Original Research

Hospital pharmacists' awareness and perspective toward the management of COVID-19 pandemic in the Kingdom of Saudi Arabia

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Abstract

Objectives: This study investigates the hospital pharmacists' awareness of important facts about the COVID-19 disease and their source of information, as well as their perception. **Methods:** This cross-sectional study using a self-administered questionnaire was conducted from November 2020 to March 2021 in the Kingdom of Saudi Arabia (KSA). The questionnaire was developed via electronic platform and invitations were sent to pharmacists working in private and government hospitals. A multivariate logistic regression was used to identify factors associated with awareness of COVID-19. **Results:** A total of 272 pharmacists submitted their responses via weblink. Many pharmacists (n=228, 84%) followed the latest COVID-19 updates on treatment and updated their information mainly through World Health Organization documents (n=151, 56%). Pharmacists working in secondary and tertiary hospitals were relatively five-times times (AOR = 4.59; 95% CI: 1.69–12.8; p-value = 0.003) and three-times (AOR = 2.93; 95% CI: 1.35–6.72; p-value = 0.008) more aware of COVID-19 than those working in primary hospitals. Pharmacists with prior adequate knowledge regarding epidemics and pandemics were two-times more likely to have a good awareness of COVID-19 compared to those who had received none (AOR = 2.15; 95% CI: 1.09–4.35; p-value = 0.030). **Conclusions:** Half of the pharmacists believed that they received required education in the past about epidemics and pandemics, and many follow the recent COVID-19 updates on medicines predominantly from the WHO followed by the government awareness campaigns. Many pharmacists believed they have a key role in the management of epidemics/pandemics via their hospital pharmacy. However, this study identified certain awareness gaps regarding COVID-19, highlighting areas of improvement.

Keywords: hospital pharmacists; COVID-19; cross-sectional

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INTRODUCTION

The novel Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2) also called COVID-19 originated in Wuhan city of China and promptly became a fatal pandemic.[1] The outbreak of COVID-19 has posed a significant risk to global economy and healthcare system.[2] As of October 16, 2020, it involved 235 countries and territories and has infected 38,3941,69 people with a mortality rate of 1089 047 (2.8%).[3] This virus is highly contagious and relatively infects a large number of people in a short span of time than previous outbreaks such as Severe Acute Respiratory Syndrome Coronavirus 1 (SARS-CoV-1) and Middle East Respiratory Syndrome (MERS-CoV).[1] Currently, there is no licensed medication to treat COVID-19; however, management is largely intensive supportive care.[4] Several therapeutic options such as anti-infective agents and antibody treatment are being studied and may be useful in the future.[4]

As of 23 June 2022, death toll in the Kingdom of Saudi Arabia

(KSA) due to outburst of COVID-19 was approximately 9,194, and about 788,294 have been declared as confirmed cases.[3] Pharmacist are recognised as an integral part of healthcare system, and their role is crucial in completing the management cycle of COVID-19 outbreak.[5] On February 5, 2020, the International Pharmaceutical Federation (FIP) released a guideline for pharmacy professionals entitled "Coronavirus 2019-nCoV outbreak: Information and interim guidelines for pharmacists and the pharmacy workforce".[6] In addition, this document stipulates the responsibility of pharmacists for controlling the outbreak of COVID-19. FIP states that "pharmacies in outbreak-affected and unaffected countries are often the first point of contact with the health system for those with health-related concerns or simply in need of information and reliable advice".[6] Therefore, it is important to explore how pharmacists across the globe are managing their roles during the COVID-19.

Current literature provides evidence related to the role of pharmacists for the provision of patient care services, improving patient's outcomes and contributing to the control of pandemic. Pharmacists must have adequate information about disease prevention, transmission, symptoms, and treatment for effectively dealing with any pandemic.[7] In the KSA, there is limited evidence regarding pharmacists' perspective of their role in the management of the COVID-19, and their awareness of important facts needed to be able to deliver their roles successfully, and the source of such facts. The aim of this study was to investigate hospital pharmacists' preparedness to contribute to the management of COVID-19. Specifically, we aimed to explore pharmacists' awareness of important facts regarding the COVID-19 pandemic and their source of information, as well as their perception.

METHODS

Study design and setting

A cross-sectional study was conducted from November 2020 to March 2021 in the KSA for understanding the awareness and perceptions of hospital pharmacists toward the management of COVID-19 pandemic.

Inclusion and exclusion criteria

Pharmacists working in the hospital pharmacy of healthcare settings were invited to participate in this study. Clinical and community pharmacists were excluded.

Data collection and ethical approval

A 38-item questionnaire was designed to explore the awareness and perceptions of hospital pharmacists toward the management of COVID-19. The self-administered and validated questionnaire was adapted from previous study.[8] The questionnaire comprises of questions related to demographics, awareness, and perceptions. The first section included items to collect demographics and general information data such as age, gender, hospital's name, level of the hospital (primary, secondary or tertiary), educational level, experience, and the number of educational workshops in the last 5 years. The second section included items aimed at evaluating pharmacists' current epidemics/pandemics and COVID-19 awareness; here participants were asked about how much they know about the coronavirus such as symptoms, modes of transmission, how to prevent the transmission and the spread, and awareness about where to access the recent coronavirus updates regarding treatment. The third section concentrated on the potential participants' perspective of the role of the pharmacist during epidemics and pandemics, and the new coronavirus pandemic. A web link of the survey questionnaire using SurveyMonkey were shared via social media pharmacy groups (WhatsApp and Facebook) to licensed hospital pharmacists working in the private and government hospitals in the KSA. An electronic version of the survey was also distributed to the directors of pharmacy department for transmission to hospital pharmacists in their respective hospitals. Awareness was classified as either poor or good based on a modified Bloom's cut-off value of 75%.[9]

This study was commenced after the approval of the Institutional Review Board of King Saud Medical City (Reference number: H1R1-01-Nov20-01).

Sample size and statistical analysis

Given an estimated pharmacist population of 8,284[10] and based on a 95% confidence level and a 5% margin of error, we estimated an ideal sample of 368 participants for this survey. The sample size was calculated by an online sample size calculator. Data analysis was carried out using R® (version 4.0.5). Descriptive and inferential statistics were used to report the data. Nominal and ordinal data were presented descriptively as percentages. Factors associated with awareness of COVID-19 were identified using multivariate logistic regression. A p-value of less than 0.05 were considered statistically significant.

RESULTS

General characteristics

Two hundred seventy-two hospital pharmacists participated in the survey. Males made up most of the respondents (65%). Fewer than half of those surveyed (43%) were between the ages of 30 and 39. About half of them worked in a tertiary hospital (47%) and had a B. Pharm degree (53%). Nearly three-quarters of the participants had more than five years of work experience (Table 1).

Eighty-five percent of the respondents claimed that they had participated in at least one instructional workshop in the previous year, while 54% of those surveyed claimed they had received enough education previously about epidemics/pandemics (Table 2). Around 84 percent of the participants kept up with the latest coronavirus therapy news. Information from colleagues, published scientific studies, World Health Organisation, government awareness campaigns and the Saudi Food and Drug Administration were specified by the participants as common sources of information about coronavirus treatment.

Table 3 shows the participants' awareness of the COVID-19

Table 1. Characteristics of the hospital pharmacists participated in the survey	
Characteristic	**n (%)**
Sex	
Female	96 (35%)
Male	176 (65%)
Age	
< 30 years	74 (28%)
30 to 39 years	115 (43%)
40 to 49 years	58 (22%)
50 years and above	22 (8.2%)
Hospital type	
Primary hospital	105 (39%)
Secondary hospital	38 (14%)
Tertiary hospital	129 (47%)
Educational level	
B. Pharm	144 (53%)
Masters	49 (18%)
PharmD	64 (24%)
PhD	5 (1.8%)
Other	10 (3.7%)
Years of experience	
< 1	27 (9.9%)
1–4	48 (18%)
5–9	76 (28%)
10–14	48 (18%)
> 15	73 (27%)

Table 2. Participants' response to the attendance of workshops about epidemics/pandemics	
Characteristic	**n (%)**
Number of attended educational workshops in the last year	
0	40 (15%)
1	36 (13%)
2	46 (17%)
3	54 (20%)
4	26 (9.6%)
5	16 (5.9%)
> 5	54 (20%)
Receiving enough education previously about epidemics/pandemics	147 (54%)
Following the latest coronavirus updates on treatment	228 (84%)
A common source of information about coronavirus treatment	
Colleagues	103 (38%)
Published scientific studies	126 (46%)
World Health Organisation	151 (56%)
Government awareness campaigns	145 (53%)
Saudi Food and Drug Administration	106 (39%)

Table 3. Participants' awareness of the COVID-19 pandemic	
Response	**Correct, N (%)**
1. One way of transmission of coronavirus is respiratory droplets from person to person among close contacts	245 (90%)
2. Coronavirus can be transmitted after touching surfaces that were contaminated with the virus	19 (7.0%)
3. Non-steroidal anti-inflammatory drugs such as Ibuprofen can decrease the risk of complications when used during viral infections	166 (61%)
4. Fever/dry cough/shortness of breath are associated with coronavirus	259 (95%)
5. Muscle aches and gastrointestinal symptoms (nausea/vomiting/diarrhea) are not associated with coronavirus	177 (65%)
6. Handwashing with soap and water for 20 s is enough to clean the hands and protect from spreading the infection	155 (57%)
7. Using steroids do not increase vulnerability to coronavirus infection	98 (36%)
8. Generally, the use of autoimmune disease treatments increases the susceptibility to contract coronavirus infection	165 (61%)
9. Hydroxychloroquine has not been used as a preventative therapy against coronavirus infection	105 (39%)
10. Azithromycin has been used along with hydroxychloroquine in the treatment of the coronavirus infection cases	207 (76%)
11. Oseltamivir has not been used in the management of coronavirus infection cases	134 (49%)
12. Protein calorie malnutrition impairs host immunity (particularly the T-cell system) resulting in increased opportunistic infections	114 (42%)
13. Patients should eat food that contains Vitamin C and D to boost their immunity	236 (87%)
14. Eating food like mushrooms and garlic is beneficial for the immune system	156 (57%)
15. Exercise causes antibodies and white blood cells to circulate in the body more rapidly detecting infections at an early stage	143 (53%)
16. The brief rise in body temperature during and right after exercise increases bacterial growth, which will lower the body's ability to fight the infection	164 (60%)
17. Not smoking and decreasing stress help support the immune system	252 (93%)
18. Sunlight activates T-helper cells hence boosts immunity	130 (48%)
19. You need to keep a distance of at least 3 m (10 feet) when counselling patients during a pandemic	105 (39%)
20. The highest risk patients of contracting coronavirus are the elderly (>65), immune-compromised and children under the age of 9 years	61 (22%)

epidemic. Respiratory droplets from person to person among close contact and touching surfaces that are contaminated with the virus were correctly stated as the most common methods of transmission of coronavirus, according to many of the responders (90%). Just two-thirds (65%) of those surveyed correctly stated that muscle aches and gastrointestinal symptoms were not linked to coronavirus. Fewer than a quarter of the participants (22%) correctly stated that highest

risk patients of contracting coronavirus were not the elderly (>65), immune-compromised and children under the age of 9 years.

Table 4 presents the perspective of the study participants on the role of the pharmacist during epidemics and pandemics and the new coronavirus pandemic. Approximately half of the respondents stated that hospital pharmacists play a significant role in the management of epidemics/pandemics through their pharmacy and that it is their responsibility to assure the supply of critical drugs. Only 12% stated that pharmacists should provide coronavirus treatment to patients who need it even if they do not have a prescription.

Factors associated with awareness of COVID-19 are given in Table 5. When compared to those who worked in primary hospitals, those who worked in secondary and tertiary hospitals were approximately five-times (AOR = 4.59; 95% CI: 1.69–12.8; p-value = 0.003) and three-times (AOR = 2.93; 95% CI: 1.35–6.72; p-value = 0.008) more aware of COVID-19, respectively. Those who had previously received adequate knowledge regarding epidemics and pandemics were twice as likely to have good awareness of COVID-19 compared to those who had received none (AOR = 2.15; 95% CI: 1.09–4.35; p-value = 0.030).

DISCUSSION

Pharmacists working in a healthcare setting play an integral role as active members of the multidisciplinary team.[11]

Table 4. Participants' perspectives on the role of the pharmacist during epidemics and pandemics, and the new coronavirus pandemic					
Response	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
1. Hospital pharmacists have a major role in the management of epidemics/pandemics through your pharmacy	145 (53%)	95 (35%)	14 (5.1%)	17 (6.2%)	1 (0.4%)
2. It is your role to ensure the availability of key medicines	134 (49%)	104 (38%)	15 (5.5%)	16 (5.9%)	3 (1.1%)
3. It is your role to counsel people about coronavirus infection and how to reduce the transmission and the spread of the disease	115 (42%)	107 (39%)	19 (7.0%)	24 (8.8%)	7 (2.6%)
4. You ensure your personal safety by wearing gloves and masks and avoid close contact with patients	173 (64%)	76 (28%)	8 (2.9%)	9 (3.3%)	6 (2.2%)
5. If you suspect someone may have coronavirus, you know how to seek medical attention	129 (47%)	118 (43%)	14 (5.1%)	9 (3.3%)	2 (0.7%)
6. You provide coronavirus treatment to patients who need it even if they don't have a prescription	34 (12%)	44 (16%)	25 (9.2%)	96 (35%)	73 (27%)
7. Pharmacies should be allowed to send medications to their patients' homes during the coronavirus pandemic when needed	145 (53%)	87 (32%)	20 (7.4%)	15 (5.5%)	5 (1.8%)
8. You should be allowed to dispense medications for coronavirus management via drive-through	108 (40%)	107 (39%)	31 (11%)	17 (6.2%)	

Table 5. Factors associated with awareness of COVID-19					
	Awareness		AOR[1]	95% CI[1]	p-value
Characteristic	Poor	Good			
Age, median (IQR)	34 (29, 41)	34 (29, 41)	1.03	0.97, 1.09	0.302
Sex					
Female	75 (35%)	21 (37%)	Reference	Reference	
Male	140 (65%)	36 (63%)	1.03	0.52, 2.07	0.932
Hospital level					
Primary hospital	94 (44%)	11 (19%)	Reference	Reference	
Secondary hospital	26 (12%)	12 (21%)	4.59	1.69, 12.8	**0.003**
Tertiary hospital	95 (44%)	34 (60%)	2.93	1.35, 6.72	**0.008**
Educational level					
BPharm	119 (55%)	25 (44%)	Reference	Reference	
Masters	36 (17%)	13 (23%)	1.33	0.56, 3.12	0.513
PharmD	48 (22%)	16 (28%)	1.42	0.61, 3.27	0.409
PhD	4 (1.9%)	1 (1.8%)	0.65	0.03, 6.30	0.744
Other	8 (3.7%)	2 (3.5%)	1.45	0.20, 6.95	0.671
Work experience					
< 5 years	58 (27%)	17 (30%)	Reference	Reference	

5 to 9 years	63 (29%)	13 (23%)	0.60	0.18, 2.01	0.409
10 years and above	94 (44%)	27 (47%)	0.57	0.22, 1.49	0.253
Attendance in workshops					
No workshop attendance	31 (14%)	9 (16%)	Reference	Reference	
Only one attendance	27 (13%)	9 (16%)	0.95	0.28, 3.18	0.940
Two or more attendance	157 (73%)	39 (68%)	0.49	0.20, 1.28	0.131
Receiving enough education previously about epidemics/pandemics					
No			Reference	Reference	
Yes	107 (50%)	40 (70%)	2.15	1.09, 4.35	**0.030**
Following the latest coronavirus updates on treatment					
No			Reference	Reference	
Yes	175 (81%)	53 (93%)	3.58	1.13, 16.1	0.053

Pharmacy professionals are integrated into pandemic planning and response globally.[12] Apart from an effective role in hospitals, pharmacists are also crucial in the community by making pharmaceutical drugs available and increasing knowledge among the public.[13] Similarly, pharmacists in our study believed that they could play an effective role during the COVID-19 outbreak via infection control and counselling people about the hygiene practices required to reduce the spread of infection. Nearly half of the hospital pharmacists in this study knew how to act in seeking immediate medical attention if they suspected someone may have the coronavirus disease. This study supports the notion of pharmacists 'willingness to play a critical role in controlling infection and public safety and assuring public health and wellbeing.[14] Pharmacists' knowledge towards the management of COVID-19 infection is crucial as it supports the patients during crisis and affects clinical practice of pharmacists, as well. Pharmacists with prior adequate knowledge regarding epidemics and pandemics were twice as likely to have good awareness of COVID-19 compared to those who did not receive enough education previously about epidemics and pandemics. Moreover, pharmacists working in the secondary and tertiary care settings were more aware of COVID-19 than those working in primary care setting.

Many pharmacists responded that they will be able to act if they suspected that a patient experiences COVID-19 infection. One of the key attributes of pharmaceutical care is to triage patients to appropriate healthcare.[15] In our study, more than half of the pharmacists showed willingness to deliver medications to their patients' homes. During the COVID-19 pandemic, pharmacists in the KSA played an important role by keeping patients safe at their residence and providing medications by postal mail along with a remote counselling.[16] Similarly, the Ministry of Health in the KSA initiated a service 'Medication Home Delivery Service' under the theme 'Medicine to your doorstep', with the goal of sending medications via temperature-controlled shipping containers to patients' homes.[17] Many pharmacists in our study closely followed the recent COVID-19 updates on treatments and updated their information mostly via WHO documents, which is consistent with previous study findings.[18-20] During the COVID-19 pandemic, the WHO facilitated healthcare professionals to acquiring up-to-date knowledge regarding the

COVID-19 treatment. FIP guidance documents and COVID-19 online webinars could benefit in the provision of correct information to the hospital pharmacists globally.[21]

Some of the pharmacists thought that hydroxychloroquine has been used as a preventive therapy against the COVID-19 infection, which is similar to the previous findings.[19] Chloroquine or Hydroxychloroquine in addition to ventilatory support have been trailed by specialists in the management of hospitalised COVID-patients.[19] Many pharmacists were aware that azithromycin and hydroxychloroquine were used together for the treatment of COVID-19 infection, while merely 49% knew that antivirals such as oseltamivir, have been used in the management of coronavirus infection cases.[22] Many pharmacists agreed that using NSAIDs such as Ibuprofen may increase the risk of COVID-19 complications. The European Medicines Agency' Pharmacovigilance Risk Assessment Committee indicated the worsening of COVID-19 infection in patients on Ibuprofen or Ketoprofen as there is a need of extreme caution and medical supervision whilst using NSAIDs.[23]

The role of pharmacist has been evolving along with the advancement in the pharmaceutical care provided to patients. A recently published study in the KSA reported the implementation and effectiveness of drive-through pharmacy service.[24] Further, many patients utilised the drive-through pharmacy service as patients' requests and the number of processed medications steadily increased during the COVID-19 pandemic.[24] Globally, the drive-through pharmacy service has been effective in improving patient satisfaction because of the fast and convenient medicines pick-up method.[25] About 80% of the pharmacists in this study agreed that they should be allowed to dispense medications for the management of COVD-19 infection via drive-through service. Nonetheless, the drive-through pharmacy service in the KSA is limited to some healthcare settings only.[26]

Strengths and limitations

This study highlighted areas of improvement by identifying gaps in the hospital pharmacist's awareness and perception toward COVID-19, thereby improving patient safety in a healthcare setting. In addition, the study findings may help authorities organize the necessary educational programs to provide cutting-

edge information and deliver the best practice for managing the COVID-19 disease. This study has some limitations. The study was conducted during the peak COVID-19 period that resulted in a small sample size because pharmacists were occupied in multiple COVID-related responsibilities. Moreover, it was an online study, so it was not possible to calculate the response rate, making the determination of denominator difficult. Despite of these study limitations, the study provides insight into sources of information about COVID-19 treatment used by hospital pharmacists, their awareness about the COVID-19, and perspectives on the role of the pharmacist during COVID-19 pandemic.

CONCLUSIONS

Half of the pharmacists believed that they received required education in the past about epidemics/pandemics, and many follow on the recent COVID-19 updates on medicines predominantly from the WHO followed by the government awareness campaigns. Many pharmacists believed they have a key role in the management of epidemics/pandemics via their hospital pharmacy. However, we also identified certain awareness gaps about COVID-19 highlighting areas of improvement. Hospital pharmacists who received prior enough education regarding epidemics/pandemics were twice as likely to have good awareness of COVID-19 compared to those who had received none.

ACKNOWLEDGMENTS

FUNDING

DISCLOSURE OF INTEREST

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