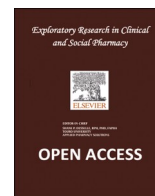


Contents lists available at [ScienceDirect](https://www.sciencedirect.com)

Exploratory Research in Clinical and Social Pharmacy

journal homepage: www.elsevier.com/locate/rcsop

Patient care and customer services during the COVID-19 pandemic at accredited pharmacies: Pharmacists and patients' perspectives

Chamipa Phanudulkitti^{a,*}, Surangkana Puengrung^b, Karen Bell Farris^c^a Faculty of Pharmaceutical Sciences, Burapha University, 169 Long Had Bangsaen Rd, Saen Suk, Chon Buri District, Chon Buri 20131, Thailand^b Independent Researcher, 502 Charunsanitwong 79, Bangphlat District, Bangkok 10700, Thailand^c University of Michigan College of Pharmacy, 428 Church Street, 3569 NUB, Ann Arbor, MI 48109-1065, United States of America

ARTICLE INFO

Keywords:

Accredited pharmacy
Community pharmacy
COVID-19 pandemic
New Normal pharmaceutical care services
Telepharmacy

ABSTRACT

Background: Community pharmacists are now the most accessible healthcare professionals, providing advice, information, drugs, and devices across the globe during the COVID-19 pandemic. In Thailand, accredited community pharmacies meet higher standards than qualified community pharmacies, but little is known about the perspectives of accredited community pharmacists and patients in this emergency situation. This study aimed to assess pharmacists' and patients' perspectives on the challenges and opportunities they faced in providing or receiving patient care and services during the COVID-19 pandemic.

Methods: A cross-sectional study was conducted in March–August 2022 in a province located in the eastern part of Thailand. Participants of the study were full-time pharmacists and patients at accredited community pharmacies. A convergent mixed methods design was used and involved quantitative data about the perspectives of participants measured by online self-administered surveys and qualitative open-ended questions.

Results: Twenty pharmacists and 416 patients provided complete responses. The meta-inferences were expansive in three standards including physical evidence, quality management, and good pharmacy practices/services for both groups of participants. For the social/community involvement standard, pharmacists' and patients' opinions (free-text responses) confirmed their perspective scores.

Conclusions: This study highlights community pharmacy's crucial role in maintaining essential healthcare services during the pandemic, with patients acknowledging and appreciating the dedication of community pharmacists. The mixed methods findings provide valuable insights into pharmacists' and patients' perspectives, facilitating a deeper understanding and exploration of the potential roles community pharmacists can play in a post-pandemic world, embracing new technologies for improved systems.

1. Introduction

Coronaviruses (CoV) are a large family of respiratory viruses causing mild to severe symptoms of respiratory diseases.¹ Since the first cases of Corona Virus Disease 2019 (COVID-19) were detected in China (Wuhan) in late 2019,² community pharmacies were among the few essential services that kept their activities ongoing during the emergency and the lockdown.³ They have become the frontline healthcare professionals with the most accessible point of care providing advice, information, drugs, and devices to the entire population.^{3,4}

Several studies explored the perspectives of community pharmacists and patients during the pandemic. A number of community pharmacists faced difficulties in providing their best pharmaceutical care services

including shortages of essential pharmaceutical products,⁵ pharmacists' job-related stress, long hours, and burn-out,⁴ as well as impacts of the pandemic on vulnerable populations.⁶ Taking patients' perspectives into account, it was necessary for pharmacies to prioritize the maintenance, adjustment, or adaptation of their services in conjunction with the development of information technology (IT) infrastructure, alongside the coordination of primary care services.⁷

In Thailand, community pharmacies are categorized into two groups, Good Pharmacy Practice (GPP) community pharmacies, and accredited community pharmacies. All community pharmacies are obligated to adhere to the Good Pharmacy Practice (GPP) standards, which serve as the minimum requirement for pharmacies. However, obtaining certification as an 'accredited pharmacy' was optional.⁸ The Thai GPP

* Corresponding author.

E-mail addresses: chamipa@go.buu.ac.th (C. Phanudulkitti), kfarris@med.umich.edu (K.B. Farris).<https://doi.org/10.1016/j.rcsop.2023.100336>

Received 17 August 2023; Received in revised form 20 September 2023; Accepted 20 September 2023

Available online 21 September 2023

2667-2766/© 2023 The Authors. Published by Elsevier Inc. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

standards encompass four domains that pharmacies must adhere to: (1) places and equipment, (2) personnel, (3) quality control, and (4) pharmacy services.⁹ With higher standards, accredited pharmacies are subject to a more comprehensive set of five standards, which include physical evidence, quality management, good pharmacy practice/services, law and ethics, and social/community involvement. Furthermore, accredited pharmacies require the continuous presence of pharmacists throughout their business hours, whereas GPP pharmacies permit pharmacists to be present for a specific portion of their operating hours. This study primarily centered on accredited pharmacies due to their elevated standards and the consistent availability of full-time pharmacists. Across the country, there were over 1600 accredited community pharmacies offering healthcare services, such as the Near-home Medicine Pick-up Project (aimed at patients enrolled in Universal Health Coverage (UHC) programs, with well-managed non-complicated conditions, enabling them to personally collect prescribed medications from pharmacies situated near their residences), and actively participating in various COVID-19-related campaigns, including home isolation and the distribution of free Antigen Test Kits (ATK), all authorized by the Minister of Public Health (MoPH) of Thailand.¹⁰

At the present time, there is limited available information regarding the perspectives of pharmacists employed at accredited community pharmacies and of patients who have received patient services from these pharmacies in the context of the emergency situation. This research focused on accredited pharmacies located in Chonburi province, Thailand, with a particular emphasis on four selected standards known for their relevance to patient care and services. These standards encompass physical evidence, quality management, good pharmacy practices/services, and social/community involvement. The study includes participation from full-time pharmacists at each accredited pharmacy and patients served by these pharmacies. The findings of this study could be shared with other pharmacies across the country as well

as other countries so that they can prepare themselves for any further uncertain situations in the future. This study aimed to (1) assess pharmacists' perspectives on the challenges and opportunities they faced in providing patient care and services during the COVID-19 pandemic, with a focus on the four standards, and (2) assess patients' perspectives on the challenges and opportunities they faced in receiving patient care and services during the COVID-19 pandemic, in relation to the four standards.

2. Methods

A convergent mixed-methods design (Fig. 1) was employed to capitalize on the strengths of quantitative data obtained from surveys with complementary qualitative data. Mixed-methods research refers to an approach in which researchers collect, analyze, and integrate both quantitative and qualitative data, enabling them to draw interpretations based on the combined merits of these data types. In the present study, a convergent design was adopted, wherein both types of data were collected and analyzed concurrently. Separate analyses were conducted for pharmacists and patients to ensure a comprehensive understanding of their attitudes toward patient care and services during the COVID-19 pandemic. The cross-sectional survey was conducted between March and August 2022. All research materials and protocols were approved by the Institutional Review Board committee, Burapha University (Project No. HS013/2565; Approval No. IRB1-023/2565; approved on February 25, 2022). An electronic informed consent from anonymous participants was added as an initial cover page before their online survey started with emphasis on voluntary participation and withdrawal without providing a reason.

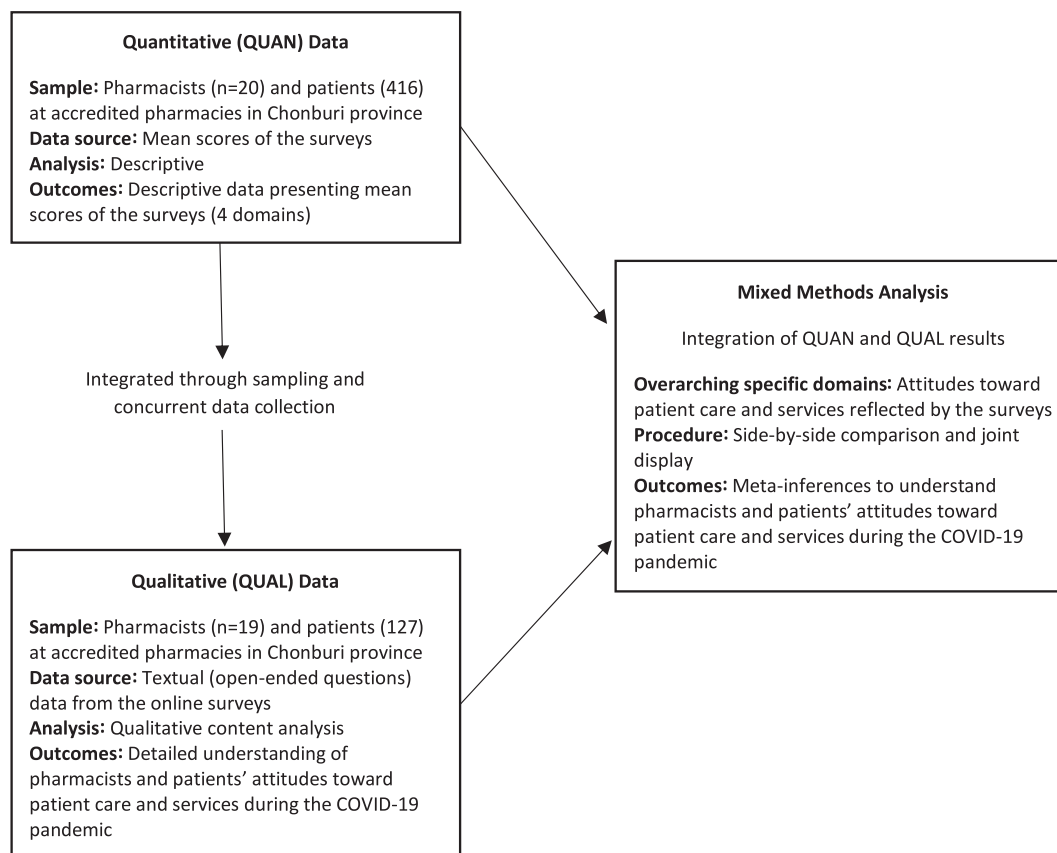


Fig. 1. Mixed methods convergent design.

2.1. Participants

Based on preliminary calls, 20 out of the 33 accredited community pharmacies in Chonburi province (61%) agreed to participate in this study. Patient sample size determination was aided by Open-source Epidemiologic Statistics for Public Health version 3 (OpenEpi), accessible at <https://www.openepi.com>. This tool facilitated the computation of sample size using parameters based on a 95% confidence level, a 5% margin of error, a hypothesized response distribution of 50%, design effect, and population size. As a result, the calculated minimum sample size requirement was 385 patients. Each participating pharmacy enlisted a full-time pharmacist and approximately 20 patients, resulting in a total of 20 pharmacists and around 400 patients as study participants, employing a convenience sampling method. The survey itself took approximately 10–15 min to complete.

2.2. Study instruments

Two sets of questionnaires were created, one tailored for pharmacists and another specifically designed for patients, drawing upon the four standards outlined in the Office of Community Pharmacy Accreditation's guideline for pharmacy accreditation.¹¹ The face validity of these questionnaires was reviewed by three experts. Content validity of the questionnaires was assessed by three experts in accredited community pharmacies, education, and survey development. The content validity index (CVI) values for these two instruments were both 1.00, indicating good content validity.

The pharmacist questionnaire (Appendix A) consisted of 22 items in two sections; the first had 18 items focused on the four standards, physical evidences, quality management, good pharmacy practices/services, and social/community involvement, and the second section had four items focused on demographic information. A 4-point Likert scale (4 = strongly agree to 1 = strongly disagree) was used for 12 items in Section 1, and six were open-ended questions. To evaluate the reliability of the questionnaire, the authors calculated Cronbach's alpha coefficients for each dimension. The resulting coefficients were as follows: 0.74 for physical evidences, 0.81 for quality management, 0.87 for good pharmacy practices/services, and 0.71 for social/community involvement. These values indicated good internal consistency within each dimension, affirming the questionnaire's reliability.

The patient questionnaire (Appendix B) consisted of 21 items that was divided into two sections. Section one had 13 items asking level of agreement about the four standards, physical evidence, quality management, good pharmacy practices/services, and social/community involvement. Five open-ended questions were included. Section two asked 3 demographic questions. To assess the questionnaire's reliability, the authors computed Cronbach's alpha coefficients for each dimension. The obtained coefficients were as follows: 0.71 for physical evidence, 0.85 for quality management, 0.88 for good pharmacy practices/services, and 0.81 for social/community involvement. These values demonstrate strong internal consistency within each dimension, confirming the questionnaire's reliability.

2.3. Data collection

The study brochure invitations and surveys, which included essential participant information in Google form links and QR codes, were distributed to the full-time pharmacist of each pharmacy via their contact email. Each pharmacy received unique links and QR codes. Two sets of surveys were provided for each pharmacy: one for the full-time pharmacist and another for patients. Pharmacists assisted in the printing of the patient survey's link and QR code, making them available on the counter for interested patients to access. Researchers consistently monitored the online responses. Once the expected number of respondents was reached, the researcher exported the data from Google Forms, conducted completeness checks, and performed the analysis.

2.4. Data analysis

Descriptive statistics were used to determine means and standard deviations. The analysis was conducted using SPSS version 24 (SPSS Inc., Chicago, Illinois). Qualitative components of the surveys were analyzed by using content analysis. Coding written data was done by two researchers (CP and SP) by identifying and defining themes, and grouping written data into a specific theme/domain using Microsoft Excel. Consensus between the two coders was obtained. Results from the qualitative and quantitative analyses were explicitly merged through a side-by-side comparison to assess for confirmation, expansion, or discordance between the results and to draw meta-inferences. Pharmacist and patient responses were 19 and 127, respectively. Integration at the reporting level occurred through weaving (matched construct-by-theme descriptions) and joint displays. Confirmation occurred if the findings from both types of results reinforced each other. Expansion occurred when the findings from the two datasets overlapped and additional insights of attitude changes were identified as different or complementary aspects. Discordance occurred if the results were inconsistent, contradictory, or disagreed with each other.

3. Results

3.1. Participant characteristics

Of the 20 accredited pharmacies, 80% ($n = 16/20$) were chain stores, while 15% ($n = 3/20$) and 5% ($n = 1/20$) were stand-alone pharmacies and faculty-owned, respectively. The majority of these pharmacies (40%, $n = 8/20$) had been in business for 11–15 years. Most (90%, $n = 18/20$) allowed customers to enter the pharmacy during the COVID-19 pandemic. Of the 20 pharmacists, 70% ($n = 14/20$) were female and 55% (11/20) were between 26 and 35 year-old. Fifty percent of the pharmacists ($n = 10/20$) had worked in pharmacies for 5–10 years. The characteristics of each pharmacist ($n = 19/20$) who provided open-ended responses are displayed in Table 1. Of the 416 patients, 72.35% ($n = 301/416$) were female. Majority of respondents were aged between 26 and 35 year-old (34.86%, $n = 145/416$) and had visited the pharmacies for about 1–3 years (45.91%, $n = 191/416$). Among the patients who provided open-ended responses ($n = 127/416$), 67.70% ($n = 86/127$) were female. Additionally, 35.40% ($n = 45/127$) of these open-ended responders were between 26 and 35 years, while 36.20% ($n = 46/127$) had visited the pharmacies for about 1–3 years.

Table 1
Characteristics of informants – Pharmacists ($n = 19$).

Informant code	Gender	Age	Experience in community pharmacy (years)	Duration of the community pharmacy's operation (years)
P01	Male	26–35	5–10	11–15
P02	Female	26–35	5–10	11–15
P03	Female	46–55	5–10	11–15
P04	Female	26–35	5–10	11–15
P05	Female	36–45	11–15	5–10
P06	Female	26–35	5–10	5–10
P07	Female	26–35	5–10	5–10
P08	Female	26–35	< 5	5–10
P09	Male	20–25	< 5	< 5
P10	Female	26–35	5–10	< 5
P11	Male	20–25	< 5	> 20
P12	Female	36–45	11–15	11–15
P13	Female	> 55	> 20	16–20
P14	Male	26–35	5–10	11–15
P15	Female	36–45	11–15	11–15
P16	Male	36–45	5–10	5–10
P17	Female	26–35	< 5	> 20
P18	Male	26–35	< 5	> 20
P19	Female	26–35	< 5	5–10

3.2. Pharmacists' perspectives

The results showed that mean agreement scores regarding the four standards, physical evidence, quality management, good pharmacy practices/services, and social/community involvement, of accredited pharmacies were 2.55 (0.84), 2.28 (0.78), 2.42 (0.79), and 1.92 (0.76), respectively. The mean scores of physical evidence, quality management, good pharmacy practices/services standards were rated 'Moderate' (2.01–3.00) whereas the mean score of social/community involvement standard was considered 'Low' (1.00–2.00).¹²

3.3. Patients' perspectives

The results showed that the mean agreement scores regarding the four standards, physical evidence, quality management, good pharmacy practices/services, and social/community involvement, of accredited pharmacies were 2.22 (0.99), 2.24 (1.00), 2.18 (1.01), and 3.11 (0.91), respectively. The mean scores of physical evidence, quality management, good pharmacy practices/services standards were rated 'Moderate' (2.01–3.00) whereas the mean score of social/community involvement standard was considered 'High' (3.01–4.00).¹²

3.4. Qualitative findings

Content analysis of the qualitative data was completed, and exemplary quotes were provided for each theme that was relevant to the specific standards – physical evidence, quality management, good pharmacy practices/services, and social/community involvement (Tables 2, 3, 4, and 5). Physical evidence was focused on limited access,

using partitions, queuing, and sanitation. Quality management included personal health and hygiene, patient referral system, and patient history taking. Good pharmacy practices/services were illustrated by good inventory management, communication between patients and pharmacists, and patient counseling. Social/community involvement was focused on providing healthcare and medicine information to people living in communities, and supporting governmental healthcare campaigns. Qualitative findings reported by pharmacists and patients for physical evidence, quality management, and good pharmacy practices/services standards elaborated their consideration and suggestions on the particular standards.

Overall feedback was also obtained related to possibilities for community pharmacy service improvement. The outstanding theme emerging from general comments by pharmacists and patients was about increasing online services. For pharmacists, the theme named increasing online and technological services covered "continuously support the use of technology", and "a pharmacy should have online channels for customers to access information and counsel with pharmacists in order to reduce the risk of COVID-19 infection. Also, telepharmacy is highly recommended to implement in pharmacies with good consideration of legal and ethics". More online services was also a theme included in patients' overall feedback. They mentioned "Please consider implementing new technology and innovation in pharmacies for more convenience", "More service options such as application for medication counseling or healthcare product information", and "Due to specific and limited service hours of pharmacies, please consider having online channels so that customers can access anytime". Other themes pharmacists suggested for improvement included governmental healthcare projects; "All accredited pharmacies should participate in

Table 2
Joint display of quantitative, qualitative, and mixed methods meta-inferences of physical evidence.

"Physical evidence"					
Pharmacists			Patients		
Perspective M (SD)	Qualitative Sources/ Related themes	Meta-Inferences	Perspective M (SD)	Qualitative Sources/ Related themes	Meta-Inferences
2.6 (0.8)	<p>Sanitation concern "I adopted vigilant measures against the spread of COVID-19 infection by cleaning service areas with alcohol, managing social distance, having partition, and cleaning more frequently." [P17] "It was important to continuously arrange and clean service areas to protect the spread of pandemic." [P01]</p> <p>New normal service consideration "Due to the pandemic, new communication channels like telemedicine or social media could be considered as they can decrease contamination/infection. However, these new normal ways were not quite well-known and widely adopted." [P03] "There were various new channels and options in selling healthcare products including providing pharmacy services especially via online platforms which have been increasingly used by people." [P19]</p>	<p>Expansion Participants described their understanding of the situation and concerned about the sanitation of service areas. They also suggested for new selling and communication channels such as online/social platforms.</p>	2.2 (1.0)	<p>No/Little effect "There was no problem because it was a part of social distance." [C091] "No effect. I can talk with pharmacists as usual" [C088]</p> <p>Appreciating with social distance and hygiene service processes "The vigilant measures were good as they made us safe." [C044] "Very appropriate" [C010]</p> <p>Long queue/ social distance "I spent longer time" [C093] "I faced difficulties in a long queue" [C098]</p> <p>Difficulties in having partitions "Due to limited access and having partition, patients and pharmacists had less counseling time" [C099] "It was difficult to see medical products through partitions." [C105]</p>	<p>Expansion Participants described their understanding of the situation and appreciate the prevention measures. Some were uncomfortable with queuing and partitions.</p>

Table 3
Joint display of quantitative, qualitative, and mixed methods meta-inferences of quality management.

"Quality management"					
Pharmacists			Patients		
Perspective M (SD)	Qualitative Sources/ Related themes	Meta-Inferences	Perspective M (SD)	Qualitative Sources/ Related themes	Meta-Inferences
2.3 (0.8)	<p>Sanitation concern "It was sort of increasing workload of pharmacies in term of personal hygiene, wearing gloves, providing alcohol gel, and cleaning service areas contacted with infected patients." [P14] "Always consider about hygiene, and social distancing. I had to modify or adjust the ways of services to protect infection." [P01]</p> <p>Patient referral concern "Pharmacies should make more efforts in collaboration with hospitals to facilitate patients." [P03] "During the pandemic, referring patients to hospitals was difficult due to limited access and full occupancy of inpatient rooms. Collaboration and communication between pharmacies and hospitals should be easier in the future." [P07]</p>	<p>Expansion Participants understood about the importance of pharmacies' quality management especially personal hygiene and health. They also considered if collaboration processes of patient referrals could be more efficient.</p>	2.2 (1.0)	<p>No/Little effects "Not at all" [C059] "Little effects" [C085]</p> <p>Communication on health problems/Needs "Overall, I understood what a pharmacist suggested. However, I preferred faster processes." [C120] "Not clearly heard and it could make misunderstood" [C078]</p>	<p>Expansion Participants considered if the communication processes can be clearer and faster.</p>

Table 4
Joint display of quantitative, qualitative, and mixed methods meta-inferences of good pharmacy practices/services.

"Good pharmacy practices/services"					
Pharmacists			Patients		
Perspective M (SD)	Qualitative Sources/ Related themes	Meta-Inferences	Perspective M (SD)	Qualitative Sources/ Related themes	Meta-Inferences
2.4 (0.8)	<p>Medical supply concern "Inventory management during the over demand situation was very challenging for me." [P03] "During the pandemic, it was difficult to order healthcare products related to COVID-19 symptoms. They were also overpriced. We should have the control on this." [P07]</p> <p>Patient counseling concern "Have to study more on the new diseases and medicines. Moreover, communication and counseling skills with patients have to be enhanced." [P16] "I have to study more about the new disease including prevention processes in order to share them with my patients. I should keep update on new healthcare products and treatment guideline." [P17]</p>	<p>Expansion Participants expressed their concerns about challenges in inventory management and knowledge updates during the pandemic.</p>	2.2 (1.0)	<p>No/Little effects "Little effect. We should support and understand roles of pharmacists" [C090] "No effect" [C117]</p> <p>Good pharmacist service "Very good services. Please continue." [C015] "I got clear, accurate, and trustworthy information." [C039]</p> <p>Medical supply concern "It was difficult to buy some medicines. Also, they were more expensive than usual situation." [C101] "Face masks and alcohol were sometime out of stock because of hoarding the supplies." [C056]</p> <p>Patient counseling concern "unmet needs for some essential medical supplies and less patient counseling." [C099] "may receive uncomplete medical suggestions from pharmacists." [C026]</p>	<p>Expansion Participants describe their understanding of their pharmacies' GPP. However, there were some challenges in shortage of health products and limited counseling time.</p>

Table 5
Joint display of quantitative, qualitative, and mixed methods meta-inferences of social/community involvement.

"Social/community involvement"					
Pharmacists			Patients		
Perspective M (SD)	Qualitative Sources/ Related themes	Meta-Inferences	Perspective M (SD)	Qualitative Sources/ Related themes	Meta-Inferences
1.9 (0.8)	<p>Healthcare information provider "... pharmacies were the first line healthcare services including providing information and better understanding about the COVID-19 infection to people." [P02] "... people in communities will get better knowledge, access to medicine, and health information rather than getting these from social media." [P03]</p> <p>Community support "During the pandemic, I collaborated with National Health Security Office (NHSO), supported communities, and provided care to patients more than usual..." [P01] "There was an increase of number of people in the community visited pharmacies during the pandemic. They contacted pharmacists via Line application, and asked to reported their ATK results via Mohprompt application..." [P08]</p> <p>Challenges in participating with governmental healthcare campaigns "There were several and complex working processes of NHSO projects including payment processes..." [P04] "I have been participated with many NHSO projects..... I faced with some challenges in stock management such as lacks of medicines and healthcare products at the beginning period of projects and overstocking at later periods..." [P18]</p>	<p>Confirmation Participants highly understood about their roles in community involvement especially health information support.</p>	3.1 (0.9)	<p>No/Little effects "Not affect me" [C076] "No problem" [C063]</p> <p>Support health care/service during COVID-19 "Apart from medical selling and counseling, I just have known that there were various community projects supported by pharmacies. Please continue having new projects." [C104] "I participated in COVID-19 home isolation with this pharmacy and I got very helpful information and good care. I also known that there were other useful services." [C108] "This pharmacy has a very good contribution. They gave ATK for free for low-income people." [C013]</p> <p>Health information services "The community gained better health knowledge from this pharmacy." [C086] "Provided useful information about basic knowledge of some diseases" [C110]</p>	<p>Confirmation Participants confirmed that their pharmacies supported communities in term of providing health information and distributing essential medicine and healthcare products to COVID-19 infected patients.</p>
		<p>Expansion Participants faced some difficulties in participating with NHSO projects due to the complex and time-consuming working processes.</p>			

National Health Security Office (NHSO) projects", "Pharmacy universal precaution practices can be considered as a good example of healthcare practice for communities", and "A connecting system between pharmacies and hospitals should be more practical and efficient so that it can ease crowd of patients at hospitals". Many patients thought that they had received good pharmacy services - "Pharmacists and pharmacist assistants provided great advices", and "This pharmacy provided very good services particularly proactive prevention information and helpful recommendation".

3.5. Mixed method findings

The mixed method results (Meta-inferences) of each standard (physical evidence, quality management, good pharmacy practices/services, and social/community involvement) were presented in Tables 2, 3, 4, and 5, respectively. The meta-inferences were expansive in three standards including physical evidence, quality management, and good pharmacy practices/services. For example, the pharmacists' consideration of physical evidence was neither supportive nor discordant with the quantitative findings. Rather, the qualitative results

expanded the understanding of the concept of physical evidence and suggested effective ways of practice.

4. Discussion

Among the four selected standards for accredited pharmacies, social/community involvement emerged as the most prominent standard. Both pharmacists and patients acknowledged the pharmacies' remarkable contributions in maintaining essential healthcare services throughout the pandemic. Patients expressed deep appreciation for the dedication that pharmacists demonstrated to their communities.

For the social/community involvement standard, pharmacists and patients agreed that this standard was outstanding during the COVID-19 crisis and the qualitative findings confirmed their perspectives. When considering the social/community involvement standard, both pharmacists and patients found it to be particularly important during the COVID-19 crisis, and qualitative findings supported their perspectives. Pharmacists rated the mean agreement scores for this standard as "Low," indicating that they were unlikely to encounter difficulties in providing patient care and services according to this standard. Conversely, patients

rated the mean agreement scores as “High,” underlining their recognition of the pharmacies’ dedication to delivering patient care and services. They both recognized important roles of accredited community pharmacists especially in providing information related to health and supporting primary patient care such as home isolation, COVID-19 testing with antigen test kits, and other self-care consultation. Several studies supported this finding that one of the most crucial roles of community pharmacists during the COVID-19 outbreak was providing reliable information on several health-related and drug-related aspects or serving as an information hub, and served as a means to debunk fake news.^{3,13,14} Facilitating self-isolation, supporting point-of-care testing (i.e., COVID-19 antigen test kits), and empowering people, families, and communities were considered crucial roles of community pharmacists in the aspect of social/community involvement during the pandemic.^{2,14,15} Although there were a number of governmental healthcare projects and campaigns during the pandemic in Thailand, the COVID-19 vaccine administration was not yet available at the accredited community pharmacies. This was different from many countries such as the USA, Canada, England, Jordan, and Switzerland, where community pharmacists were responsible for the vaccine administration.^{16–18} This study revealed that the pharmacists understood their social involvement roles and were willing to support their communities. However, they faced some difficulties in participating in the governmental healthcare campaigns, as their qualitative results expanded the perspectives of social/community involvement. They experienced more workload, complex, and time-consuming processes. A couple of studies found similar trends in terms of a high influx of patients into the pharmacy, working for extended hours, and more complicated activities.^{2,7,15}

Pharmacists’ and patients’ perspectives on the other three standards were moderate. This might be because the scope of work for these three standards was not as crucial as the social/community involvement during the COVID-19 pandemic. Moreover, it may relate to the timing of data collection of this study which was in mid-2022, when people were less scared and less critical. If we collected data during the middle of the pandemic, the results could be different. However, the mixed-method analyses provided additional insights to expand perspectives on these three standards with mostly recommendations for improvement. For instance, pharmacists suggested using more online platforms and social media to provide services whereas patients described their appreciation of preventive measures but felt uncomfortable with queuing and partitions for the standard of ‘physical evidence’.

Apart from the four standards of accredited community pharmacies in Thailand, pharmacists and patients raised the same general comment emphasizing the importance of information technology (IT) including telepharmacy, online consultation, mobile application, and social media during the pandemic. This finding was echoed by several studies. Dat and colleagues (2022) in Vietnam revealed that 87.2% of participating pharmacists were willing to apply telepharmacy in their practice.¹⁹ In Northern Ireland, there was a call for investment in better IT systems and a strong support for a change to IT pharmaceutical services by community pharmacists who worked in the periods of the COVID-19 pandemic.⁷ Nearly 90% of general population excluding pharmacists, physicians, and pharmacy students in Arabic countries supported the idea of creating a website provision of telemedicine and pharmaceutical care services.²⁰ The importance of these technologies during the crisis situation included remote pharmaceutical services with respect to home quarantined patients with chronic diseases, continuity of care for high-risk groups while allowing for social distancing and minimizing the risk of infection, and managing multiple healthcare services by integrating diverse eHealth components and collaboration with all stakeholders.^{14,15,20}

From the pharmacists’ and patients’ perspectives, this study recommends maintaining social and community involvement between community pharmacists and patients, and increasing the use of technology in pharmacy services. Policy- and decision-makers should prioritize comprehensive national guidelines for community pharmacists to

prepare for future public health crises. These should cover Standard Operating Procedures (SOPs), safety and training programs, health-related information dissemination, and collaboration with other healthcare professionals. Examples include creating patient interaction protocols and managing increased medication and PPE demand, establishing emergency preparedness initiatives, ensuring access to reliable health information for the public, and fostering effective communication among interdisciplinary teams. IT infrastructure and online platforms should be also effectively implemented in community pharmacies with appropriate and practical regulations. Lastly, compensation to recognize increased workload and stress are crucial aspects for consideration in response to these heavy and costly contributions of community pharmacists to society.

The strength of this study is the integration of the quantitative and qualitative analyses from pharmacists and patients at the accredited pharmacies that resulted in meta-inferential findings. There are, however, some limitations. The generalizability of this study is limited by the small number of accredited pharmacies which mostly were chain stores from one province, Chonburi. Some of the qualitative comments suggested improvements that could be pursued. Furthermore, it’s important to note that the evaluation did not cover all aspects of accredited pharmacy standards. Yet, these results quantify the value of national health policies for accredited pharmacy initiatives during the pandemic and raise some issues for future study. Future work should expand this healthcare concept to other qualified community pharmacies or clinics and invest in technologies and innovation supports.

5. Conclusion

In conclusion, pharmacists’ and patients’ recognized community pharmacies contributions to maintain essential healthcare services during the pandemic and patients appreciated what community pharmacists had devoted to society. This leads to a consideration of the roles community pharmacists can play in the post-pandemic world with new normal lifestyle and better systems of online technologies.

Financial disclosure

This work was financially supported by the Research Grant of the Faculty of Pharmaceutical Sciences, aBurapha University (Grant no. Rx7/2565).

Author contribution

All authors (CP, SP, and KF) contributed to the study’s conception and design. Material preparation and data collection were performed by CP. Data analyses were performed by SP and CP. The first draft of the manuscript was written by CP and reviewed and edited by KF. All authors read and approved the final manuscript.

Funding

This work was financially supported by the Research Grant of the Faculty of Pharmaceutical Sciences, Burapha University (Grant no. Rx.7/2565).

Ethical disclosure

All research materials and protocols were approved by the Institutional Review Board committee, Burapha University (Project No. HS013/2565; Approval No. IRB1–023/2565; approved on February 25, 2022).

Declaration of Competing Interest

The authors declare that they have no known competing financial

interests or personal relationships that could have appeared to influence the work reported in this paper.

Data availability

The datasets used and analyzed during the current study are available from the corresponding author on reasonable request.

Appendix A. Pharmacist survey

Please answer the following questions based on your experiences during the COVID-19 pandemic in Thailand.

A.1. Section 1: Standards

A.1.1. Physical evidence

- Q1: Did you allow patients/customers to go inside your pharmacy?
 Yes No, please provide reasons and more details
- Q2: I faced difficulties providing patient care/counseling through partitions.
 Strongly agree Agree Disagree Strongly disagree Not applicable
- Q3: I faced difficulties communicating with patients through the partition
 Strongly agree Agree Disagree Strongly disagree Not applicable
- Q4: I was concerned about the hygiene of the service areas.
 Strongly agree Agree Disagree Strongly disagree Not applicable
- Q5: How did the changes in physical evidence during the pandemic bring you challenges and opportunities for improvement?
.....
.....
.....

A.1.2. Quality management

- Q1: I faced difficulties in making sure, that all staff in my pharmacy were healthy during the pandemic.
 Strongly agree Agree Disagree Strongly disagree Not applicable
- Q2: I faced difficulties referring patients to specialists or hospitals.
 Strongly agree Agree Disagree Strongly disagree Not applicable
- Q3: I was concerned if I was able to exactly identify patients' health needs.
 Strongly agree Agree Disagree Strongly disagree Not applicable
- Q4: How did the changes in quality management during the pandemic bring you challenges and opportunities for improvement?
.....
.....
.....

A.1.3. Good pharmacy practices/services

Q1: I faced difficulties procuring COVID-19-related medications and medical supplies to meet my patients' needs.

Strongly agree Agree Disagree Strongly disagree Not applicable

Q2: I faced difficulties in gathering essential information from patients.

Strongly agree Agree Disagree Strongly disagree Not applicable

Q3: I was concerned about the way medications were delivered to patients.

Strongly agree Agree Disagree Strongly disagree Not applicable

Q4: How did the changes in good pharmacy practices/services during the pandemic bring you challenges and opportunities for improvement?

.....
.....
.....

Q1: I faced difficulties procuring COVID-19-related medications and medical supplies to meet my

A.1.4. Social/community involvement

Q1: I faced difficulties providing medical and health knowledge to the community.

Strongly agree Agree Disagree Strongly disagree Not applicable

Q2: I faced difficulties managing drug abuse consultations.

Strongly agree Agree Disagree Strongly disagree Not applicable

Q3: I faced difficulties participating in many health campaigns including home isolation and ATK testing.

Strongly agree Agree Disagree Strongly disagree Not applicable

Q4: How did the changes in social/community involvement during the pandemic bring you challenges and opportunities for improvement?

.....
.....
.....

A.1.5. General comments/suggestions

Please provide comments/suggestions for community pharmacy development to serve the new normal lifestyle (if any)

.....
.....
.....

A.2. Section 2: Demographic

1. Please specify your gender
 Male Female Prefer not to disclose

2. Please specify your age
 20-25 years old 26-35 years old 36-45 years old
 46-55 years old Older than 55 years old

3. Years of work experience in community pharmacy
 less than 5 years 5-10 years 11-15 years
 16-20 years longer than 20 years

4. How long has this pharmacy been operated for pharmacy services?
 less than 5 years 5-10 years 11-15 years
 16-20 years longer than 20 years

Appendix B. Patient survey

Please answer the following questions based on your experiences during the COVID-19 pandemic in Thailand.

B.1. Section 1: Standards

B.1.1. Physical evidence

Q1: I faced difficulties entering the pharmacy due to limited access and partition.

Strongly agree Agree Disagree Strongly disagree Not applicable

Q2: I faced difficulties selecting over-the-counter health products.

Strongly agree Agree Disagree Strongly disagree Not applicable

Q3: I face difficulties waiting in a queue for pharmacy services due to the social distance.

Strongly agree Agree Disagree Strongly disagree Not applicable

Q4: I was concerned about the hygiene of the service areas.

Strongly agree Agree Disagree Strongly disagree Not applicable

Q5: How did the changes in physical evidence during the pandemic bring you challenges and opportunities for improvement?

.....
.....
.....

B.1.2. Quality management

Q1: I was concerned about pharmacy staff' health condition during the pandemic.

Strongly agree Agree Disagree Strongly disagree Not applicable

Q2: I face difficulties in receiving clear referral procedures from the pharmacy.

Strongly agree Agree Disagree Strongly disagree Not applicable

Q3: I was worried if the pharmacist was able to identify my expectation and needs.

Strongly agree Agree Disagree Strongly disagree Not applicable

Q4: How did the changes in quality management during the pandemic bring you challenges and opportunities for improvement?

.....
.....
.....

B.1.3. Good pharmacy practices/services

Q1: I face difficulties buying essential medical and hygiene products during the pandemic.

Strongly agree Agree Disagree Strongly disagree Not applicable

Q2: I was worried if the pharmacist was able to ask for all-important information from me before making the decision to dispense medicine.

Strongly agree Agree Disagree Strongly disagree Not applicable

Q3: I was worried about the procedures of medication delivery with good counseling.

Strongly agree Agree Disagree Strongly disagree Not applicable

Q4: How did the changes in good pharmacy practices/services during the pandemic bring you challenges and opportunities for improvement?

.....
.....
.....

B.1.4. Social/community involvement

Q1: I noticed that this pharmacy supports medical and health-related information as well as consultation services for the community during the pandemic.

Strongly agree Agree Disagree Strongly disagree Not applicable

Q2: I noticed that this pharmacy supports health campaigns in the community during the pandemic such as home isolation, ATK testing, and self-care programs.

Strongly agree Agree Disagree Strongly disagree Not applicable

Q3: I noticed that this pharmacy provides drug abuse counseling for the community during the pandemic.

Strongly agree Agree Disagree Strongly disagree Not applicable

Q4: How did the changes in social/community involvement during the pandemic bring you challenges and opportunities for improvement?

.....

.....

.....

B.1.5. General comments/suggestions

Please provide comments/suggestions for community pharmacy development to serve the new normal lifestyle (if any)

.....

.....

.....

B.2. Section 2: Demographic

1. Please specify your gender
 Male Female Prefer not to disclose

2. Please specify your age
 18-25 years old 26-35 years old 36-45 years old
 46-55 years old 56-65 years old Older than 65 years old

3. How long have you been a patient/customer at this pharmacy?
 less than 1 year 1-3 years 4-6 years
 7-10 years longer than 10 years

References

- 1 Chen N, Zhou M, Dong X, et al. Epidemiological and clinical characteristics of 99 cases of 2019 novel coronavirus pneumonia in Wuhan, China: a descriptive study. *Lancet*. 2020;395(10223):507–513.
- 2 Al-Hasani NR, JabbarKadhim D, Al-Jumaili AA. Exploring the role of community pharmacists in preventing the onsite infection during covid-19 pandemic. *Pharm Sci Asia*. 2022;49(2):169–179.
- 3 Giua C, Paoletti G, Minerba L, et al. Community pharmacist's professional adaptation amid covid-19 emergency: a national survey on italian pharmacists. *Int J Clin Pharmacol*. 2021;43(3):708–715.
- 4 Jović-Bata J, Pavlović N, Milošević N, et al. Coping with the burden of the covid-19 pandemic: a cross-sectional study of community pharmacists from Serbia. *BMC Health Serv Res*. 2021;21(1):304.
- 5 Yimenu DK, Demeke CA, Kasahun AE, et al. Impact of covid-19 on pharmaceutical care services and the role of community pharmacists: a multi-center cross-sectional study in Ethiopia. *SAGE Open Nurs*. 2021;7, 23779608211025804.
- 6 Hayden JC, Parkin R. The challenges of covid-19 for community pharmacists and opportunities for the future. *Ir J Psychol Med*. 2020;37(3):198–203.
- 7 Patterson SM, Cadogan CA, Barry HE, Hughes CM. "It stayed there, front and centre": Perspectives on community pharmacy's contribution to front-line healthcare services during the covid-19 pandemic in northern ireland. *BMJ Open*. 2022;12(9). e064549.
- 8 Parinyarux P, Yotsombut K. Customers' satisfaction toward drugstore facilities and services based on the good pharmacy practice standard in Thailand. *Pharm Pract (Granada)*. 2022;20(1):2601.
9. Vimolkittiphong S, Pantong M. Guideline to Achieve Mandatory Gpp Regulation [Internet]. Available from: <https://www.lamphunhealth.go.th/office/frontend/web/?r=site/view&id=662>; 2023.
10. The Office of Community Pharmacy Accreditation (Thailand). Accredited Pharmacy [Internet]. Available from: <https://www.acc-pharm.com/Pharmacy>; 2023.
11. The Office of Community Pharmacy Accreditation (Thailand). Certificate of Commitment for the Renewal of Accredited Pharmacy Certification and Self-Assessment form [Internet]. Available from: <https://papc.pharmacycouncil.org/index.php?option=download&subpage=download>; 2023.
- 12 Talib GH. *Pembinaan instrumen: Ceramah kursus penyelidikan pendidikan. Anjuran Bahagian Pendidikan Guru, Kementerian Pendidikan Malaysia*. 1996:12–13.
- 13 Khojah HMJ. Community pharmacy services and preparedness during covid-19 outbreak in madinah, Saudi Arabia. *Saudi Pharm J*. 2020;28(11):1402–1407.
- 14 Bragazzi NL, Mansour M, Bonsignore A, Ciliberti R. The role of hospital and community pharmacists in the management of covid-19: Towards an expanded definition of the roles, responsibilities, and duties of the pharmacist. *Pharmacy (Basel)*. 2020;8(3).

- 15 Al-Saffar H, Aljazzar R, Al-Saffar A. Pharmacy practice in covid-19 from a middle eastern and african perspective: a narrative review. *Ibnosina J Med Biomed Sci.* 2021; 13:173–182.
- 16 Maidment I, Young E, MacPhee M, et al. Rapid realist review of the role of community pharmacy in the public health response to covid-19. *BMJ Open.* 2021;11(6), e050043.
- 17 Stämpfli D, Martinez-De la Torre A, Simi E, Du Pasquier S, Berger J, Burden AM. Community pharmacist-administered covid-19 vaccinations: A pilot customer survey on satisfaction and motivation to get vaccinated. *Vaccines (Base).* 2021;9(11).
- 18 Mukattash TL, Jarab AS, Abu Farha RK, Nusair MB, Muqatash SA. Pharmacists' perspectives on providing the covid-19 vaccine in community pharmacies. *J Pharm Health Serv Res.* 2021;12(2):313–316.
- 19 Dat TV, Tran TD, My NT, et al. Pharmacists' perspectives on the use of telepharmacy in response to covid-19 pandemic in ho chi minh city, Vietnam. *J Pharm Technol.* 2022;38(2):106–114.
- 20 Alsayed AR, Halloush S, Hasoun L, et al. Perspectives of the community in the developing countries toward telemedicine and pharmaceutical care during the covid-19 pandemic. *Pharm Pract (Granada).* 2022;20(1):2618.