an especially high risk of death from COVID-19, and that children are at low risk of death from COVID-19; these views correspond with what is currently believed to be the case about mortality risks from COVID-19 (20 17 21 14).

Our study finds that participants in Jordan expect a large number of people will not recover from COVID-19. This finding explains why more than half of them were worried about a coronavirus outbreak (only 16.2% of the sample believed that the recovery rate is more than 95%. Two thirds (66.6%) reported that they are worried about an outbreak of COVID-19). While the case fatality rate is currently believed to be 1–2% among reported cases ²²; ¹⁴; ¹⁸, but this figure might be substantially lower if there are many unreported and/or asymptomatic cases ²⁰; ¹⁹. Fortunately, the fatality rate of COVID-19 appears to be lower than that of other recent infectious disease outbreaks, such as Ebola ¹⁹ severe acute respiratory syndrome coronavirus SARS-CoV; ²³ and Middle East respiratory syndrome coronavirus MERS-CoV; ^{24,25} suggested that more than 80% of patients with COVID-19 have a "mild disease and will recover" and that only 2% would die from COVID-19.

It is also important to note that while the general public appears to be well informed regarding the common symptoms of COVID-19, only about 20% of the population had excluded the role of wearing masks as a preventive method that would protect them from catching a COVID-19 infection; however, WHO do not recommend wearing masks for the general population unless they are in direct contact with a person who is suspected of having a COVID-19 infection or they are coughing and/or sneezing ¹⁴.

On the other hand, participants' responses indicated a good awareness of how the virus is transmitted, since approximately half of them confirmed that COVID-19 can be transmitted via droplets from sneezing or coughing and from contaminated surfaces. Moreover, more than half of the participants believed that COVID-19 can survive outside the body for days, which accords with the findings of a recent study ²⁶. In addition, participants believed that using chlorine and alcohol can be appropriate for sterilizing and eliminating the virus from contaminated surfaces. Indeed, this awareness of using chlorine and alcohol to reduce the spread of the disease is in line with the recommendation of the Center for Disease Control and Prevention (CDC) to use chlorine and alcohol on different surfaces for sterilization purposes ²⁷.

Moreover, most of the participants believed in domestic isolation followed by sterilization and safety procedures as the best way to suppress the spread of the disease. Importantly, in cases where symptoms worsen, there was a satisfactory awareness of the need to seek help from professional care givers by going to the nearest hospital. Half of the participants stated that Jordanian society was sufficiently aware to face the coronavirus pandemic. In addition, more than half believed that the crisis would be over in Jordan by the beginning of summer or after a new treatment or vaccine had been developed. To date, there is no drug or vaccine proven to treat or prevent COVID-19¹². The epidemic could result in a large number of cases, which could put pressure on the health system. Actions and measurements should be taken by the government and the general public in order to reduce the transmission of COVID-19 and to save many lives. In this study, we have investigated the extent of the knowledge and awareness of the Jordanian population toward COVID-19. Importantly, these results will help with the campaign to implement important preventive measures and proper procedures to deal with COVID-19, and a vital part of this campaign will be its dissemination via the media and social media. More than a quarter of the participants reported that these medias were their main sources of information.

Conclusion

The general public in Jordan appears to have satisfactory information about COVID-19. Government agencies should organize information campaigns to correct misinformation and misunderstanding, and they should use media and social media platforms to target this information. This will ensure that the Jordanian population is well informed about COVID-19, which will help lessen unnecessary anxiety, contribute to the efforts to reduce transmission of the virus, and ultimately, therefore, help to save lives.

Summary box

What is already known on this subject?

COVID-19 can be effectively transmitted among humans and has high pandemic potential. In addition to COVID-19's high transmission capacity, the extent and intensity of global travel can further increase and accelerate its spread around the world.

So in order to control the spread of the disease, knowledge and awareness of the virus should be disseminated among the public from official sources, including WHO. Reliable and authoritative information will be vital in preventing and suppressing this disease.

What this study adds?

In this study we measure the knowledge and awareness of this disease within the Jordanian community. Which will help lessen unnecessary anxiety, contribute to the efforts to reduce transmission of the virus, and ultimately, therefore, help to save lives.

Funding

No funds were received from funding agencies, whether in the public, commercial, or not-for-profit sectors, in order to complete this research.

Conflicts of interest

All authors declare that they have no conflicts of interest.

Authors contributions

All authors state that they had complete access to the study data that support the publication.

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Figures

Figure 1. The main symptoms accompanying infection with COVID-19 virus Figure 2. Percentage of the appropriate procedures by study participants in case of COVID-19 virus suspension



*Statistically significant with residential area



*Statistically significant with residential area & educational level

Tables

Table1: Characteristics of the study sample N (%)			
Gender:			
• Female	2775(73.2)		
• male	1016(26.8)		
Age:			
• 18-29 years	1643 (43.3)		
• 30-39 years	1267(33.4)		
• 40-49 years	588 (15.5)		
• 50-59 years	228 (6.0)		
• More than 60 years	65 (1.7)		
Educational level:			
Pre-secondary	102((2.7)		
• Secondary	370(9.8)		
• Diploma	544(14.3)		
Bachelor	2187(57.7)		
Postgraduate	578(15.2)		
• Other	10(0.3)		
Work status:			
• I work in a health field (medical)	635(16.8)		
• In work in an unhealthy field (non-medical)	1255(33.1)		
Student in medical specialist	212(12 5)		
• Student in scientific or engineering specialist	313(12.5)		
• Other specialists not mentioned above	406(10.7)		
•	1182(31.2		
Marital status:			
• Single	1326(35.0)		
Married	2319(61.2)		
Divorced/Widowed	146(3.9)		
Having children			
• Yes	2190(57.8)		
• No	1600(42.2)		
Permanent place of residence:	420(11.0)		
• Village	428(11.3)		
• City	3348(88.3)		
• Badia	15(0.4)		
Residential area:			
North Jordan			
Amman, the capital	366(9.7)		
Central Jordan	1959(51.7)		
East Jordan	428(11.3)		
South Jordan	159(4.2)		
	879(23.2)		

Tab	Table2. Participants knowledge regarding COVID-19 N (%)			
1.	What do you think the source of Corona virus			
	(COVID-19)? (more than one answer can be chosen)			
	• The Human	307(8.1)		
	The Animals	1119(29.5)		
	Genetically modified viruses in the	1444(38.1)		
	• Others	981(24.3)		
	• ouers			
2.	What is the main source of information for you about			
	the new Corona virus (COVID-19)? (more than one			
	answer can be chosen)			
		624(16.5)		
	The media	367(9.7)		
	Social media	12(0.3)		
	Family or friends	327(8.6)		

 Government awareness campaign Medical care providers, either a doctor, pharmacist or nurse All the options are correct More than options are correct Other 	283(7.5) 172(4.5) 1912(50.4) 94(2.5)
 3. How Corona virus transmitted? (more than one answer can be chosen) Breathing Droplets from sneezing or coughing Contaminated surfaces All the options are correct More than options are correct 	27(0.7) 314(8.3) 208(5.5) 283(7.5) 2959(78.1)
 4. For how long Corona virus can survive outside the host (human or animal) body? 5-6 hours 7-12 hours 13-24 hours 2-4 days 5-9 days More than 9 days Others 	763(20.1) 510(13.5) 291(7.7) 1389(36.6) 429(11.3) 313(8.3) 96(2.5)
 5. People with high risk of complications, are? Children The elderly (more than 65 years) People with low immunity Heart or diabetic patient Pregnant women All the options are correct More than options are correct 	$\begin{array}{c} 2(0.1) \\ 198(5.2) \\ 262(6.9) \\ 1(0.0) \\ 5(0.1) \\ 418(11.0) \\ 2905(76.6) \end{array}$
 6. What is the cure rate of corona virus? 0-20% 21-50% 51-70% 71-95% More than 95% 	1296(34.2) 1357(35.8) 268(7.1) 243(6.4) 627(16.5)
 7. If a person seems healthy, can they be a carrier for the virus? Yes No I don't know 	3120(82.3) 132(3.5) 538(14.2)

Table3. The extent of community awareness of the preventive measures and proper procedures towards COVID-19 virus N (%)		
 One of the main preperson? (more than Hand wash with Hand wash with Wearing masks Drink plenty of Using hand san Avoid touching Avoid crowds All options are of Others 	vention methods for a healthy one answer can be chosen) n water only n water and soap hot fluids and take vitamins itizers mouth, nose and the eyes correct ons are correct	$\begin{array}{c} 6(0.2) \\ 51(1.3) \\ 2(0.1) \\ 6(0.2) \\ 6(0.2) \\ 16(0.4) \\ 39(0.8) \\ 149(3.9) \\ 3523(92.9) \\ 2(0.1) \end{array}$

2.	 In your opinion, what is the best way to control the spread of Corona virus? (more than one answer can be chosen) Isolate infected person Isolating people coming from an infected area Isolating people close to an infected patient Curfew and prevent going out unless necessary Stop schools and universities All options are correct More than options are correct 	54(1.4) $21(0.6)$ $5(0.1)$ $150(4.0)$ $3(0.1)$ $3334(87.9)$ $224(5.9)$
3.	 What do you think the most appropriate sterilization to eliminate virus from contaminated surfaces? (more than one answer can be chosen) Chlorine Alcohol Disinfectant extracted from natural resources All options are correct More than options are correct Others 	640(16.9) 1484(39.1) 80(2.1) 10(0.3) 1557(41.1) 20(0.5)
4.	 In your opinion, when will the nightmare of Corona virus disappear in Jordan? In the begging of summer After infected of 60% of population After discovering of vaccine At the end of the current year More than one option Other 	1214(32.0) 143(3.8) 798(21.0) 57(1.5) 1261(33.3) 318(8.4)
5.	 In your opinion, is Jordan society aware enough to face the Corona pandemic? Yes No Not sure 	1692(44.6) 899(23.7) 1199(31.6)
6.	Are you worried about Corona virus?YesNo	2524(66.6) 1266(33.4)