2024, Volume 4, Page No: 43-49
ISSN: 3108-4850

Society of Medical Education & Research

Annals of Pharmacy Education, Safety, and Public Health Advocacy

Assessment of Community Pharmacy Services and Preparedness in Saudi Arabia during the COVID-19 Pandemic: A Cross-Sectional Study

Abdulaziz Alhossan[1*], Noha Al Aloola[1], Manar Basoodan[1], Munirah Alkathiri[1], Razan Alshahrani[1], Wael Mansy[1], Thamer A Almangour[1]

[1]Department of Clinical Pharmacy, College of Pharmacy, King Saud University, Riyadh, Saudi Arabia.

***E-mail** ✉ alhossan@ksu.edu.sa

Abstract

The SARS-CoV-2 outbreak in late 2019 triggered a shift in healthcare priorities globally, with pharmacies playing a pivotal role in supporting the healthcare system throughout the pandemic. This study aimed to assess the preparedness and service delivery of community pharmacies in Saudi Arabia during the COVID-19 crisis. A cross-sectional study was conducted from July to November 2020, using an electronic questionnaire distributed to community pharmacists across the country. The survey focused on assessing preventive measures, public knowledge, and the impact of the pandemic on pharmacy operations. A total of 315 pharmacists participated in the study. The majority of respondents (81.9%) participated in COVID-19 educational programs, with 56.6% attending mandatory sessions. Key preventive actions implemented in pharmacies included hand sanitization (90.8%), face mask usage (89.2%), and body temperature checks (85.1%). The pandemic significantly impacted pharmaceutical counseling and public education, with 52.1% and 49.5% of pharmacists noting substantial changes in these areas. The findings suggest that there is a strong adherence to preventive measures in community pharmacies, though many actions were carried out voluntarily and adjusted to meet local needs.

Keywords: Community pharmacies, COVID-19 preparedness, Preventive actions, Pharmacy services, Saudi Arabia

Introduction

In December 2019, the World Health Organization (WHO) received initial reports about a cluster of unexplained pneumonia cases in Wuhan, China [1]. The illness was later linked to a new virus, Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2), which caused the coronavirus disease 2019 (COVID-19). The virus soon spread rapidly across China and the world, triggering outbreaks in multiple countries [2, 3]. SARS-CoV-2 can lead to severe complications beyond pneumonia, with the potential for multi-organ damage. The virus primarily spreads through close contact with infected individuals, transmitted by respiratory droplets or aerosols from sneezing and coughing [4, 5]. These particles can enter the body through the nose or mouth, affecting the lungs primarily [6, 7]. As of October 13, 2022, there were over 620 million confirmed cases globally, and more than 6.5 million deaths reported [8, 9]. In Saudi Arabia, the first case was recorded on March 2, 2020. By October 13, 2022, the country had over 818,000 confirmed cases and more than 11,000 deaths [10, 11].

Throughout the COVID-19 crisis, pharmacies worldwide have been vital to the healthcare system, enhancing patient care across various levels [12]. Pharmacists have played a central role in supporting both COVID-19 patients and those with other illnesses or comorbidities, offering critical pharmacy services and products [13]. They also assisted in medication delivery and managed the growing number of patients seeking help at community pharmacies [14]. In addition to dispensing

Access this article online https://smerpub.com/

Received: 23 February 2024; **Accepted:** 08 June 2024

How to cite this article: Alhossan A, Al Aloola N, Basoodan M, Alkathiri M, Alshahrani R, Mansy W, et al. Assessment of Community Pharmacy Services and Preparedness in Saudi Arabia during the COVID-19 Pandemic: A Cross-Sectional Study. Ann Pharm Educ Saf Public Health Advocacy. 2024;4:43-9. https://doi.org/10.51847/C52qAb0bZW

medications, pharmacists helped address public concerns and cleared up misconceptions about COVID-19 [15].

The demand for services from community pharmacies surged globally during the pandemic [16]. Pharmacists, as essential healthcare professionals, alleviated the pressure on other sectors such as general healthcare practices and emergency departments [15]. In some countries, community pharmacies took on additional responsibilities, such as COVID-19 testing and detection [17, 18]. In Saudi Arabia, they also became involved in providing COVID-19 vaccinations [15].

Recognizing the importance of pharmacies during this health crisis, the Centers for Disease Control and Prevention (CDC) [13] and several international organizations like the International Pharmaceutical Federation (FIP) [19], the American Pharmacist Association (APhA) [20], and the National Health Service (NHS) [21] have issued guidelines to reduce the risk of COVID-19 exposure in pharmacy environments. Similarly, the Saudi Center for Disease Prevention and Control (NCDPC) has provided recommendations for healthcare professionals and the public in Saudi Arabia [22]. However, specific directives for community pharmacies were not mandated.

Despite general recommendations on personal protective equipment (PPE) and social distancing, there has been a lack of consistent preventive guidelines across different regions [22]. Some studies on community pharmacies in various countries have found that the preparedness of pharmacy staff, including the provision of protective equipment, was generally adequate [23]. However, other studies highlighted gaps in preventive measures, such as the absence of contactless payment options, hand sanitizers, or masks for customers, and the lack of separate areas for suspected COVID-19 patients [24].

The role of community pharmacies has expanded throughout the COVID-19 pandemic. However, there is a limited global evaluation of how effectively these measures have been implemented in pharmacies. This study aims to assess the preparedness of community pharmacies in Saudi Arabia during the pandemic, focusing on the extent of preventive measures, pharmacists' handling of COVID-19-related issues, and the impact of the crisis on pharmaceutical services and products offered.

Materials and Methods

Between July and November 2020, a cross-sectional, quantitative, web-based survey was carried out to evaluate the preparedness of community pharmacies during the COVID-19 pandemic. Due to the restrictions imposed by the outbreak, data was collected through an online, self-administered questionnaire. The survey included 21 questions, designed following various international health guidelines and recommendations, including those from the International Pharmaceutical Federation (FIP, 2020), the American Pharmacists Association (APhA, 2021), the National Health Service (NHS), and the Centers for Disease Control and Prevention (CDC, 2020).

The questionnaire was organized into five main sections: (1) demographic details, (2) pharmacists' knowledge of health pandemics, (3) prevention measures and protocols implemented in the workplace, (4) the effect of the pandemic on the services and products offered by pharmacies, and (5) pharmacists' responses to COVID-19-related challenges and concerns. The survey's content validity was reviewed by several faculty members from pharmacy schools and practicing pharmacists, followed by a pilot test to ensure clarity and understanding.

The survey was targeted specifically at community pharmacists, pharmacy technicians, and managers in community pharmacies. The electronic survey was emailed to the managers of community pharmacy chains across the country. Ethical approval was waived by the King Saud University Ethics Committee, as the study did not involve sensitive or personal data. Participants' privacy was protected, and informed consent was obtained before their participation, which was voluntary and anonymous. Descriptive statistics were applied to analyze the data using the Statistical Package for the Social Sciences (SPSS).

Results and Discussion

The survey had a total of 315 respondents, with a predominant male participation rate (92.7%) and a majority of individuals under the age of 34 years (74.6%) as illustrated in **Table 1**. A smaller portion of the respondents (17.8%) were Saudi nationals. The majority held a bachelor's degree (97.1%) and had less than ten years of experience in the field (68.9%). Additionally, a notable proportion of respondents (43%) worked in shifts with at least two pharmacists present.

Table 1. Respondent demographics

Characteristic	N = 315 n (%)
Gender	
Male	292 (92.7%)
Female	23 (7.3%)
Age	
Below 25 years	8 (2.5%)
25-29 years	101 (32.1%)
30-34 years	126 (40.0%)
35-39 years	52 (16.5%)
40-44 years	18 (5.7%)
45-49 years	10 (3.2%)
Nationality	
Saudi	56 (17.8%)
Non-Saudi	259 (82.2%)
Education Level	
Bachelor's degree	306 (97.1%)
Master's degree	6 (1.9%)
Doctoral degree	3 (1.0%)
Position	
Community pharmacist	258 (81.9%)
Pharmacy manager	54 (17.1%)
Other	3 (1.0%)
Experience duration	
Less than 1 year	36 (11.4%)
1-5 years	73 (23.2%)
6-10 years	108 (34.3%)
Over 10 years	98 (31.1%)
Geographical region	
Central	108 (34.3%)
Southern	52 (16.5%)
Eastern	43 (13.6%)
Northern	38 (12.1%)
Western	74 (23.5%)
Chain pharmacies with > 100 Stores	
Yes	293 (93.0%)
No	22 (7.0%)
Employees per shift	
One pharmacist	131 (41.6%)
Two to three pharmacists	137 (43.5%)
More than three pharmacists	47 (14.9%)

A significant portion of the respondents reported that their pharmacy management had arranged meetings to educate employees on minimizing the transmission risks of COVID-19 (81%). Additionally, 81.9% of respondents attended COVID-19-related courses focused on infection control measures. For 56.6% of respondents, these courses were mandatory, and 93.8% participated through virtual platforms. Most of the participants (59%) took part in these sessions as per their company's regulations, as detailed in **Table 2**.

Pharmacies implemented a variety of preventive strategies to safeguard customers and staff, though these measures varied across locations. The most common actions included sanitizing customers' hands (90.8%), wearing face masks (89.2%), and checking body temperature upon entry (85.1%), as shown in **Table 3**. Additionally, protective windows and complimentary hand sanitizers at pharmacy counters were available in 71.7% and 82.2% of pharmacies, respectively.

Table 2. Preparedness of pharmacies and pharmacists during the COVID-19 pandemic

Preparedness measure	N = 315 n (%)
Were any meetings held by the company or pharmacy managers to reduce COVID-19 transmission?	
Yes	255 (81.0%)
No	60 (19.0%)
Did you attend any courses or programs related to COVID-19 or infection prevention?	
Yes	258 (81.9%)
No	57 (18.1%)
Was the course or program mandatory or optional?	
Mandatory by your company	146 (56.6%)
Optional	112 (43.4%)
How did you attend the course or program?	
Onsite	16 (6.2%)
Virtual (Online)	242 (93.8%)
What motivated you to attend the course or program?	
Your company	153 (59.3%)
Self-motivation	102 (39.5%)
Others	3 (1.2%)

Table 3. Preventive measures implemented against COVID-19 in pharmacies

Preventive measures	N = 315 n (%)
Availability of free hand sanitizer at pharmacy counters	259 (82.2%)
Availability of protective shields at pharmacy counters	226 (71.7%)

Disinfecting customers' hands upon entry to the pharmacy	286 (90.8%)
Disinfecting the counter after each customer	210 (66.7%)
Floor markings to ensure physical distancing	237 (75.2%)
Keeping only essential items at the counter	194 (61.6%)
Limiting the number of customers allowed in the pharmacy	219 (69.5%)
Measuring the body temperature of customers	268 (85.1%)
Pharmacy employees and customers wearing face masks	281 (89.2%)
Offering home delivery services	207 (65.7%)

Table 4 shows the actions taken by pharmacies when interacting with individuals suspected of or confirmed to have COVID-19. A large majority of pharmacists (83.7%) advised individuals to contact the Ministry of Health (MOH), while 79.1% changed their gloves and face masks during the interaction. The majority (85.3%) also ensured to clean and disinfect all surfaces that may have been in contact with the patient. Only 0.4% of respondents reported having to close their pharmacies for sterilization.

Table 4. Actions taken by pharmacies when dealing with suspected or confirmed COVID-19 cases

Actions taken by pharmacists when interacting with suspected or confirmed COVID-19 cases	**N = 258* n (%)**
Advised the individual to contact the Ministry of Health (MOH)	216 (83.7%)
Changed gloves and face mask	204 (79.1%)
Cleaned and disinfected all patient-contact surfaces	220 (85.3%)
Contacted the Ministry of Health (MOH) to report the case	85 (32.9%)
Limited the number of pharmacists interacting with the suspected case	164 (63.6%)
Ensured employee patients did not return to work until the isolation period was completed	173 (67.1%)
Ensured sterilization was done before employee patients returned to work	147 (57%)
Closed the pharmacy for sterilization	1 (0.4%)

81.9% of pharmacists had interactions with suspected or confirmed COVID-19 patients

Table 5 highlights the sources of information used by pharmacists to answer customer questions related to COVID-19. A majority (81.3%) of respondents relied on information from the Ministry of Health (MOH) and other official agencies, while only 50.8% of pharmacists recommended customers contact their healthcare providers for further advice.

Table 5. Sources used by pharmacists to respond to customer COVID-19 inquiries

Source of information used to answer COVID-19 questions	**N = 315 n (%)**
Searched via Google browser	76 (24.1%)
Consulted reliable scientific websites	132 (41.9%)
Recommend contacting a doctor	160 (50.8%)
Relied on information from MOH and official sources	256 (81.3%)
Used general knowledge from the pharmacist	156 (49.5%)

Table 6 shows the impact of the COVID-19 pandemic on different pharmacy services. Medication counseling (52.1%) and public education (49.5%) were the services most negatively affected by the pandemic, followed by home medication delivery (30.8%).

Table 6. Impact of COVID-19 on pharmacy services

Service affected by COVID-19	**N = 315 n (%)**
Drive-through services	48 (15.2%)
General public education	156 (49.5%)
Home delivery of medications	97 (30.8%)
Medication counseling for patients	164 (52.1%)
Medication prescribing services	101 (32.1%)
Supply of essential medications and prevention tools	1 (0.3%)
No services were affected	58 (18.4%)

As shown in **Table 7**, the most frequently used methods for raising public awareness in pharmacies during the COVID-19 pandemic were wall posters and printed brochures, each utilized by 64.4% of participants. This was followed by the use of social media platforms through official pharmacy accounts (59.9%), and educational videos (45.2%). Very few pharmacists (0.3%) reported giving direct verbal advice to customers. Three participants noted that they did not use any of these strategies.

Table 7. Public awareness strategies in pharmacies during the COVID-19 pandemic

Awareness strategy	N = 312* n (%)
Direct counseling from pharmacists	1 (0.3%)
Use of educational videos	141 (45.2%)
Distribution of printed leaflets	201 (64.4%)
Posts on official pharmacy social media pages	187 (59.9%)
Display of wall posters	201 (64.4%)

This study provides an insightful overview of how community pharmacies have implemented preventive protocols to curb the spread of COVID-19, and whether these measures were sufficient to safeguard pharmacy staff. Additionally, it evaluates the broader effects of the pandemic on pharmacy services from the perspective of practicing pharmacists. Given the essential role community pharmacies play in supplying medications, health-related products, and accurate medical information, the findings pinpoint key areas that require attention to enhance infection prevention and further strengthen the role of pharmacies in public health.

Despite discrepancies in the implementation of precautionary measures among different community pharmacies, the findings underscore the significant efforts made by pharmacies across Saudi Arabia to ensure safety during the pandemic. These efforts were largely aligned with the guidance issued by the Saudi Center for Disease Control (SCDC) and the Saudi Patient Safety Center (SPSC), even though compliance with these guidelines was not mandatory.

The global scale and socioeconomic effects of the COVID-19 pandemic have profoundly impacted community pharmacies [25]. Many obstacles—such as lockdown restrictions, exposure risks, and medication shortages—hindered their ability to deliver optimal care [26, 27]. In response, several pharmacy chains worldwide adopted alternative methods to ensure uninterrupted service delivery [28, 29]. Home delivery of medications emerged as one of the most effective strategies for maintaining treatment continuity [30, 31]. Likewise, virtual consultation and telepharmacy services offered via mobile apps enabled pharmacists to continue providing necessary medication guidance [32].

In this study, only a limited number of community pharmacies in Saudi Arabia offered these services. This is mainly because most patients obtain their medications from public hospitals, where medicines and delivery services are provided free of charge. Additionally, these patients typically receive medication counseling directly from their primary care teams. Nonetheless, community pharmacies played a critical role in ensuring access to personal protective equipment (PPE), especially during the peak of the pandemic. The findings also reflect the strong willingness of community pharmacists to offer a wide range of services during health crises, from medication dispensing to public health education and ensuring sufficient PPE supplies.

The study further reveals how well pharmacies prepared for the pandemic at both staff and customer levels. Most pharmacists surveyed had received proper training on how to minimize infection risk. However, such training was often provided by pharmacy management or undertaken independently by pharmacists, which highlights the need for standardized national training protocols. Official guidelines and mandatory procedures should be established and overseen by the Ministry of Health to ensure consistency across all pharmacies.

While most of the infection control measures **(Table 3)** were either compulsory or strongly recommended by the Ministry of Health and therefore widely implemented, actions taken in response to suspected or confirmed COVID-19 cases **(Table 4)** varied considerably. This inconsistency stems from the lack of uniform internal policies and the absence of national mandates regarding such scenarios. This gap raises concerns about potential exposure risks in pharmacies that lack robust infection control policies.

The study also demonstrates how community pharmacies contributed to increasing public awareness throughout the pandemic. Common strategies included visual aids like posters and printed materials, informative posts on social media, and video content. Pharmacists mainly relied on official health agency updates to respond to customer inquiries about COVID-19 and reported no significant issues accessing these resources. This reflects the Ministry of Health's effective communication efforts and support to frontline healthcare professionals.

However, the study does have certain limitations. Its exploratory nature focused on identifying how precautionary measures were applied. Due to the pandemic lockdown at the time of the research, data was collected through an online survey instead of face-to-face interviews, which could introduce bias or inconsistencies in reporting how procedures were implemented.

Conclusion

Overall, the study found a relatively strong commitment to implementing COVID-19 safety measures in community pharmacies. While there were some differences in infection control policies across pharmacies, most adhered well to recommended practices. The resources and guidance provided by official health authorities were accessible and effectively used by pharmacists. Nonetheless, the variation in implementation suggests a need for consistent national policies to ensure comprehensive protection in all community pharmacy settings.

Acknowledgments: None

Conflict of Interest: None

Financial Support: None

Ethics Statement: None

References

1. WHO Coronavirus disease (COVID-19). Available from: https://www.who.int/emergencies/diseases/novel-coronavirus-2019 (Accessed July 7, 2020)
2. Kang S, Peng W, Zhu Y, Lu S, Zhou M, Lin W, et al. Recent progress in understanding 2019 novel coronavirus (SARS-CoV-2) associated with human respiratory disease: detection, mechanisms and treatment. Int J Antimicrob Agents. 2020;55(5):105950. doi:10.1016/j.ijantimicag.2020.105950
3. Islahudin F, Ariffin NM, Aziz SA. COVID-19 one year on community response to the new norms among Malaysians. Arch Pharm Pract. 2021;12(4):69-75.
4. Khan TM, Tahir H, Salman M, Mustafa ZU, Raza MH, Asif N, et al. General anxiety predictors among frontline warriors of COVID: cross-sectional study among nursing staff in Punjab, Pakistan. Arch Pharm Pract. 2021;12(2):40-4.
5. Yan Y, Shin WI, Pang YX, Meng Y, Lai J, You C, et al. The first 75 days of novel coronavirus (SARS-CoV-2) outbreak: recent advances, prevention, and treatment. Int J Environ Res Public Health. 2020;17(7):2323. doi:10.3390/ijerph17072323
6. Shereen MA, Khan S, Kazmi A, Bashir N, Siddique R. COVID-19 infection: origin, transmission, and characteristics of human coronaviruses. J Adv Res. 2020;24:91-8. doi:10.1016/j.jare.2020.03.005
7. Baig BM, Abarian A, Baghaei S, Soroush S, Rad SA, Pooromidi S, et al. Assessment of the relationship between ABO blood group and susceptibility, severity, and mortality rates in COVID-19. Entomol Appl Sci Lett. 2021;8(2):32-6.
8. Bahramy MA, Roozdar-Chaleshtary M, Abbasi V, Amiri-Nikpour MR, Moradi-Joo E. Clinical features of guillain-barre syndrome in COVID-19 patients: Aria and Naft private hospitals in Ahvaz, Iran. Entomol Appl Sci Lett. 2021;8(3):21-7.
9. WHO Coronavirus Disease (COVID-19) Dashboard | WHO Coronavirus Disease (COVID-19) Dashboard. Available from: https://covid19.who.int/ (Accessed October 13, 2022).
10. MOH COVID 19 Dashboard: Saudi Arabia. Available from: https://covid19.moh.gov.sa/ (Accessed October 13, 2022).
11. Nguyen BT, Nguyen TT, Le UT. Nomophobia and stress among Vietnamese high school students in Covid-19 pandemic: a mediation model of loneliness. J Biochem Technol. 2022;13(1):34-40.
12. Gross AE, MacDougall C. Roles of the clinical pharmacist during the COVID-19 pandemic. J Am Coll Clin Pharm. 2020;3(3):564-6.
13. CDC Guidance for Pharmacies. Available from: https://www.cdc.gov/coronavirus/2019-ncov/hcp/pharmacies.html (Accessed July 7, 2020).
14. Bukhari N, Rasheed H, Nayyer B, Babar ZU. Pharmacists at the frontline beating the COVID-19 pandemic. J Pharm Policy Pract. 2020;13:8. doi:10.1186/s40545-020-00210-w
15. Ahmad A, Alkharfy KM, Alrabiah Z, Alhossan A. Saudi Arabia, pharmacists and COVID-19 pandemic. J Pharm Policy Pract. 2020;13:41. doi:10.1186/s40545-020-00243-1
16. Cadogan CA, Hughes CM. On the frontline against COVID-19: community pharmacists' contribution during a public health crisis. Res Social Adm Pharm. 2021;17(1):2032-5. doi:10.1016/j.sapharm.2020.03.015
17. The 2020 WPC sector analysis special edition of community pharmacy during the COVID-19 pandemic. Available from: https://www.worldpharmacycouncil.org/research (Accessed November 2020).

18. Strand MA, Bratberg J, Eukel H, Hardy M, Williams C. Community pharmacists' contributions to disease management during the COVID-19 Pandemic. Prev Chronic Dis. 2020;17:E69. doi:10.5888/pcd17.200317
19. Guidelines for Pharmacists and the Pharmacy Workforce. Advisory FIP, updated 26 March 2020 Fip Health Advisory. 2020;(March):0-48. Available from: https://www.fip.org/files/content/priority-areas/coronavirus/COVID-19-Guidelines-for-pharmacists-and-the-pharmacy-workforce.pdf (Accessed October 10, 2022).
20. Pharmacists' Guide to Coronavirus | American Pharmacists Association. Available from: https://www.pharmacist.com/coronavirus (Accessed July 7, 2021).
21. NHS England: Novel coronavirus (COVID-19) standard operating procedure: community health services. Available from: https://www.england.nhs.uk/coronavirus/publication/standard-operating-procedure-covid-19-local-vaccination-services-deployment-in-community-settings/ (Accessed October 7, 2021).
22. The National Center for Disease Prevention and Control. Available from: https://covid19.cdc.gov.sa/ar/home-ar/ (Accessed July 7, 2020).
23. Hess K, Bach A, Won K, Seed SM. Community pharmacists roles during the COVID-19 Pandemic. J Pharm Pract. 2022;35(3):469-76. doi:10.1177/0897190020980626
24. Hasan SS, Kow CS, Zaidi STR. Social distancing and the use of PPE by community pharmacy personnel: Does evidence support these measures? Res Social Adm Pharm. 2021;17(2):456-9. doi:10.1016/j.sapharm.2020.04.033
25. Elbeddini A, Prabaharan T, Almasalkhi S, Tran C. Pharmacists and COVID-19. J Pharm Policy Pract. 2020;13:36. doi:10.1186/s40545-020-00241-3
26. Amariles P, Ledezma-Morales M, Salazar-Ospina A, Hincapié-García JA. How to link patients with suspicious COVID-19 to health system from the community pharmacies? A route proposal. Res Social Adm Pharm. 2021;17(1):1988-9. doi:10.1016/j.sapharm.2020.03.007
27. Atif M, Malik I. COVID-19 and community pharmacy services in Pakistan: challenges, barriers and solution for progress. J Pharm Policy Pract. 2020;13(1):33. doi:10.1186/s40545-020-00240-4
28. Hoti K, Jakupi A, Hetemi D, Raka D, Hughes J, Desselle S. Provision of community pharmacy services during COVID-19 pandemic: a cross sectional study of community pharmacists' experiences with preventative measures and sources of information. Int J Clin Pharm. 2020;42(4):1197-206. doi:10.1007/s11096-020-01078-1
29. Melton BL, Lai Z. Review of community pharmacy services: What is being performed, and where are the opportunities for improvement? Integr Pharm Res Pract. 2017;6:79-89. doi:10.2147/IPRP.S107612
30. Khojah HM. Community pharmacy services and preparedness during COVID-19 outbreak in Madinah, Saudi Arabia. Saudi Pharm J. 2020;28(11):1402-7. doi:10.1016/j.jsps.2020.09.004
31. Bahlol M, Dewey RS. Pandemic preparedness of community pharmacies for COVID-19. Res Social Adm Pharm. 2021;17(1):1888-96. doi:10.1016/j.sapharm.2020.05.009
32. Zheng SQ, Yang L, Zhou PX, Li HB, Liu F, Zhao RS. Recommendations and guidance for providing pharmaceutical care services during COVID-19 pandemic: a China perspective. Res Social Adm Pharm. 2021;17(1):1819-24. doi:10.1016/j.sapharm.2020.03.012