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Community pharmacists' preparedness and responses to COVID-19 pandemic: A multinational study

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Abstract

Background: Community pharmacists play a pivotal role in healthcare worldwide. Their role became more critical during the COVID-19 pandemic. This study aims to investigate the community pharmacists' preparedness and responses to the COVID-19 pandemic and how efficiently they were prepared to contain and prevent the spread of infection.

Methods: An online questionnaire was distributed to community pharmacists in Saudi Arabia, Lebanon, and Jordan through social media platforms. A scoring system was developed to measure their level of adherence to the preventive measures of the global infection.

Results: The total included responses were 800. Around 44% of the pharmacists reported spending less than 15 min/d reading about COVID-19 updates. Although more than half of them were reviewing official sites, 73% of them were also retrieving information through non-official channels. Additionally, almost 35% of them were directly contacting customers without physical barriers, 81% reported encountering infected customers, and 12% wore the same facial masks for more than a day. Moreover, 58% of the pharmacies reported the absence of door signs requesting infected customers to declare the infection, 43% of the pharmacies were not limiting the number of simultaneous customers, and 70% were not measuring customers' temperatures prior to entry. Collectively, the mean total score of applied protective measures was 10.12 ± 2.77 (out of 17).

Conclusion: The level of preparedness of the community pharmacies in these three Middle Eastern countries was not adequate for facing the COVID-19 pandemic. Health authorities in these countries should closely monitor their adherence to the protective guidelines.

1 | INTRODUCTION

The COVID-19 pandemic is a serious global health threat that has claimed the lives of more than two million people worldwide. The rapid global spread of the virus has had a devastating socio-economic impact, apart from the disturbance of international health care systems.[1,2] Current evidence proposes that SARS-CoV-2 is transmitted mainly from person to person through expelled respiratory droplets and less commonly through contact with contaminated surfaces.[3-5] The viability of this virus on surfaces varies according to their type, demanding frequent surface disinfection and sanitation.[6-8] In fact, infected individuals are considered contagious 2 days

before having symptoms and throughout the illness, which draws out the importance of preventing the dissemination of the SARS-CoV-2 infection to mitigate the pandemic.[9]

Historically, during outbreaks, community pharmacists have been the first point of contact for the provision of health care services, and they played a substantial role in containing viral outbreaks. For example, community pharmacists participated in administering the influenza vaccine during the influenza outbreak in the United States of America (USA) during 2014 and 2015.[10,11] During the current COVID-19 pandemic, community pharmacists have also significantly contributed to promoting public health, preventing and managing different medical conditions, ensuring the continuity of patient care and the provision of medications, testing for COVID-19, and advocating for vaccination.[12] Moreover, patients with suspected COVID-19 symptoms usually seek medical help from the most easily accessible health care facilities such as community pharmacies.[13] Therefore, community pharmacists should be appropriately guided and prepared to triage patients presenting with typical and atypical symptoms of COVID-19.[14]

However, the pandemic has created a massive burden on community pharmacists since their professional duties were extended. This is accompanied by the increased pressure of searching for alternative medications since patients often practice medications' stockpiling out of fear of drug shortages in some countries.[15,16] As providers of pharmaceutical services and free consultations, community pharmacists are being directly exposed to the public, which escalates their risk of acquiring the infection, especially since they are assuming their duties during the lockdown period.[17-21] Thus, protective measures should be implemented in pharmacy settings to contain the spread of COVID-19. These procedures include adhering to the protective personal equipment (PPE), frequently disinfecting contact surfaces, and maintaining social distancing. Moreover, community pharmacies should limit the number of clients in the pharmacy, instruct them to wear face masks, screen their temperature before entering, and encounter them through a glass barrier.[21-24] In addition, the use of tele-pharmacy care, which includes the provision of consultations, medication order review, and drug information services, should be encouraged to minimize client visits to the pharmacy, to limit the spread of infection.[25]

The use of dietary supplements for the prevention and treatment of COVID-19 is controversial. Yet recent studies have proven a plausible role of vitamin C, vitamin D, and zinc in preventing acute respiratory tract infections, including COVID-19. These supplements have a safe profile, and their use is warranted among individuals with serum deficiencies and those who are at high risk of acquiring COVID-19.[26-30]

It is worth mentioning that the preparedness and response of the pharmacists to COVID-19 in the Middle Eastern community has not yet been thoroughly investigated. A simulated-client study from Saudi Arabia has shown that community pharmacies were not well prepared during the onset of the outbreak.[31] Hence, the main aim of this study was to gain an insight on the pharmacists' awareness of COVID-19 in the Middle Eastern community, identify the degree of implementing the recommended preventive measures during their daily practice, and to pinpoint the sources of information on which they rely to offer their perceived recommendations to suspected COVID-19 patients.

What's known

- In the Middle East, in addition to providing patients with medications, community pharmacists play a crucial role in providing initial scientific-based health-related information, consultations, and referring patients to physicians.
- The role of community pharmacists was further exacerbated by the COVID-19 pandemic where they were at the frontline combating SARS-CoV-2.
- This has posed an increased burden and exposure of community pharmacists to the virus which prompts adequate adaptation of preventive methods to minimize the risk.
- Therefore, our study aims to evaluate the implementation of preventive methods, preparedness, and responses of the Middle Eastern community pharmacists during the COVID-19 pandemic.

What's new

- In the literature, there is scanty evidence describing the preparedness of the community pharmacists to respond to the current COVID-19 pandemic.
- This paper is the first to investigate thoroughly the preparedness and responses of the Middle Eastern community pharmacists.
- In a survey of 800 community pharmacies, pharmacists were found to inadequately implement the infection preventive measures during their practice, and to inappropriately provide recommendations to patients with suspected COVID-19.
- This reflects a low level of awareness among the practicing pharmacists. I believe that this paper will be of interest to the readership of your journal because the findings should be relevant in reviewing the compliance to protective regulations in the healthcare sector.
- It will also alert policymakers (MOH, OPL, JPA) to support community pharmacists in preventing community transmission, as well as protecting pharmacy personnel.

2 | METHODS

2.1 | Study design

This was an observational cross-sectional study that was conducted during November and December 2020. A self-administered

questionnaire was distributed to community pharmacists informally, as only groups on social media platforms were used. These groups included practicing community pharmacists in Lebanon, Jordan, and Saudi Arabia. The shared link to the questionnaire was posted once daily throughout the study period.

2.2 | Questionnaire development and structure

The questionnaire was revised after it was validated by academics in pharmacy and after being piloted on a sample of 25 pharmacists that were excluded from the total sample. It consisted of four parts: (a) socio-demographic information and pharmacy characteristics (ie, size, number of staff members per shift, number of clients per day, methods of encountering patients, and methods of handling prescriptions); (b) the adopted preventive measures by pharmacists (ie, PPE, hygiene and disinfection practices, frequency of face mask change, the intake of dietary supplements, and previous influenza vaccination) and information about client-directed infection control procedures (ie, limiting the number of clients in the pharmacy, screening clients' body temperature, and offering free hand sanitizers for patients' use at the entrance and counter areas); (c) the information resources utilized by the pharmacist and time spent to retrieve COVID-19-related updates; and (d) the perceived recommendations for suspected COVID-19 patients.

2.3 | Data analysis

Completed questionnaires were analyzed by the Statistical Package for the Social Sciences (SPSS®, International Business Machines Corp., Armonk, New York, USA) software version 24. Frequencies and ratios were used for categorical variables and mean ± standard deviation for continuous variables of descriptive data. Also, the Shapiro-Wilk test was used for testing all continuous variables for normality before statistical comparisons. In addition, the association between the degree of preventive measures implemented with the independent variables was tested by Kruskal-Wallis and Mann-Whitney *U* tests. The significance level was set at $P \leq .05$ with a confidence interval (CI) of 95%.

2.4 | The preventive measures score

A score ranging from 0 to 17 was used to count the degree of preventive measures practiced by the community pharmacists, where one mark was counted for each adopted measure of the following: wearing a facemask, frequent handwashing, using sanitizers regularly, disinfecting surfaces and cash, washing white coats frequently, applying a social distancing strategy, avoiding face touch, taking vitamin C, taking zinc, taking vitamin D, receiving this year's flu vaccine, placing a door sign to instruct patients to wear a facemask prior to entering, posting a door sign to inform patients to alert the staff if they are experiencing COVID-19 symptoms, offering free hand sanitizers for patients' use, screening patients' body temperature before entering, limiting the number of clients in the pharmacy, and encountering patients through a physical barrier (either a plexiglass barrier or a dispensing window).

2.5 | Appropriateness of pharmaceutical care

Community pharmacists encountering a patient with typical symptoms of COVID-19 should optimally recommend the patient do a polymerase chain reaction (PCR) test.[32] Pharmacists were asked about the primary perceived recommendation to provide when encountering a patient with a suspected COVID-19 infection. Accordingly, the response was considered appropriate when advising the patient to do a PCR test.

2.6 | Ethical considerations

Guidance from the World Medical Association Declaration of Helsinki was followed in designing and conducting this study. The study protocol was approved by the Institutional Review Board, King Abdullah University Hospital, Jordan University of Science and Technology, Irbid, Jordan (No. 2020-0833). Pharmacists were requested at the beginning of the study form to approve their participation. The purpose of the study was clearly stated, and they had the right to defer from submitting their response at any time. Confidentiality, anonymity, and non-traceability were strictly maintained.

3 | RESULTS

The study included 800 community pharmacists who participated voluntarily from three Arab countries, of whom 115 (14.4%) were from Saudi Arabia, 424 (53%) from Lebanon, and 261 (32.6%) from Jordan. The estimated numbers of community pharmacists practicing in Lebanon, Jordan, and Saudi Arabia are 3762, 8419, and 8214, respectively.[33-35] The participants' socio-demographic information and pharmacy characteristics in the selected countries are presented in Table 1.

Less than half of the pharmacists (354, 44.3%) have reported reading about COVID-19 for less than 15 minutes per day, whereas 251 (31.4%) reported spending 15-30 minutes, 122 (15.3%) reported >0.5-2 hours, and 73 (9%) denied getting any COVID-19 related updates. For the sources of information, the most sought were the websites of health authorities (521, 65.1%), the World Health Organization (456, 57%), and pharmacy colleagues (336, 42%). In addition, social media, TV/radio, the Centers for Disease Control and Prevention (CDC), and the Infectious Disease Society of America website were sought by 312 (39%), 268 (33.5%), 252 (31.5%), and 111 (13.9%), respectively.

TABLE 1 Participants' socio-demographics and pharmacy characteristics among countries (N = 800)

Factors	Total N (%)[a]	Lebanon 424 (53)[b]	Jordan 261 (32.6)[b]	Saudi Arabia 115 (14.4)[b]
Age (y, mean = 32 ± 9.8)				
22-30	481 (60.1)	303 (63)	132 (27.4)	46 (9.6)
31-40	172 (21.5)	57 (33.1)	81 (47.1)	34 (19.8)
41-50	90 (11.3)	34 (37.8)	36 (40)	20 (22.2)
>50	57 (7.1)	30 (52.6)	12 (21.1)	15 (26.3)
Sex				
Male	357 (44.6)	126 (35.3)	136 (38.1)	95 (26.6)
Female	443 (55.4)	298 (67.3)	125 (28.2)	20 (4.5)
Pharmacy ownership				
Owner	191 (23.9)	129 (67.5)	51 (26.7)	11 (5.8)
Employee	609 (76.1)	295 (48.4)	210 (34.5)	104 (17.1)
Academic degree				
Bachelor	558 (69.8)	303 (54.3)	172 (30.8)	83 (14.9)
PharmD	148 (18.5)	82 (55.4)	45 (30.4)	21 (14.2)
Masters	84 (10.5)	36 (42.9)	40 (47.6)	8 (9.5)
PhD	10 (1.3)	3 (30)	4 (4)	3 (3)
Experience (y, mean = 8.3 ± 8.6)				
<5	397 (49.5)	257 (64.7)	101 (25.4)	39 (9.8)
5-10	187 (23.4)	85 (45.5)	83 (44.4)	19 (10.2)
11-15	72 (9)	23 (31.9)	27 (37.5)	22 (30.6)
16-20	49 (6.1)	13 (26.5)	22 (44.9)	14 (28.6)
>20	95 (11.9)	46 (48.4)	28 (29.5)	21 (22.1)
Pharmacy location				
City	599 (74.9)	272 (45.4)	224 (37.4)	103 (17.2)
Rural	201 (25.1)	152 (75.6)	37 (18.4)	12 (6)
Average size of the pharmacy				
Small (32-70 m^2)	249 (31.1)	128 (51.4)	93 (37.3)	28 (11.2)
Medium (71-100 m^2)	378 (47.3)	198 (52.4)	127 (33.6)	53 (14)
Large (>100 m^2)	173 (21.6)	98 (56.6)	41 (23.7)	34 (19.7)
Number of staff present at the same time per duty shift (mean = 2.4 ± 1.2)				
1	186 (23.3)	124 (66.7)	49 (26.3)	13 (7)
2	315 (39.4)	148 (47)	128 (40.6)	39 (12.4)
3	163 (20.4)	73 (44.8)	61 (37.4)	29 (17.8)
4	50 (6.3)	17 (34)	14 (28)	19 (38)
≥5	86 (10.8)	62 (72.1)	9 (10.5)	15 (17.4)
Method of encountering patients				
Direct contact (person to person)	277 (34.6)	32 (11.6)	171 (61.7)	74 (26.7)
From behind a plexi-glass barrier	419 (52.4)	305 (72.8)	74 (17.7)	40 (9.5)
Through the dispensing window	104 (13)	87 (83.7)	16 (15.4)	1 (1)
Method of handling prescriptions[c]				
Directly from the patient	597 (74.6)	338 (56.6)	156 (26.1)	103 (17.3)
Using disposable gloves	318 (39.8)	99 (31.1)	148 (46.5)	71 (22.3)
Electronically	101 (12.6)	13 (12.9)	56 (55.4)	32 (31.7)

(Continues)

TABLE 1 (Continued)

Factors	Total N (%)[a]	Lebanon 424 (53)[b]	Jordan 261 (32.6)[b]	Saudi Arabia 115 (14.4)[b]
Number of clients encountered per day				
0-10	32 (4)	15 (46.9)	7 (21.9)	10 (31.3)
11-20	97 (12.1)	47 (48.5)	38 (39.2)	12 (12.4)
21-30	142 (17.8)	63 (44.4)	73 (51.4)	6 (4.2)
31-40	127 (15.9)	65 (51.2)	53 (41.7)	9 (7.1)
41-50	137 (17.1)	78 (56.9)	35 (25.5)	24 (17.5)
51-100	265 (33.1)	156 (58.9)	55 (20.8)	54 (20.4)
Average time spent in the pharmacy per day				
<5 h	76 (9.5)	49 (64.5)	17 (22.4)	10 (13.2)
5-8 h	476 (59.5)	269 (56.5)	188 (39.5)	19 (4)
>8 h	248 (31)	106 (42.7)	56 (22.6)	86 (34.7)
COVID-19 patients encountered during practice				
No	153 (19.1)	70 (45.8)	27 (17.6)	56 (36.6)
Yes	647 (80.9)	354 (54.7)	234 (36.2)	59 (9.1)

[a]Percentages for the columns.

[b]Percentages for the row.

[c]As multiple responses were given, numbers do add up to 800.

Table 2 presents the preventive measures implemented by pharmacists during their duty shifts. Interestingly, although the surveyed community pharmacies belong to the private sector, 72 pharmacies reported receiving governmental support such as PPE, of which 35 (48.6%) were Jordanian, 25 (34.7%) were from Saudi Arabia, and 12 (16.7%) were Lebanese. The most adopted preventive measures by pharmacists included maintaining social distancing (708, 88.5%), avoiding face touch (636, 79.5%), frequent use of sanitizers (691, 86.4%), disinfecting contact surfaces (453, 56.6%), and regular hand washing with soap and water (576, 72%). Most of the participants stated they wore surgical facemasks (626, 78.3%), whereas other types of protectors were less adopted. Eleven pharmacists (1.4%), however, reported not using any PPE. The frequency of changing/washing the facemask among participants varied from once (339, 42.5%), twice (227, 28.4%), to thrice daily (140, 17.5%), while the remaining pharmacists (94, 11.8%) reported using the same facemask for more than a day without changing/washing it, which is against the recommendations. Over one third of the participants took daily vitamin C (42.3%), daily zinc (26.1%), and vitamin D regularly (35.8%).

Although only 240 (30%) pharmacies reported measuring the patient's body temperature prior to entering the pharmacy, 336 (42%) reported placing a sign requesting the patients having COVID-19 symptoms to alert the pharmacy staff. Also, a total of 672 (84%) pharmacies posted a sign at the entrance requesting the customers to wear facemasks before entering, and a significant number of participants 698 (87.3%) reported providing free hand sanitizers for patients at the entrance and counter areas.

Table 3 summarizes the association between various factors and the score of the preventive measures which were implemented. The mean score was 10.12 ± 2.77 (out of 17), ranging from 2 to 17, where pharmacists in Saudi Arabia have scored the highest (11.03 ± 2.56, $P < .001$). Female pharmacists were more commonly adhering to the preventive measures than males (10.38 ± 2.68 and 9.8 ± 2.85, respectively, $P = .004$). Also, pharmacy owners were also more likely to apply more preventive measures than employees (10.66 ± 2.93 and 9.95 ± 2.7, respectively, $P = .002$), and pharmacists who were older than 40 years were also more devoted to the measures than younger ones (10.79 ± 3.17 and 9.97 ± 2.65, respectively, $P = .001$). Results have also shown that pharmacies with three or more staff members per duty shift were more commonly adherent than those with one or two pharmacists per shift (10.49 ± 2.55 and 9.90 ± 2.87, respectively, $P = .003$). In addition, a significant increase in the number of adopted protective measures was noticed in pharmacies with 51-100 clients per day compared with those with ≤50 clients (10.70 ± 2.50 and 9.83 ± 2.85, respectively, $P = .001$). Moreover, respondents working in small or medium-sized pharmacies were less likely to apply more preventive measures than those in large ones (9.86 ± 2.86, 10.11 ± 2.78, 10.52 ± 2.59, respectively, $P = .037$). It was also shown that participants who spent around 30 minutes or less per day reading about COVID-19 were less likely to adhere to preventive measures compared with those who consumed more time (9.95 ± 2.73 and 11.06 ± 2.82, respectively, $P < .0001$).

Participants have reported using a variety of facemasks, where the surgical ones were the most used (626, 55%) followed by N-95 (240, 21.1%) and fabric masks (123, 10.8%). Surgical masks were mostly used in Lebanon (383, 61.2%), while the N-95 mask use was more common in Jordan (139, 57.9%) and infrequent in Lebanon (80, 33.3%). Finally, with regard to social distancing, it was less likely to be practiced in small pharmacies (odds ratio [OR] = 0.57, CI = 0.35-0.92, $P = .02$).

Pharmacists were asked about the primary action taken when dealing with a suspected COVID-19 patient (Figure 1), for which

TABLE 2 Preventive measures adopted by the community pharmacists (N = 800)

Factors	Total N (%)[a]	Lebanon 424 (53)[b]	Jordan 261 (32.6)[b]	Saudi Arabia 115 (14.4)[b]
Self-directed infection control measures				
Personal protective equipment[c]				
Surgical facemask	626 (78.3)	383 (61.2)	166 (26.5)	77 (12.3)
N-95 facemask	240 (30)	80 (33.3)	139 (57.9)	21 (8.8)
Fabric facemask	123 (15.4)	27 (22)	44 (35.8)	52 (42.3)
Face shield	148 (18.5)	84 (56.8)	48 (32.4)	16 (10.8)
None of the above	11 (1.4)	10 (90.9)	1 (9.1)	0 (0)
Disinfection and hygiene[c]				
Frequent handwashing with soap and water	576 (72)	324 (56.3)	181 (31.4)	71 (12.3)
Frequent use of sanitizers	691 (86.4)	377 (54.6)	208 (30.1)	106 (15.3)
Frequent surfaces and cashier area disinfection	453 (56.6)	278 (61.4)	107 (23.6)	68 (15)
Frequent white-coat washing	298 (37.3)	162 (54.4)	72 (24.2)	64 (21.5)
None of the above	16 (2)	5 (31.3)	9 (56.3)	2 (12.5)
General preventive measures[c]				
Maintaining at least 1.5-2 m apart from others	708 (88.5)	388 (54.8)	216 (30.5)	104 (14.7)
Avoiding touching eyes, nose, and mouth	636 (79.5)	359 (56.4)	193 (30.3)	84 (13.2)
Taking vitamin C on a daily basis	338 (42.3)	170 (50.3)	114 (33.7)	54 (16)
Taking zinc on a daily basis	209 (26.1)	81 (38.8)	92 (44)	36 (17.2)
Taking vitamin D regularly	286 (35.8)	153 (53.5)	89 (31.1)	44 (15.4)
None of the above	9 (1.1)	2 (22.2)	5 (55.6)	2 (22.2)
Frequency of facemask change/wash				
Once daily	339 (42.5)	211 (62.2)	98 (28.9)	30 (8.8)
Twice daily	227 (28.4)	133 (58.6)	54 (23.8)	40 (17.6)
Three times daily	140 (17.5)	63 (45)	39 (27.9)	38 (27.1)
Using it for more than 1 d	94 (11.8)	17 (18.1)	70 (74.5)	7 (7.4)
Received flu vaccine this year				
No	610 (76.3)	337 (55.2)	204 (33.4)	69 (11.3)
Yes	190 (23.8)	87 (45.8)	57 (30)	46 (24.2)
Client-directed infection control measures				
Presence of a door sign requesting patients to wear facemasks prior to entrance				
No	128 (16)	76 (59.4)	52 (40.6)	0 (0)
Yes	672 (84)	348 (51.8)	209 (31.1)	115 (17.1)
Presence of a door sign requesting patients to alert the pharmacy staff if they are experiencing COVID-19 symptoms				
No	464 (58)	207 (44.6)	184 (39.7)	73 (15.7)
Yes	336 (42)	217 (64.6)	77 (22.9)	42 (12.5)
Pharmacies limiting the number of clients present at one time in the pharmacy				
No	347 (43.4)	166 (47.8)	148 (42.7)	33 (9.5)
Yes	453 (56.6)	258 (57)	113 (24.9)	82 (18.1)
Measuring the patient's body temperature before entering				
No	560 (70)	336 (60)	196 (35)	28 (5)
Yes	240 (30)	88 (36.7)	65 (27.1)	87 (36.3)
Free hand sanitizers at the entrance and counter areas				
No	102 (12.8)	60 (58.8)	37 (36.3)	5 (4.9)
Yes	698 (87.3)	364 (52.1)	224 (32.1)	110 (15.8)

[a]Percentages for the columns.

[b]Percentages for the row.

[c]As multiple responses were given, numbers do add up to 800.

TABLE 3 The score of implemented preventive measures by pharmacists and its association with different factors (N = 800)

Factors	Score (out of 17) of total implemented preventive measures (mean ± SD)	Mann-Whitney *U* test	Kruskal-Wallis test	*P* value
Country		—	56.07	<.0001*
Lebanon	10.52 ± 2.55			
Jordan	9.07 ± 2.9			
Saudi Arabia	11.03 ± 2.56			
Sex		69702.5	—	.004*
Male	9.8 ± 2.85			
Female	10.38 ± 2.68			
Pharmacy ownership		49615.5	—	.002*
Owner	10.66 ± 2.93			
Employee	9.95 ± 2.7			
Age (y)		39,630	—	.001*
22-40	9.97 ± 2.65			
>40	10.79 ± 3.17			
Experience		31,700	—	.004*
<5 y	10.2 ± 2.62			
≥5 y	9.45 ± 2.74			
The average number of clients per day		39,630	—	.001*
≤50	9.83 ± 2.85			
51-100	10.70 ± 2.50			
Time spent in pharmacy per day		—	22.32	<.0001*
<5 h	10.41 ± 2.6			
5-8 h	9.76 ± 2.77			
>8 h	10.73 ± 2.71			
The average size of the pharmacy		—	6.61	.037
Small (32-70 m^2)	9.86 ± 2.86			
Medium y	10.11 ± 2.78			
Large (>100 m^2)	10.52 ± 2.59			
Number of staff present per duty shift		65,618	—	.003*
1-2	9.90 ± 2.87			
≥3	10.49 ± 2.55			
Time spent per day to retrieve information about COVID-19		31499.5	—	<.0001*
≤30 min	9.95 ± 2.73			
>30 min	11.06 ± 2.82			
COVID-19 patients encountered during practice		47,348	—	.40
No	10.26 ± 2.88			
Yes	10.09 ± 2.75			

*Statistically significant ($P \leq .05$).

the majority (493, 61.6%) responded that they would recommend performing the PCR test. Lebanese pharmacists (OR = 1.67, CI = 1.21-2.31, $P < .001$), females (OR = 1.41, CI = 1.06-1.87, $P = .02$), and young participants aging between 22 and 40 years (OR = 1.65, CI = 1.15-2.37, $P = .01$) were more likely to provide the most appropriate recommendation. In contrast, participants who work more than 8 hours per day (OR = 0.48, CI = 0.35-0.65, $P < .001$), and pharmacists who encounter patients directly without a glass barrier (OR = 0.63, CI = 0.47-0.85, $P < .001$) have provided less appropriate recommendations, such as taking over-the-counter medications. Finally, pharmacists encountering COVID-19 patients during their practice were also more commonly instructing patients to do the PCR test (OR = 1.58, CI = 1.17-2.12, $P < .001$).

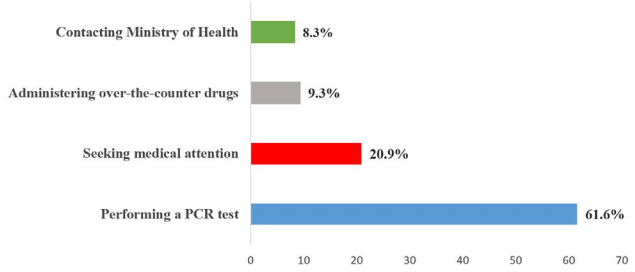

FIGURE 1 Pharmacists perceived recommendation for suspected COVID-19 patients (N = 800)

4 | DISCUSSION

On November 13, 2020, the CDC issued a guiding statement for community pharmacists and pharmacy technicians to appropriately respond to COVID-19. This guidance displays the recommended strategies and preventive measures to tackle COVID-19 that should be implemented into pharmacy operations to minimize the occupational risk of exposure to SARS-CoV-2 and to reduce the risk of patients and staff acquiring the infection.[21] Besides, applying adequate and sufficient practices improves the patients' and health professionals' perception of the pharmacy profession.[36]

Since the onset of the outbreak, community pharmacists have been involved not only in the provision of medications and COVID-19 preventive supplements and medical equipment supplies, but also in raising public awareness and education about COVID-19.[36] For the latter to be attained, the pharmacist should have solid background information on COVID-19. In this study, the greater proportion of community pharmacists spent less than 15 minutes per day to obtain information about COVID-19, which might be due to their overwhelming duties, particularly during the lockdown period. In fact, this might affect the quality, precision, and accuracy of information provided to the public, which is essential for combating COVID-19.[37] Interestingly, more than 73% of the community pharmacists relied on traditional media and social network platforms as a source of information about COVID-19. This finding corroborates recent studies about COVID-19-related information among pharmacists and exhibits the importance of the social network and traditional mass media in information delivery.[38,39]

However, pharmacists need to rely on professional and official medical information to acquire adequate knowledge about COVID-19 that supports them in educating the public without spreading incorrect and misleading information. In Taiwan, for example, health care providers have received COVID-19 updates through formal training sessions. This method has not only provided reliable information to the health care providers but also enhanced their self-confidence when forwarding the information to the community.[38] On the other hand, health care providers in China, who were not guided and exposed to COVID-19 information in a proper way, had higher levels of anxiety and depression.[40] In our study, it was evident that pharmacists in Saudi Arabia and Jordan are significantly relying on governmental websites, which is considered as a good indicator of the trust in national health care systems in these countries.

Although pharmacists in Saudi Arabia have significantly scored higher than the other countries regarding adherence to infection preventive measures, the overall score for the three countries was generally slightly higher than the average score for the scale used. This indicates that most community pharmacies in these countries did not undertake sufficient protective actions to protect pharmacy staff and customers from COVID-19. This was supported by a recent study from Saudi Arabia, where social distancing, wearing facial masks, and other protective measures were violated by community pharmacies despite the strict directives from the government.[31] It is essential to distinguish the several challenges that act as barriers restraining the adoption of precautionary measures. Even though these challenges do not apply to Saudi Arabia, they may include the absence of effective national policies, the lack of resources and funds including the high cost of applying the measures, and the declined income of pharmacists in Jordan and Lebanon.[36,41] However, pharmacists should recognize that these measures provide a safe environment for staff and customers and ensure the continuity of their role in addressing the current global health crisis.[36] It was also found, in the current study, that pharmacists older than 40 years were significantly more adherent to the measures than younger ones. This might be due to the fact that age increases the risk for severe illness from COVID-19 (eg, hospitalization, intensive care unit admission, ventilator requirement, or death).[42]

When encountering patients with typical COVID-19 symptoms, performing a PCR test was mostly recommended by both Lebanese and Jordanian pharmacists. This could be explained by the larger percentage of pharmacists encountering such patients in both countries compared with Saudi Arabia. On the other hand, in the latter country, community awareness of this test is high because it is widely and freely available for the public, and anyone can set an online appointment for it anytime (usually through the smartphone application).[43] It was also found that participants who worked more than 8 hours, and those who encountered many clients per day, were providing inappropriate recommendations. This might be due to the work overload, exhaustion, and stress during the lockdown period, which can be diminished by having enough personnel to divide the required tasks.

Finally, our current study is associated with some limitations. A self-administered online questionnaire was used to collect the data, which would probably demonstrate results that do not reflect the actual behavior of pharmacists. However, this was found as the most convenient method available for data collection during the pandemic. Another potential limitation to this non-probability sampling method is that our findings may not be extrapolated to all Arab countries in the Middle East, where national regulations and pharmacy practice during the COVID-19 outbreak may vary from one country to another. Also, it is worth noting that this study was conducted when the outbreak was at its peak in the Middle East, when community pharmacies were targets for pharmaceutical care due to the fear

of visiting hospitals. This overload on community pharmacists may have greatly affected their responses.

5 | CONCLUSION

Within this study, the performance of community pharmacies in Jordan, Saudi Arabia, and Lebanon during the COVID-19 outbreak was inadequate regarding the application of infection prevention measures. Health authorities in these countries are advised to strengthen surveillance and monitoring activities to ensure better adherence to the regulations. Furthermore, simulated-patient research to evaluate the actual behavior of community pharmacists and the extent to which they are implementing the infection control measures are highly recommended.

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DISCLOSURE

The authors declare no conflicts of interest.

DATA AVAILABILITY STATEMENT

The dataset presented in this article is available only upon reasonable request, since it contains confidential information. Requests to access the datasets should be directed to the first author (r.itani@bau.edu.lb).

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