Original Article

Pharmacists Knowledge and Contribution during Coronavirus Disease-2019 Pandemic in Sudan, 2020

Nahid Osman Ahmed, Ali Awadallah Saeed[1]

Departments of Pharmacy Practice and[1]Pharmacology and Therapeutics, Pharmacy Program, Napata College, Khartoum, Sudan

Abstract

Introduction: Pharmacist's knowledge about the different aspects of this pandemic is crucial because it influence their role and contribution as a frontline health-care provider, as pharmacies and most of the pharmacy practice sectors are kept open even during lockdowns providing counseling and patient care. Pharmacist can provide valuable services during coronavirus disease 2019 (COVID-19) pandemic, these services may include: Provide reliable information on the disease, participate in public education on preventive measures, referring of suspected cases, insuring continuous supply of medicine. **Methods:** A web-based, cross-sectional study, conducted using the survey instrument to obtain the responses from Sudanese pharmacists during the period from May 26, 2020, to June 3, 2020. A 14-item survey instrument was developed. The web-based cross-sectional study was carried out among the Sudanese pharmacists. A self-reported structured questionnaire was divided into three sections: Demographic characteristics, questions assessing the knowledge, and one question for the pharmacist contribution during the pandemic. **Results:** The present study showed that 51.1% of pharmacists have good knowledge about the COVID-19. The work experience and education level significantly ($P < 0.05$) influence pharmacist knowledge. Majority of pharmacists contribute to different activities during the pandemic, for example, providing patients with transmission information (94%), provide factual and reliable information on the diseases symptoms (93.1%), providing patients with prevention information (91.1%). **Conclusion:** The present study identified that pharmacists have good knowledge about COVID-19 pandemic. Furthermore, pharmacists contributed in many activities as a frontline health-care provider during this pandemic.

Keywords: Coronavirus disease 2019, knowledge, pharmacists

Introduction

The outbreak of novel coronavirus disease 2019 (COVID-19) is the recent worldwide disaster which is considered by the WHO as a Public Health Emergency of International Concern.[1] The first case was discovered in Wuhan City, China,[2,3] and then after few weeks spread as a global pandemic.[4,5]

In Sudan, the first reported COVID-19 positive case was in March 11, 2020, at the time of writing this article (March 6, 2020), there were 9081 reported cases.

The novel coronavirus can live on hands, surfaces, objects, mucus membranes, body fluids, respiratory secretions, and spread from person to person through the direct contact,[6,7] which makes the most effective preventive measures are avoiding close contact with people, hand hygiene, clean, and disinfect surfaces,[8] as there is no specific efficacious treatment or vaccine available for this virus until writing of this paper.[9,10]

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Pharmacist's knowledge about different aspects of this pandemic is crucial because it influence their role and contribution as a frontline health care provider, as pharmacies and most of the pharmacy practice sectors are kept open even during lockdowns providing counseling, patient care.[11-13]

To strengthen pharmacists' knowledge about COVID-19, there are many training programs held worldwide, for example, the International Pharmaceutical Federation, and American Pharmacist Association have issued guidance, and resource documents.[14,15]

Address for correspondence: Dr. Ali Awadallah Saeed, Department of Pharmacology and Therapeutics, Pharmacy Program, Napata College, Khartoum, Sudan.
E-mail: alimhsd@gmail.com

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Although the role of pharmacist, especially in the community, is ranging between essential and expanded role according to the policies in different countries,[16-18] but still pharmacist can provide valuable services during COVID-19 pandemic, these services may include: Provide reliable information on the disease, participate in public education on preventive measures, referring of suspected cases, insuring continuous supply of medicine.[19,20]

Methods

Survey instrument and dissemination

A web-based, cross-sectional study was conducted using the survey instrument to obtain responses from Sudanese pharmacists during the period from May 26, 2020, to June 3, 2020.

A 14-item survey instrument was developed. The web-based cross-sectional study was carried out among Sudanese pharmacists. A self-reported structured questionnaire was divided into three sections: Demographic characteristics (4 questions), questions assessing the knowledge (9 questions), and one question for the pharmacist contribution during the pandemic. The questionnaire prepared using the Google forms and the link was shared through social media; Facebook, E-mail, and WhatsApp groups. The purpose of the study was explained to the participants before attending the survey. The participation of the study was voluntary and only those who are willing participated in the survey.

Data analysis

For the analysis of data, Statistical Package for the Social Sciences (SPSS) software, version 21.0 (IBM SPSS Inc., Chicago, IL, USA) and STATA 11 were used. Initially, all information gathered through questionnaire then coded into variables. Normality of data was tested using the Kolmogorov–Smirnov test and Shapiro–Wilk test. Both descriptive and inferential statistics involving Pearson Chi-square, Fisher's exact test, Pearson correlation, one-way analysis of variances (ANOVAs) test, were used to present the results. $P < 0.05$ was considered statistically significant.

Score: In order to have a better assessment of overall knowledge, each correct answer in the knowledge domain carried 1 mark while wrong answer carried 0 mark, also question consist of more than one correct answers one mark was distributed according to number of answers, this gave a total score range of 0–10 then converted to percentages.

Ethical considerations

Survey questions do not include name or contact information, and participation in the study was voluntary.

Results

Demographic data

Three hundred and forty-eight pharmacists participated in the study, 62.1% were female while 37.9% were male. 57.8% from the participants were master holders, 38.8% were bachelor holders, and 3.4% were PhD holder.

Regarding participants' work place, 25.9% working as community pharmacists, 17.2% working in pharmaceutical companies, and 13.8% working in hospital pharmacy [Table 1].

The participants' working experience ranges between more than 10 years' experience (37.4%), 5–10 years' experience (33.9%), and <5 years' experience (28.7%).

Knowledge of the participants about coronavirus disease 2019

The majority of participants (80.2%) respond with the right answer about the incubation period for the COVID-19 virus which is 2–14 days.

About the main methods of transmission of COVID-19 virus, 26.4% and 7.5% of participants give wrong response about the possibility of transmission through fecal-oral route and raw food, respectively. While 82.2%, 82.5%, 89.1%, 64.4%, and 26.4% choose the right methods of transmission: close contact from person to person, contaminated surface, coughing and sneezing, air droplets and through body fluids, respectively.

About the main signs and symptoms associated with COVID-19, 96.6%, 95.1%, 94.8%, 91.4% 91.1%, and 68.1% of participants think that main signs and symptoms are fever, shortness of breath, dry cough, headache, general weakness, and diarrhea, respectively. Furthermore, 27.3%, 23.3%, 19%, and 5.2% think that the symptoms are anorexia, computed tomography ground-glass opacification, insomnia, and ageusia, respectively. While 2.3% select the wrong answer edema.

Table 1: Demographic data

Demographic variables	Percentage
Place of work (*n*=348)	
Hospital pharmacy, community pharmacy and company	0.3
Clinical pharmacy, community pharmacy and ministry of health	0.3
Community pharmacy, academic and company	0.3
Hospital pharmacy and company	0.3
Hospital pharmacy and academic	0.6
Hospital pharmacy and clinical pharmacy	0.6
Community pharmacy and company	0.9
Clinical pharmacy and academic	0.9
Clinical pharmacy and ministry of health	1.1
Community pharmacy and academic	1.1
Clinical pharmacy and community pharmacy	1.7
National medical supply	2.6
Hospital pharmacy and community pharmacy	3.2
Ministry of health	7.8
Academic	9.8
Clinical pharmacy	11.8
Hospital pharmacy	13.8
Company	17.2
Community pharmacy	25.9

Regarding sever illness risk factors, participants think that chronic illness, older adults, cancer patients, smoker, pregnant women, and adult male are at high risk for severe COVID-19, while 7.8% and 4.6% select the wrong answers: Children and adult female, respectively.

Few participants (9.5%) think that COVID-19 can only gain inside the body through the nose but not through the eyes and mouth. Furthermore, only 6% think that healthy carriers of virus who has no cough or fever cannot spread COVID-19. The majority (98.9%) know that the best way to prevent COVID-19 is to avoid crowed and stay at home.

As a response to the question about the management of mild cases, 73%, and 96.8% of participants select Vitamin D and Vitamin C, respectively, while some of them select wrong answers, for example, azithromycin (67.5%) and oxygen (24.4%). For moderate cases 12.6% select amoxicillin, 88.5% select azithromycin, and some of them select wrong answers e.g., hydoxychloroquine (75.3%) and corticosteroids (8.9%) [Table 2].

Table 2: Pharmacists' knowledge about coronavirus disease 2019 pandemic

Knowledge variables	Percentage	Knowledge variables	Percentage
COVID-19 can only gain side the body through the nose but not through the eyes and mouth		Incubation periods for the COVID-19 virus	
True	9.5	2-14 days	80.2
False	90.5	14-30 days	18.4
		Up to 45 days	1.4
Who looks healthy and has no cough or fever cannot spread COVID-19		Main methods of transmission of COVID-19 virus	
True	6	Raw food	7.5
False	94	Body fluids	26.4
		Fecal- oral route	26.4
		Air droplets	64.4
		Close contact from person to person	82.2
		Contaminated surfaces	82.5
		Coughing and sneezing	89.1
The best way to prevent COVID-19 is to avoid the crowd and staying at home		Signs and symptoms associated with COVID-19	
True	98.9	Edema	2.3
False	1.1	Ageusia	5.2
		Insomnia	19
		CT ground- glass opacification	23.3
		Anorexia	27.3
		Diarrhea	68.1
		General weakness	91.1
		Headache	91.4
		Dry cough	94.8
		Shortness of breath	95.1
		Fever	96.6
According to Sudan case treatment protocol, the management of mild cases includes		Risk factors for severe-moderate illness of COVID-19	
Corticosteroids	2	Adult female	4.6
Amoxicillin 500 mg	9.2	Children	7.8
Oxygen	24.4	Adult male	17.8
Azithromycin 500 mg	67.5	Pregnant	64.4
Vitamin D 1000 IU	73.0	Smoker	79.7
Vitamin C 1000 IU	96.8	Cancer patients	82.2
		Older adults	93.7
		Chronic diseases	96
According to Sudan case treatment protocol, the management of moderate cases includes			
Corticosteroids	8.9		
Amoxicillin 500 mg	12.6		
Oxygen	55.7		
Hydroxychloroquine 400 mg	75.3		
Azithromycin 500 mg	88.5		

COVID-19: Coronavirus disease 2019

As general after responding to the knowledge questions, about half of the participants (51.1%) in the study have good knowledge about COVID-19.

Contribution of pharmacists during coronavirus disease 2019

During these pandemic, pharmacists as a health-care provider participated in different activities. The majority (94%, 93.1%) provide factual and reliable information on the diseases symptoms and transmission information, respectively. And other activities, for example, providing patients with prevention information [Table 3].

There is a significant relationship between work experience and the participants knowledge about COVID-19 ($P = 0.043$) using the Pearson Chi-square and Fisher's exact test, as shown in Table 4.

There is a significant relationship between the level of education and knowledge score using the one-way ANOVA-test ($P = 0.035$), as shown in Table 5.

Discussion

This study revealed that more than half of the pharmacists (51.1%) have good knowledge about COVID-19 pandemic, especially concerning the methods of transmission, incubation period, prevention methods, and risk of severe illness.

Moreover, this type of knowledge is very important as suspected patients and co-patients may reach pharmacists in community pharmacy asking for over the counter medications to relief their symptoms before they seek medical attention, when they get worse, so it is so important that the pharmacists must have the knowledge to council those patients, moreover, this good know edge may help pharmacists to protect themselves from getting infected.

Nevertheless, their knowledge about treatment guidelines should be better, for example, more than 67% of participants, and more than 24% think that azithromycin and oxygen, respectively, is used in the national protocol for treatment of mild cases, while in fact they are not.

Furthermore, more than 75% of pharmacists think that hydroxychloroquine is used for treatment moderate cases, while according to the Sudan national protocol, it is used for the treatment of severe cases.

Although the Sudan national treatment protocol for COVID-19 is available in the Federal Ministry of Health website,[21] but it is not widely distributed in the media so pharmacists do not have the sufficient knowledge about this protocol.

Regarding contribution, the majority of participants provide different types of information, e.g., Information about diseases symptoms (93.1%), Transmission information (94%), and prevention information (91.1%).

Table 3: Pharmacists' contribution during corona virus disease 2019 pandemic

Contribution variables	Percent of yes
Participate in developing COVID-19 protocols	51.7
Participate in COVID-19 research efforts	52.9
Participate in preparation of stock of medications used in of COVID-19 treatment protocols	59.5
Referral of suspected patients	69
Participate in synthesizing or distributing sanitizers initiatives	75
Participate in community awareness programs	76.7
Providing patients with prevention information	91.1
Provide factual and reliable information on the diseases symptoms	93.1
Providing patients with transmission information	94

Table 4: Correlation between the variables and knowledge using the Chi-square test

Variables	Knowledge score (%)		Pearson Chi-square test (*P*)	Fisher's exact test (*P*)
	Poor	Good		
Gender				
Male	50.00	50.00	0.737*	0.742*
Female	48.10	51.90		
Level of education				
Bachelor	54.10	45.90	0.205*	0.227*
Master	46.30	53.70		
PhD	33.30	66.70		
Work experience				
<5 years	59.00	41.00	0.043**	0.043**
5-10 years	42.40	57.60		
More than 10 years	46.90	53.10		

* No significant relationship, ** there is significant relationship written in page 4 left lines from 12 to 18

Table 5: Correlation between variables and the knowledge using the one-way analysis of variance-test

	One-way ANOVA-test				
Variables	*n*	Knowledge score (%)			*P*
		Mean	SD	SE	
Level of education					
Bachelor	135	73	10	1	0.035**
Master	201	75	8	1	
PhD	12	78	8	2	
Work experience					
<5 years	100	73	9	1	0.111*
5-10 years	118	75	9	1	
More than 10 years	130	74	9	1	

* No significant relationship, ** there is significant relationship written in page 4 left lines from 12 to 18, SD: Standard deviation, SE: Standard error, ANOVA: Analysis of variance

Different initiatives were acting in Sudan during this pandemic; pharmacists play many roles in these initiatives e.g., Synthesizing or distributing sanitizers (75%), also 76.7% of pharmacists participate in community awareness programs.

More than half of pharmacists participate in referral of suspected patients, developing protocols, research efforts, preparing medication stocks.

The study revealed that work experience and level of education significantly ($P < 0.05$) influence pharmacists knowledge about the COVID-19 pandemic.

Limitations

This study has the limitations of online cross-sectional studies which depends on participants' honesty, and the limited sample size, which may limit the generalization of the results.

Conclusion

We identified that pharmacists have good knowledge in different aspects regarding COVID-19 pandemic, we found that the level of education and work experience influence this knowledge.

Furthermore, pharmacists contributed in many activities as a frontline health-care provider during this pandemic.

Human rights

This article does not contain any studies with human subjects performed by the any of the authors.

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Conflicts of interest

There are no conflicts of interest.

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