Knowledge, attitudes, and practices toward COVID-19 at Menoufia Governorate, Egypt

Hala M. Gabr[a], Ahmed S. Seif[b], Heba K. Allam[a]

[a]Department of Public Health and Community Medicine, Faculty of Medicine, Menoufia University, [b]Department Tropical Medicine, Shebin Elkom Teaching Hospital, Menoufia, Egypt

Correspondence to Heba K. Allam, MD, Department of Public Health and Community Medicine, Faculty of Medicine, Menoufia University, Menoufia, 32511, Egypt.
Tel: 00201006412302;
e-mail: hebaallam81@gmail.com

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Background
Coronavirus disease (COVID-19) is a new strain of coronavirus that was discovered in 2019 and has not been previously identified in humans. As of July 6th, 2020, the pandemic of COVID-19 has resulted in 11 327 790 confirmed cases and 532 340 deaths all over the world as reported by WHO.
Aim
The aim was to assess the knowledge, attitudes, and practices of Egyptians toward COVID-19 infection.
Participants and methods
A cross-sectional descriptive study was conducted during May 2020 over a period of 6 days for all adult attendees to outpatient clinics in Menoufia University Hospitals. A self-administered questionnaire was distributed and completed by all participants.
Results
Participant's age in this study ranged from 18 to 76 years old, and 80.68% of them were above forty years old. Overall, 53.2% of the participants were females. Most of them had middle socio economic standard (SES) (68.72%), high education (53.23), and worked as professionals (45.64). Multivariate linear regression analysis showed a significant independent association between knowledge score and each of educational level and occupation ($P<0.001$). In addition, a significant independent association was found between attitude score and each of age, residence, educational level, and SES ($P<0.001$). There was a significant independent association between practice score and each of residence, educational level, SES, and occupation of the participants ($P<0.001$).
Conclusion
As there was a significant positive correlation between knowledge and practice of the studied group toward COVID-19, more educational programs should be directed to people of low SES and rural areas.

Keywords:
attitude, COVID-19, Egypt, knowledge, practice

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Introduction

Coronaviruses (CoV) are a large family of viruses that cause illness ranging from the common cold to more severe diseases such as Middle East respiratory syndrome (MERS-CoV) and severe acute respiratory syndrome (SARS-CoV). Coronavirus disease (COVID-19) is a new strain that was discovered in 2019 and has not been previously identified in humans (https://www.who.int/health-topics/coronavirus).

In late December 2019, an outbreak of an emerging disease (COVID-19) owing to a novel coronavirus started in Wuhan, China, and rapidly spread in China and outside [1,2]. The WHO declared the epidemic of COVID-19 as a pandemic on March 12, 2020 [3].

As of July 6, 2020, the pandemic of COVID-19 has resulted in 11 327 790 confirmed cases and 532 340 deaths all over the world reported to WHO. There were 75 253 confirmed cases of Covid-19 and 3343 deaths in Egypt [4].

The current period of active monitoring recommended by the US Centers for Disease Control and Prevention is 14 days [5]. Symptomatic disease is frequently associated with the transmissibility of a pathogen, and also there was evidence of transmission by mildly symptomatic and asymptomatic persons [6,7].

Infection with the COVID-19 virus can be asymptomatic or can result in mild to severe symptomatic disease [8]. Approximately 80% of the

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people who get COVID-19 have mild or no symptoms, according to the WHO. However, older adults and people with serious chronic medical conditions – including heart disease, diabetes, and lung disease – are at higher risk (https://www.usatoday.com/story/news/nation/2020/03/18/lgbtq-coronavirus-community-vulnerable-covid-19-pandemic/2863813001/).

Common signs of infection include respiratory symptoms, fever, cough, shortness of breath, and breathing difficulties. In more severe cases, infection can cause pneumonia, severe acute respiratory syndrome, kidney failure, and even death (https://www.who.int/health-topics/coronavirus).

The virus is fatal in rare cases, so far mainly among older people with pre-existing medical conditions (https://www.unicef.org/stories/novel-coronavirus-outbreak-what-parents-should-know).

According to a recent Chinese study, ~80% of patients present with mild disease, and the overall case-fatality rate is ~2.3% but reaches 8.0% in patients aged 70–79 years and 14.8% in those aged more than 80 years [9]. However, there is probably an important number of asymptomatic carriers in the population, and thus the mortality rate is probably overestimated [10].

Standard recommendations to prevent infection spread include regular hand washing, covering mouth and nose when coughing and sneezing, thoroughly cooking meat and eggs, and avoiding close contact with anyone showing symptoms of respiratory illness such as coughing and sneezing (https://www.who.int/health-topics/coronavirus). This study may help in recommending any additional measures and interventions in the study area to improve their awareness, attitudes, and practices.

Aim

This study aimed to assess the knowledge, attitudes, and practices of the Egyptian population toward COVID-19 infection.

Participants and methods

This cross-sectional descriptive study was conducted during March 2020 over a period of 6 days for all adult attendees (persons ≥18 years old) to outpatient clinics of Menoufia University Hospitals, which are located in Shebin el Kom City, Menoufia Governorate.

The total number of all attendees was 3320 person, and the responders were 3287 individuals.

The total studied group was 3017 persons after exclusion of incomplete questionnaires.

Ethical approval of the study was obtained from the Institutional Review Board at Menoufia Faculty of Medicine, Egypt. The study was done following the 1964 Helsinki declaration and its later amendments. Verbal consent was obtained from all participants.

A written self-administered questionnaire was distributed and completed by 3017 participants.

The questionnaire was formulated by the authors and carefully revised by a panel of health care professionals, including two epidemiologists and two infection control specialists. The questionnaire was further validated by a pilot survey of 20 persons. This validation aims to evaluate the time needed to complete the questionnaire and assure that all the questions are phrased clearly and appropriately for comprehension. Moreover, more validation was done for the reliability coefficient with Cronbach's α which was of 0.78.

The questionnaire was initially designed in English and translated into Arabic by experts. A pilot study was done on 30 persons who are not included among the study participants to determine the clarity of the questions and to confirm its validity, and then modifications were done accordingly.

The questionnaire comprised four parts. The first part covered sociodemographic data such as age, sex, residence, occupation, education, and socioeconomic status of the participants.

Socioeconomic scoring was done according to the scoring system of Ibrahim and Abdel-Ghaffar [11].

The second part assessed the knowledge of the Egyptian population toward COVID-19 through 18 questions about characteristics of the disease, signs and symptoms of the disease, prevention, and control of the disease.

Correct answers had three points, the incorrect answer had one point, whereas I do not know was allocated two points.

The overall knowledge score ranged from 18 to 54.

The third part of the questionnaire assessed the attitude of Egyptian population toward COVID-19 using a set of five questions including the following:

Stigma about the disease, worry and anxiety about the disease, going to hospital isolation in case of illness, importance of reporting a suspected case, and trusting the medical team and governmental measures.

A scoring system was applied to assess the level of attitude of each subject, and the answers included yes, to some extent, and no.

The overall attitude score ranged from 5 to 15.

The fourth part assessed the practice of Egyptian population toward COVID-19 through the seven questions: staying at home; avoidance of crowded places; wearing masks; washing hands; avoid touching eyes, nose, and mouth; disinfection of surfaces; and cough etiquette.

Always had three points, never had one point, whereas sometimes was allocated two points.

The overall practice score ranged from 7 to 21.

Statistical analysis

Data were analyzed by Statistical Package for the Social Sciences version 20 (SPSS Inc. 2011. IBM SPSS statistics for windows, version 20.0; IBM Corp. Armonk, New York, USA). Qualitative data were expressed in the form of numbers and percentages. Student *t*-test, Mann–Whitney test, or analysis of variance was used to assess the difference between quantitative variables. Multiple-variate regression analysis models were used to assess the association (risk) of independent factor (s) with the dependent factor (outcome). Differences were considered significant at *P* value less than 0.05.

Results

Participant's age in this study ranged from 18 to 76 years old, where 80.68% of them were above 40 years (41.40% aged more than forty up to 60 years old, 39.28% aged above 60 years, only 19.32% aged less than 40 years). Overall, 53.2% of the participants were females. Most of them had middle socio economic standard (SES) (68.72%), high education (53.23), and worked as professionals (45.64) (Table 1).

The study showed that there was a significant difference in knowledge of the studied group regarding age, residence, SES, educational level, and occupation. Sex had no effect on knowledge of the studied group.

Table 1 Sociodemographic data of the studied group

Sociodemographic data	3017 (%)
Age group in years	
18–40	583 (19.32)
>40–60	1249 (41.40)
>60	1185 (39.28)
Sex	
Male	1412 (46.80)
Female	1605 (53.20)
Residence	
Urban	1487 (49.29)
Rural	1530 (50.71)
Socioeconomic state	
Low	438 (14.52)
Middle	1894 (62.78)
High	685 (22.70)
Educational level	
Illiterate and basic education	337 (11.17)
Secondary education	1074 (35.60)
High education	1606 (53.23)
Occupation	
Not working	793 (26.29)
Worker	847 (28.07)
Professional	1377 (45.64)

Higher mean knowledge scores were found in age group greater than 40 to 60 years old, urban populations, high educational level, high SES, and those who worked as professionals (P=0.005, <0.001, <0.001, <0.001, and 0.008, respectively).

Positive attitude was significantly higher among age group 18–40 years old, urban populations, high educational level, high SES, and those who worked as professionals (P<0.001).

Higher mean practice scores was found in age group 18–40 years old, female participants, urban populations, high educational level, high SES, and those who worked as professionals (P<0.001) (Table 2).

Non-significant correlation was found between knowledge score and attitude score of the studied group (r=0.06; P=0.271). However, there was a significant positive correlation between knowledge score and practice score of the studied group toward COVID-19 (r=0.170; P=0.002).

Multivariate linear regression analysis showed a significant independent association between knowledge score and each of educational level and occupation (P<0.001) (Table 3).

Multivariate linear regression analysis showed a significant independent association between attitude

Table 2 Frequency distribution of the studied group according to their knowledge, attitude, and practice scores with sociodemographic data

Sociodemographic data	Knowledge score (mean±SD)	*P* value	Attitude score (mean±SD)	*P* value	Practice score (mean±SD)	*P* value
Age group in years						
18–40	43.22±4.82	0.005	12.44±1.90	<0.001	18.11±1.53	<0.001
>40–60	41.25±6.16		12.10±1.71		16.60±3.36	
>60	43.14±6.83		11.29±1.16		15.43±2.21	
Sex						
Male	40.92±7.09	0.112	11.17±1.28	0.069	15.25±3.07	<0.001
Female	42.17±6.57		12.71±1.05		18.14±1.46	
Residence						
Urban	43.57±4.58	<0.001	12.71±1.71	<0.001	18.14±1.46	<0.001
Rural	40.92±7.08		11.16±1.28		15.25±3.07	
Educational level						
Illiterate and basic education	34.00±4.08	<0.001	9.50±0.51	<0.001	14.20±4.08	<0.001
Secondary education	42.30±6.75		11.52±1.12		15.51±2.78	
High education	43.75±4.58		12.71±1.71		18.14±1.46	
Socioeconomic state						
Low	38.50±4.76	<0.001	12.00±0.71	<0.001	13.5±1.13	<0.001
Middle	42.69±6.57		11.75±1.86		17.13±2.81	
High	44.01±3.72		12.67±1.61		18.17±1.22	
Occupation						
Not working	40.80±7.14	0.008	10.20±0.98	<0.001	15.60±3.29	<0.001
Worker	41.75±6.92		12.25±1.39		15.63±3.17	
Professional	43.31±4.64		12.54±1.65		18.00±1.42	

Table 3 Multivariate regression model of the possible determinants of knowledge among the studied group

Participants characteristics	Multivariate		
	Unstandardized *B*	Standardized *B*	*P* value
Age	–0.45	0.108	0.124
SES	0.99	0.102	0.075
Educational level	7.71	0.815	<0.001
Occupation	–5.23	–0.675	<0.001

SES, socio economic standard.

Table 4 Multivariate regression model of the possible determinants of attitude among the studied group

Participants characteristics	Multivariate		
	Unstandardized *B*	Standardized *B*	*P* value
Age	0.063	0.532	<0.001
Residence	–2.131	–0.621	<0.001
Educational level	1.138	0.422	0.001
SES	–0.612	–0.220	<0.001
Occupation	0.041	0.018	0.853

SES, socio economic standard.

Table 5 Multivariate regression model of the possible determinants of practice among the studied group

Participants characteristics	Multivariate		
	Unstandardized *B*	Standardized *B*	*P* value
Age	–0.018	–0.097	0.233
Sex	–0.267	–0.048	0.772
Residence	–4.261	–0.562	<0.001
Educational level	3.216	0.743	<0.001
SES	1.267	0.284	<0.001
Occupation	–1.483	–0.418	<0.001

SES, socio economic standard.

score and each of age, residence, educational level, and SES ($P<0.001$) (Table 4).

A significant independent association between practice score and each of residence, educational level, SES, and occupation of the participants was found ($P<0.001$) (Table 5).

Discussion

This study aimed to assess the knowledge, attitudes, and practices of the population toward COVID-19 infection.

This cross-sectional, descriptive study was carried out during April 2020 over a period of 6 days on 3017 adult participants attending outpatient clinics in Menoufia University Hospitals.

Participant's age in this study ranged from 18 to 76 years old, where 80.68% of them were older than 40 years (41.40% were older than 40 up to 60 years,

39.28% were older than 60 years, and only 19.32% were younger than 40 years). Overall, 53.2% of the participants were females. Most of them had middle SES (68.72%), high education (53.23), and worked as professionals (45.64) (Table 1).

The study showed that there was a significant difference in knowledge of the studied group regarding age, residence, SES, educational level, and occupation. Sex had no effect on knowledge of the studied group.

Higher mean knowledge scores were found in age group greater than 40 to 60 years old, urban populations, high educational level, high SES, and those who worked as professionals (P=0.005, <0.001, <0.001, <0.001, and 0.008, respectively).

Positive attitude was significantly higher among age group 18–40 years old, urban populations, high educational level, high SES, and those who worked as professionals (P<0.001).

Higher mean practice scores were found in age group 18–40 years old, female participants, urban populations, high educational level, high SES, and those who worked as professionals (P<0.001) (Table 2).

A non-significant correlation was found between knowledge score and attitude score of the studied group (r=0.06; P=0.271). However, there was a significant positive correlation between knowledge and practice of the studied group toward COVID-19 (r=0.170 and P=0.002).

Another study carried out by Erfani *et al.* [12] in Iran found that there was a significant association among the participants' knowledge, attitude, and practice (P<0.001).

These results show the significance of improving general population's knowledge regarding COVID-19 by health education programs, which, in turn, would enhance their practice regarding COVID-19.

Multivariate linear regression analysis showed a significant independent association between knowledge score and each of educational level and occupation (P<0.001) (Table 3).

Multivariate linear regression analysis showed a significant independent association between attitude score and each of age, residence, educational level, and SES (P<0.001) (Table 4).

COVID-19 is a new disease, and its emergence and spread has caused confusion, fear, and anxiety among the general public. Fear and stigma make a difficult situation worse. For example, there are reports emerging from around the world of individuals, particularly of Asian descent, being subject to verbal or even physical abuse (https://www.unicef.org/stories/novel-coronavirus-outbreak-what-parents-should-know).

There are an increasing number of reports of public stigmatization against people from areas affected by the epidemic. Stigma can drive people to hide the illness to avoid discrimination, prevent people from seeking health care immediately, and discourage them from adopting healthy behaviors. These barriers could potentially contribute to more severe health condition, ongoing transmission, and difficulties to control the outbreak of infectious diseases (https://www.who.int/docs/default-source/coronaviruse/situation-reports/20200224-sitrep-35-covid-19.pdf?sfvrsn=1ac4218d_2).

Multivariate linear regression analysis showed significant independent association between practice score and each of residence, educational level, SES, and occupation of the participants (P<0.001) (Table 5).

Since the emergence of the coronavirus, Egypt has adopted an integrated plan which covers early detection, quarantine and treatment measures, as well as raising public awareness.

Egypt is implementing 14-day quarantine periods in all cases. Egypt decided to hold up all events with large gatherings of people until further notice, banned weekly local markets to reduce gatherings, banned smoking water pipes in coffee shops and public places, and decided to suspend school and university classes as well as all sports activities for two weeks in an attempt to confront the spread of the virus (https://www.iol.co.za/news/world/egypt-takes-urgent-measures-against-covid-19-as-death-toll-rises-45133576).

According to Erfani *et al.* [12] who carried a population-based survey in Iran, a significant correlation was found between female sex, higher age, and higher education with knowledge, attitude, and practice. Based on multiple linear regression analysis, male sex and lower level of education were significantly associated with lower knowledge scores.

Multiple linear regression analysis showed that age, being male, and having a lower level of education were

significantly associated with having a lower attitude toward COVID-19. Age, male sex, and lower level of education were significantly associated with the lower practice. There was a significant association among the participants' knowledge, attitude, and practice ($P<0.001$).

Recommendations

(1) Awareness about COVID-19 should be raised through the use of mass media and activities of the school and university health programs.
(2) More educational programs should be directed to people of low SES and old age people.
(3) Talking positively about COVID –19 to change the negative attitude of the public and get rid of the associated stigma.
(4) Emphasize the importance of effective prevention measures, including hand washing.

Conclusion

Low knowledge scores were found in low SES, not working, and those who were illiterate or had basic education, as well as also in those aged less than or equal 40 years followed by age group above 60 years old.

Negative attitudes were significantly higher in middle SES, not working group, and those who had secondary education, as well as also in the age group above 60 years old.

The practice score was significantly lower in the age group above 60 years old and rural residence individuals.

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Conflicts of interest

There are no conflicts of interest.

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