



Original article

Community pharmacy services and preparedness during COVID-19 outbreak in Madinah, Saudi Arabia

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ABSTRACT

Background: Wearing facial masks, hand hygiene, and social distancing are highly recommended preventive measures against COVID-19. Masks and disinfectants are usually sold in community pharmacies that are supposed to undertake extreme precautions to avoid cross infection among clients. It is also their responsibility to play a prominent role in educating the community regarding this outbreak.

Objectives: To investigate the preparedness of private community pharmacies in Madinah, Saudi Arabia, for the COVID-19 outbreak with regard to safety measures, customer education, and quality of preventive aids sold by them.

Methods: One hundred pharmacies were visited by simulated clients. The availability of free hand disinfectants, masks, gloves, and customer educational aids as well as the measures employed to ensure maintenance of safe distances between customers were documented. The adherence of pharmacists and customers to safety precautions and the behavior of pharmacists against violators of regulations were also observed. Finally, the availability and quality of facial masks and hand disinfectants sold by these pharmacies was documented.

Results: Fifty-five pharmacies offered free hand disinfectants but only in three of them all customers used them. Only two pharmacies offered free disposable masks and temperature screening was available in only one pharmacy. Educational aids were found in 31 pharmacies and only 53 pharmacies used visual indicators for social distancing. Violation of wearing masks by pharmacy personnel and customers was seen in 34 and 87 pharmacies, respectively. Social distancing was violated in 64 pharmacies and intervention by staff was seen in only three of them. Finally, facial masks were available for sale in only 35 pharmacies, and in 23 of these, the quality was questionable; hand disinfectants were available in 84 pharmacies, and in 14 of these, the quality was unknown.

Conclusions: Community pharmacies in Madinah were short of registered, high-quality facial masks during the survey. Means to control the transmission of infection inside pharmacies were unsatisfactory. Society has shown poor compliance to preventive measures against COVID-19 infection and the role of community pharmacists in promoting compliance was found to be poor. The study reveals an unsatisfactory level of preparedness of Madinah community pharmacies for the pandemic.

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1. Introduction

The coronavirus disease 2019 (COVID-19) has shocked the world with its rapid spread from China through the continents.

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The pandemic poses a serious threat to public health globally. This highly contagious disease is caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), formerly named as 2019 novel coronavirus (2019-nCoV) (World Health Organization, 2020a). At the time of writing of this manuscript, the total number of confirmed cases worldwide had exceeded 7.5 million and the number of deaths caused by this pandemic were more than 400,000 (World Health Organization, 2020b). Unfortunately, no effective prophylactic or therapeutic agent against this infection has yet been approved and disease management is currently limited to supportive measures and administration of certain promising drugs (Centers for Disease Control and Prevention, 2020a).

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Various preventive aids have been suggested to limit the spread of infection among societies—wearing of facial masks, practicing hand hygiene, and social distancing are among the top recommended measures (Adhikari et al., 2020; Eikenberry et al., 2020; Ma et al., 2020). However, the quality of personal protective equipment, facial masks, and alcohol-based disinfectants plays a major role in this strategy (Cheng et al., 2020; Pecchia et al., 2020).

Masks and hand disinfectants are usually sold in community pharmacies, which are usually highly accessed by the public for obtaining medications and health-related products and information (Hayden and Parkin, 2020; Zheng et al., 2020). Thus, pharmacies are expected to shoulder the responsibility of spreading knowledge about COVID-19 and should promote the use of preventive measures to help communities survive this outbreak (Basheti et al., 2020; Cadogan and Hughes, 2020). In addition, community pharmacies may also help in early detection of the disease by offering body temperature screening service to customers (Amariles et al., 2020; Bukhari et al., 2020). However, pharmacies are also places where people get in close contact owing to the availability of relatively small spaces, and provide a suitable environment for potential transfer of the virus. This demands the exercise of extreme caution, such as maintenance of safe customer-to-customer and customer-to-staff distances, wearing of facial masks by both customers and staff, and the availability of free hand disinfectants at pharmacy entrance (Bahlol and Dewey, 2020; Hasan et al., 2020).

A recent study has revealed an increased number of community pharmacy customers during the COVID-19 outbreak in the United Kingdom with noticeable inappropriate customer behavior regarding protective measures although the majority of pharmacies were strictly practicing these measures (Zaidi and Hasan, 2020). In contrast, an Australian study has reflected that most pharmacists were inadequately aware of proper measures needed for infection control in a community pharmacy setting during the outbreak (Sum and Ow, 2020). The situation appears much worse in the community pharmacies of Pakistan, as the concept of pharmaceutical care was not basically applied in them before the pandemic (Atif and Malik, 2020). Similarly, in Zimbabwe, community pharmacists were found at risk of being infected due to the lack of preventive guidelines and preparedness (Dzingirai et al., 2020). In Saudi Arabia, there is only one type of community pharmacies (also known as private pharmacies). These pharmacies sell both prescription and nonprescription drugs in addition to other health products (Saudi Ministry of Health, 2019). However, searching across multiple search engines did not reveal any study about the preparedness of Saudi community pharmacies during the COVID-19 pandemic.

The first COVID-19 case in Saudi Arabia (population size nearly 35 million) was reported on March 2, 2020. He was a Saudi citizen who came from Iran through Bahrain (Saudi Ministry of Health, 2020a). Since then, the government has taken strict measures to limit the spread of the disease; these include curfew during certain times (ranging from partial to total lockdown) and prohibition of mass gatherings, free treatment and quarantine facilities even for violators of residence, field screening and contact tracing, and spreading of the culture of hygiene and social distancing among citizens and residents, especially when visiting crowded areas (Saudi Ministry of Health, 2020b). The Ministry of Municipal and Rural Affairs has also issued strict instructions to shopping stores, including the application of safe distancing using suitable marks, the provision of free hand disinfectants, the measurement of customers' temperature, and the prevention of entry for customers whose temperatures exceed 38 °C and who do not wear face masks (Saudi Press Agency, 2020a). However, a recent study has reported that the total number of COVID-19 cases in Saudi Arabia has jumped to 1,519 cases (\approx 4:100,000) by the end of March 2020

(Alsofayan et al., 2020). The study has revealed that almost 66% of the cases were between 25 and 55 years of age, while either of those under 25 or more than 55 represented 17% of the cases. The study has also reported that 54.3% of cases were males, 45.7% were females, 53.4% were Saudis, 46.6% were foreigners, and 10.7% have declared being outside the country in the near past. Interestingly, 12.5% of the cases were working in healthcare facilities. Despite the aforementioned efforts to minimize the spread of the pandemic, the countrywide number of confirmed cases has steadily increased to more than 123,000 (\approx 351:100,000) by mid-June 2020 (Saudi Ministry of Health, 2020c). Fortunately, the recovery rate has also increased to more than 67% and the death rate has dropped to as low as 0.8%.

Madinah (population size nearly 1.2 million) is among the top Saudi cities with registered cases of COVID-19. By mid-June 2020, the total number of confirmed cases in Madinah exceeded 11,000 (\approx 917:100,000), the number of patients who recovered from the disease exceeded 9,000, and the number of reported deaths was 67 (Saudi Ministry of Health, 2020c).

The objective of this study was to investigate the preparedness of private community pharmacies in Madinah for COVID-19 with respect to the provision of safe shopping environment to avoid the transmission of infection. In addition, the study also examined the customer education service regarding the outbreak provided by these pharmacies and the availability and quality of preventive aids against the infection sold by them.

2. Methods

The study protocol was approved by the Research Ethics Committee of the College of Pharmacy, Taibah University, Madinah, Saudi Arabia. Selected pharmacies were visited outside the lockdown hours (between 6 am and 3 pm) from April 20 to May 15, 2020 by simulated clients (nine last-year, male pharmacy students), who were trained to follow a standard scenario and complete a standard form after each visit. Each client visited pharmacies in the district of his residence because roaming across the city was not allowed during the study period.

2.1. Selection of pharmacies

Hundred private community pharmacies (28% of a total of 353 pharmacies based on a personal contact with the local Directorate of Health Affairs) from nine major districts of Madinah were selected through convenience sampling. If a pharmacy was found closed, it was replaced by the one nearest to it.

2.2. Precautions for simulated clients

Simulated clients were instructed to wear facial masks during pharmacy visits, use hand disinfectant immediately before entering the pharmacy and immediately after leaving, and to stay at a 2-meter distance from other customers and at least 1-meter distance from the cashier.

2.3. The simulated client scenario

The simulated client entered the pharmacy only when there were at least two other customers. First, the client noted the following:

- The availability of a free hand disinfectant at the pharmacy entrance and whether the pharmacy personnel requested the customers to use it.

- The availability of free facial masks and gloves (as a nonobligatory offer) and whether the personnel invited customers not wearing them to use the free ones.
- The availability of free body temperature screening.
- Whether pharmacy personnel wore facial masks?
- Whether all customers wore masks?
- Presence of visual signs guiding customers to keep suitable interpersonal distances inside the pharmacy.
- Presence of posters or audio/visual educational aids about COVID-19.
- Availability of free printed educational materials about COVID-19.
- Presence of customers or personnel who coughed, sneezed, or seemed to have difficulty in breathing.
- The behavior of personnel with customers who were not wearing masks, were staying close to each other while shopping, staying close to each other at the cashier counter, or were sneezing, coughing, or having difficulty in breathing.

Thereafter, the simulated client checked the brands, quality, and price of facial masks, gloves, and hand disinfectants available at the pharmacy. The availability and price of home delivery service was also checked.

2.4. The survey form

The form contained simple check boxes for all intended observations (based on the current protective regulations) in addition to special spaces for any additional information to be reported. The first page contained the name and location of the pharmacy, the name of the simulated client, and the time and date of the visit to pharmacy. After filling out the form, the client had to give each page a similar code and then remove the first page. The first pages were collected by the leader of the clients and were secured in a sealed envelope to keep the researcher blind to the information in these pages. Finally, all the forms were collected by the leader and submitted to the researcher.

2.5. The quality check

Products were checked for registration codes, brand registration, manufacturers, batch numbers, and ingredients (for hand disinfectants).

2.6. Confidentiality

Personal information of pharmacy staff was not collected. Pharmacy names were kept confidential unless requested by the authorities.

2.7. Data analysis

The survey results were expressed as frequencies and ratios.

3. Results

Six pharmacies were found closed and were, therefore, replaced by the one nearest to each of them. A total of 100 pharmacies were included in the survey. Table 1 summarizes the availability of free preventive and educational aids against COVID-19 in the pharmacies that were visited. In three of the 55 pharmacies that offered free hand disinfectants at their entrance, all customers used them upon request from the pharmacy staff. However, in the remaining pharmacies, some customers used them, and the pharmacy staff was not requesting the customers to do so. Among the four phar-

Table 1
Availability of free preventive and educational aids against COVID-19 and home delivery service in community pharmacies.

Item	Number of pharmacies (out of 100)
Availability of free hand disinfectant at pharmacy entrance	55
Availability of free disposable facial masks at pharmacy entrance	2
Availability of free gloves at pharmacy entrance	25
Availability of free body temperature testing	1
Availability of free printed educational materials about COVID-19	4
Availability of posters or audio/visual educational aids about COVID-19	27
Presence of visual signs guiding customers to keep suitable distances	53
Availability of home delivery service	39

macies that offered free printed educational materials about COVID-19, one offered free temperature testing and one offered free disinfectant, as well. It was also observed that protection screens at dispensing and cashier counters were not installed in all visited pharmacies. This is probably because the current regulations do not necessitate their existence. In pharmacies that offered home delivery, the service was free for purchases exceeding a certain limit. Otherwise, a fixed fee was charged for the service.

The behavior of the pharmacy staff with regard to their adherence to protective measures against COVID-19 is presented in Table 2. It was observed that in 66 pharmacies, all staff members were wearing facial masks whereas in 17 pharmacies only some staff members were wearing the masks. In the remaining 17 pharmacies, none of the staff members was wearing the mask and one of them was coughing.

With regard to the adherence of the customers to the regulations, it was observed that in 12 pharmacies, all customers were wearing facial masks. In one of the two pharmacies that offered free masks at their entrance, only some customers used them, and the personnel did not invite them to use this free service. As evident from the data presented in Table 3, social distancing was violated in 64 pharmacies, either during shopping or at the cashier counter, with 27 incidences of close contact noticed between customers who were not wearing masks. There was one incidence of a customer sneezing without any observed intervention by the pharmacy personnel or other customers. In 23 pharmacies, some customers came with their family members, and in 12 of these, the accompanying family members were children or elderly relatives.

Although some pharmacies offered free hand disinfectants, masks, or gloves for customers, pharmacy personnel were not requesting the customers who were not already wearing masks

Table 2
Behavior of pharmacy staff toward protective measures.

Behavior	Number of pharmacies (out of 100)
All personnel wore masks and gloves	48
Some personnel wore masks and gloves	6
All personnel wore masks only	13
Some personnel wore masks only	8
All personnel wore gloves only	4
Some personnel wore gloves only	0
All personnel wore masks; some of them wore gloves	5
All personnel wore gloves; some of them wore masks	3
None of the personnel wore a mask and gloves	13
Incidence of coughing or sneezing by personnel who were not wearing masks	1

Table 3
Behavior of customers toward protective measures.

Behavior	Number of pharmacies
All customers used the free disinfectant offered by the pharmacy	3/55*
Some customers used the free disinfectant offered by the pharmacy	52/55*
All customers wore masks and gloves	2/100
Some customers wore masks and gloves	37/100
All customers wore masks only	4/100
Some customers wore masks only	16/100
All customers wore gloves only	0/100
Some customers wore gloves only	1/100
All customers wore masks; some of them wore gloves	6/100
All customers wore gloves; some of them wore masks	3/100
None of the personnel wore a mask and gloves	31/100
Incidence of violating social distancing inside the pharmacy by customers	64/100
Incidence of violating social distancing inside the pharmacy by customers who were not wearing masks	27/64
Incidence of coughing or sneezing by customers who were not wearing masks	1/100
Incidence of family or group shopping	23/100

* Free hand disinfectant was offered only by 55 pharmacies.

or gloves to use the free service except in five pharmacies. A negative response of personnel was also observed against customers who were not wearing masks inside pharmacies. Only in one pharmacy, the pharmacist was gently advising non-masked customers to wear them. However, none of the pharmacies prevented non-masked customers from entering. The behavior of pharmacists is depicted in Table 4.

Finally, with regard to the availability of facial masks, gloves, and disinfectants for sale, it was observed that disinfectants were available in most pharmacies ($n = 84$) and at a reasonable price (Table 5). However, the quality of disinfectants in 14 pharmacies could not be ascertained because the ingredients were not listed, and the brands did not look familiar. Facial masks were available for sale only in 35 pharmacies. In 23 of these pharmacies, the quality of disposable, single-use masks were unknown because packages did not bear any registration code. It was also observed that in 25 of the 35 pharmacies, each customer was allowed to buy only a limited number of the disposable masks (not more than 10 in general) and that the price of either high-quality or unknown-quality masks was 3–6-times of the pre-COVID-19 price.

4. Discussion

This observational study aimed at exploring the services provided by community pharmacies in Madinah, Saudi Arabia, a city with high prevalence of COVID-19 cases (compared with other

Table 4
Behavior of pharmacist with regard to the promotion of protective measures.

Item	Number of pharmacies
Requesting customers to use the free hand disinfectant, where available	3/55
Requesting customers to use the free facial masks, where available	0/2
Requesting customers to use the free gloves, where available	2/25
Requesting non-masked customers to wear masks, where violation was observed	1/89
Requesting customers to keep away while shopping and at the cashier counter of the pharmacy, where violation of distancing was observed	3/64

Table 5
Availability and quality of facial masks, disinfectants, and gloves sold by pharmacies.

Item	Number of pharmacies	Notes
Hand disinfectants of registered brands	74/84 ^a	
Hand disinfectants of unknown quality, brands, or registration status	14/84 ^b	Ingredients not listed
Surface disinfectants of registered brands	63/100	
Disposable facial masks of surgical quality of known registered brands	6/35 ^b	Price was 5-times that of pre-COVID-19
Disposable facial masks of unknown brands, quality, or registration status	23/35 ^b	Price was 5-times that of pre-COVID-19
Facial masks of N95 quality of known registered brands.	9/35 ^b	Price was 3–6 times that of pre-COVID-19
Disposable surgical gloves of registered brands	3/100	
Disposable plastic glove of unknown brands or registration status	36/100	

^a Seven pharmacies were selling mixed quality and three pharmacies were selling only unknown-quality disinfectants.

^b Three pharmacies were selling both N95 and unknown-quality masks.

Saudi cities). The sample size of pharmacies in this survey ($n = 100$) is believed to be satisfactory based on a recent study wherein it was reported that the total number of community pharmacies in Madinah is 353 (Khojah, 2019). Community pharmacies are cornerstones in providing medications and health products to the public. In addition, they are always sought by patients for obtaining information related to health (Melton and Lai, 2017). They are accessed by a large number of customers; however, the space in most pharmacies is relatively smaller compared with that available in other shops.

It was observed that nearly all shopping malls and supermarkets in Madinah offered free hand disinfectants and requested all customers to use them. Also, in most of these places, disposable masks are offered to customers who are not already wearing one (Saudi Press Agency, 2020b). These preventive aids are crucial for controlling the spread of infection (Adhikari et al., 2020; Eikenberry et al., 2020; Ma et al., 2020). Many shopping centers in Madinah are also offering free disposable gloves for customers although the use of gloves for the general public is not recommended because they may act as a source of infection after being contaminated (Centers for Disease Control and Prevention, 2020b). In addition, body temperature testing is widely available in marketplaces and other public areas in the city. However, this study revealed an unsatisfactory provision of such services by private community pharmacies in Madinah. Moreover, visual signs that guide customers to stay at proper distances were not available in about half of the pharmacies unlike in almost all other shopping services in the city.

It was supposed that in such a situation of increasing COVID-19 infection rate in Madinah, all pharmacy staff must be strictly undertaking the preventive measures. However, in 36% of all the visited pharmacies, only some personnel in each pharmacy were wearing facial masks, and in 17%, none of the personnel was wearing a mask. A similar non-compliance was observed regarding the wearing of disposable gloves by pharmacy personnel. Although one of the staff in a pharmacy was coughing, no customer or other personnel showed any concern. These observations reflect a lack of seriousness among pharmacy personnel in dealing with this outbreak. This behavior may also convey a misleading message to the public about the seriousness of the situation.

This survey also revealed a negative role of community pharmacies in customer education, particularly regarding the COVID-19

outbreak. The use of posters, audiovisual aids, or printed materials was very limited. In addition, pharmacists were almost careless about the importance of educating the public, as reflected by their nonchalant behavior toward the violators of social distancing inside their pharmacies, and their carelessness in encouraging customers, who were not wearing masks, to use the free hand disinfectants and masks where available. It was reported that most private community pharmacies in Madinah offered free counseling to nonbuyers upon request, although the quality of the information provided was insufficient (Khojah and Abdalla, 2019). However, the situation with COVID-19 is quite different and community pharmacies must spontaneously participate in educating the public. Also, carelessness about social distancing in Madinah private community pharmacies was reported in another study where privacy, in the form of social distancing, was almost absent during patient counseling (Khojah, 2019). This may indicate a perceptual defect about the concept of social distancing among community pharmacists and in the society, as well. It needs to be reiterated that surviving through this pandemic necessitates behavioral changes.

On the other hand, a very low level of customer adherence to the protective measures against COVID-19 was observed in the current study. Customers were almost ignorant to the importance of wearing facial masks, hand hygiene, and social distancing inside small-spaced areas, such as the community pharmacies. In 23% of the visited pharmacies, more than one family member were shopping together, including children and/or elderly in 12 cases. Sneezing by a customer who was not wearing a mask was observed but no action was taken by the pharmacy staff or other customers. The risk of communicating the infection within community pharmacies may increase with this ignorant behavior taking into consideration that some customers may also be asymptomatic carriers of the virus (Lai et al., 2020).

Finally, the survey shows that facial masks were available in only 35% of the visited pharmacies, some of which sell more than one kind of masks. Nevertheless, the quality of masks in most visited pharmacies was questionable. Disposable, single-use masks in nearly 26% of pharmacies that sold them were of kitchen quality as stated on the packages. Also, in about 40% of pharmacies that sold masks, the quality of those single-use masks was either not mentioned or was stated as surgical quality while they looked exactly like the kitchen quality masks. Good quality masks of either surgical quality or N95 were available in 43% of pharmacies that sold masks (15 pharmacies out of the 100 surveyed). However, it was observed that prices of all kinds of facial masks was very exaggerated and ranged from 3 to 6 times their prices before the COVID-19 outbreak. It was also observed that some pharmacies repackage the disposable masks in special bags bearing the names of pharmacies and containing 5–10 masks per package. However, masks in each package were of unknown quality or brand, and in some instances they were of different thickness or number of layers. On the other hand, although hand disinfectants were available in most pharmacies, in 14 of these they were of unknown brands, quality, or ingredients. It is worth mentioning that the Saudi Food and Drug Authority has lately launched an interactive online platform that lists pharmacies selling masks and disinfectants, searchable by city (Saudi Food and Drug Authority, 2020). Unfortunately, when most of the listed pharmacies in Madinah were contacted, masks were not available.

The bottom line is that facial masks were not available in satisfactory amounts in community pharmacies in Madinah and their quality and anti-COVID-19 effectiveness, when available, was largely questionable. This, in addition to the availability of unknown-quality hand disinfectants in some pharmacies, may play a major role in the spread of infection in Madinah. However, the observed carelessness of customers, as well as community phar-

macists, about the application of protective measures against COVID-19 may also have a great effect on the increased rate of infection. The findings of the current study can be generalized to all Saudi cities because more than 65% of the surveyed pharmacies belong to chains distributed all over the country and are supposed to follow a similar theme of service. Lately, the Saudi Ministry of Interior has issued a table listing penalties against the violators of the regulations that aim at limiting the spread of COVID-19. The penalties are against social gathering, not wearing facial masks when in contact of others, and not committing to social distancing and hand hygiene while shopping (Saudi Ministry of Interior, 2020; Saudi Press Agency, 2020c). These penalties also include shops that do not adhere to such regulations. It is highly recommended that the Saudi authorities also take an assertive action to ensure the selling of approved-quality facial masks and hand disinfectants in community pharmacies in Saudi Arabia at reasonable prices. Authorities are also advised to routinely and strictly monitor the adherence of community pharmacies and their customers to the protective regulations against COVID-19. It is also recommended that all pharmacies must install protective screens at dispensing and cashier counters. Finally, the number of pharmacy staff must be increased. It was noticed that in about 62% of the visited pharmacies there were only two personnel (a pharmacist and an assistant). A similar finding was reported in a previous study in Madinah community pharmacies (Khojah, 2019). There must be at least one employee responsible for monitoring customers' compliance with the protective instructions and preventing those who do not wear masks from entering, as well as allowing a limited number of them to enter when crowded. These, in addition to any recommendations emerging during the pandemic, must be firmly applied until the end of the pandemic or in anticipation of any subsequent waves of it.

5. Limitations of the study

Random selection was not feasible because roaming between districts of Madinah was prohibited during certain times of the outbreak. However, the pharmacy sample was satisfactory because more than 70% of the selected pharmacies belonged to chains that have branches in almost all districts of the city and are expected to follow a similar pattern of practice.

6. Conclusions

The study reveals a low level of awareness in the society of Madinah regarding the seriousness of the COVID-19 pandemic. Ignorance of preventive measures, such as wearing of facial masks, hand hygiene, and social distancing, was prevalent among the customers of community pharmacies, as well as among pharmacy staff. A negative response from community pharmacists toward the negligent behavior of the customers was observed and the effect of community pharmacies on community education regarding the outbreak was poor. There was a shortage in the supply of facial masks in the community pharmacies of Madinah and the quality of most of the available masks and some of the hand disinfectants was questionable. Community pharmacies in Madinah may not be satisfactorily prepared for COVID-19. Further and follow-up studies in Madinah and other Saudi cities are recommended.

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Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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