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Knowledge and Preventive Behaviors toward the Coronavirus (COVID-19) Pandemic among Adults Population: A Cross-Sectional Study in Iraq

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Abstract

Introduction: Coronavirus disease (COVID-19) caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) is an infectious disease. The political decisions have been exerted together with personal knowledge and behaviors to emphasize the community global efforts to prevent the spreading of disease. This study was performed to identify the public knowledge and behavioral responses about the outbreak of COVID-19.

Methods: A cross-sectional study was performed from the period of 15th May 2020 to 20th July 2022 among Iraqi populations. A convenience sampling consist of 1943 participants were involved in this survey. The data were collected through an online questionnaire by using a Google Form; the data were investigated by using the SPSS program Version 25.

Results: The study results expose a high knowledge level about symptoms related to COVID-19; the mean score of knowledge was (1.5). In addition to that, the result reveals a high level of participants' behaviors to confront the preventing transmission of COVID-19; about 95.0% of participants perform hand washing frequently, 90.0%, 84.8%, and 80.2% avoid participate in social events, maintain social distance and prevent contact with infected persons, and prevent contact with any persons respectively, and 70.0% of participants reschedule or cancel travel plans as preventing behavior to avoid the COVID-19 transmission.

Conclusion: Our study concludes a high knowledge level of the COVID-19 symptoms, and a high level of behaviors to prevent the spreading of COVID-19, also many factors can prevent of home quarantine and social isolation to avoid the spreading of COVID-19 among Iraqi residents from these factors the need for daily income, the need for health care outside the home.

Keywords: Public Knowledge; Behavioral Responses; COVID-19; Pandemic.

1. Introduction

Coronavirus (COVID-19) is an evolving respiratory disease, it was firstly identified in December, 2019 in Wuhan, China. This disease is extremely infectious, and about 18.5% of the patients infected with COVID-19 develop acute respiratory distress syndrome (ARDS), septic shock, and coagulation or bleeding disorder. In response to the quickly spreading of this serious disease (Kurtaiş Aytür, 2020) . The World Health Organization (WHO) confirmed it as a public health crisis of global concern and called for collaborative efforts of all nations to avoid the fast spread of COVID-19. Some protective actions have been assumed to control the spread of COVID-19, this involving the avoidance of public transport, the closing of public spaces, isolation and care for suspected and infected people (Coates et al., 2022; Ellwanger et al., 2021) .

The danger of transmitting an infectious disease could be stimulating individuals to take preventive behaviours to attempt to decrease this risk, as they recognize it (Ellwanger et al., 2021) . Persons who comply with these infection control methods are important, which is mainly affected by their level of knowledge toward COVID (Aleanizy & Alqahtani, 2021) . In Iraq, the authorities' measures have successfully controlled and slowed the spreading of the virus, but the cases have increased abruptly. Therefore, public precautionary measures are essential to protect them, relatives, and others from this infection and control the spreading of the disease. Therefore, dealing with this health crisis hangs mainly on the public and preventive behaviors concerning this virus and follows all the infection control precautions to avoid the cross-infection and to follow the WHO and the Center for Disease Control and Prevention (CDC) guidelines (Saeed et al., 2021) . The WHO confirmed a safety measures approach to reduce the transmission of COVID-19 infection. These safety measures include preventing public gatherings, preserving social distancing, avoiding direct contact with infected persons, and using special protecting equipment. Personal hygiene such as washing hand with soap and water for at least 20 seconds, particularly once touching environmental surfaces, another advice includes not to touch the eyes, mouth with unwashed hands, and self-isolation when COVID-19 symptoms taking place (GÜNER et al., 2020; Organization, 2020) .

To avoid the occurrence of diseases, it is necessary to emphasize the prevention of disease by knowing the method of the disease process, identify the risk factors that help the occurrence of the disease, and developing, implementing the plans that help to reduce the chances of the disease (Athbi & Hassan, 2019) . The public knowledge about COVID-19 infection plays a significant role in defining the readiness of Iraqi residents to modify their behaviors and recognize the type of interventions that are required to precise the false impression concerning the virus, highlight the lack of knowledge about the disease, improvement, and applying of new protective methods.

2. Patients and Methods:

Study design and participants: A cross-sectional study was conducted from the period of 15th April 2020 to 20th July 2022 among Iraqi populations to identify the public knowledge and behavioral responses toward the COVID-19 outbreak in Iraq. Because there is no possibility to implement a community-based sampling during this period, the data were collected online by using an electronic link shared via Google form platform; data were collected between 15th-April-20th May, 2020. A convenience sampling contained 1943 participants were involved in this survey. The data were collected through an online survey approach, Google Form was

generated, and all participants were asked to filling and submit the questionnaire form. The platform included directions for completing the questionnaire along with a brief overview of the background, goals, and voluntary nature of participation. The electronic questionnaire can be filled out by clicking on the link for individuals of Iraqi nationality who are 16 years of age or older and have been given permission to participate in the study. Each participant was asked to respond with a yes-or-no response to a question indicating their willingness to participate in the study. After completing the self-report questionnaire, they were instructed to click the "Submit" button.

Study instrument: The researchers and two multilingual faculty members at Kerbala University, who speak Arabic and English fluently, created an electronic version of the questionnaire in Arabic using a forward-backward translation technique to ensure the validity of translation and prevent errors. A panel of specialists in the field examined the questionnaire to determine whether it was a suitable way to collect the data required for this study, thereby testing its validity. The internal consistency reliability of the questionnaire was assessed using the Cronbach alpha coefficient in a pilot study with fifteen participants. The reliability score was 0.87. The questionnaire consists of two parts; part (I) includes the socio-demographic data include age group, gender, marital status, occupation, education level, and residency and governorate. Part (II) includes the knowledge and behavioral responses toward the COVID-19 outbreak in Iraq.

Statistical Analysis: Version 25 of the Statistical Package of Social Sciences (SPSS) was used to examine the data. A descriptive statistical analysis measures such as {frequency (f), percentage (%), means of scores (MS) and standard deviations (SD)}, were used to discover the different levels of knowledge and behavioral responses toward Coronavirus.

3. Results

Table (1): Participants socio-demographic data (N=1943):

Variables	Categories	Frequency	Percent
Age groups (years)	16-25	376	19.4
	26-35	841	43.3
	36-45	428	22.0
	46-55	193	9.9
	56-65	60	3.1
	≥ 66	45	2.3
Sex	Female	872	44.9
	Male	1071	55.1
Educational levels	Primary school	24	1.2
	Intermediate school	76	3.9

	Secondary school	129	6.6
	University graduates	794	40.9
	Master degree	675	34.7
	PhD-Degree	245	12.6
Residency	Rural	475	24.4
	Urban	1468	75.6
Occupation	Private employer	240	12.4
	Governmental employer	944	48.6
	Do not work	276	14.2
	Gainer	140	7.2
	Student	285	14.7
	Retired	58	3.0

Frequency(F),Percent(%)

Results in the table (1) demonstrate that 43.3% of the participants were within the age-group of 26-35 years old, and approximately one fifth (22.0%), (19.4%) of them were (36-45), and (16-25) years of old respectively. 55.1% of participants were males, and the majority (88.2%) of them were university graduated and have a higher education degree. About three-quarters (75.6 %) of them were from urban, and about one-half of participants (48.6%) were governmental employers

Table (2): Distribution of participants according to Iraqi governorates:

Governorate	Frequency	Percent
Baghdad	**300**	**15.4**
Kerbala	**403**	**20.7**
Babil	**170**	**8.7**
Wasit	**87**	**4.5**
Najaf	**102**	**5.2**
Dhi Qar	**100**	**5.1**
Muthanna	**59**	**3.0**
Al-Qadisiyyah	**82**	**4.2**
Maysan	**59**	**3.0**
Basra	**114**	**5.9**

Diyala	**86**	**4.4**
Al Anbar	**61**	**3.1**
Nineveh	**113**	**5.8**
Saladin	**63**	**3.2**
Kirkuk	**59**	**3.0**
Duhok	**30**	**1.5**
Arpil	**24**	**1.2**
Sulaimania	**31**	**1.6**
Total	**1943**	**100.0**

This table (2) exposed that most (20.7%) of the participants were from the Kerbala governorate followed by 15.4% of them were from Baghdad and the others from Iraqi governorates.

Table (3): Participants' knowledge about symptoms of the COVID-19:

No	Symptoms	Responses				M.S	Level
		Know		Do not know			
		F	%	F	%		
1.	**Headache**	**1424**	**73.3**	**519**	**26.7**	**1.7**	**H**
2.	**Fever**	**1842**	**94.8**	**101**	**5.2**	**1.9**	**H**
3.	**Abnormal bleeding**	**143**	**7.4**	**1800**	**92.6**	**1.0**	**L**
4.	**Cough**	**1826**	**94.0**	**117**	**6.0**	**1.9**	**H**
5.	**General weakness**	**1488**	**76.6**	**455**	**23.4**	**1.7**	**H**
6.	**Throat pain**	**1770**	**91.1**	**173**	**8.9**	**1.9**	**H**
7.	**Runny nose**	**1095**	**56.4**	**848**	**43.6**	**1.5**	**H**
8.	**Joint/muscle pain**	**1263**	**65.0**	**680**	**35.0**	**1.6**	**H**
9.	**Skin rash**	**1830**	**94.2**	**113**	**5.8**	**1.0**	**L**
10.	**Nausea /vomiting**	**6.9**	**31.3**	**1334**	**68.7**	**1.3**	**L**
11.	**Diarrhea**	**790**	**40.7**	**1153**	**59.3**	**1.4**	**L**
12.	**Shortness of breath**	**1862**	**95.8**	**81**	**4.2**	**1.9**	**H**
13.	**Abdominal pain**	**374**	**19.2**	**1569**	**80.8**	**1.1**	**L**
Total symptoms knowledge						**1.5**	**H**

F=Frequency; %= Percentage; M.S= Mean of score; H= High level of knowledge (M.S≥1.5); L=Low level of knowledge (M.S < 1.5).

This table exposed a high knowledge level about symptoms related to COVID-19 infection.

Table (4): Participants' behaviors to confront the spreading of COVID-19:

Behaviors		Responses			
		Yes		No	
		F	%	F	%
1.	Perform hand washing frequently.	1841	94.7	102	5.3
2.	Maintain social distance and prevent contact with infected persons?	1648	84.8	295	15.2
3.	Maintain social distance and prevent contact with any persons?	1559	80.2	384	19.8
4.	Avoid participate in social events?	1747	90.0	196	10.0
5.	Wear facemask and gloves?	1352	69.6	591	30.4
6.	Store household supplies and medications?	1106	57.0	837	43.0
7.	Reschedule or cancel travel plans.	1360	70.0	583	30.0
8.	Don’t leave home in the last week?	966	49.7	977	50.3

The results in table (4) show that most of participants' have a high level of behaviors to confront the spreading of COVID-19 infection among the most preventive behaviors.

Table (5): Factors prevent participants' for implementing home quarantine and social isolation:

Items		Categories	Responses	
			F	%
1	The need for daily income.	Very effective	741	38.1
		Effective	528	27.2
		Somewhat Effective	378	19.5
		Absolutely non-effective	296	15.2
2	The need for caring of people outside the home (for example, parents or relatives).	Very effective	714	36.7
		Effective	517	26.6
		Somewhat Effective	489	25.2

		Absolutely non-effective	**223**	**11.5**
3	**I do not wish not to participate in social events.**	**Very effective**	**1510**	**77.7**
		Effective	**240**	**12.4**
		Somewhat Effective	**111**	**5.7**
		Absolutely non-effective	**82**	**4.2**
4	**Information you received about how to combat the spreading of COVID-19.**	**Not available**	**87**	**4.5**
		Somewhat available	**890**	**45.8**
		Available	**683**	**35.2**
		Very available	**283**	**14.6**
5	**Information you received about how COVID-19 spreading?**	**Not available**	**64**	**3.3**
		Somewhat available	**808**	**41.6**
		Available	**791**	**40.7**
		Very available	**280**	**14.4**
6	**How well do you know to protect yourself from being infected with COVID-19.**	**Need to be better**	**451**	**23.2**
		Good	**983**	**50.6**
		Excellent	**509**	**26.2**

As shown in table (5), many factors prevent participants' for implementing home quarantine and social isolation, from these factors the need for daily income, the need for caring outside the home, do not wish not to participate in social events and others.

4. Discussion

The results showed that 43.3% of the participants have 26-35 years old, and approximately one fifth (22.0%), (19.4%) of them were 36-45, and 16-25 years of old respectively. More than one-half (55.1%) of participants were males, and the majority (88.2%) of them were university graduated and have a higher education degree. In addition to that, about three-quarters (75.6 %) of them were from urban, and about one-half of participants (48.6%) were governmental employers. A similar study in Iraq for the period of the COVID-19 pandemic to assess the risk perceptions and community attention concerning the outbreaks of COVID-19, this study revealed that are more than 50% of the participants were males, within the age-group of 20-29 years, and singles. The majority of participants were from urban residencies, and more than 60% of the participants have had universities graduated and postgraduate (Al-Juboori et al., 2021) .

Regarding the knowledge level of participants about the symptoms of COVID-19 infection, the results in table (3) indicate a high knowledge level in participants related to symptoms of COVID-19 infection, the study that exposed the greater percentage of the study sample were had a sufficient level of knowledge about COVID-19 infection among the Iraqi population. In a cross-sectional study, performed in Egypt to assess community attitude,

knowledge, and perceptions regarding COVID-19 infections among 559 persons, shows that the greater percentage of the study sample had a respectable knowledge about the COVID-19 pandemic and protective behaviors (Al-Juboori et al., 2021; Geldsetzer, 2020) . Another online study performs to measure the community knowledge and opinions about the COVID-19 pandemic in the United Kingdom (UK) and the United States (US), exposed that the participants had a good knowledge level concerning the main method of transmission and common COVID-19 symptoms (van der Weerd et al., 2011). In an online cross-sectional survey was conducted in Mosul-Iraqi among persons above the age of 18, found that the majority of the participants had a high knowledge level concerning the cause, incubation period, and the symptoms of a COVID-19. The high participant's knowledge level in this study may be because most study samples have a college graduated or higher, or because of the high level of media coverage. The COVID-19 infection causes a respiratory illness that ranges from symptoms like common cold to severe illnesses. Most of the patients infected with COVID-19 suffer from dyspnea, fever, cough, loss of taste, and/or smell sensation and may be asymptomatic. In severe infection, patients may complain of pneumonia, and various organ dysfunction (Aleanizy & Alqahtani, 2021).

Concerning the participants' behaviours to confront the spreading of COVID-19 infection. The results in table (4) show a high level of behaviours among participants' to prevent the spreading of COVID-19 infection, about 95.0% of participants perform hand washing frequently, 90.0%, 84.8%, and 80.2% avoid participate in social events, maintain social distance and prevent contact with infected persons, and prevent contact with any persons respectively, and 70.0% of participants reschedule or cancel travel plans as preventing behavior to avoid the transmission of COVID-19, other behaviours include prevent participate in social events, wear facemask and gloves, store household supplies and medications, and don't leave home in the last week. These findings come along with the findings of cross-sectional study exposed an increased community intention about the implementation of protective methods of H1N1 infection (Maqbool & Khan, 2020) . A cross-sectional online survey was conducted in Mosul-Iraqi among persons above the age of 18. Found that the majority of the participants started washing their hands regularly during the COVID-19, and similar to those who used sanitizer if the soap is not accessible, about 83.2% of participants put on a mask when they going outside the home. In addition to that, about three-quarters of respondents maintain a social distance from others when going outside to prevent the virus transmission. The WHO confirmed perceptional approaches to control the transmission of infections. These precautions measures include avoiding public gatherings, maintaining social distancing, preventing direct contact with infected persons, and using personal protective tools such as face masks, and personal hygiene such as handwashing with water and soap for at least 20 seconds, particularly after surfaces touching, which also include an instruction not to touch the eyes, nose, and mouth with unwashed hands, and self-isolate when COVID-19 symptoms started. Public knowledge and preventive behavior toward COVID-19 contributes to a significant role in determining the readiness of Iraqi citizens to modify their behavior and identify the type of measures that is necessary to correct the misconceptions about preventive behaviors concerning the virus, highlight the deficit in knowledge concerning the virus and disease, and improvement of new precautionary methods about COVID-19 (Saeed et al., 2021) .

Furthermore, many factors can prevent the implementation of home quarantine and social isolation to prevent the spreading of COVID-19 infection among Iraqi residents, as

shown in table (5), the most important factors include the need for daily income, the need for health care outside the home, do not wish to not participate in social events and others. revealed that about 88% of participants stopped going to crowded areas in recent times. Conversely, about two-thirds of the participants stated that they stopped visiting and kissing their relatives or friends, while 75% of participants stopped the handshake when greeting the others (Saeed et al., 2021) . In a systematic literature review study that to detect the obstacles that hinder the effective application of the COVID-19 preventive measures, it is identified that lack of resources for performing social measures and public health is found to be the most important barrier to applying social measures and public health for preventing the transmission of COVID-19 (Mat Dawi et al., 2021).

5. Limitations of the Study:

The data that were collected through this survey is done by distributing the questionnaire to the internet allowed only; people who have internet access and those who can read are only able to participate. This represents the main restraint of this study.

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7. Conflict of interest statement

The authors declare no conflicts of interest relevant to the content of this study. No financial relationships, personal interests, or affiliations influenced the research design, analysis, interpretation, or reporting of the findings.

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