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## Role of pharmacist during the COVID-19 pandemic: A scoping review

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### ARTICLE INFO

**Keywords:**  
COVID-19  
Pharmacists  
Pharmaceutical services  
Review

### ABSTRACT

**Background:** Since the start of the new Coronavirus (COVID-19) outbreak in December 2019, pharmacists worldwide are playing a key role adopting innovative strategies to minimize the adverse impact of the pandemic. **Objectives:** To identify and describe core services provided by the pharmacist during the COVID-19 pandemic. **Methods:** A literature search was performed in MEDLINE, Embase, Scopus, and LILACS for studies published between December 1st, 2019 and May 20th, 2020 without language restriction. Studies that reported services provided by pharmacists during the COVID-19 pandemic were included. Two independent authors performed study selection and data extraction with a consensus process. The pharmacist's intervention identified in the included studies were described based on key domains in the DEPICT v.2. **Results:** A total of 1189 records were identified, of which 11 studies fully met the eligibility criteria. Most of them were conducted in the United States of America (n = 4) and China (n = 4). The most common type of publication were letters (n = 4) describing the workplace of the pharmacist in hospitals (n = 8). These findings showed the different roles of pharmacists during the COVID-19 pandemic, such as disease prevention and infection control, adequate storage and drug supply, patient care and support for healthcare professionals. Pharmacists' interventions were mostly conducted for healthcare professionals and patients (n = 7), through one-to-one contact (n = 11), telephone (n = 6) or video conference (n = 5). The pharmacists' main responsibility was to provide drug information for healthcare professionals (n = 7) as well as patient counseling (n = 8). **Conclusions:** A reasonable number of studies that described the role of the pharmacists during the COVID-19 pandemic were found. All studies reported actions taken by pharmacists, although without providing a satisfactory description. Thus, future research with more detailed description as well as an evaluation of the impact of pharmacist intervention is needed in order to guide future actions in this and/or other pandemic.

### Introduction

The Coronavirus Disease 2019 (COVID-19) is an infection caused by the Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2) first emerged in Wuhan (China) in December 2019, spreading rapidly across the world.<sup>1</sup> On the 11<sup>th</sup> of March 2020, the World Health Organization (WHO) declared COVID-19 a pandemic.<sup>2</sup> At the time of writing there have been 10 million cases of COVID-19 reported globally, with more than 500 000 deaths reported across 216 countries.<sup>3</sup> Currently, the COVID-19 pandemic is a major public health problem worldwide.

The most common symptoms for patients infected with COVID-19 are fever, cough, difficulty breathing, fatigue, and headache.<sup>4</sup> Most

symptomatic patients will develop mild symptoms. However, some patients may progress to serious illness, such pneumonia, acute respiratory distress syndrome, multi organ dysfunction and even death.<sup>5</sup> So far, there are no proven effective treatments against COVID-19 and wide-spread effort is being devoted towards the development of a safe vaccine.<sup>3</sup> Thus, the population must follow recommendations to decrease the transmission of SARS-CoV-2, including social distancing, wearing masks and strict hand hygiene.<sup>6</sup>

While millions of people are in their homes in order to decrease the risk of transmission of the infection, health workers are on the frontline against COVID-19.<sup>7</sup> These professionals are committed to ensuring that the population have access to health services and to minimize the

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<https://doi.org/10.1016/j.sapharm.2020.07.003>

Received 1 July 2020; Accepted 1 July 2020

Available online 4 July 2020

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adverse impact of the pandemic. Given the seriousness of the coronavirus outbreaks, health professionals with expertise in public health are essential.

As healthcare professionals, pharmacists can play key role during the pandemic, acting directly with the community,<sup>8</sup> continuing to care for patients with chronic diseases,<sup>9,10</sup> working in hospital pharmacies and providing pharmaceutical care to COVID-19 patients.<sup>11</sup> Moreover, they may provide reliable information for preventing, detecting, treating and managing coronavirus infections.<sup>12,13</sup> As a result, several challenges have emerged and innovative strategies are being adopted by pharmacists to overcome them.<sup>14</sup>

Since the beginning of the outbreak, many guidelines have been published with recommendations for pharmacists as well as their responsibilities during the pandemic. However, few describe pharmacists' experiences in this novel context. Therefore, this scoping review is aimed to identify and describe core services provided by the pharmacist during the COVID-19 pandemic.

## Method

A scoping review was performed to explore the literature, map and summarize the evidence regarding the role of the pharmacist during COVID-19 pandemic.<sup>15</sup> This review was conducted following the recommendations of the Preferred Reporting Items for Systematic reviews and Meta-Analyses statement for Scoping Reviews (PRISMA-ScR)<sup>16</sup> and the review protocol registered on Open Science Framework (<https://doi.org/10.17605/OSF.IO/NE2GY>).

### Search strategy

A comprehensive literature search was performed in the MEDLINE (PubMed), Embase, Scopus, and LILACS (Latin American and Caribbean Health Sciences Literature) databases published between December 1st, 2019 (first reports of COVID-19 in China) and May 20th, 2020 in order to identify relevant studies. The search strategy included combinations of terms relating the COVID-19 and pharmacy. The full strategies search for all databases can be found in S1 Appendix. Additionally, it was conducted a grey literature search in DOAJ - Directory of Open Access Journals (<https://doaj.org/>) aiming to identify not indexed studies in the databases listed above. No language restriction was applied. Duplicated studies were eliminated. In addition, references cited in all included articles were reviewed to identify any studies that might have been missed.

### Study selection

Studies that described services provided by the pharmacist during the COVID-19 pandemic were included. In addition, all publication types were eligible for inclusion. Studies that did not describe the role of the pharmacist during the COVID-19 pandemic; reviews, recommendations, and-or guidelines of pharmacist's role during the pandemic; presented only pharmacotherapeutic options for COVID-19; and involved graduate students were excluded.

All titles and abstracts were independently screened and selected by the authors. Full-text articles were obtained and reviewed to determine whether the article met the eligibility criteria. If the full texts of the articles were not available in the databases, the corresponding authors were contacted by email or through ResearchGate ([www.researchgate.net](http://www.researchgate.net)). Disagreements were resolved through discussion.

This process was performed using Rayyan QCRI, a free web application designed to help researchers working on systematic reviews.<sup>17</sup>

### Data extraction and analysis

For each included study, information such as the: author, date of publication or availability online, publication type, region, workplace of

the pharmacist, participants, and results summary were extracted. The pharmacist interventions reported in these studies were described based on key domains in the Descriptive Elements of Pharmacist Intervention Characterization Tool (DEPICT) version 2: 1) contact with recipient (how the contact with the recipient occurs); 2) method of communication with recipient; 3) setting of the intervention (where the recipient received the service); 4) action(s) taken by pharmacist (what is done to address the identified problems); and 5) materials that support action(s) (items developed or provided by the pharmacist as part of the service).<sup>18</sup> The authors independently completed the data extraction, using a pre-formatted spreadsheet in Microsoft Excel. Disagreements were resolved through discussion.

The results of this scoping review are presented as a narrative synthesis due to the heterogeneity of the studies included. The studies were categorized according to the characteristics of the publication and summarized in tables.

Following the PRISMA-ScR,<sup>16</sup> no quality assessment was performed due to the fact that scoping reviews aim to identify all the available evidence and highlight their main characteristics, regardless of the quality.

## Results

### Search results

The electronic search found 1189 potentially relevant studies. After removing duplicates and reviewing the titles and abstracts, 62 articles were selected for full-text reading. In addition, no relevant studies were identified from searching the reference lists of the included studies. Of these, 11 studies met the inclusion criteria and were included for review. A flowchart of the literature search is shown in Fig. 1. The references for the excluded studies, with the reasons for their exclusion, are available in S2 Appendix.

### Characteristics and summary of the results of the included studies

The characteristics of the 11 studies included in this scoping review are summarized in Table 1. Studies were conducted in the United States of America (n = 4)<sup>20,21,27,29</sup>, China (n = 4)<sup>22,23,25,28</sup>, Saudi Arabia (n = 1)<sup>19</sup>, Taiwan (n = 1)<sup>24</sup>, and Macao (n = 1).<sup>26</sup> All studies were published in English and reported between February and May 2020. The publication type of the included studies consisted of letters (n = 4)<sup>20,21,25,27</sup>, research article (n = 2)<sup>19,22</sup>, commentary (n = 2)<sup>23,26</sup>, ideas and opinions (n = 1)<sup>24</sup>, discussion (n = 1)<sup>28</sup>, and note (n = 1)<sup>29</sup>. The majority of the studies described the workplace of the pharmacist in hospitals (n = 8)<sup>19–23,25,28,29</sup> following the ambulatory pharmacies (n = 4)<sup>19,20,28,29</sup>, community pharmacies (n = 2)<sup>24,26</sup>, and clinic (n = 1).<sup>27</sup> The participants of the included studies were miscellaneous, including the healthcare professionals (n = 7)<sup>19–23,28,29</sup>, COVID-19 patients (n = 5)<sup>19,22,23,28,29</sup>, general inpatient (n = 2)<sup>19,29</sup>, general population (n = 2)<sup>24,26</sup>, pediatric patients (n = 1)<sup>20</sup>, solid organ transplant patients (n = 1)<sup>21</sup>, patients on warfarin therapy (n = 1)<sup>25</sup>, and myelofibrosis patients (n = 1).<sup>27</sup>

Table 2 shows a summary of the results of the included studies. All described actions taken by the pharmacist. However, only one study evaluated the outcomes associated with pharmacist intervention.<sup>22</sup> Several services were related in these studies, including disease prevention and infection control<sup>19,23,24,28</sup> (e.g., distribution of the masks, develop hygiene strategies, discard all unused drugs dispensed for COVID-19 patients, and social distancing), adequate storage and drug supply<sup>19,20,22,23,28</sup> (e.g., drug formulary for treatment of COVID-19 to guide the drug supply and purchase, conversion of intravenous to oral medications when it was possible, and virtual communication for supply inventory), and patient care and support for healthcare professionals<sup>19–23,25,27–29</sup> (e.g., ensure appropriate drug utilization for patients and healthcare professionals, participation of virtual rounds with

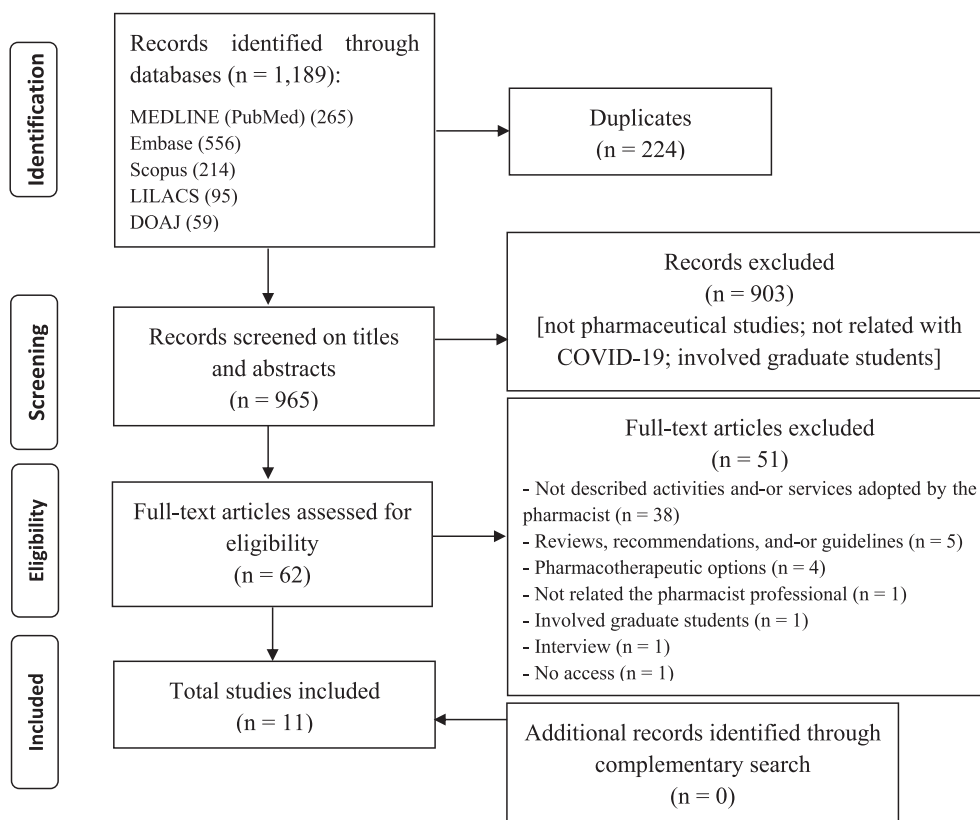


Fig. 1. Study selection flowchart through literature search.

Table 1  
Characteristics of the included studies in the scoping review.

Author	Date of publication (or available online)	Publication Type	Region	Workplace of the pharmacist	Participants
Arain et al. <sup>19</sup>	2020 May 18	Research article	Saudi Arabia	Hospital and ambulatory pharmacy	Healthcare professionals and COVID-19 and non-COVID-19 patients
Elson et al. <sup>20</sup>	2000 May 5	Letter to the Editor	United States	Hospital and ambulatory pharmacy	Healthcare professionals and pediatric patients
Fan and Kamath <sup>21</sup>	2020 May 4	Letter to the Editor	United States	Hospital	Healthcare professionals and solid organ transplant patients
Hua et al. <sup>22</sup>	2020 April 10	Research article	China	Hospital	Healthcare professionals and COVID-19 patients
Meng et al. <sup>23</sup>	2020 April 2	Commentary	China	Hospital	Healthcare professionals and COVID-19 patients
Ou and Yang <sup>24</sup>	2020 April 13	Ideas and Opinions	Taiwan	Community pharmacy	Taiwan's population
Tan et al. <sup>25</sup>	2020 May 13	Letter	China	Hospital	Patients on warfarin therapy
Ung <sup>26</sup>	2020 February 12	Commentary	Macao	Community pharmacy	Macao's population
Yemm et al. <sup>27</sup>	2020 May 14	Letter to the Editor	United States	Clinic	Myelofibrosis patients
Ying et al. <sup>28</sup>	2020 April 6	Discussion	China	Hospital and ambulatory pharmacy	Healthcare professionals and COVID-19 patients
Zuckerman et al. <sup>29</sup>	2020 May 16	Note	United States	Hospital and ambulatory pharmacy	Healthcare professionals and COVID-19 and non-COVID-19 patients

Abbreviation: COVID-19 (coronavirus disease 2019).

interdisciplinary team, review online of the electronic orders, patient education, virtual medication consultation, and medication reconciliation).

Characteristics of pharmacist interventions based on DEPICT 2

Studies were conducted for healthcare professionals and patients (n = 7)<sup>19–23,28,29</sup> or only patients (n = 2).<sup>25,27</sup> Two studies<sup>24,26</sup> were conducted for the general population and, therefore, were classified as “not applicable”. All studies performed one-to-one contact with the recipients and six studies<sup>19–22,28,29</sup> also used the group contact. Different

methods of communication were reported, including face-to-face (n = 4)<sup>19,24,26,28</sup>, written (n = 5)<sup>19,20,22,28,29</sup>, telephone (n = 6)<sup>19,20,22,23,27,29</sup>, video conference (n = 5)<sup>20–23,29</sup> and radio station.<sup>22</sup> One study<sup>25</sup> did not describe how the communication with the recipient has been performed. The studies were conducted at different setting of intervention, such as hospital bedside (n = 7)<sup>19–23,28,29</sup>, hospital pharmacy (n = 2)<sup>19,29</sup>, community pharmacy (n = 2)<sup>24,26</sup>, ambulatory (n = 4)<sup>19,20,28,29</sup>, and recipient's home (n = 5).<sup>20,21,25,27,29</sup>

Pharmacists had an important role in taking actions to address during the COVID-19 pandemic, including drug information for healthcare professionals (n = 7)<sup>19–23,28,29</sup>, patient counseling (n = 8)<sup>19–23,25,28,29</sup>,

**Table 2**  
Summary of the results of the included studies in the scoping review.

Author	Disease prevention and infection control	Adequate storage and drug supply	Patient care and support for healthcare professionals
Arain et al. <sup>19</sup>	Decrease the visits to the pharmacy area by colleagues from other units, encouraging them to use phones or in-basket messages from the computerized physician order entry system to communicate; change of staff plan; implementation of system changes in perioperative areas; utilization of automation to reduce traffic of pharmacy staff in the hospital; discard of all unused medications dispensed for COVID-19 patients; floor markings on the ground to section areas of the pharmacy that patients can stand in while waiting or being helped.	Switch of intravenous to oral medications and intravenous infusion to intravenous push to prevent drug shortages; management of drug stocks using therapeutic interchange; communication with the supply team about adequate supplies of medications.	Participation in the development of a COVID-19 protocol; conduction of clinical interventions; monitoring and prevention of drug-drug interactions and ADR; updating pharmacy professionals about new scientific research
Elson et al. <sup>20</sup>	NR	Contribution with medication access by making telephone calls to outside pharmacies, insurance companies, and patients or families.	Participation in interdisciplinary inpatient rounds using Microsoft Teams; conduction patient profile reviews to assess the safety and efficacy of medication therapy using secure remote access to patient information in the EMR; providing patient education and counseling via telephone and Microsoft Teams; continuation of quality improvement projects, formulary and inventory management, and research by conference calls, email, and telephone communication as well as Microsoft Teams and other video conferencing platforms; providing ambulatory care services remotely. Providing medication recommendations during virtual rounds with HCP; providing remote education for the patients to assist
Fan and Kamath <sup>21</sup>	NR	NR	

**Table 2 (continued)**

Author	Disease prevention and infection control	Adequate storage and drug supply	Patient care and support for healthcare professionals
Hua et al. <sup>22</sup>	NR	Drug formulary and purchase, storage, and distribution of drugs; critical care trolleys loaded with all kinds of critical care drugs.	their learning of medications and lifestyle choices in discharge or admission. Online review of 20 000 electronic orders; providing online medication consultation for 484 patients using WeChat; providing medication and health education in the WeChat group; use a module radio station to inform the patients about the medication, rational nutrition and diet suggestions for COVID-19, and self-protection and medication guidance after discharge.
Meng et al. <sup>23</sup>	Change in mode of drug delivery.	Establishing pharmacies from grounds up, including locating the ideal pharmacy location and procuring necessary equipment; compiling drug formulary; cataloging and stocking formulary drugs; resolving drug shortages.	Development of a medicinal dictionary for formulary drugs to be docked into the CDS to provide prescribing support; education for patients on medications taken at the hospital and upon discharge; providing drug information to physicians especially concerning drugs that general practitioners are not familiar with a focus on off-label drug use, and interactions between TCMs and western medicines; medication reconciliation to ensure the safe transition of care. NR
Ou and Yang <sup>24</sup>	Repacking of bulk packages of masks into unit packets containing the rationed amount and distributed them for residents in their communities; education and consultation on proper hygiene strategies; disseminating of accurate information to counter myths and misinformation; and providing of emotional support to alleviate public concerns arising from the COVID-19 crisis.	NR	NR
Tan et al. <sup>25</sup>	NR	NR	Managing and providing recommendations on

(continued on next page)

Table 2 (continued)

Author	Disease prevention and infection control	Adequate storage and drug supply	Patient care and support for healthcare professionals
Ung <sup>26</sup>	Help consumers differentiate surgical masks from other types of face masks not made for protection against virus transmission; price control of surgical masks within reasonable price range and implementing “The Guaranteed Mask Supply for Macao Residents Scheme” in response to the new government policy	NR	warfarin dose adjustment to 500 patients via a mobile phone app NR
Yemm et al <sup>27</sup>	NR	NR	Application of MPN-SAF TSS and the DIPSS plus via telephone and upload this information to the EMR prior to the patient’s next visit.
Ying et al <sup>28</sup>	Designing safety transfer devices to avoid contacting patients in drugs dispensing; adjusting the route and time of drug transportation in the hospital and using designated elevators and vehicles for drug delivery; publicized the prevention and control of COVID-19 to the public free of charge online.	Establishing a list of COVID-19 therapeutic drugs to control drug supply schemes; implementing online drug procurement; managing donated medicine.	Monitoring ADR and providing ADR information; participating in the multidisciplinary diagnosis and treatment of COVID-19 patients; participating in multidisciplinary consultations; monitoring drug interactions, implementing remote pharmaceutical services; caring out medication review.
Zuckerman et al. <sup>29</sup>	Staff redeployment and staffing modifications; sourcing and using of PPE; installation of hand-sanitizing stations and plexiglass dividers in pharmacies.	Developing a list of medications required for treatment of COVID-19 patients to guide the drug supply and calculating medication quantities to purchase; developing new medication and supply storage and delivery mechanisms; creation of a virtual dashboard to clearly communicate current strategic supply inventory.	Participating in virtual meetings and inpatient rounds; patient counseling via smartphones or telehealth visits; participating of the COVID-19 pharmacotherapy working group that provided initial treatment recommendations published weekly on institutions intranet; developing of a guidance for patients receiving biologics who were at risk for COVID-19 acquisition due to immunosuppression so that providers could advise them to suspend

Table 2 (continued)

Author	Disease prevention and infection control	Adequate storage and drug supply	Patient care and support for healthcare professionals
			therapy if necessary; coordinated many patients’ transition from infusions to self-administered medications.

Abbreviation: ADR (adverse drug reaction), CDS (clinical decision support system), COVID-19 (coronavirus disease 2019), DIPSS plus (Dynamic International Prognostic Scoring System), EMR (Electronic Medical Record), HCP (healthcare professionals), NR (not reported), PPE (personal protective equipment), MPN-SAF TSS (Myeloproliferative Neoplasm Symptom Assessment Form total symptom score), TCM (traditional chinese medicine).

suggestion for change in therapy (n = 3)<sup>19,25,29</sup>, monitoring results report (n = 1)<sup>19</sup>, drug supply management (n = 6)<sup>19,20,22,23,28,29</sup>, safety measures for infection control (n = 4)<sup>19,24,26,29</sup>, and application of tools to evaluated a disease (n = 1).<sup>27</sup> Regarding the materials that support actions adopted by pharmacists, most studies (n = 7)<sup>20–22,24–27</sup> did not report them. Among those that described support resources provided by the pharmacists, educational materials (n = 4)<sup>19,23,28,29</sup> were the most reported, following the protocols (n = 2)<sup>19,29</sup>, discharge letter (n = 1)<sup>19</sup>, and safety alert system (n = 1).<sup>19</sup> The description of the pharmacist interventions according to DEPICT version 2 are shown in Table 3.

Discussion

Summary of evidence

This scoping review identified 11 relevant studies on the services provided by the pharmacist during the COVID-19 pandemic. To the best of our knowledge, this is the first review to discuss this question. These results indicate that there are a reasonable number of studies on this topic in a short time of the COVID-19 pandemic, although most of them are letters to the editor and other rapid scientific communications. Moreover, most studies were conducted in the United States and Asia, particularly in the region of China. These findings were expected because this region was the first local affected by the SARS-CoV-2 virus. Diversely, to our surprise, no studies were performed in Europe, especially in the United Kingdom, Italy and Spain, where the COVID-19 pandemic spread quickly in mid-March. It is important to note that most studies reported the hospital as the workplace of pharmacists. Experiences with community pharmacists should be encouraged since most of the time the community pharmacy is a first point-of-care of the patients.

In light of these findings, researchers must be engaged to design and report future studies with greater methodological rigor and more detailed description of the pharmacist interventions, in order to support and guide the actions of the pharmacists in this and-or other pandemic.

General view of the studies

Most of the studies found in this review were conducted in the United States of America and China. These countries are the second and first in the scientific publication ranking worldwide, respectively.<sup>30</sup> Moreover, China was the first region affected by the COVID-19 infection<sup>1</sup> and therefore first experiences were felt in this location.

Regarding the type of publication, most studies were letters and other rapid scientific communications reporting experiences. These publications did not contain details of the work experiences and are at the lowest level of evidence.<sup>31</sup> However, considering the current pandemic, when there is a need for rapid information for activity guidelines by the pharmacists need to have quick information to guide



**Table 3**  
Description of the pharmacist interventions according to the DEPICT version 2.

Author	Recipient	Contact with recipient	Methods of communication	Setting of the intervention	Action(s) taken by pharmacist	Materials that support action(s)
Arain et al. <sup>19</sup>	Patient and HCP	One-to-one (patient and HCP) and group (HCP)	Face-to-face (patient and HCP), written (patient and HCP), and telephone (HCP)	Hospital bedside (patient and HCP), hospital pharmacy (HCP), and ambulatory setting (patient)	Drug information for HCP; patient counseling; suggestion for change in therapy; monitoring results report; drug supply management; safety measures for infection control	Discharge letter; educational materials; protocol; safety alert system
Elson et al. <sup>20</sup>	Patient and HCP	One-to-one (patient) and group (HCP)	Written (patient and HCP), telephone (patient and HCP), and video conference (patient and HCP)	Hospital bedside (patients and HCP), ambulatory setting (patient), and recipient's home (patient)	Drug information for HCP; patient counseling; drug supply management	NR
Fan and Kamath <sup>21</sup>	Patient and HCP	One-to-one (patient) and group (HCP)	Video conference (patient and HCP)	Hospital bedside (patients and HCP) and recipient's home (patient)	Drug information for HCP; patient counseling	NR
Hua et al. <sup>22</sup>	Patient and HCP	One-to-one (patient and HCP) and group (patient)	Written (patient and HCP), telephone (patient), video conference (patient), and radio station (patient)	Hospital bedside (patient and HCP)	Drug information for HCP; patient counseling; drug supply management	NR
Meng et al. <sup>23</sup>	Patient and HCP	One-to-one (patient and HCP)	Telephone and video conference (patient and HCP)	Hospital bedside (patient and HCP)	Drug information for HCP; patient counseling; drug supply management; safety measures for infection control	Educational materials
Ou and Yang <sup>24</sup>	NA <sup>a</sup>	One-to-one	Face-to-face	Community pharmacy	Safety measures for infection control	NR
Tan et al. <sup>25</sup>	Patient	One-to-one	NR	Recipient's home	Patient counseling; suggestion for change in therapy	NR
Ung <sup>26</sup>	NA <sup>a</sup>	One-to-one	Face-to-face	Community pharmacy	Safety measures for infection control	NR
Yemm et al. <sup>27</sup>	Patient	One-to-one	Telephone	Recipient's home	Application of tools to evaluated a disease	NR
Ying et al. <sup>28</sup>	Patient and HCP	One-to-one (patient and HCP) and group (HCP)	Face-to-face, written (patient and HCP)	Hospital bedside (patient and HCP) and ambulatory setting (patient and HCP)	Drug information for HCP; patient counseling; drug supply management; safety measures for infection control	Educational materials
Zuckerman et al. <sup>29</sup>	Patient and HCP	One-to-one (patient and HCP) and group (HCP)	Written (patients and HCP), telephone (patients), and video conference (HCP)	Hospital bedside (patient and HCP), hospital pharmacy (HCP), ambulatory setting (patient and HCP) and recipient's home (patient)	Drug information for HCP; patient counseling; suggestion for change in therapy; drug supply management; safety measures for infection control	Educational materials; protocols

Abbreviation: HCP (healthcare professionals), NA (not applicable), NR (not reported).

<sup>a</sup> Pharmacist interventions were conducted for the general population.

their activities, these publications are convenient and acceptable.

The hospital was the main workplace of the pharmacist in the included studies, which was an expected result because the role of pharmacist in hospital pharmacy practice is one of the most consolidated.<sup>32</sup> Pharmacists have a very comprehensive role within the hospital, performing from administrative activities to clinical services.<sup>33</sup> Therefore, they must be involved with all aspects of medicines use and be accessible as a point of contact for patients and health care providers.<sup>34</sup> As a consequence, it is more than expected that they would be on the frontline against COVID-19 pandemic and reporting on their successful experiences.

This review showed that pharmacists may play an important role during the COVID-19 pandemic. The results reported were categorized as “disease prevention and infection control”, “adequate storage and drug supply” and “patient care and support for healthcare professionals”. These categories are basically the responsibilities that International Pharmaceutical Federation (FIP) has stated that it would like pharmacists to have in both primary care context (i.e. community pharmacies and primary healthcare facilities) and in hospital settings.<sup>12</sup> Other recommendations of the scientific societies are also available and can help to direct the pharmacist intervention.<sup>35–37</sup>

According to the key domains of pharmacist interventions, most studies were carried out for healthcare professionals and patients. Pharmacist-provided interventions with the recipients have been shown to improve patient outcomes and contribute to substantial healthcare savings.<sup>38</sup> In contrast, two studies did not classify as to the recipient of the intervention because the DEPICT version 2 did not predict interventions in the general population. It is important to note that pharmacists can play a role in health education and disease prevention

in various ways for the general population.<sup>39–42</sup> Moreover, the level of pharmacist-recipient interaction varied between studies. Most of them described the use of telephone, written interaction including web-based, and video conference. Studies involving the use of these methods of communication have been successful<sup>43–45</sup> and these valuable tools may be applied in a social distancing context. In addition, one study reported that pharmacists used a hospital's radio station as a communication strategy in patients who had difficulty in dealing with available technologies, highlighting the creative character.<sup>22</sup> Regarding the setting of intervention, most studies were performed in hospital bedside, ambulatory, and recipient's home. Pharmacist interventions were described in several settings<sup>46–48</sup> as to improving the quality of care. Unfortunately, only two studies related the community pharmacy as the setting of intervention. A recent study discussed the role of community pharmacists during the COVID-19 pandemic, collecting and summarizing the experience of Chinese community pharmacies.<sup>49</sup> It is well known that community pharmacies are an important setting of care in the COVID-19 pandemic period and further studies in this context should be encouraged.

Drug information for healthcare professionals and patient counseling were the main actions provided by the pharmacists identified in this review, similarly with other studies.<sup>48,50</sup> These actions focus on enhancing the problem solving skills of the patient for the purpose of improving or maintaining the quality of life.<sup>18</sup> In addition, other actions (drug supply management and safety measures for infection control) were also identified in some studies. Gross and MacDougall<sup>51</sup> described these actions (e.g. planning the drug shortages and antiviral stewardship) as vital during the COVID-19 pandemic period. Moreover, the key domain “Materials that support actions” has not been reported in most

studies. Among those that described these resources, most of them used educational materials. These findings are similar to a study that describes the role and impact of pharmacists in Spain.<sup>52</sup> These resources are useful to support the pharmacy services.<sup>18</sup> The lack of this information affected the understanding which tools were used by pharmacists in their actions.

### Limitations

This study has some limitations. It is possible that some studies were missed due to not being indexed in the databases searched or being published in websites of institutions or scientific societies. Moreover, the number of publications on COVID-19 is rapidly increasing in a short time and some studies of interest available after the established search period have not been included. Finally, this review did not analyze the quality of the studies taking into account the inherent characteristic of the scoping reviews.

### Conclusion

A reasonable number of studies that described the role of the pharmacists during the COVID-19 pandemic were found. Several methods of communication were performed in different settings of intervention. Moreover, all studies reported actions taken by pharmacists, mainly drug information and patient counseling, although description was not satisfactory. Thus, future research with more detailed description and evaluated the impact of pharmacist intervention is needed in order to guide the actions of the pharmacists in this and-or other pandemic.

### Authors' contributions

MBV and TML identified the reports in the databases and collected data of the studies included. MBV and TML drafted the manuscript. IVF revised for finalization of the manuscript. All authors approved the final manuscript.

### Source of funding

The authors received no financial support for the research, authorship, and/or publication of this article.

### Declaration of competing interest

The authors declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

### Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.sapharm.2020.07.003>.

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