Assessment of implementing the Safety Measures and Prevention to reduce the spread of Coronavirus Disease (COVID-19) pandemic in Egypt

Eman Sobhy Elsaid Hussein and Fatma Abdou Eltaib

Medical-Surgical Nursing, Faculty of Nursing, Ain Shams University, Egypt

Abstract

Background: The coronavirus disease (COVID-19) has caused significant mortality, so implementation of universal safety measures and prevention in all countries led to an improvement in social and economic aspects, and long-term health outcomes for many communities. The study aimed to assess the implementation of safety measures and prevention to reduce the spread of coronavirus disease (COVID-19) pandemic in Egypt. **Methods:** Descriptive design was used; a self-administered questionnaire was distributed among adult Egyptians at the various governorates "the Great Cairo, Al-Dakahlia, and Assuit" through social media. Sample: 400 adult respondents who completed the questionnaire were enrolled in the study pertaining to inclusive criteria. **Tools:** Structured questionnaire included the socio-demographic characteristics of respondents and knowledge assessment sheet about coronavirus disease (COVID-19) pandemic and a self-administered structured questionnaire about the safety measures and prevention. **Results:** The mean age of the respondents was 26.265+10.868; 27.5% of the respondents were living in Cairo and 25% in Giza, respectively; 30% of the respondents had a satisfactory level of knowledge about COVID-19 with social media as their source of information, and 98% of them had a satisfactory level of knowledge about the spread of new Coronavirus disease. The respondents were highly positive about hand washing, wearing medical masks, and home quarantine as safety measures and prevention. **Conclusion:** The majority of respondents possessed a satisfactory level of knowledge about COVID-19, ways through which the virus spreads, and implementation of the safety measures and prevention to reduce the spread of coronavirus disease (COVID-19) pandemic in Egypt. **Recommendations:** It is recommended that the study be applied to a larger population, especially with the arrival of the second wave of the virus, and also health awareness be increased about COVID-19 by WHO based in Egypt with the help of multi-social media like twitter or periodical SMS with health instructions from Egyptian Ministry of Health to the population.

Keywords: (COVID-19) pandemic, prevention, safety measures.

E-mail: esobhy14@gmail.com

Introduction:

The World Health Organization has recognized coronavirus disease 2019 (COVID-19) as a pandemic and recommends implementing safety measures and prevention such as physical distancing, wearing a mask, and keeping rooms well ventilated, avoiding crowds, coughing into a bent elbow or tissue, and cleaning hands, all over the world to reduce the spread of COVID-19. *(WHO 2020).*

As of 14 August 2020, the total cases in the world accounted for over 21 million with over 13 million recovered cases and over 752,580 deaths. Now, there are over 95000 cases with 55000 recovered and 5000 deaths per one million people *(Worldometers 2020)*, so health care systems have been forced to rapidly defer less urgent care during this crisis *(Azam, Myers et al. 2020)*.

On 14 Feb 2020, Egypt's Ministry of Health affirmed the first case in the country at Cairo International Airport involving a Chinese national *(Egypt Today 14 Feb 2020) (BBC News 14 February 2020)*. Egyptian authorities had informed the World Health Organization (WHO) and the patient had been quarantined in the hospital *(France 24 16 February 2020)*.

Preventive measures were subsequently taken to monitor those who came into contact with the person where the others tested negative *(Egyptian Streets 14 February 2020)*.

The COVID-19 virus spreads through breathing and contact. A healthy human is at risk of exposure to potentially infectious respiratory droplets. The COVID-19 virus is mostly transmitted through droplets that are produced when an infected person coughs, sneezes, or exhales. These droplets are too heavy to hang in the air and quickly fall on floors or surfaces *(WHO₁ 2020)*. Droplet infection may be a result of the transmission of a water-like particle (usually 5-10 µm in diameter) containing the virus. Direct person-to-person transmission occurs through air droplets among peoples who are in close contact within 1. Moreover, droplet infection has also been documented to indirectly spread through surfaces of fomites *(Ong, Tan et al. 2020).*

COVID-19 sickness is an infection disease begun by an as of late discovered coronavirus. Most people who fall sick with COVID-19 experience mild to moderate symptoms and recover without special treatment *(WHO₁ 2020)*. Signs and symptoms include respiratory symptoms as cough and shortness of breath, and fever. In more severe cases, the infection can cause severe Acute Respiratory Distress Syndrome (ARDS), pneumonia and sometimes death. Universal counsel to forestall the spread of COVID-19 involves frequency handwashing using liquor based hand rub or cleanser and water, covering the nose and mouth with a flexed elbow or disposable tissue when coughing and sneezing, and avoiding close contact with any person has a fever and cough *(WHO₂ 2020)*.

Countries all around the world have been working to try to combat the pandemic through public safety measures, where the primary aim is to encourage hygiene improvement activities through regular and long hand washes, the introduction of social distancing steps, rules for holding a distance of more than six feet apart from others, cancelation of big events and restriction on meetings of more than a few individuals and staying at home or lockdown orders, the closing of non-essential businesses and banning of outdoor movements, except those pertaining to health, sustenance necessities, or those deemed essential for businesses *(Amla and Amla 2020).*

The most important prevention measure to control the spread of COVID-19 infection is frequent hand wash with soap and water or with an alcohol-based hand sanitizer. If hands are not visibly dirty, they should preferably be washed with alcohol-based sanitizer for 20 to 30 seconds *(Siddharta, Pfaender et al. 2017)*. However, if hands are seemingly polluted, they must be washed with soap and water for 40 to 60 seconds using the appropriate technique *(WHO₃ 2009)*.

Hand wash can conserve a person from contracting this highly infectious virus and subsequently spreading it to others. Recurrent and correct hand washing is one of the most important measures that can be used to prevent infection with the COVID-19 virus. Clinicians should work to upgrade more frequent and regular hand washing by improving facilities and using proven behavior-change techniques *(WHO₄ 2020).*

Prohibition of generalized use of masks by WHO is often criticized by some researchers. However, use of a surgical mask for COVID-19 patients, their caregivers, and health care workers (HCW) is well accepted *(WHO₅ 2020).* Face mask application by the healthy population in the community to decrease the risk of spread of respiratory droplets remains controversial. So the impact of public-wide mask application to control coronavirus disease should be assessed (COVID-19) *(Cheng, Wong et al. 2020)*. It is controversial but progressively recommended for the public to wear a face mask to avoid the spread of the COVID-19 pandemic; however the potential of this intervention is not well-known *(Eikenberry, Mancuso et al. 2020)*.

The purpose of the general public mask wearing is to decrease community transmission from infected individuals, who can be pre-symptomatic or asymptomatic but still spread the virus *(Sunjaya and Jenkins 2020) (Greenhalgh, Schmid et al. 2020).* The World Health Organization (WHO) advises that the wearing of mask by symptomatic persons and their contacts only may therefore be inadequate *(WHO₆ 2020)*. Some countries and cities, which implemented universal mask wear have much lower COVID-19 incidence, which is an indirect evidence of its effective prevention; these countries include Hong

Kong and South Korea *(Black Dot Research January 30, 2020).*

The motivation behind general measures is to decrease the danger of transmission of the virus to the people group through contact with infected subjects, items, gear, or contaminated natural surfaces. Personal Protective Equipment (PPE) must be used whenever there is potentially close contact with a suspect case, particularly when the potentially infected person does not wear a surgical mask; thus doing so could reduce the spread of virus in the environment. By implementing the specific prevention and protection measures recommended in the workplace, it will be possible to help overcome COVID-19 *(Cirrincione, Plescia et al. 2020)*.

It is clear that in many nations, the steps taken to tackle epidemic transmission have had a dramatic economic effect. So if the safety measures and prevention from COVID-19 are not applied, it will lead to loss of income, which may likely result in an increase of adverse health outcomes for many of the individuals affected, and the overall economic crisis will negatively affect the ability of entire countries to provide effective healthcare to their citizens *(Cheema, Ameduri et al. 2020).*

The magnitude of the problem:

Coronavirus disease (COVID-19) is thought to spread mainly through close contact from person-to-person or by **touching a surface or object that has the virus on it.** Some people without symptoms may be able to spread the virus. We are still learning about how the virus spreads and the severity of illness it causes, so safety measures and prevention are the primary intervention to reduce the spread of Coronavirus Disease (COVID-19) pandemic and reduce the utilization of medical supplies, human resources and the number of hospitalization cases.

Aim of the Study:

This study aimed to assess the implementation of safety measures and prevention to reduce the spread of coronavirus disease (COVID-19) pandemic in Egypt.

Research Questions:

- What are the resources of knowledge about the coronavirus disease (COVID-19) pandemic in Egypt?

- What are the safety measures and prevention which can reduce the spread of Coronavirus disease (COVID-19) pandemic in Egypt?

- What are the responses to implementing the safety measures and prevention to reduce the spread of coronavirus disease (COVID-19) pandemic in Egypt?

- What is the relationship between sociodemo - graphic characteristics of respondents and implementing the safety measures and prevention to reduce the spread of coronavirus disease (COVID-19) pandemic in Egypt?

Subjects & Methods

1-Research Design:

Descriptive design was used to achieve the aims of the study.

2-Setting:

The study was conducted at the various governorates of Egypt, Great Cairo which includes Cairo, Giza, Qaluibia; Al-Dakahlia that represents AlDelta because it represents the main regions in Egypt; and Assuit which represents the upper Egypt, through social media. The study was conducted from June to August 2020 among Egyptian adults.

3-Subjects:

Random samples of adult respondents were enrolled in the study with respect to inclusive criteria, which included those who were able to read & write and able to use social media during the three months from June to August 2020. Sample size was calculated by using Steven K. Thompson equation with the following formula:

$$n = \frac{N * P(1 - P)}{[N - 1] * \left(\frac{d2}{Z}\right) - P(1 - P)}$$

In which n=sample size, N= population size, Z= confidence level at 95% (1.96), d= Error proportion (0.05) and P= probability 50%. The probability of having good knowledge and a positive attitude towards preventive measures against coronavirus disease was 50.0%, which gave a calculated sample size of 384 participants. Our objective was to reach 400 participants so the results could be representative of the whole population.

4-Tools of Data Collection:

The data was collected using the following tools:

4-1 Structured questionnaire:

It was developed online by the researcher on Google forms in simple Arabic language, containing two parts:

a- **Socio-demographic characteristics** of the respondents, such as age, sex, marital status, education level, work status, standard of living, which governorate the participants were affiliated to, living area including city or village, and the source of information about coronavirus.

b- **Knowledge Assessment Sheet** about Coronavirus disease (COVID-19) pandemic. The questionnaire was developed by the researcher in a simple Arabic language based on the related literature *(WHO$_7$ 2020)* from WHO. It was designed to assess the respondent's knowledge about COVID-19 including sources of data about COVID-19, definition, etiology, the spread of disease, signs & symptoms, people at high-risk, recovery rate, first intervention, and medical management, covering 12 questions which have to be answered by Yes, No and Don't know.

A score of two was given for correct answer and one for incorrect answer while a zero for a don't know answer. The scores were summed, and the total was divided by the number of the items, giving a mean score for the part. These scores were converted into a percent score; and mean and standard deviations were computed. The respondents' knowledge was considered satisfactory if the percent score was more than 75% and unsatisfactory if it was ≤ 75%

4-2 A Self-Administered Structured Question-naire about the safety measures and prevention to reduce the spread of coronavirus disease (COVID-19) pandemic: It was developed by the researcher using Google forms in simple Arabic language based on the related literature *(WHO$_8$ 2020)*. It included 10 items about hand washing, 11 items about wearing masks, 7 items about wearing gloves, and 7 items about other safety measures. All of these elements were answered by always, often, sometimes, rarely, and never.

A score of **4** was allotted for always took, **3** for often took, **2** for sometimes took, **1** for rarely took, and **0** never took. The negative question was given the opposite score (question no. 2 regarding hand washing and question no. 5 regarding wearing mask). These scores were summed up for each question and the total was divided by the number of the respondents, giving a mean score and standard deviation for each question. The total scores for each part were summed up and represented in mean and standard deviation.

5- Pilot study: A pilot study was conducted to test the feasibility and applicability of the tools and the maneuvers of the interventions, and to estimate the time needed. It was conducted on 5 respondents; these respondents were excluded from the study.

6- **Validity and Reliability**

Testing validity includes face validity aimed at inspecting the tools for clarity, relevance, comprehensiveness, simplicity, and applicability. Slight adjustments were made such as content validity for tools reviewed by 5 nursing specialists in the Medical-Surgical Nursing Department at the Faculty of Nursing, Ain Shams University. Tools reliability: Cronbach's Alpha test was used to measure the internal consistency of tools. The reliability score for the second part of the structured questionnaire that assessed the respondent's response about the safety measures and prevention to reduce the spread of coronavirus disease (COVID-19) pandemic was 0.839**.**

Ethical consideration of the study

Official permission was obtained from the head of the department, and the aim of the research was also clarified to the respondents at the top of the questionnaire. The researcher considered the online informed consent process, privacy and confidentiality protections, and strategies necessary for ethically conducting internet research studies. The respondents were offered the opportunity to withdraw from the research at any time and retract their data and were ensured that their data would not be used for subsequent non-research purposes.

Study maneuver:

The data was collected from June to August 2020 by an electronic questionnaire that was

developed by the researchers. The questionnaires were presented to specialized doctors to examine the content and face validity; some points have been modified and reordered and then placed online by using Google Forms. Participants were invited to complete and submit the form. The participants were recruited through convenient sampling, which included five regions simultaneously, Cairo, Giza, AL-Qaluibia, Al-Dakahlia and Assuit, that represent the main regions in Egypt. The respondents were informed regarding the ethical aspect of the research and no data was disclosed to them before their consent to fill in the questionnaire. Participants were then asked to spread the link of the questionnaire in order to cover more participants, and consequently, as the number of participants surpassed the sample size at the end of August, the questionnaire was closed. The researchers utilized digital technology to collect data by sending the questionnaire link through social media such as E-mail, WhatsApp, Messenger, Facebook, and Telegram. The data was collected in an excel sheet to enter into SPSS for data analysis.

Data analysis

The data analysis was conducted using SPSS version 23, and necessary descriptive analysis of minimum, maximum, mean, frequencies, percentages, and Standard Deviation (SD) and correlation analysis were carried out to measure differences in the studied outcomes.

Results

Table (1) illustrates that the mean age of the respondents was 26.265+10.868 with a minimum of 18 years and a maximum of 59 years; more than two-third of them were females (60.5%), and the majority were university graduates (78.2%). As regards living area, 62.7 % were living in the city with more than half of them (50.5%) with an average income (more than 2,000 and less than 5,000 pounds). Regarding the governorate to which the respondents belonged, 27.5% and 25% were living in Cairo and Giza, respectively.

Figure (1) illustrates that the major source of information of the respondents for COVID-19 was social media (30%).

Table (2) shows that 91.5% of the respondents had a satisfactory level of knowledge

about Coronavirus (COVID-19) with a mean of 18.275±2.101, and also, 98% of them had had a satisfactory level of knowledge about the ways through which the new Coronavirus spreads with a mean 3.955±0.351.

Table (3) illustrates that the mean response of the respondents toward implementing the safety measures and prevention (washing hands) to reduce the spread of coronavirus disease (COVID-19) was highly positive, with regard to making sure to wash their hands when they are significantly dirty, hand washing is one of the preventive ways to limit the spread of the virus, and making sure to wash their hands when caring for a sick person (3.84 ± 0.453, 3.795 ± 0.473, and 3.78 ± 0.675), respectively.

Table (4) illustrates that the mean response of the respondents toward implementing the safety measures and prevention (wearing a mask) to reduce the spread of coronavirus disease (COVID-19) was highly positive, with respect to wearing medical masks as one of the preventive ways to limit the spread of the virus, masks are effective in preventing transmission of infection, respirators protect from inhaling dust, steam and harmful gases, and healthy people should wear a mask (3.67 ± 0.63, 3.66 ± 0.62, 3.59 + 0.74 and 3.58 ± 0.70), respectively.

Table (5) illustrates that the mean response of the respondents toward implementing the safety measures and prevention (wearing gloves) to reduce the spread of coronavirus disease (COVID-19) was highly positive, concerning avoiding touching the face and nose while wearing gloves (3.88 ± 0.49) and that the glove should be disposed of by placing it in a completely closed bag and spraying with chlorine water (3.4 ± 0.98), while their response was highly negative about wearing gloves is not effective to prevent the emerging coronavirus (1.91±1.285), rubber gloves are safer than plastic gloves (2.52 ± 1.185), gloves are a means of transmitting infection (2.52 ± 1.276), wearing gloves while in the public places (2.64 ± 1.26), respectively.

Table (6) illustrates that the mean response of the respondents toward implementing other precautionary measures to reduce the spread of coronavirus disease (COVID-19) was high, concerning adhering to home quarantine if symptoms such as cough or sore throat appear

(3.83 $\pm$ 0.52), use disinfectants or detergents to disinfect the home (3.60 $\pm$ 0.81) and make sure to stay home and go out only when necessary (3.59 $\pm$ 0.78), respectively.

Table (7) shows that there was a statistically significant relationship between sociodemographic characteristics and implementing the safety measures and prevention to reduce the spread of coronavirus disease (COVID-19) pandemic in Egypt. A relationship was found between washing hands and sex, while there was also a relationship observed between wearing gloves and marital status, education level, and standard of living and housing area. Also the relationship was found between wearing face mask and standard of living.

Table (1): Percentage distribution of the respondents concerning socio-demographic data.

Items	Total NO = 400	%
Age		
Mean $\pm$SD	26.265$\pm$10.868	
Minimum	18	
Maximum	59	
Sex	N	
Male	158	39.5
Female	242	60.5
Marital status		
Married	110	27.5
Unmarried	290	72.5
Education level		
Preparatory	11	2.8
Diploma - High School or Equivalent	27	6.8
University	313	78.2
Higher studies	49	12.2
work status		
Student	260	65
Government worker	62	15.5
Private job	46	11.5
No work	32	8
Standard of living		
Simple income (less than 2000 pounds	111	27.75
Average income (more than 2,000 and less than 5,000 pounds)	202	50.5
High income (more than 5000 pounds.)	87	21.75
The governorate to which the respondent belongs		
Cairo	110	27.5
Giza	100	25
Qaluibia	65	16.25
Al-Dakahlia	75	18.75
Assuit	50	12.5
Living area		
City	251	62.7
Village	149	37.3

Fig. (1) Source of information about the Coronvirus COVID-19

- Television
- Internet
- Social media
- Family
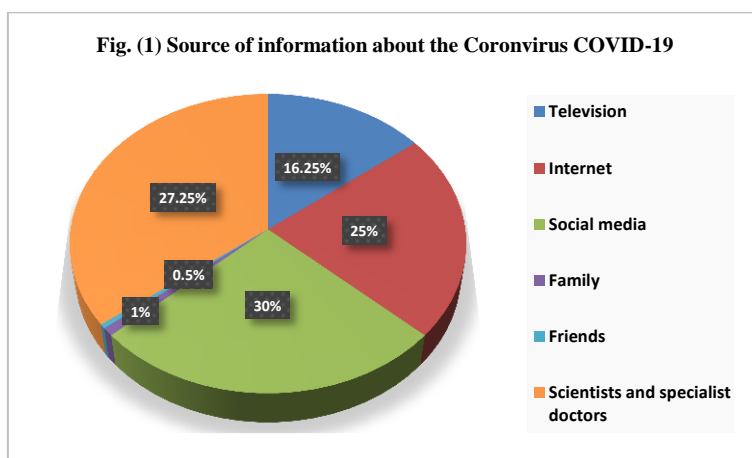- Friends
- Scientists and specialist doctors

Table (2): Percentage distribution of the respondents concerning their knowledge about Coronavirus disease (COVID-19) pandemic in Egypt and its ways of spreading.

Information about Coronavirus (Covid-19)	Yes	No	Don't know
• Coronaviruses are a broad family of viruses that may cause disease in animals and humans.	328 (82%)	46 (11.5%)	26(6.5%)
• COVID-19 is an infectious disease caused by the last virus discovered in the Coronavirus strain.	331 (82.8%)	10 (2.5%)	59(14.8%)
• The new Corona-19 virus began its outbreak in Wuhan, China, in December 2019.	380 (95%)	8 (2%)	12(3%)
• The most common symptom of Covid-19 disease is fever, fatigue, and dry cough.	382 (95.5%)	10 (2.5%)	8(2%)
• Other symptoms include less common but may develop, such as aches and pains, nasal congestion, headache, conjunctivitis, sore throat, diarrhea, and loss of taste, or smell, the appearance of a rash, or discoloration of the fingers of the hands, or the feet.	356 (89%)	26 (6.5%)	18(4.5%)
• Some people become infected with only very mild symptoms	362 (90.5%)	16 (4%)	22(5.5%)
• Most people (about 80%) recover from the disease without needing special treatment.	281 (70.3%)	73 (18.3%)	46(11.5%)
• The risk of developing severe complications increases among the elderly and people with chronic health problems such as hypertension, heart and lung disease, diabetes, or cancer.	392 (98%)	2 (0.5%)	6 (1.5%)
• All persons of any age should seek medical attention immediately if they develop a fever, cough with difficulty in breathing, and shortness of breath/pain or pressure in the chest/loss of speech or movement.	369 (92.3%)	13 (3.3%)	18(4.5%)
• A physician or a health care facility should be contacted in advance so that the patient can be directed to the appropriate clinic.	360 (90%)	24 (6%)	16(4%)
Mean + SD	18.275±2.101		
Satisfactory level of knowledge	366 (91.5%)		
Unsatisfactory level of knowledge	34(8.5%)		
Ways of spread of the new Coronavirus (Covid-19)			
• The disease is spread mainly from person to person through the small droplets that patients with Covid-19 secrete from their nose or mouth when they cough, sneeze or speak.	394(98.5%)	2(0.5%)	4(1%)
• People become infected when they come into contact with some objects or surfaces with secretory droplets on them from a person infected with the virus and then touch their eyes, nose, or mouth	396(99%)	0 (0%)	4(1%)
Mean ±SD	3.955±0.351		
Satisfactory level of knowledge	392(98%)		
Unsatisfactory level of knowledge	8(2%)		

Table (3): Percentage distribution of the respondents regarding their responses to implementing the safety measures and prevention to reduce the spread of coronavirus disease (COVID-19) pandemic in Egypt (washing hands).

Precautionary measures - washing hands	Mean +SD
• Hand washing is one of the preventive ways to limit the spread of the virus	3.795 ± 0.473
• Regular hand washing with disinfectants weakens immunity	2.178 ± 1.378
• Make sure to wash hands after coughing or sneezing	3.357 ± 0.947
• Make sure to wash hands before and after eating	3.55 ± 0.891
• Make sure to wash hands when caring for a sick person	3.78 ± 0.675
• Make sure to wash hands after handling animals	3.58 ± 0.875
• Make sure to wash hands when they are significantly dirty	3.84 ± 0.453
• Make sure to wash hands for 20 seconds	3.27 ± 0.929
• Make sure to wash hands with soap and water	3.63 ± 0.732
• Make sure to wash hands with disinfectants, such as an alcohol-based hand rub	2.97 ± 1.008
Total	**$33.937 + 4.587$**

Table (4): Percentage distribution of the respondents concerning their responses to implementing the safety measures and prevention to reduce the spread of coronavirus disease (COVID-19) pandemic in Egypt (Wearing medical mask)

Items	Mean $\pm$ SD
Precautionary measures - wearing medical masks	
• Wearing medical masks is one of the preventive ways to limit the spread of the virus	3.67 ± 0.63
• Healthy people should wear a mask	3.58 ± 0.70
• Wear a mask only when caring for a suspected infected person	2.93 ± 1.48
• The cap with a shawl is just as effective as a mask	1.54 ± 1.24
• Shallow use increases the risk of catching the virus	1.57 ± 1.15
• Masks are an effective way to protect against airborne diseases	3.53 ± 0.678
• Respirators protect from inhaling dust, steam, and harmful gases	$3.59 + 0.74$
• Masks are effective in preventing transmission of infection	3.66 ± 0.62
• Regular masks provide limited and weak protection from viruses	2.79 ± 1.109
• Wearing masks with filters is better protection than regular masks	3.43 ± 1.045
• Are you obligated to wear a mask?	3.36 ± 0.939
Total	**$33.65 + 4.47$**

Table (5): Percentage distribution of the respondents concerning their responses to implementing the safety measures and prevention to reduce the spread of coronavirus disease (COVID-19) pandemic in Egypt (Wearing gloves)

Items	Mean $\pm$ SD
Precautionary measures - Wear gloves	
• Wearing gloves is not effective to prevent the emerging coronavirus	1.91$\pm$1.285
• Gloves are a means of transmitting infection	2.52 $\pm$ 1.185
• Rubber gloves are safer than plastic gloves	2.52 $\pm$ 1.276
• Wear gloves while in public places	2.64 $\pm$ 1.26
• The glove should be disposed of by placing it in a completely closed bag and spraying it with chlorine water	3.4 $\pm$ 0.98
• Washing hands frequently every half hour eliminates the need for wearing gloves	2.97$\pm$1.185
• Avoid touching the face and nose while wearing gloves	3.88 $\pm$ 0.49
Total	**19.83 $\pm$ 3.184**

Table (6): Percentage distribution of the respondents concerning their responses to implementing the safety measures and prevention to reduce the spread of coronavirus disease (COVID-19) pandemic in Egypt (other precautionary measures)

Other Precautionary measures	Mean $\pm$SD
• Shake hands/kisses/hugs	2.48 $\pm$ 1.38
• Avoid constantly touching the face	3.35 $\pm$ 0.97
• Take care to keep your distance from others	3.44 $\pm$ 0.85
• Make sure to stay home and go out only when necessary	3.59 $\pm$ 0.78
• Adhere to home quarantine if symptoms such as cough or sore throat appear	3.83 $\pm$ 0.52
• I avoid gatherings of more than five people	3.56 $\pm$ 0.74
• Use disinfectants or detergents to disinfect the home	3.60 $\pm$ 0.81
Total	**23.86 $\pm$3.29**

Table (7): indicates the relationship between sociodemographic characteristics and implementing the safety measures and prevention to reduce the spread of coronavirus disease (COVID-19) pandemic in Egypt.

Items	Test	washing hands	wearing medical masks	Wearing gloves	Other Precautionary measures
Sex	R	0.146	0.039	0.067	0.228
	P	0.003	.433	0.183	0.000
Marital status	R	0.055	0.009	0.138	0.004
	P	.271	.851	0.006	.930
Education level	R	.052	.076	0.162	.094
	P	.303	.129	0.001	.059
Job	R	.003	.007	.088	0.120
	P	.959	.886	.079	0.017
Standard of living	R	0.064	0.151	0.178	.066
	P	.200	0.002	0.000	.189
The governorate to which the respondent belongs	R	.003	.059	.092	.063
	P	.947	.237	.067	.208
Housing area	R	.080	.049	0.132	.027
	P	.111	.330	0.008	.597

Discussion

The World Health Organization (WHO) announced the novel coronavirus disease 2019 (COVID-19) a public health emergency of international concern on January 30, 2020 (**WHO₉ 2020**). The virus was confirmed to have reached Egypt on 14 February 2020. Until now, in Egypt, there are 102.000 cases of COVID-19, of which 88.666 are cured cases and 5.750 are dead cases; various bodies including the WHO and US Centers for Disease Control and Prevention (CDC) have issued advice on preventing further spread of COVID-19 (**Fagbule 2019, WHO₁₀ 2020**). They recommend avoiding contact with individuals who are symptomatic, and taking basic hand hygiene measures, including frequent hand washing and the use of Personal Protective Equipment (PPE), such as face masks.

Concerning sociodemographic characteristics, the results of the current study indicate that the mean age of the respondents was 26.265+10.868 (18 to 59) years. These results were inconsistent with (Serwaa, Lamptey et al. 2020) who studied "Knowledge, risk perception and preparedness towards coronavirus disease-2019 (COVID-19) outbreak among Ghanaians", and found that the age of more than half of the studied population ranged between 18-30 years and most of the participants were males, while our findings were found to be consistent with the findings of (**Logunov, Dolzhikova et al. 2020**) who reported that enrolled healthy adult volunteers (men and women) were between the age of 18-60 years.

Concerning gender and education level, the current results revealed that more than two-third of them were females, and more than three-quarter of the respondents were university graduates. This was in agreement with the study "knowledge, attitude and practice toward COVID-19 among the public in the kingdom of Saudi Arabia: a cross-sectional study" conducted by (**Al-Hanawi, Angawi et al. 2020**) who reported that more than half of the sample (56.20%) had a college or university degree and more than half of the sample was females.

Concerning the living area, our study revealed that more than two-third of the participants were living in the cities, with 27.5% and 25% living in Cairo and Giza, respectively. These results might be due to the fact that more than 20% of Egyptian

population lives in these two governorates and these are considered the most crowded ones. National Population Council (NPC) recorded that Greater Cairo ranks seventh in the world in terms of population density, and is expected to rank fifth by 2035. According to Test and Evaluation Master Plan (TEMP), by 2035, more than 24 percent of Egyptian population will live in Greater Cairo.

In relation to income level, more than half of the respondents had an average income level (more than 2,000 and less than 5,000 pounds). These results were in agreement with the study "Knowledge, Perceptions, and Attitude of Egyptians towards the Novel Coronavirus Disease (COVID‑19)" conducted by (**Abdelhafiz, Mohammed et al. 2020**) who reported that the monthly income ranged from 2000 to 5000 Egyptian pounds for a significant proportion of the participants (44 percent).

Regarding the source of information about the Coronavirus, the current results showed that the source of information of one-third of the respondents was social media. This result was in agreement with the study "Knowledge And Perception Of Covid-19 Pandemic Among Residents Of Eleme, Rivers State, Nigeria" conducted by Etor and Ukaga, who reported that more than half of the respondents received information from news media, and nearly one-third of them had information from social media. During the COVID-19 epidemic, social media platforms played an important role in the dissemination of information (**Tang, Zhang et al. 2020**). While these findings were inconsistent with those of (**Serwaa, Lamptey et al. 2020**) in which more than three-quarter of the studied population reported that the majority of the information about COVID 19 was obtained from the Internet. Social media plays a vital role in the dissemination of public health knowledge; however, during the epidemic, it is sometimes abused to spread unrealistic news, which may cause mental health problems.

Concerning the level of knowledge regarding Coronavirus (COVID-19), as shown in Table2, the results of the current study exhibited the mean knowledge score among respondents as 18.275+2.101, with overall 91.5% having a satisfactory level of information about Coronavirus (COVID-19), including the definition, etiology, the spread of disease, signs &

symptoms, people at high-risk, recovery rate, first intervention, and medical management**.** This might be because of the serious situation of the epidemic and the overwhelming news reports on this public health emergency and that the government and some organizations like WHO have made their best effort to make communities knowledgeable about the coronavirus pandemic state. These study findings were supported by findings of *(Elgendy, El-Gendy et al. 2020)* in their study "Public awareness in Egypt about COVID-19 spread in the early phase of the pandemic", where nearly 82% of the respondents were classified as knowledgeable about coronavirus and its treatment. Also, in the same line, *(Narayana, Pradeepkumar et al. 2020)* in their study titled "Knowledge, perceptions, and practices towards COVID-19 pandemic among the general public of India: A cross-sectional online survey", found that the respondents' mean knowledge score of COVID-19 was 7.47, indicating that the overall accurate knowledge rate was 74.7%. This was also supported by *(Zhong, Luo et al. 2020)* who found an overall score of 90% on the knowledge questionnaire, indicating most respondents to be knowledgeable about COVID-19.

Many countries have implemented lockdown, movement restrictions, or shelter for their citizens to minimize the outbreak of COVID-19. The success of these preventive initiatives depends heavily on the cooperation and compliance of all community members. The performances, attitudes, and activities individuals have towards the disease play an integral role in determining a society's readiness to accept behavioral change measures from health authorities.

The current study findings illustrated that the mean response of the respondents toward implementing the safety measures and prevention (washing hands) to reduce the spread of coronavirus disease (COVID-19) (table 3) was highly positive, with regard to making sure to wash their hands when they are significantly dirty, hand washing is one of the preventive ways to limit the spread of the virus, and make sure to wash their hands when caring for a sick person (3.84 + 0.453, 3.795 + 0.473, and 3.78 + 0.675) respectively. These study findings were supported with the study findings of *(Ali, Hamed et al. 2020)* where approximately 99% of the respondents reported to keep washing their hands

and just half of them reported using hand antiseptics. Also *(Azlan, Hamzah et al. 2020)* in their study "Public knowledge, attitudes and practices towards COVID-19: A cross-sectional study in Malaysia", noted that most participants(87.8%) reported proper hand hygiene by washing their hands regularly and using the hand sanitizer.

The current study illustrated that the mean response of the respondents toward implementing the safety measures and prevention (wearing a mask) to reduce the spread of coronavirus disease (COVID-19) was highly positive, with respect to wearing medical masks as one of the preventive ways to limit the spread of the virus, masks are effective in preventing transmission of infection, respirators protect from inhaling dust, steam and harmful gases and healthy people should wear a mask, respectively. These results were in agreement with those of *(Zhong, Luo et al. 2020)* who studied and found that almost all of the participants (98.0%) wore masks when going out in recent days; *(Cheng, Wong et al. 2020)* who reported that community-wide mask-wearing may contribute to the control of COVID-19 by reducing the amount of emission of infected saliva and respiratory droplets from individuals with subclinical or mild COVID-19; and *(Chughtai, Seale et al. 2020)*added that cloth masks may be used to prevent community spread of infections by sick or asymptomatically infected persons, and the public should be educated about their correct use. The use of facial masks has been reported to be a successful approach to reducing the spread of COVID-19 by *(Greenhalgh, Schmid et al. 2020) (Howard 2020).*

Regarding implementing the safety measures and prevention (wearing gloves) to reduce the spread of coronavirus disease (COVID-19), the current study showed that the mean response of the respondents was highly positive with respect to avoiding touching the face and nose while wearing gloves and that the glove should be disposed of by placing it in a completely closed bag and spraying with chlorine water. Our study findings were supported by the findings of *(Gunasekaran, Gunasekaran et al. 2020)* in their study "Prevalence and acceptance of glove-wearing practice among the general population during local COVID-19 outbreak", who found that a higher proportion of the respondents were using medical-grade glove (62.7%) while the

remaining were using non-medical grade glove (37.3%). In the same line, (Anedda, Ferreli et al. 2020) reported that the regular use of gloves for daily activities may lead to a false sense of protection and an increased risk for self-contamination. This would involve the involuntary touching of the face or the spreading of fomites to desks, phones, and computer keyboards.

Concerning implementing other precautionary measures to reduce the spread of coronavirus disease (COVID-19), the current study showed that the mean response of respondents was highly positive in relation to adhering to home quarantine if symptoms such as cough or sore throat appear, use of disinfectants or detergents to disinfect the home and make sure to stay home and go out only when necessary. These findings were in agreement with those of *(Ali, Hamed et al. 2020)* who reported that the majority of respondents said that they stay at home to stop the spread of the infection and about 89% agreed to work distantly in order to preserve the workflow and employee's safety at the same time. In the same line, (Krpan, Makki et al. 2020) reported that responses for distancing, relative hand washing, hand washing times, and disinfecting indicate that people largely try to keep a distance of 1.5-2 meters between themselves and others when outside and maintain appropriate hygiene. Also, WHO stated that in the context of the COVID-19 pandemic, it is recommended that all persons should avoid groups of people and crowded spaces, maintain physical distance of at least one meter (3.3 feet) from other persons, especially if they are suffering from coughing and sneezing or other respiratory symptoms, perform hand hygiene frequently using an alcohol-based hand rub if hands are not visibly dirty or soap and water, use respiratory hygiene, i.e. cover their mouth and nose with a curved elbow or paper tissue when coughing or sneezing, dispose of the tissue immediately after use, and refrain from touching their mouth, nose, and eyes.

Moreover, our study revealed that there was a statistically significant relationship between sociodemographic characteristics and implementing the safety measures and prevention to reduce the spread of coronavirus disease (COVID-19) pandemic in Egypt. There was a relationship between washing hands and sex, while there was a relationship between wearing gloves and marital status, education level, and standard of living and housing area. Also, a relationship was observed between wearing face mask and standard of living. These results were in concurrence with those of *(Azlan, Hamzah et al. 2020)* who noticed significant associations between proper hand hygiene and gender, that females, and those living in the central region, are more likely to practice good hand hygiene; and wearing of the face mask was significantly found to be associated with gender, age group, region, occupation, and income group.

Conclusion:

The results concluded that the major resource of information for respondents regarding Coronavirus was social media, and that the respondents were highly positive about implementing safety measures and prevention including washing hands, wearing a mask, and wearing gloves to reduce the spread of coronavirus disease (COVID-19). The majority of the respondents have had a satisfactory level of knowledge about COVID-19, ways through which it spreads, and implementing the safety measures and prevention to reduce the spread of Coronavirus disease (COVID-19) pandemic in Egypt. There were statistically significant relationships between sociodemographic characteristics of respondents and implementing the safety measures and prevention to reduce the spread of coronavirus disease (COVID-19) pandemic in Egypt.

Recommendations:

It is recommended that the study be applied to a larger population with the second wave of the virus spread. Moreover, health awareness should also be increased about COVID-19 by WHO based in Egypt via social media as Facebook and twitter or SMS with health instructions from Egypt Ministry of Health to the Egyptian population.

Limitation of the study:

The internet questionnaire was answered by those who could only read and write and able to contact via the internet. So the researcher's opinion was that the study does not represent the illiterate population.

Conflict of Interest:

The author declares no conflict of interest (s).

References:

Abdelhafiz, A. S., Z. Mohammed, M. E. Ibrahim, H. H. Ziady, M. Alorabi, M. Ayyad and E. A. Sultan (2020). "Knowledge, Perceptions, and Attitude of Egyptians Towards the Novel Coronavirus Disease (COVID-19)." J Community Health 45(5): 881-890.

Al-Hanawi, M. K., K. Angawi, N. Alshareef, A. M. N. Qattan, H. Z. Helmy, Y. Abudawood, M. Alqurashi, W. M. Kattan, N. A. Kadasah, G. C. Chirwa and O. Alsharqi (2020). "Knowledge, Attitude and Practice Toward COVID-19 Among the Public in the Kingdom of Saudi Arabia: A Cross-Sectional Study." Frontiers in public health 8: 217-217.

Ali, D., M. Hamed and L. El-Korashi (2020). "Public Knowledge, Attitudes, and Practices towards COVID-19 Pandemic among Egyptian Citizens: A Descriptive Study." PROBLEMS of Infectious and Parasitic Diseases 48(3): 5-15. https://pipd. ncipd.org/index.php/pipd/article/view/48_ 13_11_public_knowledge_attitude_and_pr actices.

Amla, K. and T. Amla (2020). The Impact of Public Safety Measures on the Spread of COVID-19 in the United States Assessed By Causal Model-Based Projections of the Pandemic. https:// arxiv. org/ abs/ 2004. 03200, arXiv preprint arXiv:2004.03200..

Anedda, J., C. Ferreli, F. Rongioletti and L. Atzori (2020). "Changing gears: Medical gloves in the era of coronavirus disease 2019 pandemic." Clinics in Dermatology.

Azam, S. A., L. Myers, B. K. K. Fields, N. L. Demirjian, D. Patel, E. Roberge, A.

Gholamrezanezhad and S. Reddy (2020). "Coronavirus disease 2019 (COVID-19) pandemic: Review of guidelines for resuming non-urgent imaging and procedures in radiology during Phase II." Clin Imaging 67: 30-36.

Azlan, A. A., M. R. Hamzah, T. J. Sern, S. H. Ayub and E. Mohamad (2020). "Public noledge, attitudes and practices towards COVID-19: A cross-sectional study in Malaysia." PloS one 15(5): e0233668-e0233668.

BBC News (14 February 2020). Beijing orders 14-day quarantine for all returnees Archived from the original on 14 February 2020. https://www.bbc.com/news/world-asia-china-51509248. .

Black Dot Research (January 30, 2020). [COVIDWatch]: To Mask Or Not To Mask? Black Dot Research. H. COVID-19. https:// blackdotresearch. sg/ wuhan watch- to-mask-or-not-to-mask/.

Cheema, S., M. Ameduri, A. Abraham, S. Doraiswamy and R. Mamtani (2020). "The COVID-19 pandemic: The Public Health Reality." Epidemiology and Infection: 1-13.

Cheng, V. C., S. C. Wong, V. W. Chuang, S. Y. So, J. H. Chen, S. Sridhar, K. K. To, J. F. Chan, I. F. Hung, P. L. Ho and K. Y. Yuen (2020). "The role of community-wide wearing of face mask for control of coronavirus disease 2019 (COVID-19) epidemic due to SARS-CoV-2." J Infect 81(1): 107-114.

Chughtai, A., H. Seale and C. R. Macintyre (2020). "Effectiveness of Cloth Masks for Protection Against Severe Acute Respiratory Syndrome Coronavirus 2." Emerging Infectious Disease journal 26(10): 1.

Cirrincione, L., F. Plescia, C. Ledda, V. Rapisarda, D. Martorana, R. E. Moldovan, K. Theodoridou and E. Cannizzaro (2020). "COVID-19 Pandemic: Prevention and Protection Measures to Be Adopted at the Workplace." Sustainability 12(9): 3603.

Egypt Today (14 Feb 2020). Egypt announces first Coronavirus infection. from the original on 15 February 2020. Retrieved 14 February 2020. https://www. egypttoday. com/ Article/1/81641/Egypt-announces-first-Coronavirus-infection.

Egyptian Streets (14 February 2020). Breaking: Egypt Reports First Case of Coronavirus. Archived from the original on 15 February 2020. https:// egyptianstreets. com/ 2020 / 02/14/breaking-egypt-reports-first-case-of-coronavirus/.

Eikenberry, S. E., M. Mancuso, E. Iboi, T. Phan, K. Eikenberry, Y. Kuang, E. Kostelich and A. B. Gumel (2020). "To mask or not to mask: Modeling the potential for face mask use by the general public to curtail the COVID-19 pandemic." Infect Dis Model 5: 293-308.

Elgendy, M. O., A. O. El-Gendy and M. E. A. Abdelrahim (2020). "Public awareness in Egypt about COVID-19 spread in the early phase of the pandemic." Patient Education and Counseling 103(12): 2598-2601.

Fagbule, O. F. (2019). "2019 NOVEL CORONAVIRUS." Annals of Ibadan postgraduate medicine 17(2): 108-110.

France 24 (16 February 2020). Egypt's health ministry announces first confirmed coronavirus case. Archived from the original on 16 February 2020. https:// www. france24.com/en/20200214-egypt-s-health-ministry-announces-first-confirmed-coronavirus-case. .

Greenhalgh, T., M. B. Schmid, T. Czypionka, D. Bassler and L. Gruer (2020). "Face masks for the public during the covid-19 crisis." Bmj 369: m1435.

Gunasekaran, G. H., S. S. S. Gunasekaran, S. S. Gunasekaran, F. H. Abdul Halim, N. A. abdul halim and N. S. I. Zaimi (2020). "Prevalence and acceptance of glove wearing practice among general population when visiting high risk are during local COVID-19 outbreak." medRxiv: 2020.2005.2030.20117564.

Howard, J. H., A.; Li, Z.; Tufekci, Z.; Zdimal, V.; van der Westhuizen, H.; von Delft, A.; Price, A.; Fridman, L.; Tang, L.; Tang, V.; Watson, G.L.; Bax, C.E.; Shaikh, R.; Questier, F.; Hernandez, D.; Chu, L.F.; Ramirez, C.M.; Rimoin, A.W. (2020). "Face Masks Against COVID-19: An Evidence Review." Preprints 2020.

Krpan, D., F. Makki, N. Saleh, S. I. Brink and H. V. Klauznicer (2020). "When behavioural science can make a difference in times of COVID-19." Behavioural Public Policy: 1-27.

Logunov, D. Y., I. V. Dolzhikova, O. V. Zubkova, A. I. Tukhvatullin, D. V. Shcheblyakov, A. S. Dzharullaeva, D. M. Grousova, A. S. Erokhova, A. V. Kovyrshina, A. G. Botikov, F. M. Izhaeva, O. Popova, T. A. Ozharovskaya, I. B. Esmagambetov, I. A. Favorskaya, D. I. Zrelkin, D. V. Voronina, D. N. Shcherbinin, A. S. Semikhin, Y. V. Simakova, E. A. Tokarskaya, N. L. Lubenets, D. A. Egorova, M. M. Shmarov, N. A. Nikitenko, L. F. Morozova, E. A. Smolyarchuk, E. V. Kryukov, V. F. Babira, S. V. Borisevich, B. S. Naroditsky and A. L. Gintsburg (2020). "Safety and immunogenicity of an rAd26 and rAd5 vector-based heterologous prime-boost COVID-19 vaccine in two formulations: two open, non-randomised phase 1/2 studies from Russia." Lancet.

Narayana, G., B. Pradeepkumar, J. D. Ramaiah, T. Jayasree, D. L. Yadav and B. K. Kumar (2020). "Knowledge, perception, and practices towards COVID-19 pandemic among general public of India: A cross-sectional online survey." Current medicine research and practice 10(4): 153-159.

Ong, S. W. X., Y. K. Tan, P. Y. Chia, T. H. Lee, O. T. Ng, M. S. Y. Wong and K. Marimuthu (2020). "Air, Surface Environmental, and Personal Protective Equipment Contamination by Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2) From a Symptomatic Patient." Jama 323(16): 1610-1612.

Serwaa, D., E. Lamptey, A. B. Appiah, E. K. Senkyire and J. K. Ameyaw (2020).

"Knowledge, risk perception and preparedness towards coronavirus disease-2019 (COVID-19) outbreak among Ghanaians: a quick online cross-sectional survey." Pan African Medical Journal. 35(44).

Siddharta, A., S. Pfaender, N. J. Vielle, R. Dijkman, M. Friesland, B. Becker, J. Yang, M. Engelmann, D. Todt, M. P. Windisch, F. H. Brill, J. Steinmann, J. Steinmann, S. Becker, M. P. Alves, T. Pietschmann, M. Eickmann, V. Thiel and E. Steinmann (2017). "Virucidal Activity of World Health Organization-Recommended Formulations Against Enveloped Viruses, Including Zika, Ebola, and Emerging Coronaviruses." J Infect Dis 215(6): 902-906.

Sunjaya, A. P. and C. Jenkins (2020). "Rationale for universal face masks in public against COVID-19." Respirology 25(7): 678-679.

Tang, Q., K. Zhang and Y. Li (2020). "The important role of social media during the COVID-19 epidemic." Disaster Medicine and Public Health Preparedness: 1-5.

WHO1 (2020). Coronavirus disease (COVID-19) pandemic. World Health Organization, 14 August https:// www. who. int/ emergencies/ diseases/novel-coronavirus-2019.

WHO2 (2020). Coronavirus Disease (Covid-19) Outbreak: Rights, Roles and Responsibilities Of Health Workers, Including Key Considerations for Occupational Safety and Health, World Health Organization . 18/3/2020 https:// www.who.int/docs/default-source/ coronaviruse/ who-rights-roles-respon-hw-covid-19.pdf?sfvrsn=bcabd401_0.

WHO3 (2009). guidelines on hand hygiene in health care settings. Geneva. World Health Organization, World Health Organization; https://apps.who.int/iris/bitstream/handle/1 0665/44. 3 March 2020.

WHO4 (2020). Water, sanitation, hygiene, and waste management for the COVID-19 virus. World Health Organization, 19

March. Available at https:// apps. who. int/iris/rest/bitstreams/1272446/retrieve.

WHO5 (2020). Infection Prevention and Control during health care when novel coronavirus (Ncov) infection is suspected: interim guidance. World Health Organization, January 15. Available at, https:// www. who.int/publications/i/item/infection-prevention-and-control-during-health-care-when-novel-coronavirus-(ncov)-infection-is-suspected-20200125.

WHO6 (2020). Coronavirus disease (COVID-19) advice for the public: when and how to use masks. Scientific brief. ,. World Health Organization, Available from URL: https://www.who.int/emergencies/diseases /novel-coronavirus-2019/advice-for-public/when-and-how-to-use-masks. Accessed date 31 May 2020.

WHO7 (2020). Q&A on coronaviruses (COVID-19). World Health Organization, 17 April 2020 | Q&A. https:// www. who. int/ emergencies/diseases/novel-coronavirus-2019/question-and-answers-hub/q-a-detail/q-a-coronaviruses.

WHO8 (2020). Q&A: Masks and COVID-19. https://www.who.int/emergencies/diseases /novel-coronavirus-2019/question-and-answers- hub/q-a-detail/q-a-on-covid-19-and-masks, World Health Organization. 7 June 2020 | Q&A.

WHO9 (2020). Statement on the second meeting of the International Health Regulations (2005) Emergency Committee regarding the outbreak of novel coronavirus (2019-nCoV). 30 January 2020. https://www. who.int/news/item/30-01-2020-statement-on-the-second-meeting-of-the-international-health-regulations-(2005)-emergency-committee-regarding-the-outbreak-of-novel-coronavirus-(2019-ncov), World Health Organization.

WHO10 (2020). Novel Coronavirus (2019-nCoV). https:// www. who. int/ emergencies/ diseases/novel-coronavirus-2019, World Health Organization: situation report, 13.

WHO (2020). Coronavirus disease (COVID-19) advice for the public. World Health

Organization, Available from URL: https://www.who.int/emergencies/diseases /novel-coronavirus-2019/advice-for-public. update 8 December 2020.

Worldometers (2020). COVID-19 Coronavirus Pandemic. Last updated: August 14, 2020, https:// www. worldometers. info/ coronavirus/.

Zhong, B.-L., W. Luo, H.-M. Li, Q.-Q. Zhang, X.-G. Liu, W.-T. Li and Y. Li (2020). "Knowledge, attitudes, and practices towards COVID-19 among Chinese residents during the rapid rise period of the COVID-19 outbreak: a quick online cross-sectional survey." International Journal of Biological Sciences 16(10): 1745-1752.