Original Article

Knowledge, attitudes, and practices toward COVID-19 among healthcare workers in Shabwah Governorate, Yemen: A cross-sectional study

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ABSTRACT

Background: The first wave of the COVID-19 pandemic was associated with significant morbidity and mortality among healthcare workers worldwide. The present study aimed to assess the knowledge, attitudes, and practices of healthcare workers toward COVID-19 at Ataq General Hospital, and three other hospitals and health centers in Shabwah Governorate, Yemen. **Materials and Methods:** From January 1, 2022, to February 28, 2022, a cross-sectional survey of healthcare workers was conducted in the city of Ataq, Shabwah Governorate at the following hospitals: Ataq General Hospital, Al Shefa'a Hospital, Al Aafiah Hospital, and COVID-19 Isolation Center. **Results:** A total of 107 healthcare workers completed the survey. Their mean age was 28.17 ± 7.73 years, 79 (73.8%) of them were male and 28 (26.2%) were female. The overall knowledge was good, with a score of 19 out of 21; however, most participants were unaware of some of the extra-respiratory symptoms of the disease, such as diarrhea and confusion, and about 57% of them were unaware that eating or interacting with wild animals may contribute to the infection with the COVID-19 virus. Attitude analysis of the participants revealed that about half of those surveyed do not believe that Yemen can contain COVID-19. In general, the practice of the participants was good. **Conclusion:** Although the overall knowledge score in this study was good, most respondents could not recognize some of the extrapulmonary manifestations of COVID-19 and were unaware of the possibility of transmission of the disease from wild animals. In addition, about half of those surveyed do not believe that Yemen can contain COVID-19.

Key words: Attitude, COVID-19, Knowledge, Prevention, Shabwa, Yemen

In December 2019, China first reported the outbreak of severe acute respiratory syndrome Coronavirus 2 (SARS-CoV-2), also called the COVID-19 virus [1]. Since then the virus spread causing an infection called COVID-19 that was declared a pandemic by the WHO on March 11, 2020, and since then, it has continued to have a disruptive impact worldwide on healthcare delivery, public health, and economic activities. To date, the number of people infected with COVID-19 worldwide is 442,586,456 and the number of deaths is 6,003,619 [2]. Most countries have established educational programs to raise awareness among healthcare workers and the public about COVID-19.

Since healthcare workers are the frontline in the battle against COVID-19, they are at risk of acquiring and subsequently transmitting this infection. Reports from Europe, and Egypt revealed that physicians and nurses have been infected with significant mortalities during the first wave of the pandemic [3,4]. Therefore, healthcare workers were evaluated for their knowledge, practice, and attitude toward COVID-19 in many

countries to understand their knowledge gaps and training needs [1,5-8].

In Yemen, there is a lack of data on the real number of COVID-19 patients. The latest data showed that since the start of the pandemic in the country, 11,772 infections and 2,135 coronavirus-related deaths have been reported nationwide [9], while in Shabwa Governorate, local health authority records showed that there had been 734 cases of COVID-19 and 180 coronavirus-related deaths. However, the reality of the COVID-19 situation in Yemen remains unknown due to the country's limited capacity to test and monitor the number of cases, moreover, little is known about the impact of COVID-19 on healthcare workers in terms of morbidity and mortality. This study aimed to assess the knowledge, attitude, and practices of healthcare workers toward COVID-19 at Ataq General Hospital, and three other hospitals and health centers in Shabwa Governorate, Yemen.

MATERIALS AND METHODS

Design, Population, and Setting

A cross-sectional survey of healthcare workers was conducted in Ataq city, Shabwah Governorate, at the following hospitals: Ataq

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General Hospital, Al Shefa'a Hospital, Al Aafiah Hospital, and COVID-19 Isolation Center, from January 1, 2022, to February 28, 2022. Shabwah is the third-largest governorate by area in Yemen and located in the center of the country. This governorate, which is under the control of the internationally recognized government, consists of 17 districts covering an area of around 43,000 square kilometers and has the lowest population density in Yemen. Shabwah's estimated population of between 600,000 and 700,000 is spread across several small urban centers – the largest being the capital Ataq – and numerous small towns, villages, and hamlets. Ataq General Hospital is the main hospital in the city, with a bed capacity of 120. The permission to conduct this study was obtained from the local authorities.

Questionnaire

We used a slightly modified questionnaire from a previous study as a data collection tool [5]. The self-administered questionnaire was printed in English and Arabic languages and comprised closed-ended and open-ended questions. The questionnaires were distributed to the healthcare workers as I saw them in the hospitals. The questionnaire consisted of four parts. The first part included demographics such as sex, age, academic qualification, and level of education. The second part of the questionnaire included 21 items related to general knowledge about COVID-19. The answer to each item was either yes or no. Each correct answer was scored 1 point and zero for the wrong answer. A total score of <10 points represented poor knowledge, a score between 10 and 16 represented average knowledge, and a score >17 meant that the healthcare worker had good knowledge about COVID-19. The third and fourth parts of the questionnaire included attitudes (four items) and practices (five items) of healthcare workers toward COVID-19.

Data Analysis

The obtained data were analyzed using descriptive statistics. Data were reported as the mean ± standard deviation (SD) with the range for quantitative variables, whereas qualitative variables were described as numbers and percentages.

RESULTS

A total of 107 health workers had completed the survey. The mean age of the respondents was 28.17 ± 7.73 years (range: 17–58 years); 79 (73.8%) of them were male and 28 (26.2%) were female. The majority of those who responded to the survey were nurses 48 (44.9%) and doctors 34 (31.8%). Of the 107 participants, 59 (55.1%) had diploma certificates, while 34 (31.8%) had Master's/doctorate degrees. Table 1 summarizes the demographic data of the participants.

Knowledge of the Participants Toward COVID-19

The overall knowledge score in our study was 19 out of a total score of 21. The majority of the participants were able

Table 1: Demographic characteristics of the participants

Variables	n(%)/Mean±SD (range)
Age	28.17±7.73 (17–58 years)
Sex	
Male	79 (73.8)
Female	28 (26.2)
Healthcare worker categories	
Doctors	34 (31.8)
Nurses	48 (44.9)
Technicians	16 (14.9)
Clarks	2 (1.9)
Housekeeping	7 (6.5)
Healthcare workers degrees	
Master/doctorate	34 (31.8)
Diploma	59 (55.1)
Primary school	3 (2.8)
Secondary school	4 (3.7)
None	7 (6.5)

to recognize the respiratory symptoms of COVID-19, such as fever, cough, smell disturbance, and sneezing, while the majority were unaware of some of the extra-respiratory symptoms of the disease, such as diarrhea and confusion (Table 2). Regarding the mode of transmission, 87 (81.3%) of the participants agreed that the COVID-19 virus spreads through respiratory droplets from infected people; however, most of them were unaware that eating or interacting with wild animals may contribute to the infection with the COVID-19 virus (Table 2). The majority of the respondents believed that COVID-19 could be controlled by wearing masks (72.0%), avoiding overcrowded places (92.5%), isolation and treatment of COVID-19 patients (80.4%), and isolation of people who had contact with COVID-19 patients (77.6%). Responses to knowledge-based questions are summarized in Table 2.

Attitude and Practice of Health Workers Toward COVID-19

In terms of attitudes toward preventive measures against COVID-19, 81 (75.7%) respondents agreed that wearing a well-fitting face mask is effective in preventing COVID-19 infection, 73 (68.2) believed that washing the hands can protect them from contracting COVID-19, and 54 (50.5) agreed that if a patient shows signs and symptoms of COVID-19, they can confidently participate in that patient's treatment, while only 55 (51.4) agreed that Yemen is in a good position to contain COVID-19 (Table 3). Most participants in our study had good practices in preventing COVID-19 infection. Only 32 (29.9) had always gone to crowded places and 71 (66.4) had always worn face masks each time when contacting patients, and 65(60.7) had always washed their hands before and after handling each patient. About half of the participants have refrained from shaking hands and always avoided patients with signs and symptoms suggestive of COVID-19 (Table 4).

Table 2: Knowledge of the participants toward COVID-19

No	Knowledge about COVID-19	Yes (%)
1	Fever is the main clinical symptom of COVID-19	100 (93.5)
2	Headache is the main clinical symptom of COVID-19	85 (79.4)
3	Smell disturbance is a recognized clinical symptom of COVID-19	77 (72.0)
4	Sneezing is a recognized clinical symptom of COVID-19	65 (60.7)
5	Diarrhea is a recognized clinical symptom of COVID-19	46 (43.0)
6	Cough is a recognized clinical symptoms of COVID-19	92 (86.0)
7	Confusion is a recognized clinical symptom of COVID-19	53 (49.5)
8	Not all persons with COVID-19 will develop severe cases, Only those who are elderly, have chronic illnesses, and are obese are more likely to be severe cases	83 (77.6)
9	It is not necessary for children and young adults to take measures to prevent the infection by the COVID-19 virus	34 (31.8)
10	Eating or contacting wild animals would result in the infection by the COVID-19 virus	46 (43.0)
11	If a person with COVID-19 does not have fever, he/she can transmit the virus to others	61 (57.0)
12	The COVID-19 virus spreads via respiratory droplets of infected individuals	87 (81.3)
13	Wearing a mask can prevent COVID-19 infections	77 (72.0)
14	To prevent the infection by COVID-19, individuals should avoid going to crowded places such as bus parks and avoid taking public transportations	99 (92.5)
15	One can get infection while crossing the patient	54 (50.5)
16	One can get infection while sitting with the patient in the same room with mask	50 (46.7)
17	One can get infection while sitting in the same room without mask	87 (81.3)
18	One can get infection while having tea without one arm distance	78 (72.9)
19	There is currently no effective cure for COVID-19, but early symptomatic and supportive treatment can help most patients recover from the infection	86 (80.4)
20	Isolation and treatment of COVID-19 patients are effective ways to reduce the spread	91 (85.0)
21	People who have contact with someone infected with the COVID-19 virus should be immediately isolated in a proper place. In general, the observation period is 14 days	83 (77.6)

Table 3: The attitude of healthcare workers toward COVID

Attitude	Agree	Not sure	Disagree
Wearing a well-fitting face mask is effective in preventing COVID-19	81 (75.7)	18 (16.8)	8 (7.5)
Using a hand wash can prevent you from getting COVID-19	73 (68.2)	23 (21.5)	11 (10.3)
When a patient has signs and symptoms of COVID-19, I can confidently participate in the management of the patient after taking the necessary precautions	54 (50.5)	34 (31.8)	19 (17.8)
Yemen can contain the COVID-19 virus and win the battle	55 (51.4)	24 (22.4)	28 (26.2)

Table 4: Practices of the Healthcare workers toward COVID-19

Practice	Always	Occasional	Never
In recent days, I have gone to any crowded place	32 (29.9)	55 (51.4)	20 (18.7)
In recent days, I have worn a mask when in contact with patients	71 (66.4)	31 (29.0)	5 (4.7)
In recent days, I have not been shaking hands with people	54 (50.5)	36 (33.6)	17 (15.9)
In the recent days, I have washed my hands before and after handling each patient	65 (60.9)	34 (31.8)	8 (7.5)
In the recent days, I have avoided patients with signs and symptoms suggestive of COVID-19	55 (51.4)	35 (32.7)	17 (15.9)

DISCUSSION

Since COVID-19 became a pandemic, too many healthcare workers have become infected, sick, or died. The WHO estimates that between January 2020 and May 2021, between 80,000 and 180,000 healthcare workers may have died from COVID-19 [10]. In Yemen, the pre-COVID-19 civil war prompted many Yemeni healthcare workers to emigrate from the country in search of better salaries and safer conditions elsewhere. In addition, the first wave of COVID-19 has been linked to the deaths of an unknown number of healthcare workers. I know about 150 healthcare workers who have died since the start of the pandemic. To my knowledge, this is the first survey among healthcare workers in Yemen aimed to assess their knowledge, attitude, and practices toward COVID-19 to understand their knowledge gaps and training needs.

Adequate knowledge is a crucial requirement for dealing with the COVID-19 pandemic, to establish good prevention beliefs, form positive attitudes, encourage positive behaviors and, to some extent, gain individual insights into their coping strategies [11]. The overall knowledge score in this study was 19 out of a total score of 21, which means that most of the respondents have

good knowledge of COVID-19. This is similar to reports of knowledge of COVID-19 among healthcare workers in Nigeria, China, Pakistan, and Guinea [6,12-17]. However, this study has highlighted two main observations:

First, most of the respondents were unable to recognize some of the extra-respiratory symptoms of COVID-19 such as diarrhea and confusion, which are consistent with a study from Nigeria [17]. COVID-19 is not only a respiratory disease but also a multisystem disease. Many people, including physicians, incorrectly believe that the disease affects only the respiratory tract. The mild and moderate forms of COVID-19 may have non-specific symptoms such as fever, gastroenteritis, vomiting, dysgeusia (loss of taste), and headache with no or mild respiratory symptoms [18]. Knowledge of these extrapulmonary manifestations can help identify the mild and moderate forms that mimic other viral diseases and aid in the early detection and rapid quarantine, thereby preventing community spread, particularly in low- and middle-income countries such as Yemen, which have limited capacities for intensive care for serious illnesses. Therefore, continuing professional education for healthcare workers is necessary to keep them up to date on the various symptoms and signs of COVID-19.

Second, most of the participants were unaware that eating or interacting with wild animals may contribute to the infection with the COVID-19 virus. Noteworthy, some animal-borne coronaviruses can infect humans and subsequently spread between them, but this is uncommon. This is what happened with SARS-CoV-2, a virus that is thought to have originated in bats [19]. Therefore, policymakers should raise awareness among the healthcare workers concerning the adverse upshots resulting from eating or interacting with wild animals.

Similar to other studies [5-8], this study revealed that most of the study participants agreed that face mask and hand washing are important to prevent the disease spread, however, in contrast with other studies [5-7,14,17], only 51.4% agreed that Yemen is in a good position to contain COVID-19. This view reflects participants' awareness of the already overburdened healthcare system in Yemen due to the civil war, and the difficulties in recruiting well-trained and motivated healthcare professionals, as most Yemeni healthcare professionals emigrate from the country in search of better wages and more secure conditions elsewhere. Therefore, international donors are urged to immediately include healthcare workers in their aid plans and ensure that they are well and regularly paid, to prevent their flight out of the country, and thus avoid a further deterioration of vital medical services in Yemen.

Practices toward preventive strategies by each participant were assessed using five questions. This study demonstrated good practice toward COVID-19 among the participants as most of the respondents were complying with the avoidance of crowded places, wearing face masks, avoiding contact with patients with signs and symptoms suggestive of COVID-19, and regular washing of hands. Similarly, the practice of the respondents was found positive in many studies from India, Nigeria, Pakistan, Saudi Arabia, and Guinea [6,8,14-16].

This study is limited by its small sample size, and implementation after the third wave of COVID-19, which may partly account for the good level of knowledge about COVID-19 among respondents. Moreover, this survey was conducted among healthcare workers in Ataq city; therefore, the findings cannot be generalized to all healthcare workers in the governorate. Despite these limitations, this study provides insights into the knowledge, attitude, and practices of healthcare workers toward COVID-19 pandemic in the main city of Shabwah Governorate.

CONCLUSION

Although the overall knowledge score in this study was good, most respondents could not recognize some of the extrapulmonary manifestations of COVID-19 and were unaware of the possibility of transmission of the disease from wild animals. In addition, about half of those surveyed do not believe that Yemen can contain COVID-19. Therefore, continued professional education is required for healthcare workers to keep them updated on the clinical presentation of COVID-19 and its modes of transmission. Likewise, there is a need to improve the health sector to ensure that it is ready to face the emergencies and challenges posed by the pandemic and other future emerging diseases.

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