Gharaibeh L, Alameri MA, Sibai OA, Alfreahat S, Saeed F, Al Badran M, Al-Qaisi A. Practices, knowledge, and attitudes of community pharmacists towards dispensing drugs during the COVID-19 pandemic: A cross sectional study from Jordan. Pharmacy Practice 2022 Jul-Sep;20(3):2692.

https://doi.org/10.18549/PharmPract.2022.3.2692

Original Research

Practices, knowledge, and attitudes of community pharmacists towards dispensing drugs during the COVID-19 pandemic: A cross sectional study from Jordan

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Received (first version): 20-Jun-2022 Accepted: 18-Jul-2022 Published online: 06-Aug-2022

Abstract

Background: Pharmacists have an important role in providing correct information, education, and counseling to the public during the COVID-19 pandemic and other health crisis. In order to perform their duties in a correct manner, they must receive adequate and evidence-based information from official resources. **Objectives:** The objectives of the study were to examine the practices of community pharmacists towards dispensing drugs during the COVI-19 pandemic and assess their knowledge concerning the safety and efficacy of these drugs in managing the COVID-19 infection. **Methods:** This was a web-based cross-sectional study conducted through the distribution of the questionnaire via the social media through a google form. The drugs examined were azithromycin, hydroxychloroquine, dexamethasone, and certain antiviral drugs. **Results:** A total of 485 community pharmacists responded to the questionnaire. Pharmacists dispensed these medications based on the physician's orders, 420 (86.6%), according to the pharmacist´s recommendations 327 (67.4%), or upon patient´s request 278 (57.3%). Azithromycin was the most dispensed drug and two thirds of the pharmacists dispensed drugs more than 10 times. Community pharmacists did not possess adequate knowledge concerning the effectiveness and safety of the drugs in the management of COVID-19 infection. In the multivariate linear regression analysis; education, type of university, and the average number of daily customers were statistically significant, p values: 0.004, 0.002, and 0.016, respectively. Pharmacists did not have a positive attitude towards dispensing drugs based on their own recommendations. More than half of the pharmacists agreed that they thought it was a correct decision to give these drugs based on their own judgment. **Conclusion:** Community pharmacists should not receive information from non-official sources. Strict regulations and implementation of disciplinary actions against pharmacists that dispense prescription only drugs based on their medical judgment are necessary to stop this illegal behavior. A proactive role demonstrated by the pharmacists and based on scientific facts will reduce misconceptions and hazardous behavior of self-medication using prescription only drugs based on rumors and fictitious news.

Keywords: COVID-19; pandemic; community pharmacist; knowledge; attitude; practice; azithromycin; hydroxychloroquine; antibiotic

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INTRODUCTION

Coronavirus disease 2019 (COVID-19) is a novel coronavirus that was discovered in Wuhan, China in December 2019.[1] It is associated with symptoms that range from mild to moderate and can cause severe illness and death.[2] Symptoms such as cough, fever, shortness of breath., and muscle pain generally start 2 to 14 days after exposure to the virus.[3] Cough, fever, and shortness of breath are all common symptoms. Weakness, malaise, respiratory difficulty, muscle pain, sore throat, and loss of taste and/or smell are among the other symptoms mentioned.[4] Treatment of covid 19 infection is multifaceted and depends on the different phases of COVID-19. Management consists of supportive care, including supplemental oxygen and mechanical ventilatory support, remdesivir, corticosteroids, and monoclonal antibodies.[5] According to Centers for Disease Control and Prevention , certain antiviral medications and monoclonal antibodies have been given emergency use authorizations by the U.S. Food and Drug Administration to treat mild to moderate COVID-19 in persons who are more prone to get severely sick.[6] Antiviral medications include the oral antivirals; Nirmatrelvir with ritonavir (Paxlovid), and Molnupiravir (Lagevrio), which should be started within 5 days of initial symptoms. Remdesivir (Veklury) through intravenous (IV) infusions, should be started within 7 days

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of initial symptoms. Bebtelovimab is a monoclonal antibody therapy that is given as a single IV injection and should be given within 7 days of initial symptoms.[6] Multiple randomized trials demonstrated that systemic corticosteroids improved clinical outcomes and reduced mortality in hospitalized COVID-19 patients who needed supplementary oxygen.[7,8] There is no evidence that systemic corticosteroids can be used in COVID-19 patients who are not hospitalized.[6] Azithromycin has in vitro antiviral activity, it exerts anti-inflammatory properties through the suppression of inflammatory cytokines such as IL-1beta and IL-2, and TNF.[9,10] Many clinical studies were conducted to evaluate the efficacy of azithromycin in covid 19 infection. A large, randomized trial was conducted in the United Kingdom to assess the effects of azithromycin versus usual care on 28-day mortality, duration of hospital stays or admissions to the intensive care unit. There were no differences between the two arms of the study.[11] Hydroxychloroquine is another drug that was also studied as a possible candidate for the treatment of corona virus. In vitro, azithromycin and hydroxychloroquine revealed synergistic effect against human coronaviruses.[12] Consequently many studies, including large randomized clinical trials, were performed to investigate the role of these drugs and found no benefits of hydroxychloroquine, either alone or in combination with azithromycin in COVID-19 hospitalized patients.[13-16] In addition, no clinical benefits were observed in non-hospitalized patients with early, asymptomatic, or mild COVID-19 for hydroxychloroquine[17] and azithromycin.[18]

The COVID-19 Treatment Guidelines Panel in the National Institutes of Health recommends against the use of chloroquine or hydroxychloroquine and/or azithromycin for the management of COVID-19 in both hospitalized and non-hospitalized patients.[6]

Based on previous results, azithromycin and hydroxychloroquine have no benefits in the hospitalized or community setting of covid 19 infection. One argument for the use of azithromycin is the secondary bacterial infection after corona virus. In a meta-analysis that included 24 studies, bacterial co-infection was identified in only 3·5% of patients with covid 19, which renders the use of an antibiotic such as azithromycin irrational.[19] Despite all the previous evidence on the lack of efficacy of azithromycin and hydroxychloroquine, news on their potential benefits and the conduction of trials examining their effects attracted public attention and led to self-medication of these prescription drugs hydroxychloroquine.[20] Hoarding and self-medication by the public led to shortages and affected patients who needed them for the right medical conditions.[21] Furthermore, the safety of these drugs, as mentioned earlier, is of concern. Some of the serious side effects of hydroxychloroquine are toxic retinopathy[22] and prolonged QTc interval.[23]

The role of the pharmacist in providing appropriate information to the physicians and the public, especially in a health crisis is of great importance. However, pharmacists cannot provide appropriate, evidence-based information if they do not possess appropriate knowledge and positive attitudes. Many studies evaluated the knowledge and attitudes of the pharmacists in the Middle East and Jordan, but the approach was general and did not focus on drugs that were known among the public and pharmacists as candidates for COVID-19 treatment, but extensive research proved them ineffective. In this study we evaluated the knowledge, attitude, and practices of community pharmacists in Jordan regarding dispensing drugs that were commonly known in Jordan (and globally) as possible candidates for managing COVID-19 in non-hospitalized patients. These drugs are azithromycin, hydroxychloroquine, dexamethasone, and certain antiviral drugs.

METHODS

This was a web-based cross-sectional study conducted through the distribution of the questionnaire via social media through a google form. The institutional review board approval from Amman Al-Ahliyya university was obtained before starting the study. An attached cover letter that explained the aims and importance of the study and guaranteed the confidentiality and anonymity of the collected data was attached at the beginning of the questionnaire. The questionnaire would only open if the pharmacists agreed to participate.

Inclusion criteria: Pharmacists with at least a bachelor's degree in pharmacy and with at least one year experience of working in a community pharmacy (to ensure practice during the COVID 19 pandemic) were asked to participate in the study.

Development of the questionnaire

The questionnaire was developed and written in the English language after thorough and comprehensive literature review. The self-developed questionnaire was constructed based on the information that must be collected to achieve the aims and objectives of the study. The questionnaire included four sections: demographic and social data, knowledge of pharmacists on efficacy and safety of the drugs in managing COVID-19 infection in non-hospitalized patients, practice patterns of community pharmacists, and attitudes towards providing the drugs to their roles in the pandemic. The questionnaire included close-ended questions and Likert scale questions. The questionnaire was translated to Arabic language since some pharmacists received their education in languages other than English.

The Arabic version was reviewed by two external examiners for clarity, structure, scientific competency, and relevance. An Arabic language expert revised the questionnaire to ensure that the questions were comprehendible without any confusion. A pilot study that included 15 pharmacists known to the researchers was conducted to provide feedback and check the appropriateness and presence of ambiguities in the questions. Corrections and modifications to the questionnaire were performed accordingly. Cronbach's alpha was 0.60 which is considered acceptable.[24] The responses from the pilot study were not included in the analysis.

Knowledge of pharmacists on the efficacy and safety of the designated drugs dispensed during the COVID 19 pandemic were multiple choice questions (5 choices) and more than one answer could be chosen. For each question. Each correct

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answer was given one point and the wrong answer was given zero point. The sum of the points was calculated for each question and divided by 5 to standardize all the MCQs of knowledge to one point each. Only one question was true/false and was given one point if answered correctly and zero point if the wrong answer was provided. The knowledge score for each participant was the sum of all the questions, the maximum score on knowledge was 5 and the lowest was zero.

The attitude of the community pharmacists regarding covid-19 medications was evaluated using Likert scale, the following code was used for the inappropriate practices: strongly agree (1 point), agree (2 points), neutral (3 points), disagree (4 points), and strongly disagree (5 points). For the attitude score, the sum of the points of all the questions was calculated. The highest possible attitude score (which reflects a positive attitude) is 25, and the lowest score is 5.

Sample size

For observational studies the following equation is used to determine the sample size:[25]

$$n = \frac{Z^2 P(1-P)}{d^2}$$

Where n is the sample size, Z is the statistic corresponding to the level of confidence, for a 95% confidence interval Z is 1.96, P is expected prevalence (results from similar studies), and d is precision, d=0.05. This equation results in the largest sample size when P = 0.50 and 1-P is 0.50. By using the above values, the sample size is 380 participants. However, larger sample size was targeted to be more representative.

Statistical analysis

Data was analyzed using IBM SPSS Statistics for Windows, Version 25.0. Armonk, NY: IBM Corp. Descriptive analysis, including frequency and percentage was used for categorical variables and the mean, standard deviation (SD) was provided for the continuous variables. Univariate linear regression was utilized to evaluate possible predictors of knowledge. Variables were introduced to multivariate linear regression to examine adjusted predictors. P values less than 0.05 were considered statistically significant.

RESULTS

A total of 485 community pharmacists responded to the questionnaire. The participants were young with an average age of 31.88 (SD=9.89) years and wide range of 23 to 75 years. The general characteristics are shown in Table 1.

Almost all participants received the COVID-19 vaccine 477 (98.4%). Pharmacists had numerous sources of information. However, most of them received data from the Ministry of Health (64.4%), followed by results of research published in the media (48.9%), the World Health Organization and the Centre for Disease Control (45.7%), colleagues (45.3%), social media (39.4%), Google (6%), medical representatives (23.1%), and others (11.5%).

Practices

Pharmacists in most cases dispensed these medications based on the physician's orders, 420 (86.6%). However, these drugs were frequently administered according to the pharmacist´s

Table 1. Demographic, educational, and occupational characteristics of the pharmacists, N=485

	Frequency (%)		Frequency (%)
Gender		**Geographic location of the pharmacy**	
Male	257 (53.0%)	South of Jordan	42 (8.7%)
Female	228 (47.0%)	Middle of Jordan	362 (74.6%)
Education		North of Jordan	81 (16.7%)
B.Sc. in pharmacy	388 (80.0%)	**Area of the pharmacy**	
Pharm. D	62 (12.8%)	In a commercial area	379 (78.1%)
Master's degree in pharmacy	35 (7.2%)	In the suburbs	91 (18.8%)
University		In rural areas	15 (3.1%)
Government university in Jordan	203 (41.9%)	**Average number of daily customers**	
Private university in Jordan	251 (51.8%)	Less than 50 Patients	136 (28.0%)
University outside Jordan	31 (6.4%)	50-100 Patients	252 (52.0%)
Employment		More than 100 Patients	97 (20.0%)
Pharmacy owner	98 (20.2%)	**Daily sales of the pharmacy (Jordanian Dinars)**	
Employee in the pharmacy	387 (79.8%)	Less than 300	143 (29.5%)
Years of Experience as a community pharmacist		300-600	231 (47.6%)
Less than 5 years	250 (51.5%)	More than 600	111 (22.9%)
5-10 years	119 (24.5%)		
More than 10 years	116 (23.9%)		

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recommendations based on his/her knowledge 327 (67.4%). In addition, many pharmacists provided these medications to customers if they asked for it 278 (57.3%). Azithromycin was the most dispensed drug and two thirds of the pharmacists dispensed drugs more than 10 times. Sixty percent of the pharmacists told the patients about the side effects, and they intend to maintain this dispensing behavior in future pandemics, Table 2.

Knowledge

Community pharmacists did not possess adequate knowledge concerning the effectiveness of the drugs in the management of COVID-19 infection. A substantial lack of knowledge was evident on the frequency of secondary bacterial infection after COVID-19. The pharmacists had better knowledge of the drugs that were associated with serious cardiac side effects, Table 3.

Table 2. Assessment of practices of community pharmacists during the COVID-19 pandemic, N=485

	Frequency (%)
Which one of these medications did you give to a patient for COVID-19 infection? (You can choose more than one option)	
Azithromycin	442 (91.1%)
Hydroxychloroquine	103 (21.2%)
Dexamethasone	271 (55.9%)
Vitamin C/ Zinc	452 (93.2%)
Certain Antiviral drugs	170 (35.1%)
None	0.0%
What are the medications that you told the patients about their side effects? (You can choose more than one option)	
Azithromycin	252 (52.0%)
Hydroxychloroquine	158 (32.6%)
Dexamethasone	314 (64.7%)
Vitamin C/ Zinc	155 (32.0%)
Certain Antiviral drugs	98 (20.2%)
None	44 (9.1%)
How often did you tell the patients about the possible side effects for these medications?	
Always	289 (59.6%)
Sometimes	151 (31.1%)
Never	45 (9.3%)
Approximately, how many times since the beginning of the corona epidemic did you give a COVID-19 patient these medications without a prescription?	
< 5	64 (13.2%)
5-10	65 (13.4%)
>10	356 (73.4%)
In future pandemics, will you repeat this behavior again and dispense drugs in the same manner?	
No	68 (14.0%)
Yes	417 (86.0%)

Several variables were evaluated as possible predictors of better knowledge. In the univariate linear regression analysis, education, type of university, area of the pharmacy, and the average number of daily customers were statistically significant. In the multivariate analysis, education, type of university, and the average number of daily customers were statistically significant, with p values of 0.004, 0.002, and 0.016, respectively. In the adjusted model, having a master's degree predicted an increase in knowledge score of 0.44 compared to those with a bachelor's degree. Additionally, graduation from a private university predicts a decrease in knowledge score of 0.216 compared to those who received their education from a public university, Table 4.

Attitudes

In general, the perspectives on the importance of the role of pharmacists in providing information concerning the safety, efficacy of drugs was acceptable. Attitudes towards dispensing drugs based on the patients demands were positive, many disagreed on that behavior. However, pharmacists did not have a positive attitude towards dispensing drugs based on their own recommendations. More than half of the pharmacists agreed that they thought it was a correct decision to give these drugs based on their own judgment, Table 5.

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Table 3. Community pharmacist Knowledge regarding COVID-19 medications, N=485

	Frequency (%)	Average score (Highest score is 1)
Q1. The following medication(s) is/are effective in the treatment of the COVID-19 infection (You can choose more than one option): a) Azithromycin, b) Hydroxychloroquine, c) Dexamethasone d) Vitamin C / Zinc supplements, e) Certain antiviral drugs Ω		
Azithromycin	299 (61.6%)	**0.54**
Hydroxychloroquine	68 (14.0%)	
Dexamethasone	202 (41.6%)	
Vitamin C / Zinc supplements	280 (57.7%)	
Certain antiviral drugs	229 (47.2%)	
None	105 (21.6%)	
Q2. The following medication(s) can reduce the severity of symptoms in COVID-19 infection (You can choose more than one option): a) Azithromycin, b) Hydroxychloroquine, c) Dexamethasone d) Vitamin C / Zinc supplements, e) Certain antiviral drugs Ω		
Azithromycin	311 (64.1%)	**0.54**
Hydroxychloroquine	55 (11.3%)	
Dexamethasone	287 (59.2%)	
Vitamin C / Zinc supplements	380 (78.4%)	
Certain antiviral drugs	161 (33.2%)	
None	17 (3.5%)	
Q3. The risk of secondary bacterial infection is frequent after COVID-19 infection which justifies the use of Azithromycin:		**0.23**
Agree	374 (77.1%)	
Disagree Ω	111 (22.9%)	
Q4. The following medication(s) has/ have serious side effects (You can choose more than one option): a) Azithromycin Ω, b) Hydroxychloroquine Ω, c) Dexamethasone Ω d) Vitamin C / Zinc supplements, e) Certain antiviral drugs Ω		
Azithromycin	117 (24.1%)	
Hydroxychloroquine	264 (54.4%)	**0.51**
Dexamethasone	285 (58.8%)	
Vitamin C / Zinc supplements	34 (7.0%)	
Certain antiviral drugs	111 (22.9%)	
None	58 (12.0%)	
Q5. The following medication(s) has/ have serious cardiac side effects (You can choose more than one option): a) Azithromycin Ω, b) Hydroxychloroquine, Ω c) Dexamethasone, d) Vitamin C / Zinc supplements, e) Certain antiviral drugs		
Azithromycin	152 (31.3%)	
Hydroxychloroquine	202 (41.6%)	**0.68**
Dexamethasone	106 (21.9%)	
Vitamin C / Zinc supplements	8 (1.6%)	
Certain antiviral drugs	40 (8.2%)	
None	129 (26.6%)	
Total score		**2.50/5**

Ω: A correct answer, if the participant provided only the correct answer. If the correct answer was not provided or if wrong answers were provided the participant did not get the point.

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Table 4. Possible predictors of knowledge in community pharmacists, N=485

	Univariate Linear Regression			Multivariate Linear Regression		
	B	**95% CI**	**P value**	**B**	**95% CI**	**P value**
Age	-0.007	-0.014 - 0.001	0.072	-0.010	-0.024 - 0.004	0.161
Gender						
Male (reference)						
Female	-0.010	-0.159 - 0.138	0.892	-0.074	-0.230 - 0.081	0.348
Education						
B.Sc. in pharmacy (reference)						
Pharm. D	-0.030	-0.252 - 0.191	0.789	-0.050	-0.281 - 0.181	0.670
Master's degree in pharmacy	0.442	0.156 - 0.728	0.003	0.434	0.139 - 0.730	0.004
University						
Public university in Jordan (reference)						
Private university in Jordan	-0.216	-0.369 - -0.063	0.006	-0.261	-0.426 - -0.097	0.002
University outside Jordan	-0.027	-0.340 - 0.286	0.867	0.009	-0.328 - 0.346	0.958
Employment						
Pharmacy owner (reference)						
Employee in the pharmacy	0.036	-0.149 - 0.221	0.702	0.042	-0.188 - 0.271	0.721
Years of Experience as a community pharmacist						
Less than 5 years (reference)						
5-10 years	-0.180	-0.361 - 0.001	0.052	-0.150	-0.345 - 0.045	0.132
More than 10 years	-0.149	-0.332 - 0.034	0.110	-0.057	-0.371 - 0.257	0.720
Geographic location of the pharmacy						
Middle of Jordan (reference)						
North of Jordan	0.122	-0.079 - 0.323	0.233	0.070	-0.132 - 0.272	0.495
South of Jordan	0.022	-0.244 - 0.289	0.871	-0.138	-0.410 - 0.133	0.317
Area of the pharmacy						
In a commercial area (reference)						
In a suburb	0.183	-0.007 - 0.373	0.060	0.193	0.000 - 0.386	0.050
In rural areas	0.015	-0.415 - 0.444	0.947	0.028	-0.406 - 0.462	0.900
Average number of daily customers						
Less than 50 Patients (reference)						
50-100 Patients	-0.013	-0.186 - 0.161	0.887	0.159	-0.054 - 0.373	0.144
More than 100 Patients	0.237	0.043 - 0.432	0.017	0.292	0.055 - 0.529	0.016
Daily sales of the pharmacy (Jordanian Dinars)						
Less than 300 (reference)						
300-600	-0.084	-0.257 - 0.090	0.346	-0.152	-0.366 - 0.063	0.165
More than 600	0.031	-0.176 - 0.238	0.768	0-.270	-0.557 - 0.016	0.064

B: Beta coefficient; CI: Confidence interval

DISCUSSION

Pharmacists are part of the healthcare team and play an important role during pandemics and other health crises and can assume additional roles in low-income countries.[26] Additionally, they are accessible to the public and are frequently consulted regarding COVID-19 management which makes them a primary source of information.[27] Moreover, community pharmacists have a valuable contribution in managing chronic conditions and maintaining medication adherence and supply.[28]

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Table 5. Attitudes of community pharmacists´ dispensing during COVID-19, N= 485

Attitude	Strongly agree	Agree	Neutral	Disagree	Strongly disagree	Positive attitude score/5
It is a correct decision to give medications for COVID-19 infection based on patient´s request? *	25 (5.2%)	23 (4.7%)	93 (19.2%)	90 (18.6%)	254 (52.4%)	4.08 (SD=1.168)
It is a correct decision to give medications for COVID-19 infection based on your own recommendations? *	167 (34.4%)	100 (20.6%)	151 (31.1%)	34 (7.0%)	33 (6.8%)	2.31 (SD=1.21)
The pharmacist has a major role in the management of COVID-19 infection including patient education on the safety of medications such as azithromycin, hydroxychloroquine, dexamethasone, Zinc/ Vitamin C supplement, and/or certain antiviral drugs α	362 (74.6%)	53 (10.9%)	49 (10.1%)	11 (2.3%)	10 (2.1%)	4.54 (SD=0.91)
The pharmacist has a major role in the management of COVID-19 infection including patient education on the efficacy of medications such as azithromycin, hydroxychloroquine, dexamethasone, Zinc/ Vitamin C supplement, and/or certain antiviral drugs α	357 (73.6%)	57 (11.8%)	47 (9.7%)	12 (2.5%)	12 (2.5%)	4.52 (SD=0.94)
The pharmacist has a major role in providing patient education on effective preventive measures against COVID-19 infection α	384 (79.2%)	45 (9.3%)	35 (7.2%)	6 (1.2%)	15 (3.1%)	4.60 (SD=0.912)
Total score						**20.05/25.00**

*: Reverse coding to reflect positive attitude as an increase in the score; strongly agree (1), agree (2), neutral (3), disagree (4), and strongly disagree (5); α: Normal coding: strongly agree (5), agree (4), neutral (3), disagree (2), and strongly disagree (1).

Although most of the pharmacists in this study dispensed the drugs in response to the physician´s prescription. This behavior is alarming because despite the lack of evidence on the beneficial effects of these drugs on the COVID-19 infections, they are still prescribed by the physicians. A considerable percentage of pharmacists provided the drugs based on their own recommendations and public request. The attempt of the public to obtain these drugs is based merely on wrongful information transmitted through social media and non-scientific journals. Except for the vitamin C and zinc supplements, these drugs are not considered nonprescription drugs, but pharmacists dispense them without a prescription.[29] This practice exposes patients to unjustified serious side effects in the absence of medical supervision.[22,23,30,31] The combination of azithromycin and hydroxychloroquine significantly prolongs the QTc interval in patients with COVID-19 which can be fatal.[32] In addition, the surge in the use and acquisition of these drugs leads to shortages such as the case of hydroxychloroquine supply problems for patients with rheumatic disease,[21] mainly due to the spread of early rumors on its potential use in COVID-19 management[33].

Community pharmacists achieved low knowledge scores, especially on the risk of secondary infection. Most pharmacists believed that bacterial infections were common after COVID-19 infection which is not true.[19] Knowledge of the serious side effects caused by the drugs was low which renders the pharmacists at a disadvantaged position in providing correct information and advice on the serious life-threatening consequences of these drugs that might refrain patients from self-medication. This mandates the need for professional development and appropriate knowledge acquisition related to COVID-19, which was expressed by pharmacists themselves elsewhere.[34] Alnajjar et al conducted a study in UAE pharmacists' knowledge in the COVID-19 pandemic, they revealed that only 45.7% of the participated pharmacists had good knowledge about COVID-19 transmission, symptoms and treatment.[35]

Pharmacists with a master's degree had better knowledge compared to those with a bachelor's degree, similar results were identified in Vietnam where education level was significantly associated with knowledge.[36] This emphasizes the importance of additional education that can be compensated by continuous professional development practices by the pharmacists. Compared to public universities, graduates of private universities had lower knowledge, the caliber of graduates may be different than public universities which necessitates the importance of bridging the gap between the different institutions that grant bachelor's degrees in pharmacy. Basheti et al revealed that pharmacists who graduated from a public versus a private university and attended more educational workshops had better awareness scores regarding the management of the coronavirus pandemic.[37]

Sources of information were versatile; most information came from the Ministry of Health and the contribution of social media was lower than that in the Middle East and North Africa (MENA) region.[38]

In general, pharmacists had a positive attitude towards their role in the COVID-19 pandemic. This proactive role towards the COVID-19 pandemic was expressed by pharmacist in other studies.[37,39] Unfortunately, they scored a low positive attitude on dispensing drugs based on their knowledge, which means that they are convinced that this behavior is correct. This is problematic especially since the pharmacists lack the appropriate knowledge and should legally refrain from dispensing prescription only drugs.

This study has limitations, the questionnaire was distributed through a google form, some older pharmacists may not be competent or enthusiastic in filling these forms which explains the young age of the participants. Only few pharmacists were from rural area, this might affect the results since these areas

www.pharmacypractice.org (eISSN: 1886-3655 ISSN: 1885-642X)

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depend heavily on the pharmacists for medical advice and treatment.

CONCLUSION

Among healthcare providers, community pharmacists are the most accessible and their valuable contribution sets grounds for accurate, evidence-based medical practice. Acquiring accurate, up to date information regarding the effective drugs used in COVID-19 pandemic or during any other health crisis is essential. The Ministry of Health and Jordan Pharmacist Association are responsible for providing regular updated scientifically correct information to the pharmacists. Strict regulations and implementation of disciplinary actions against pharmacists that dispense prescription only drugs based on their medical judgment are necessary to stop this illegal behavior. Continuous professional development is necessary to reduce disparities in knowledge among pharmacists from different educational backgrounds. Community pharmacists should disseminate factual and precise information and correct false and distorted data perceived by the public.

CREDIT AUTHOR STATEMENT

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ACKNOWLEDGMENT

The researchers would like to express their deepest appreciation and gratitude to the community pharmacists who participated in this study.

FUNDING STATEMENT

This research did not receive any fund from any public, commercial, or non-profit organization.

DISCLOSURE STATEMENT

There are no conflicts of interest to declare.

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