Original Research

COVID-19 and role of pharmacists: Knowledge and perceptions of pharmacists from Iraq and Syria

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Abstract

Objectives: To assess pharmacists from Syria and Iraq on their knowledge, readiness, and perspectives on their roles during the COVID-19 pandemic. In addition to investigate pharmacists' perceived barriers towards delivering their emergency roles during the COVID-19 pandemic and perceived policymakers' responsibilities. **Methods**: This cross-sectional study design was conducted in Iraq and Syria during COVID-19 outbreak over one month (April 2020). The study objectives were addressed through a validated online questionnaire. Data was analyzed using statistical package for social science (SPSS). **Results:** A total of 916 individuals participated in this study (447 from Iraq and 439 from Syria). Most of Iraqi participants were students while most of Syrian participants were graduates and technicians. The mean age for the Iraqi participants was 22.5 (SD= 4.1) while the mean age for the Syrian participants was 28.7 (SD= 9.1). A significant difference (p< 0.001) was found in following the latest coronavirus updates on management among pharmacy graduates and technicians and undergraduate students. Media was reported as the most used source for knowledge about epidemics/pandemics among the Iraqi and the Syrian participants. Around 72% strongly agreed/agreed that the faculties of pharmacy have a role in preparing them to deal with epidemics/pandemics. In addition, 64.3% strongly agreed/agreed that pharmacist associations and societies have a role in preparing them to deal with epidemics/pandemics such as the coronavirus. Moreover, 82.9% believed that pharmacists should receive training programs on how to provide mental health support for people during epidemic and pandemic outbreaks. **Conclusion:** Tertiary pharmacy education providers and pharmacy professional bodies have a strong role in preparing pharmacists to deal with pandemics. Therefore, the importance of providing beforehand training programs on epidemics/pandemics management, workshops, lectures, and online information resources for such circumstances is crucial for pharmacists.

Keywords: Coronavirus; Pandemics; Pharmacists; Pharmaceutical associations; Syria; Iraq

INTRODUCTION

Coronaviruses (CoV) are respiratory viruses that can be transmitted through animal to human and human to human routes which can lead to illness ranging from mild symptoms of common cold to severe acute respiratory syndrome (SARS).[1,2] The outbreak of a novel coronavirus, SARS-CoV 2 (severe acute respiratory syndrome coronavirus 2, COVID-19) epidemic started at Wuhan, China which was followed by an outbreak globally.[3,4] By March 2020, the World Health Organization (WHO) reported COVID-19 to be a worldwide pandemic.[3,4] Up to October 2021, more than 243 million cases have been reported and more than 4 million deaths were confirmed globally.[5]

In the Syrian Arab Republic, there has been 41,515 confirmed cases of COVID-19 with 2,504 deaths, reported to the WHO,[5] while in Iraq more than 2 million cases were confirmed with COVID-19 infection and 23,000 deaths in Baghdad, Basra, Sulaymaniyah, Erbil, and Al Najaf.[3,6] Up to this day, both countries are still undergoing prolonged political and socio-economic conditions that led to serious deterioration of the living conditions and the health care system in general in both countries.

It is suspected that Iraq and Syria might have higher numbers of infected cases than what was actually being reported. Many challenges exist facing both countries when it comes to handling testing for COVID-19 cases; some of these challenges include the long term wars and lack of medical supplies leading to the inefficient healthcare system.[7,8] Moreover, the public's low knowledge and lack of awareness regarding the indistinct COVID-19 symptoms and preventative measures affect the number of people who reach medical help and get tested, contributing to the lower number of people who are being tested for COVID-19 infection.

After the rapid spread of the virus throughout the countries, the Iraqi Ministry of Health (MOH) and Syrian health authorities implemented precautionary measures including lockdown and

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self-quarantining to combat the spread of the virus, which imposed an additional burden on the people who suffered from poverty and lost their livelihood during the last ten-year of war.[9-12]

Nevertheless, Syria and Iraq remain under the threat of this pandemic, especially due to the lack of financial and human resources and the lack of preparedness of the medical sector.

All departments of the health care system including pharmacists play a crucial role in managing and hindering the spread of this pandemic. Pharmacists should be always updated on any information regarding COVID-19.[13] In addition, health authorities need to implement strategies in order to prepare future pharmacists to deal with pandemics such as COVID-19.[14] The burden of responsibility increases since many barriers can impede the pharmacists from performing their role.[14] Therefore, this study was designed to assess Syria and Iraq pharmacists' knowledge, readiness, and perspectives on their roles during the COVID-19 pandemic. In addition to investigate pharmacists' perspectives on the role of the educational institutes and professional pharmacy associations in supporting them to take on new roles during COVID-19 pandemic and to identify any barriers hindering them from optimally delivering their responsibilities.

METHODS

Study design and participants

This descriptive cross-sectional study was conducted in Iraq and Syria during COVID-19 outbreak over one month (April 2020). The study objectives were addressed through an online survey developed by the research team, assessing Iraq and Syria pharmacists' readiness and awareness to combat epidemics/pandemics especially coronavirus pandemic. The ethical approval for this study was obtained from the Faculty of Pharmacy, Applied Science Private University, Jordan. Licensed pharmacists' and pharmacy students were deemed eligible for participation in this study. Participant did not pose a minimal risk to participate and their participation was voluntary. Participants' who completed and submitted their responses were considered to have given consent for participation.

Survey development

An extensive literature review was conducted to help in developing the first draft of the survey. The survey was composed in Arabic. A variety of sources was used to generate relevant questions that met the study objectives.[14] Questions with similar concepts were combined and duplicates were removed after the research team revised the survey.

To ensure face validity of the survey, the research team chose six independent academics that are experts in Pharmacy Practice and Education to evaluate the first drafted survey. They evaluated items' comprehension and clarity of words then they informed the research team whether the items were easy to comprehend and whether they were clear and easy

to understand. Any refinements were made as per feedback before the last version of the survey was finalized. To finalize and release the survey, the research team re-assessed each question and evaluated the suitability of the survey to be administered online.

The final version of the developed survey consisted of five sections which aimed to address the aspects of interest. The first section included items designed to collect information regarding participants' demographics. The second section included 20 True/ False/ Not sure items that assessed participants' knowledge of COVID-19, including a) modes of coronavirus transmission, b) the symptoms associated with COVID-19, c) high-risk patients, d) how to prevent the spread and the transmission of the virus, e) drugs used in the management of COVID-19 (Hydroxychloroquine, Azithromycin and Oseltamivir), f) the effect of some drugs on COVID-19 complications or their effect on the susceptibility of contracting the virus (Ibuprofen, steroids, and autoimmune disease medications), and g) questions on how to increase body's immunity. Participants were requested to provide their emails (optional) to get the correct answers for the 20 knowledge questions at the end of the study.

The third section included 8 close-ended questions aimed to assess the participants' perspective on the role of pharmacists in Iraq or Syria during epidemics/pandemics and their role in COVID-19 management. In this section, participants were asked if pharmacists have a general role in the management of the virus, counseling patients about how to decrease the spread and the transmission of COVID-19, ensuring the availability of key medicine, ensuring their personal safety, seeking medical attention for any suspected patients, sending medication to patient's home, selling medication via drive-through, and lastly if pharmacists can provide Hydroxychloroquine to patients who do not have a prescription.

The fourth section included 5 close-ended questions that assessed participants' perspectives on the role of pharmacy educators and the educational institutes in Iraq or Syria in preparing upcoming pharmacists for epidemics/pandemics and the coronavirus specifically. In this section, participants were asked if pharmacy educators and educational institutes should be providing online resources on the pandemic coronavirus, webinars and online lectures for students and alumni, online educational workshops, whether an epidemic/pandemic management course should be added and generally if they have a role in preparing the students to manage epidemics/ pandemics.

The fifth section included 5 close-ended questions that assessed participants' perspective on the role of pharmaceutical associations in Iraq or Syria in helping upcoming pharmacists to manage epidemics/pandemics and the coronavirus pandemic specifically. In this section, participants were asked if pharmaceutical associations should work with the pharmacy faculties to join their forces to produce coronavirus management educational modules, if pharmaceutical associations should monitor the medications used in coronavirus management

plan and their availability, if awareness emails should be sent, if educational workshops about the coronavirus should be delivered and if pharmaceutical associations have a role that would help in preparing the pharmacists to manage epidemics/ pandemics such as COVID-19. A Likert scale (strongly agree, agree, neutral, disagree, and strongly disagree) was used to document participants' responses in the last three sections.

Survey implementation

Social media (Facebook and WhatsApp) was used to target the study participants. The research team designed the survey to take less than 10 minutes to complete. Eligible participants were able to view the ethics committee approval letter before filling out the survey.

Statistical analysis

Following data collection, the survey responses were coded and entered into a customized database using the Statistical Package for the Social Sciences (SPSS), Version 22.0 (IBM Corp., Armonk, New York, USA). Descriptive results were presented as means and standard deviations for continuous variables and percentages for qualitative variables. An independent sample t-test and chi-square test were performed to assess the knowledge and perception scores between Iraqi and Syrian pharmacists. A p-value of <0.05 was considered statistically significant.

RESULTS

A total number of 916 individuals participated in this study (447 from Iraq and 439 from Syria). Most of the Iraqi participants were students while most of the Syrian participants were graduates and technicians. The mean age of Iraq participants was 22.5 (SD= 4.1) years. Of the total sample, 61.2% were females, 90.8% were not married, 5.9% had children, 63.1% were students, 86.4% graduated ≤ 5 years ago, 86.4% had ≤ 5 years of experience, 50.3% did not attend a workshop in the last year, 19.1% attended one workshop, and 6.1% attended more than five workshops. More than half of them (51.6%) graduated from private universities.

Among Syrian participants, the mean age was 28.7 (SD= 9.1) years. Of the total sample, 72.0% were females, 67.0% were not married, 42.1% had children, 60.8% had a Bachelor of Pharmacy or Doctor of Pharmacy degree, 57.7% graduated ≤ 5 years ago, 62.1% had ≤ 5 years of experience, 42.1% did not attend any workshop in the last year, 20.7% attended one workshop, and 5.0% attended more than five workshops. More than half of them graduated from public universities (56.5%). Demographics are presented in Table 1.

Table 1. Demographic characteristics of the study participants (pharmacy graduates and technicians, and pharmacy students) from Iraq and Syria						
Parameter	**Iraq**			**Syria**		
	Students	Graduates and technicians	**Total**	Students	Graduates and technicians	**Total**
Number of participants	301	176	**477**	122	317	**439**
Age (mean ± SD)	20.6 (1.8)	25.6 (4.9)	**22.5 (4.1)**	22.3 (2.5)	31.2 (9.5)	**28.7 (9.1)**
Gender, n (%)						
• Female	209 (69.4)	83 (47.2)	**292 (61.2)**	97 (79.5)	219 (69.1)	**316 (72.0)**
• Male	92 (30.6)	93 (52.8)	**185 (38.8)**	25 (20.5)	98 (30.9)	**123 (28.0)**
Marital status, n (%)						
• Married	4 (1.3)	40 (22.7)	**44 (9.2)**	10 (8.2)	135 (42.6)	**145 (33.0)**
• Not married	297 (98.7)	136 (77.3)	**433 (90.8)**	112 (91.8)	182 (57.4)	**294 (67.0)**
Having children, n (%)	1 (0.3)	27 (15.3)	**28 (5.9)**	4 (3.3)	102 (32.2)	**106 (42.1)**
Educational level, n (%)						
• Student	301 (100.0)	0	**301 (63.1)**	122 (100.0)	0	**122 (27.8)**
• Diploma	0	8 (4.5)	**8 (1.7)**	0	11 (3.5)	**11 (2.5)**
• B. Pharm or Pharm. D	0	161 (91.5)	**161 (33.8)**	0	267 (84.2)	**267 (60.8)**
• Masters	0	4 (2.3)	**4 (0.8)**	0	37 (11.7)	**37 (8.4)**
• PhD.	0	3 (1.7)	**3 (0.6)**	0	2 (0.6)	**2 (0.5)**
Employment, n (%)						
• Pharmacy owner	0	13 (7.4)	**13 (2.7)**	0	94 (29.7)	**94 (21.4)**
• Pharmacy employee	0	36 (20.5)	**36 (7.5)**	0	87 (27.4)	**87 (19.8)**
• Hospital pharmacist	0	33 (18.8)	**33 (6.9)**	0	11 (3.5)	**11 (2.5)**
• Pharmacy trainee	0	35 (19.9)	**35 (7.3)**	0	13 (4.1)	**13 (3.0)**

• Academic	0	2 (1.1)	**2 (0.4)**	0	18 (5.7)	**18 (4.1)**
• Pharmacy undergraduate student	301 (100.0)	0	**301 (63.1)**	122 (100.0)	0	**122 (27.8)**
• Postgraduate student	0	35 (19.9)	**35 (7.3)**	0	20 (6.3)	**20 (4.6)**
• Other	0	22 (12.5)	**22 (4.6)**	0	74 (23.3)	**74 (16.9)**
Graduation years, n (%)	N/A			N/A		
• 0-5 years ago		152 (86.4)			183 (57.7)	
• 6-15 years ago		16 (9.1)			80 (25.2)	
• 16-25 years ago		5 (2.8)			34 (10.7)	
• More than 25 years ago		3 (1.7)			20 (6.3)	
Years of experience, n (%)	N/A			N/A		
• 0-5 years		152 (86.4)			197 (62.1)	
• 6-10 years		11 (6.3)			48 (15.1)	
• 11-15 years		6 (3.4)			19 (6.0)	
• 16-20 years		5 (2.8)			19 (6.0)	
• 21-25 years		1 (0.6)			14 (4.4)	
• More than 25 years		1 (0.6)			20 (6.3)	
Number of attended educational workshops in the last year, n (%)						
• 0	167 (55.5)	73 (41.5)	**240 (50.3)**	47 (38.5)	138 (43.5)	**185 (42.1)**
• 1	53 (17.6)	38 (21.6)	**91 (19.1)**	35 (28.7)	56 (17.7)	**91 (20.7)**
• 2	37 (12.3)	31 (17.6)	**68 (14.3)**	25 (20.5)	56 (17.7)	**81 (18.5)**
• 3	17 (5.6)	13 (7.4)	**30 (6.3)**	8 (6.6)	34 (10.7)	**42 (9.6)**
• 4	7 (2.3)	7 (4.0)	**14 (2.9)**	1 (0.8)	7 (2.2)	**8 (1.8)**
• 5	2 (0.7)	3 (1.7)	**5 (1.0)**	1 (0.8)	9 (2.8)	**10 (2.3)**
• More than 5	18 (6.0)	11 (6.3)	**29 (6.1)**	5 (4.1)	17 (5.4)	**22 (5.0)**
University, n (%)						
• Public university	142 (47.2)	77 (43.8)	**219 (45.9)**	43 (35.2)	205 (64.7)	**248 (56.5)**
• Private university	153 (50.8)	93 (52.8)	**246 (51.6)**	78 (63.9)	104 (32.8)	**182 (41.5)**
• Others	6 (2.0)	6 (3.4)	**12 (2.5)**	1 (0.8)	8 (2.5)	**9 (2.1)**

Regarding getting enough previous education on epidemics/pandemics, no statistically significant difference was found between Iraqi and Syrian participants (p-value= 0.288), neither between pharmacy undergraduate students and pharmacy graduates and technicians (p-value= 1.000) as represented in Table 2 and Table 3. On the other hand, a statistically significant difference (p< 0.001) was found in following the latest coronavirus updates on management between the Iraqi and the Syrian participants, and between pharmacy undergraduate students and pharmacy graduates and technicians.

Study participants were asked about the source of knowledge regarding the epidemics/pandemics (Figure 1), among the Iraqi and the Syrian participants, more than half of them reported media as their most used source (61.4%, 59.2%; respectively), followed by the faculty of pharmacy (47.5%, 57.2%; respectively), and then published literature (39.6%, 48.5%; respectively).

Table 2. Study participants previous education (by country) on epidemics/pandemics and updates regarding coronavirus management

Parameter	Iraq	Syria	p-value
	Yes, n (%)	**Yes,** n (%)	(Fisher's Exact Test)
Got enough education previously about epidemics/pandemics	145 (30.4)	148 (33.7)	0.288
Follow the latest corona virus updates on management	410 (86.0)	419 (95.4)	**< 0.001**

Statistical significance when p ≤0.05.

The same findings were reported comparing pharmacy graduates and technicians with pharmacy students (Figure 2); media ranked first (57.6%, 63.6%; respectively), followed by the faculty of pharmacy (50.7%, 53.4%; respectively), and
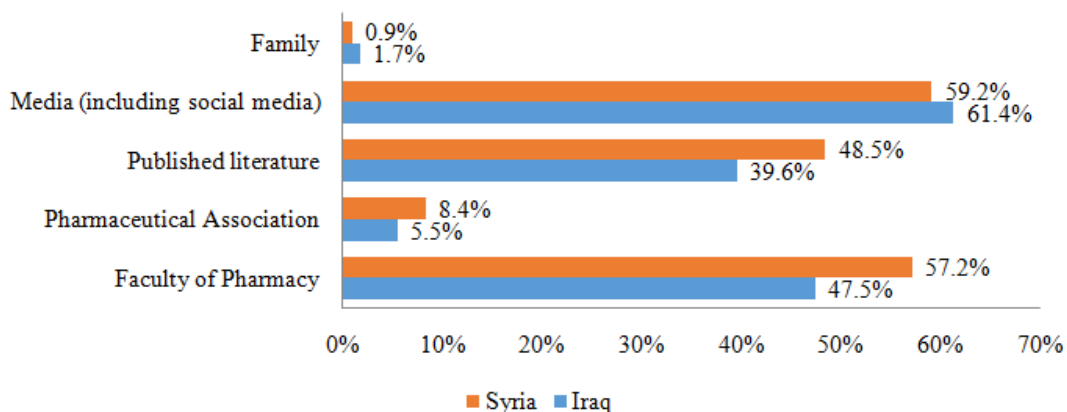
Figure 1. Source of knowledge about epidemics/pandemics among the study participants (by country)
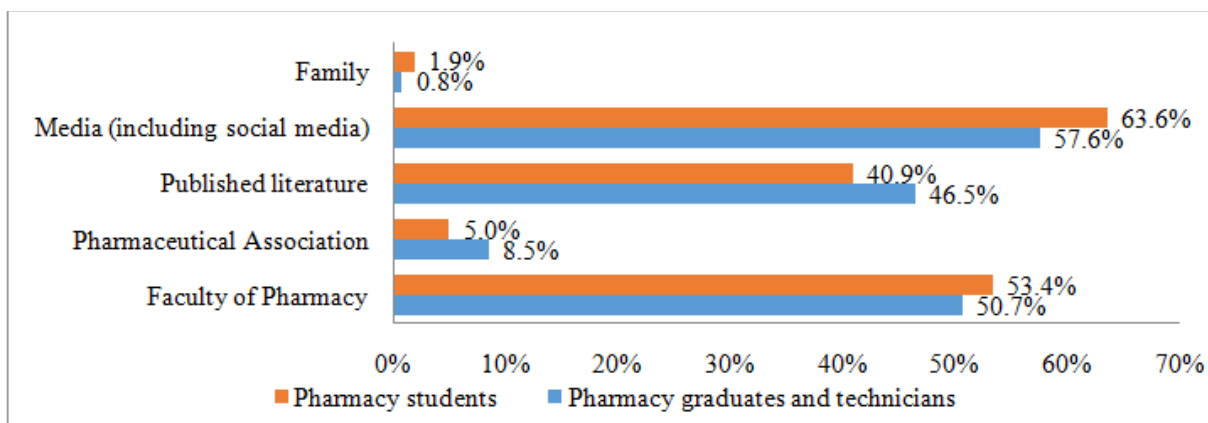

Figure 2. Source of knowledge about epidemics/pandemics among the study participants (pharmacy graduates & technicians vs. pharmacy students)
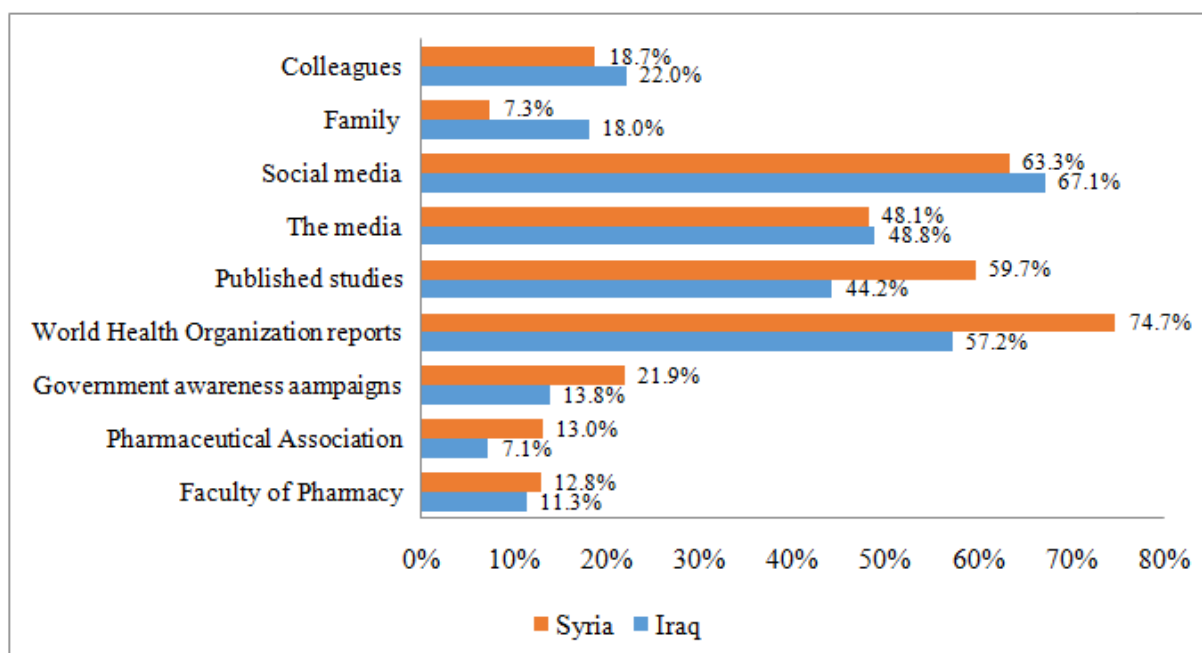

Figure 3. Sources of information about coronavirus management among the study participants (by country)

Table 3. Study participants previous education (graduates vs students) on epidemics/pandemics and updates regarding coronavirus management			
Parameter	Pharmacy graduates and pharmacy technicians	Pharmacy undergraduate students	p-value
	Yes, n (%)	Yes, n (%)	(Fisher's Exact Test)
Got enough education previously about epidemics/ pandemics	158 (32.0)	135 (31.9)	1.000
Follow the latest corona virus updates on management	466 (94.5)	363 (85.8)	**< 0.001**

Statistical significance when p ≤0.05.

published literature (46.5%, 40.9%; respectively).

The study participants were further asked about their source of information regarding the coronavirus management (Figure 3), among the Iraqi participants, social media ranked first (67.1%), followed by the WHO reports (57.2%), and then the media (48.8%). In contrast, Syrian participants reported the WHO reports in first place (74.7%), followed by the social media (63.3%), and published studies (59.7%). Regarding the source of information on coronavirus management (Figure 4), 72.4% of the pharmacy graduates and technicians chose the WHO reports, followed by the social media (61.5%), and then the published studies (56.8%); while 69.7% of the pharmacy students chose the social media, followed by the WHO reports (57.7%), and then the media (49.9%).

Higher knowledge scores were found among the Syrian participants compared to the Iraqi participants (14.1 vs. 12.2 / out of 20). As well, pharmacy graduates and technicians scored higher than pharmacy undergraduate students (14.1 vs. 12.1 / out of 20) in the knowledge scores as represented in Table 4.

Participants' knowledge regarding coronavirus was assessed through 20 True/ False/ Not sure statements. A statistical difference was found between Iraqi and Syrian participants in 15 statements: likewise, among pharmacy graduates and technicians and pharmacy undergraduate students. All the participants' responses are presented in Table 5.

All statements assessing the role of pharmacy faculties were agreed upon by more than 88.0% of the participants, except for one of the statement '*Your faculty has a role in preparing you to deal with any epidemic/pandemic*' (71.7%). Regarding participants' perspective on the role of pharmaceutical associations, more than 80.0% agreed with the statements presented, except for '*Pharmacist associations and societies have a role in preparing you to deal with epidemics/pandemics such as the coronavirus*' (64.3%). As for the role of pharmacists,
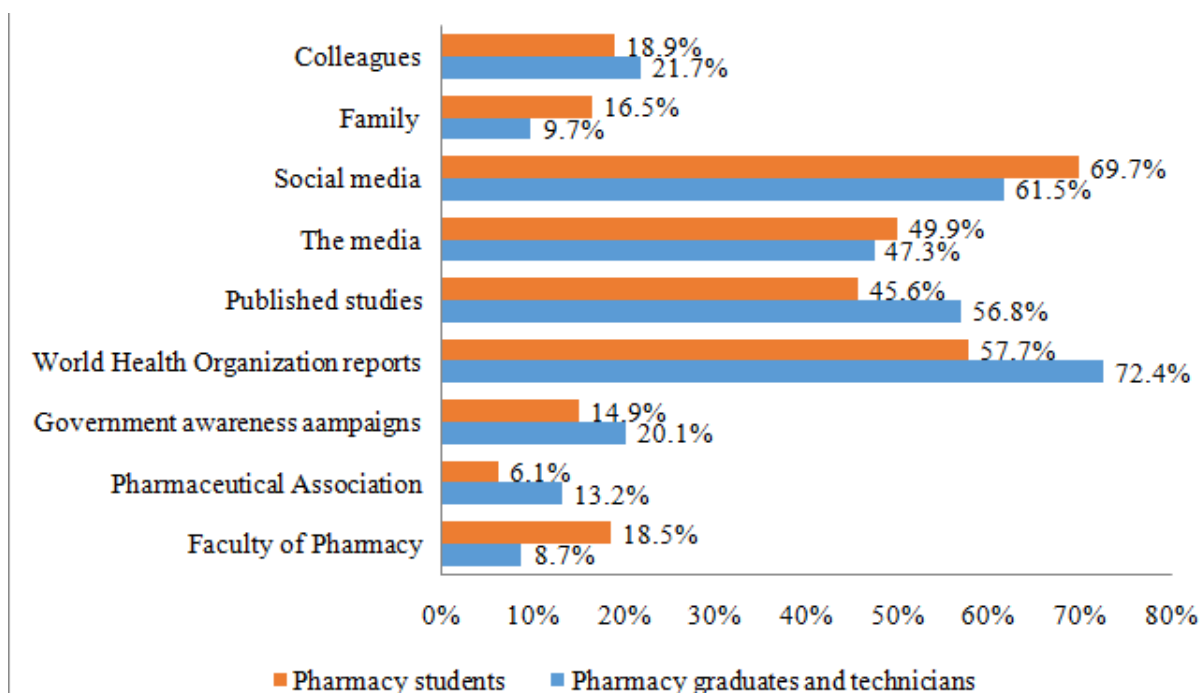

Figure 4. Sources of information about coronavirus management among the study participants (pharmacy graduates & technicians vs. pharmacy students)

Table 4. Study participants knowledge scores (out of 20)					
	Iraq	**Syria**	**p-value**	**Pharmacy graduates and pharmacy technicians**	**Pharmacy undergraduate students**	**p-value**
Mean (SD)	12.2 (2.5)	14.1 (2.1)	< 0.001*	14.1 (2.2)	12.1 (2.4)	< 0.001*

* Statistically significant difference (2-tailed t-test).

Table 5. Assessment of study participants' knowledge about the coronavirus pandemic						
Statement	**Correct answer, n (%)**					
	Iraq	**Syria**	**p-value**	**Pharmacy graduates and pharmacy technicians**	**Pharmacy undergraduate students**	**p-value**
One way of transmission of Coronavirus is respiratory droplets from person to person among close contacts.	444 (93.1)	421 (95.9)	0.083	477 (96.8)	388 (91.7)	**0.001***
Coronavirus can be transmitted after touching surfaces that were contaminated with the virus.	464 (97.3)	421 (95.9)	0.276	474 (96.1)	411(97.2)	0.465
Non-steroidal anti-inflammatory drugs such as Ibuprofen decrease the risk of complications when there is an infection.	250 (52.4)	392 (89.3)	**< 0.001***	423 (85.8)	219 (51.8)	**< 0.001***
Fevers/ dry cough/ shortness of breath are associated with Coronavirus.	471 (98.7)	437 (99.5)	0.290	489 (99.2)	419 (99.1)	1.000
Muscle aches and GI symptoms (nausea/ vomiting/ diarrhea) are not associated with Coronavirus.	221 (46.3)	328 (74.7)	**< 0.001***	338 (68.6)	211 (49.9)	**< 0.001***
Handwashing with soap and water for 20 seconds is enough to clean the hands and protect from spreading the infection.	398 (83.4)	382 (87.0)	0.137	432 (87.6)	348 (82.3)	**0.025***
Steroids do not increase the susceptibility to Coronavirus infection.	148 (31.0)	233 (53.1)	**< 0.001***	269 (54.6)	112 (26.5)	**< 0.001***
Generally, the use of autoimmune disease medications increases the susceptibility to contract Coronavirus infection.	202 (42.3)	251 (57.2)	**< 0.001***	291 (59.0)	162 (38.3)	**< 0.001***
Hydroxychloroquine can be used as a preventative therapy against Coronavirus infection.	168 (35.2)	304 (69.2)	**< 0.001***	315 (63.9)	157 (37.1)	**< 0.001***
Azithromycin can be used along with Hydroxychloroquine in the management of the Coronavirus infection.	215 (45.1)	346 (78.8)	**< 0.001***	380 (77.1)	181 (42.8)	**< 0.001***
Oseltamivir cannot be used in the management of Coronavirus infection.	90 (18.9)	172 (39.2)	**< 0.001***	215 (43.6)	47 (11.1)	**< 0.001***
Protein calorie malnutrition impairs host immunity (particularly the T-cell system) resulting in increased opportunistic infection.	381 (79.9)	341 (77.7)	0.420	375 (76.1)	347 (82.0)	**0.029***
Patients should eat food that contains Vitamin C and D to boost their immunity.	467 (97.9)	416 (94.8)	**0.013***	471 (95.5)	412 (97.4)	0.156
Eating food like mushrooms and garlic is beneficial for the immune system.	391 (82.0)	331 (75.4)	**0.015***	376 (76.3)	346 (81.8)	**0.043***

|						
Exercise causes antibodies and white blood cells to circulate in the body more rapidly detecting infections at an early stage.	325 (68.1)	199 (45.3)	**< 0.001***	243 (49.3)	281 (66.4)	**< 0.001***
The brief rise in body temperature during and right after exercise increases bacterial growth, which will lower the body's ability to fight the infection.	272 (57.0)	335 (76.3)	**< 0.001***	360 (73.0)	247 (58.4)	**< 0.001***
Not smoking and decreasing stress help support the immune system.	455 (95.4)	434 (98.9)	**0.003***	481 (97.6)	408 (96.5)	0.335
Sunlight activates T-helper cells hence boosts immunity.	390 (81.8)	276 (62.9)	**< 0.001***	345 (70.0)	321 (75.9)	0.053
You need to keep a distance of at least 3 meters (10 feet) when counseling patients during a pandemic.	36 (7.5)	95 (21.6)	**< 0.001***	88 (17.8)	43 (10.2)	**< 0.001***
The highest risk patients in contracting Coronavirus are elderly (> 65), immune-compromised and children under the age of nine.	50 (10.5)	91 (20.7)	**< 0.001***	99 (20.1)	42 (9.9)	**< 0.001***
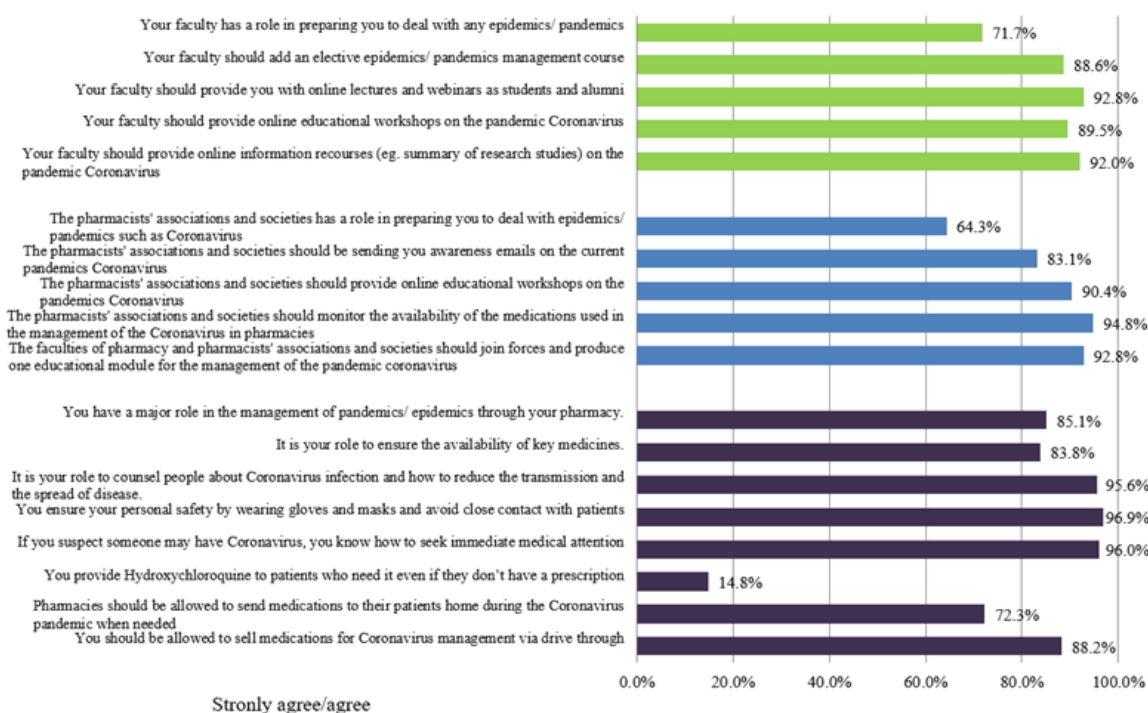
Figure 5. Study participants' perceptions about the current role of the faculties of pharmacies, pharmacists' associations and societies, and pharmacists' role to deal with epidemics/ pandemics and Coronavirus specifically (n= 916)

all of the statements were agreed by more than 70% of the participants; and regarding the statement 'You provide Hydroxychloroquine to patients who need it even if they do not have a prescription' 85.2% reported that they do not agree with this statement (Figure 5).

With regards to the role of pharmacy faculties, a significant difference was found between Iraq and Syria participants regarding 'Your faculty should add an elective epidemics/ pandemics management course', 'Your faculty should provide online educational workshops on the coronavirus pandemic', and 'Your faculty should provide online information recourses (e.g. summary of research studies) on the coronavirus pandemic'. No statistically significant difference was found between the two populations regarding the role of pharmaceutical associations.

As for the role of the pharmacists; a statistically significant differences were found between the study groups regarding *'You have a major role in the management of pandemics/ epidemics', 'It is your role to ensure the availability of key medicines', 'You provide Hydroxychloroquine to patients who need it even if they do not have a prescription'*, and *'Pharmacies should be allowed to send medications to their patients home during the coronavirus pandemic when needed'*.

Most of the participants from the two counties believed that working in a pharmacy increased their fears of contracting the virus (78.1%) with a significant difference between the two counties (p <0.001). Moreover, they believed that pharmacists should receive training programs on how to provide mental health support for people during epidemic and pandemic outbreaks (82.9%).

DISCUSSION

The COVID-19 pandemic imposed great pressure on health care services, facilities and providers which shed the light on the importance of community pharmacist's role and responsibility in serving the citizens during this crisis around the world. Through this study, we were able to assess Syria and Iraq pharmacists' knowledge, readiness, and perspectives on their roles during the COVID-19 pandemic. In addition to investigate pharmacists' perspectives on the role of educational institutes and professional pharmacy associations in supporting them to take on roles during COVID-19 pandemic and to identify any barriers hindering them from delivering their roles.

The study participants agreed on the significance of their roles during this pandemic, similar to other studies conducted globally.[15-18] As being the most accessible and feasible health care professionals,[19] community pharmacists around the world are taking huge steps against COVID-19. The pharmacist's knowledge regarding COVID-19 is crucial drastically affecting their clinical practice. The World Health Organization reports, social media, and published literature were all reported as sources of information for pharmacists similar to other findings the MENA region.[22,23] According to the Pharmacy Guild of Australia, community pharmacists took a step in serving the population during this time, spreading awareness, providing home delivery services to ensure the maintenance of treatments and access to lifesaving drugs during the pandemic.[20] Pharmacists have also contributed to urge citizens to download created mobile applications designed to trace COVID-19 infected cases, as in safe application in Australia,[21] AMAN application in Jordan, and many more in other countries.[22] In China, special mobile applications were invented to engage the pharmacist with community and drug companies in order to offer online consultation services and medication home delivery facilities.[23] With regard to patients who prefer to hold in their homes, a counseling service was provided by specialist doctors as a tele health appointment, and a digital copy of the prescription was sent to the pharmacist, who in turn delivered the aforementioned medications to the patient`s home; therefore, supporting safe and convenient healthcare services

for vulnerable patients in South Australia, the United Kingdom,[24] China[25] and the United States of America.[26] However, this was not the case for low-income countries including Iraq and Syria, as these countries suffer from shortage of medical supplies and basic medicines, which made it difficult for the pharmacists to fulfill their duties in providing essential medications needed by the patients.

The role of the pharmaceutical associations in COVID-19 crisis is highly crucial in increasing awareness and guiding the different healthcare professionals including the pharmacists in handling this challenging situation. Globally, the Pharmaceutical International Federation (FIP) has announced several recommendations and summaries for guidance on COVID-19 pandemic.[27] Also, the Chinese Pharmaceutical Association has published guidance and prevention strategies and recommendations for hospital and community working pharmacists.[28] As well as, the American Pharmaceutical Association (APhA) has reported guidelines in the need of strengthening and preparing the community pharmacists as front line health care workers in this crisis.[29] To add on, other several pharmaceutical associations (The National Association of State Pharmacy Associations (NASPA), the Alliance for Pharmacy Compounding, the American Pharmacists Association, and the National Community Pharmacists Association) have requested to expand the compounding capabilities of pharmacists to hand sanitizers and anticipating other supplementary health needs.[30] The various actions of the global pharmaceutical associations are vital in recognizing the value of the pharmacists as being an important part of the health care sector, highlighting the need of coordinating their role and efforts with other health care professionals to deliver the best health care services aiming to overcome this global burden. In Syria, WHO Strategic Preparedness and Response Plan, has engaged the Syrian MOH and health partners to enhance awareness and management of COVID-19 situation in the country.[5] The Pharmaceutical Syndicate in Homs Governorate with the support of WHO held an awareness session on COVID-19 for 20 doctors and 19 people.[5] Similarly, neighboring country Jordan reported the vital roles of the Jordanian Pharmaceutical Association (JPM) in awareness, education and management efforts incorporated next to the Ministry of Health in facing the COVID-19 pandemic.[17] Thus, pharmacy organizations and associations worldwide should establish or clarify the policies needed to strengthen the roles of pharmacists during a pandemic to support pharmacy practices hence contributing positively in managing such situations.[31]

So that, preparing the pharmacists, educating them, and keeping them updated is key for effective management in pandemics, such as the current coronavirus situation.[30] The pharmaceutical faculties play an important role in assessing, preparing, and educating the current and future pharmacists. It was found that most pharmacists believed that tertiary pharmacy education providers and pharmacy professional bodies have a strong role in preparing them in dealing with pandemics.[17] The COVID-19 crisis sheds the light on the importance of providing beforehand training programs on

epidemics/pandemics management, workshops,[17] lectures, and online information resources for such circumstances.

On the other hand, many barriers against the pharmacists were reported during the pandemic, hindering them from fulfilling their roles optimally.[32,33] Especially their mental health concerns, as fear and anxiety of contracting the virus increases their concerns from acting to their full potential during such emergencies. Hence, the pharmaceutical faculties, associations and authorities need to prepare and train the pharmacists in advance to overcome their stress and anxieties in these situations.[19,33]

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