

Role of Pharmacists as Health Professionals during the COVID-19 Pandemic – A Cross-Sectional Study from the Perspective of Hospital Pharmacists in Riyadh Region, Saudi Arabia

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Abstract

Background and Aims: Pharmacists are frontline workers available to patients and customers. The purpose of this study is to assess the role of clinical or infectious disease pharmacists as health professionals during the Coronavirus-2019 (COVID-19) pandemic. **Materials and Methods:** Cross-sectional face-to-face interviews were conducted in the Riyadh region, in 2022, using hospital pharmacies over a period of 6 months. Data analysis was performed using the Statistical Package for the Social Sciences software, version 26. **Results:** This study included 110 pharmacists, with 39% ($n = 43$) males and 60.1% ($n = 67$) females. In terms of experience, 20.9% ($n = 23$) had 1 year, 60.9% ($n = 67$) had 5–10 years, and 18.18% ($n = 20$) had 10–15 years. The pharmacists unanimously agreed (100%, $n = 110$) that the COVID-19 pandemic could be prevented or controlled through public education, advising, and informing. In addition, all pharmacists believed that clinical or infectious disease pharmacists play a crucial role in advising social distancing and avoiding crowded areas (100%, $n = 110$), educating the public on hygiene practices (100%, $n = 110$), informing about proper coughing and sneezing etiquette (100%, $n = 110$), explaining disease transmission (100%, $n = 110$). Some pharmacists (24.55%, $n = 27$) also provided home delivery of medications. **Conclusion:** According to the findings, all pharmacists agreed that COVID-19 is preventable and advising, informing, and educating the public helps in preventing COVID-19. The findings conclude that pharmacists' roles in Saudi Arabia have expanded beyond dispensing and patient counseling.

Key words: COVID-19, hand hygiene, health care, pharmacist, role, social distance

INTRODUCTION

Pharmacists are qualified healthcare professionals who are commonly regarded as frontline workers; their role in healthcare is comprehensive.^[1,2] Furthermore, it was discovered that pharmacists, both hospital and community-based, play an important role in pandemics, such as influenza, Coronavirus-2019 (COVID-19), and others by providing essential healthcare services, such as medication dispensing and patient counseling for COVID-19 patients.^[3] Community pharmacies are frequently the first point of contact with the health system for those suffering from illnesses or simply seeking information and sound advice.^[3] Community pharmacists play an important role in preventing the spread of the

COVID-19 pandemic.^[4] They are responsible for advising, informing, and educating the public, as well as maintaining a supply of pharmaceuticals and personal hygiene products and screening suspected cases for referral as needed.^[5]

The International Pharmaceutical Federation on February 2020, issued the COVID-19 outbreak: Information and

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interim guidelines for pharmacists and the pharmacy workforce” to provide relevant information and guidelines on coronavirus outbreaks for pharmacists and the pharmacy workforce.^[4] Pharmacists should understand the epidemiology of COVID-19, how it is transmitted, and how to prevent it from spreading. Pharmacists must be familiar with the most recent COVID-19 prevention and treatment guidelines, which are constantly changing.^[4] They are the primary suppliers of pharmaceutical products and can advise patients on when to seek medical attention. Customers’ travel to high-risk areas and personal contact histories should be known to them.^[4,6,7] Pharmacists should advise patients to maintain social distancing and avoid enclosed, crowded areas. They should encourage practicing regular hand washing, and follow appropriate ways of coughing or sneezing using paper tissue or within a flexed elbow, as well as discarding the tissue immediately after use into an appropriate receptacle and avoiding touching the mouth, nose, and eyes.^[8] Home-delivery service for medications, with online or phone counseling, may help high-risk individuals and those in home isolation. Pharmacists have a major role in preventing stigma due to COVID-19 infection and outcome by promoting a culture of empathy and helping infected patients by broadcasting facts in their communities via various media. They can protect COVID-19 patients from rejection, social avoidance, or being denied healthcare, education, housing, or employment, and even physical violence.^[9]

Some studies assessed the role of pharmacists during the COVID-19 pandemic^[10-13] and revealed various roles of pharmacists during the pandemic, such as disease prevention and infection control,^[10] health education and promotion,^[11] delivery of tele pharmacy and telehealth services,^[12] and basic temperature checks on staff members and customers.^[13] Therefore, highly trained pharmacists having up-to-date chronic disease knowledge are required to control medication-related problems and the chronic disease burden and ensure rational medication use during the pandemic.

This highlights the need for appropriate pharmaceutical care for this vulnerable group of patients. Some studies reported pharmacy services were effective in optimizing patients’ health outcomes for chronic illnesses.^[14,15] Such services include: (1) The provision of suitable counseling and medication information, (2) ensuring essential medications for the management of chronic diseases are steadily available and easily accessible, (3) preventing, identifying, and resolving potential medication-related problems, (4) evaluating patient’s medication need, (5) encouraging medication adherence, (6) promoting self-management practices, (7) managing comorbidities and other risk factors, and (8) enhancing continuous therapeutic drug monitoring and follow-up to make optimal pharmacotherapy.^[14,16] Furthermore, pharmacist vaccination services can improve vaccination coverage, particularly in rural and remote areas,^[17] strengthen pharmacists’ roles as immunizers, and increase future capacity to deliver vaccination services.^[18]

From this perspective, we can conclude that pharmacists play an important role in combating COVID-19; however, very few studies have examined the role of pharmacists in combating COVID-19 in Saudi Arabia. This study bridges that gap by looking into the role of hospital pharmacists in the Kingdom of Saudi Arabia in combating COVID-19. Therefore, the purpose of this study was to evaluate the role of pharmacists as health professionals during the COVID-19 pandemic.

MATERIALS AND METHODS

A cross-sectional study was conducted over 6 months to assess the role of clinical or infectious disease pharmacists as health professionals during the COVID-19 pandemic. The data were collected from the selected hospitals in Riyadh city after the researcher received approval to implement the study (E-22-6622). In addition, informed consent was obtained from the pharmacists who were informed that the data would be used solely for research purpose and that confidentiality would be maintained throughout the study.

The present study has been conducted among pharmacists working in

- Prince Mohammed bin Abdel Aziz Hospital
- AL Imam Abdel Rahman Hospital, located in the west area
- King Khalid University Hospital
- Specialist Hospital located in the south area.

All of these hospitals are located in the capital region of Saudi Arabia. The primary reason for selecting these hospitals is due to the nature of the facilities (government and large university teaching hospitals in the heart of the city. Moreover, the majority of patients preferred to visit these hospitals because they offered high-quality health care at no cost in a safe setting. Furthermore, these health-care facilities strive for excellence in national health-care delivery, as well as a leadership role in medical education and scientific research.

Sample size

The sample size was calculated using the Raosoft sample size calculator. Considering a pharmacist population of $n = 300$, at study sites, a 5% margin of error and 95% confidence interval, the required sample size for this study was calculated to be 169. The study approached 169 pharmacists randomly from each selected facility

The ethical committee provided a letter of recommendation to conduct the study and facilitate workflow. The researcher reviewed electronic and paper patient files for data collection. A master sheet was prepared to organize all recorded cases for data presentation. Face-to-face interviews lasting

10–15 min were conducted with pharmacists in targeted hospitals settings to explore their roles during the COVID-19 pandemic. Data were collected to assess demographic characteristics of pharmacists, including gender and years of experience in the field. The second part of the study involved 25 questionnaires that gathered information about the roles of clinical or infectious disease pharmacists. These roles included advising, informing, and educating the public, maintaining a supply of pharmaceuticals and personal hygiene products, screening suspected cases, referring as needed, staying updated on COVID-19 guidelines, and promoting hand washing, among other tasks. Responses to these questions were assessed on a three-point scale (Yes/No/Uncertain). In addition, the questionnaires collected the following information.

- a. The provision of suitable counseling and medication information
- b. Ensuring essential medications for the management of chronic diseases are steadily available and easily accessible
- c. Preventing, identifying, and resolving potential medication-related problems
- d. Enhancing continuous therapeutic drug monitoring and follow-up to make optimal pharmacotherapy
- e. Health education
- f. Vaccination
- g. Early detection of cases of COVID-19
- h. Proper referral of cases
- i. Evaluating patients' medication needs
- j. Encouraging medication adherence
- k. Promoting self-management practices
- l. management of comorbidities and other risk factors
- m. Health education
- n. Availability of drugs and personal protective measures
- o. Infection control measures
- p. Vaccination.

Before using the questionnaires to conduct the study, a researcher evaluated them to assess their content and flow. Subsequently, the questionnaires were subjected to pilot testing among randomly selected pharmacists ($n = 20$). The pilot study did not indicate any necessary changes to the questionnaires. A Cronbach alpha value of 0.70 was obtained, indicating that the questionnaires are valid and reliable for the study. Data collection was carried out using a simple random sampling technique. Pharmacists working in the selected hospital were contacted via telephone to enroll in the study. Data collection continued until the required sample size was achieved.

Data analysis

After data collection, the data obtained from the pharmacists were checked for accuracy and completeness. The Statistical Package for the Social Sciences (SPSS) (version 26 for Windows, SPSS Inc., Chicago, IL, USA) was used to analyze the data. The demographic characteristics were summarized

using descriptive statistics, such as frequencies (n) and percentages (%).

RESULTS

The detailed demographics of the pharmacists are provided in Table 1. In this study, 39% of the pharmacists were male ($n = 43$), while the majority were female (60.1%; $n = 67$). Most pharmacists (60.9%) reported having between 5 and 10 years of experience [Table 1].

The recent findings revealed that all 110 pharmacists (100%) believed that the COVID-19 pandemic could be prevented or controlled. They all agreed that advising, informing, and educating the public helps in preventing COVID-19. In terms of medication management, 99 out of 110 respondents (90%) thought that maintaining a supply of pharmaceuticals and personal hygiene products would help control COVID-19 [Table 2].

In this study, all pharmacists agreed on understanding the epidemiology of COVID-19, its transmission, and how to prevent its spread, highlighting the positive impact of its prevention. When asked about customer's awareness of traveling to high-risk areas and their personal contact histories, all interviewed pharmacists emphasized on the importance of these factors. In addition, 100% of pharmacists supported advising people to practice social distancing, avoid enclosed crowded places, and educate the public on hygiene etiquette, such as hand washing (100% $n = 110$), appropriate ways of coughing or sneezing, and disease transmission roles typically handled by clinical or infectious disease pharmacists (100% $n = 110$). In this study, 24.55% of pharmacists supported the home-delivery of medications to patients, while the majority of pharmacists (75.45%; $n = 83$) did not agree with it. Similarly, 38.18% ($n = 42$) of pharmacists had positive feedback on online or phone counseling for high-risk individuals and those in home isolation, while 39.10% ($n = 43$) of pharmacists did not agree with this approach.

When it comes to medication-related problems, such as evaluating patients' medication needs, encouraging

Table 1: Role of clinical or infectious disease pharmacists ($n=110$)

Characters	Frequency n (%)
Gender	
Male	43 (39)
Female	67 (60.1)
Year of experience	
1–5 years	23 (20.9)
5–10 years	67 (60.9)
10–15 years	20 (18.18)

Table 2: Role of clinical or infectious disease pharmacists (n=110)

Variables	Frequency	Frequency	Frequency
	n (%) yes	n (%) no	n (%) uncertain
Prevention of the spread of the COVID-19 pandemic	110 (100.0)	0	0
Advising, informing, and educating the public	110 (100.0)	0	0
Maintaining a supply of pharmaceuticals and personal hygiene products	99 (90.00)	11 (10.00)	0
Screening of suspected cases and referral as required	57 (51.82)	41 (37.27)	12 (10.91)
Understand the epidemiology of COVID-19, how is it transmitted, and how to prevent it from spreading.	110 (100.0)	0	0
Familiar with the latest up-to-date COVID-19 prevention and treatment guidelines	100 (90.91)	10 (9.09)	0
Aware of customers' travel to high-risk areas and their personal contact histories	110 (100.0)	0	0
Advise people to practice social distancing and avoid enclosed crowded places	110 (100.0)	0	0
Encourage practicing regular hand washing	110 (100.0)	0	0
Follow appropriate ways of coughing or sneezing using paper tissue or within a flexed elbow, as well as discarding the tissue immediately after use into an appropriate receptacle, and avoiding touching the mouth, nose, and eyes	110 (100.0)	0	0
Home-delivery service for medications	27 (24.55)	83 (75.45)	0
Online or phone counseling may help high-risk individuals and those in home isolation	42 (38.18)	43 (39.10)	25 (22.73)
Promoting an empathy culture and helping infected patients by broadcasting facts in their communities via various media	87 (79.10)	23 (20.90)	0
Protect COVID-19 patients from rejection, social avoidance, or being denied healthcare, education, housing, or employment, and even physical violence	66 (60.00)	44 (40.00)	0
Optimizing patients' health outcomes for chronic illnesses	82 (74.55)	28 (25.45)	0
Ensuring essential medications for the management of chronic diseases are steadily available and easily accessible	110 (100.0)	0	0
Preventing, identifying, and resolving potential medication-related problems	110 (100.0)	0	0
Evaluating the patient's medication need	110 (100.0)	0	0
Encouraging medication adherence	110 (100.0)	0	0
Promoting self-management practices	110 (100.0)	0	0
Management of comorbidities and other risk factors	99 (90.00)	11 (10.00)	0
Enhancing continuous therapeutic drug monitoring and follow-up to make optimal pharmacotherapy	95 (86.36)	15 (13.64)	0
Improve vaccination coverage, particularly in regional and remote areas	94 (85.45)	16 (14.55)	0
Strengthen the role of pharmacists as immunizers	110 (100.0)	0	0
Enhance capacity to deliver vaccination services in future	68 (61.82)	20 (18.18)	22 (20.00)

medication adherence, and promoting self-management practices, almost all pharmacists believe that it is the role of clinical pharmacists (100%, $n = 110$). Ninety percent of pharmacists also believe that their role includes maintaining a supply of pharmaceuticals and personal hygiene products. A similar percentage is concerned about staying up-to-date on COVID-19 prevention and treatment guidelines, as well as managing comorbidities and other risk factors [Table 2].

In general, approximately 86% of pharmacists were concerned about enhancing continuous therapeutic drug monitoring and follow-up to optimize pharmacotherapy and improve vaccination coverage, especially in regional and remote areas. Most of the participants (79.10%) claimed that promoting a culture

of empathy and assisting infected patients by disseminating information in their communities through various media outlets was their role during the pandemic. In this study, 85.4% of pharmacists agreed to improve vaccination coverage, particularly in regional and remote areas, and 100% of pharmacists agreed to strengthen their role as immunizers. Furthermore, 61.8% of pharmacists stated that they plan to increase their capacity to provide vaccination services in the future.

DISCUSSION

Pharmacists are healthcare professionals, who play a significant role in the delivery of healthcare.^[12,13] They

are considered frontline healthcare workers, available to the public and patients in providing counseling and education about the disease they suffered, especially during the pandemic. Although the role of the pharmacist during COVID-19 is well documented in many studies internationally.^[19-22] The present findings reported that all of the surveyed pharmacists agreed on advising, informing, and educating the public about the prevention of COVID-19, also 90% of the pharmacist thought that maintaining a supply of pharmaceuticals and personal hygiene products would help them in controlling the COVID-19 infection. In addition, the majority of the pharmacist agreed with the statement of understanding the epidemiology of COVID-19, its transition, and how to prevent its spreading, indicating the positive role of its prevention. These findings were similar to previous findings by Visacri *et al.*, 2021; Pantasri, 2022; Ahmad *et al.*, 2020; Alshahrani, 2020; Earl *et al.*, 2021; Jia *et al.* in 2021; and Durand *et al.*, and suggested that pharmacist play a vital role in health care delivery during the COVID-19 pandemic.^[10-13,19,20,22]

For example, a previous study in Saudi Arabia aimed to assess the readiness of pharmacists to play a supportive role during the COVID-19 pandemic. The findings revealed that 74% of community pharmacists always disinfected contact surfaces, while most were responsible for temperature checks of staff members and customers.^[13] Furthermore, previous findings reported that community pharmacists in Saudi Arabia displayed positive attitudes and extensive knowledge in the fight against COVID-19. Specifically, 62% of community pharmacists were aware of COVID-19 management strategies, and 81% believed that the information supplied by the ministry was sufficient.^[13] Similarly, a study by Earl *et al.* reported that pharmacists dispensed and counseled COVID-19 patients, providing medications, such as bronchodilators, inhalers for dyspnea, glucocorticoid anti-inflammatory drugs (prednisone) following recovery from acute lung disease, and drugs for symptomatic conditions.^[19] Another study by Jia *et al.* in 2021 conducted in-depth interviews among frontline medical staff working in isolation wards during COVID-19. They reported that pharmacists played a positive role in ensuring the supply of non-routinely stocked drugs, including traditional Chinese medicine preventative preparations, providing drug information and medication consultation for complex patients, and identifying adverse drug reactions.^[20]

On the other hand, Durand *et al.* conducted qualitative interviews to explore the experiences, contributions, and perceived challenges of community pharmacists regarding the provision of healthcare services during the COVID-19 pandemic. The results reported that pharmacists provided a range of novel services in response to the pandemic on top of continuing their usual services. Furthermore, the results indicated that the surveyed pharmacists provided preventative services to reduce and mitigate the spread of SARS-CoV-2, such as education on hygiene and social

distancing, delivery of face masks and hand sanitizer, and adjustments to pharmacy premises.^[22] These findings were similar to our findings, suggesting that the pharmacist's role during the pandemic was widespread and similar to that of other healthcare professionals.

In the present study, 85.4% of pharmacists agreed to improve vaccination coverage, particularly in regional and remote areas, and 100% of pharmacists agreed to strengthen their role as immunizers. Furthermore, 61.8% of pharmacists stated that they plan to increase their capacity to provide vaccination services in the future. These findings were consistent with previous findings by Durand *et al.* 2022, who conducted qualitative interviews and revealed that pharmacists reported being actively involved in COVID-19 vaccination by educating the general public about vaccines, facilitating their distribution to general practitioners and administering vaccines.^[22] However, a previous study by Ahmed *et al.* revealed that pharmacists assisted in health education and promotion, medication dispensing, medication reconciliation, medication and patient counseling, training for self-management in the present outbreak, and emergency preparedness.^[12] The novel services provided by pharmacists in both the present study and previous studies seem to have made a significant contribution to the national and international response to the pandemic. Our findings also suggest that pharmacists' availability, accessibility, and cognitive abilities play a key role in integrating these services into their practice. In addition, external factors, such as motivation from their respective countries and support from other experts, and resources from the organizations they work for may have influenced this response.

Similarly, another recent review by Kusuma *et al.* aimed to assess the role of Pharmacists in Antimicrobial Stewardship During COVID-19 and reported that pharmacists are responsible for identifying and treating patients during pandemics, ensuring the continued supply and accessibility of medications, promoting health policies, and monitoring antibiotic use for COVID-19 cases and co-infections.^[21] Furthermore, it was found that pharmacists help in educate patients on telehealth services, clarify misconceptions about treatments and antibiotic consumption, as well as take a leadership position to establish local guidelines for the COVID-19 treatment protocol.^[21]

Although the role of the pharmacist was further expanded in the era of the COVID-19 pandemic, concerning many aspects of health care. For instance, the present findings revealed that a considerable number of pharmacists (24.5%) agreed on the home-delivery service of medications to their patients. Similarly, 38.1% of pharmacists responded positively about online or phone counseling to help high-risk individuals and those in home isolation. These findings were in line with previous findings by Kambayashi *et al.* in 2023, who performed a systematic review and meta-analysis about the adaptations in the role of pharmacists under the conditions of the COVID-19 pandemic and reported that approximately

half of the pharmacists performed additional duties, such as telemedicine and home delivery services to their patients and customers, respectively.^[23] Furthermore, studies also revealed that given the pandemic pharmacist's role in educating the patient was improved, where one meta-analysis reported that 72.5% of the pharmacists from 22 studies agreed on providing education and counseling to the patients.

In the present study, the majority of pharmacists did not agree to provide home delivery services despite the wide benefits and effectiveness of these services in preventing infection, especially in this COVID-19 era. The reasons for the low acceptance of the home delivery service may be because it necessitates additional requirements for the pharmacist, including human resources and distribution expenses. Similar to present findings, telemedicine services were more common among developed countries, such as the United States and Spain.^[23,24] as well as in developing countries.^[25-28] Although all these services were based on the settings of pharmacists and organizational status. In this view, the current findings highlight the potential role of pharmacists during the pandemic in public health emergencies and have raised the image of the pharmacy profession in the eyes of the public and health authorities.

The present study has a few limitations. First, it is limited to one region of Saudi Arabia. Second, due to the smaller sample size, the study lacks the generalizability of the results. Finally, one cannot describe the pharmaceutical care provided by all pharmacists in Saudi Arabia. Despite these limitations, such a report is critical in identifying such issues and, if they exist, further investigating their impact on the research and demonstrating strategies to address them later. That being said, our study is the first of its kind and will serve as the foundation for future research on this topic.

CONCLUSION

According to the findings of this study, all pharmacists agreed that COVID-19 is preventable. In addition, they all agreed that advising, informing, and educating the public helps in preventing COVID-19. Furthermore, pharmacists also agreed to provide home delivery of drugs along with COVID-19 prevention measures. The findings conclude that pharmacists' roles in Saudi Arabia have expanded beyond dispensing and patient counseling during the COVID-19 outbreak. Individuals and other healthcare professionals, on the other hand, have higher expectations of pharmacists. To meet the needs of individuals, patients, and healthcare in Saudi Arabia and other countries, pharmacists' competencies must be further strengthened.

Data availability statement

The datasets used and analyzed during the present study are available from the corresponding author upon reasonable request.

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