



Qualitative analysis of Indonesian hospital pharmacist's perceptions of their roles and behaviour during the covid-19 pandemic

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Abstract

Background: Pharmacists are health workers who play an important role in dealing with COVID-19 pandemic problems. This study explored the hospital pharmacist's perception of their roles and behaviours and the influence factors during the COVID-19 pandemic period.

Material and Methods: The research was conducted using phenomenological qualitative methods through in-depth online interviews using an online meetings platform. Informants were taken until the data was saturated. Credibility tests by member checking, dependability, and confirmability tests were performed to ensure data validity. The results of the interviews then were analyzed by thematic analysis.

Results: Eight informants were included with 5 emerging themes revealed from this study. The theme consists of the pharmacist's high commitment to his important role as a team member of the healthcare provider in providing the best service by adapting their services, ensuring rational therapy for COVID-19 patients, and maintaining the availability of medicines, medical devices, and consumable medical materials. Furthermore, pharmacists described some innovation strategies, like drug delivery for outpatients and telepharmacy services. The supporting factors for pharmacists in their services were interprofessional collaboration between pharmacists and other healthcare providers. Support from colleagues, hospital management, government, donations and technology were also revealed as positive factors. The barrier factors included uncertain pandemic conditions, pharmacists who were exposed to the virus and the mental health condition of healthcare professionals during the pandemic.

Conclusion: Pharmacists have a strong commitment to playing a crucial part in the healthcare team in offering the most treatment possible and providing management work. They created some innovative initiatives to tackle the COVID-19 burden. Supportive and barrier factors that affect pharmacist performance during pandemics were also disclosed and examined in this paper.

Keywords: pharmacists, hospital, COVID-19, qualitative, perception

1. INTRODUCTION

The impact of COVID-19 has affected the healthcare system in hospitals in various countries. Health care facilities including hospitals are trying to overhaul their health care systems and services to suppress infection control and management of COVID-19 patients. Pharmacists are healthcare providers who have an important role in handling COVID-19 in the field of pharmaceutical services, one of which is ensuring that medicines and other medical supplies remain available for patients (1).

Li et al (2) stated that the role of Chinese clinical pharmacists and innovative strategies for

pharmaceutical services during the COVID-19 pandemic were developing pharmaceutical service guidelines, building evidence-based drug evaluation and guidelines, providing remote inpatient medication, tele-pharmacy, developing individual treatment with a multidisciplinary team, telehealth counselling and education, and multi-media health education.

In a qualitative study conducted by Cheong (1), it was revealed that the impact of the COVID-19 pandemic on clinical pharmacists working in hospitals in Malaysia was that pharmacy services were withdrawn entirely or partially from the wards to reduce the risk of infection and to save

on the use of personal protective equipment. Some clinical pharmacists continued to do it intensively and were assigned to provide pharmaceutical care for COVID-19 patients in critical care units.

There is no research on this topic based on an Indonesian setting. Thus, this study was conducted to analyse Indonesian hospital pharmacists' perceptions, behaviour, and influence factors regarding their role during the COVID-19 pandemic.

2. MATERIALS AND METHODS

This research applied qualitative methods using a phenomenological approach through in-depth interviews between April to July 2021. Interviews were carried out through the Zoom® meetings application. Sampling was done by purposive sampling. The criteria for the research subjects were pharmacists who had worked in the hospital for at least 2 years, were willing to be participants and filled out informed consent. Informants were taken until data saturation was achieved.

The validity of the data through credibility is carried out by member checking by sending interview transcripts to the informant to be

corrected and approved by the informant by filling out the member check approval form via Google Form. Dependability and confirmability tests were conducted by performing joint discussions by all researcher members starting from the data collection process, determining data saturation, to data analysis. The data analysis technique used thematic analysis methods through the coding process, obtaining sub-themes, individual themes, and research themes.

This research has received ethical permission from the Ethics Committee of the Faculty of Health Sciences, Jenderal Soedirman University with number 278/EC/KEPK/2021.

3. RESULT

The study of pharmacists' perceptions of their role and behaviour in hospitals during the COVID-19 pandemic was conducted through in-depth interviews online via Zoom meetings with hospital pharmacists based on predefined criteria. The interview process was carried out from April 2021 to July 2021 with 8 informants who were willing to participate in the interview. The characteristics of the informants can be seen in the table 1.

Table 1. Informant Characteristics

Informant Code	Gender	Age (years old)	Duration of practice (years)	Hospital Type
A	Man	36	10	B
B	Man	34	6	B
C	Man	30	6	B
D	Woman	42	15	B
E	Man	41	5	C
F	Man	39	12	C
G	Woman	32	6	A
H	Man	32	5	A

Several tests were conducted to prove the validity of the data including the member checking test, the dependability test and the confirmability test. In the member checking test, the researcher provided the results of the interview transcript to the informant so that the informant could correct it and provide additional information. The results of the member checking test showed that 4 informants agreed with the results of the interview transcript and 4 other informants reconfirmed their statements and provided additional information. After a mutual

agreement was obtained, all informants gave their statements of agreement via Google Forms. The dependability test and confirmability test were carried out by the research team by evaluating together data collection process, determining data saturation, and data analysis.

The interview results obtained were analyzed using the thematic analysis method through the coding process, sub-themes, and individual themes until the research theme was obtained. The results of the analysis in this study produced 5 main themes.

A. Pharmacists' high commitment to their important role as a health team in providing the best service during the pandemic

The informants are committed to providing pharmaceutical services during the pandemic. Several informants felt that they had an important role in dealing with the pandemic both in clinical and managerial fields such as providing care for COVID-19 patients and managing COVID-19 supplies. Informants stated that the pandemic was an opportunity for pharmacists to contribute by discussing with other healthcare providers. Two informants stated, "...for me personally, I would say that we are health workers who have been sworn.... If the problem is that we get infected or whatever, that is a risk.... So if I say the role of pharmacists in COVID, it is actually very big (Informant F) . " " ...our services from the pharmacy also play an important role because we also have to carry out services to the COVID isolation wards... because the pharmacy handles everything, from the administration process, distribution, then services, especially those related to COVID supplies (Informant C).

B. The role of pharmacists in clinical pharmacy services

a. Adaptation of clinical pharmacy services during the COVID-19 pandemic

The informants adapted to their roles in clinical pharmacy services for COVID-19 patients. The informants continued to provide care to patients in non-COVID-19 wards such as drug reconciliation, and drug therapy monitoring (DTM) by implementing health protocols in an effort to prevent the spreading of COVID-19. The informants explained various prevention efforts, namely wearing personal protective equipment (PPE), maintaining distance, washing hands, and taking a shower before going home. Facilities were rearranged such as adding partitions in the hospital pharmacy. Several informants stated, " ... if the work pattern may not change, we only use PPE. So we still do reconciliation, we still do visits, we also still do DTM (Informant H) ." "If in the COVID isolation room, yes, we are in accordance with that standard, yes... hazmat suits, then N95 masks, gloves, masks, then face shields... (Informant A) . "

Several informants stated that they did not meet COVID-19 patients directly. The informants performed clinical services such as electronic medical record review, electronic prescribing and visitation services, drug reconciliation, DTM via intercom, CCTV or through nurses who entered the COVID-19

room. For example, the informant explained, " ...in the COVID room, we do the reconciliation using an intercom besides that, there are nurses who also enter, then from the room like the nurse station, we can monitor it directly from the CCTV (Informant H) ." " We can only see the patient through glass and monitor using CCTV ... we can monitor it, and if in the ICU we can do it via telephone (Informant F) ."

b. Pharmacists play a role in providing appropriate therapy for COVID-19 patients

Informants stated that pharmacists play a role in providing appropriate drug therapy for patients by discussing and providing advice to physicians regarding the selection of appropriate therapy, being involved in determining therapy for COVID-19 patients by providing information related to drugs to physicians and providing recommendations for therapy for managing drug related problems. For example, informants said, " ...we provide literature "Doc, this is blah blah", well that's our role. IVIG Gammaraas, usually pharmacists only prepare and it is given directly by nurses. Remember, in the literature, IVIG is... its effectiveness depends on speed, the speed increases every 5 minutes, the faster... If there is a risk of allergy, it is stopped immediately... (Informant F) ."

Other informants stated that they ensure that COVID-19 patients receive the best and adequate therapy according to guidelines. One informant explained, "... then we ensure that patients in the isolation room, they receive the best, adequate therapy, according to guidelines, well that's what we maintain during the pandemic... (Informant D) ."

Informants stated that pharmacists are responsible for everything from compounding drugs to managing the administration of drugs such as Actemra to COVID-19 patients. One informant explained, " Actemra... the effect is malignancy, its nature is like cytostatics, like but not cytostatic drugs, meaning that compounding and so on must be safe... as soon as there is an Actemra consultation, we have to jump in, whether it is starting from compounding, or managing the administration because Actemra has a high risk of allergies, we have to manage it (Informant F) ."

Informants stated that they played a role in preventing the transmission of COVID-19 by monitoring the patient's condition to detect COVID-19 symptoms in patients early. One informant explained, "... so the first COVID-19

patient, our first COVID-19 positive patient, I was the one who found it... I took the initiative to discuss it with the doctor, why did it go that way... well, we started - it turned out to be checked, positive, since then we started, in the room we started discussing it, as soon as we saw it, not only from the doctor, but also from the nurse, from the pharmacist, whoever found it first, we were the ones who helped protect each other... (Informant E)."

C. The role of pharmacists in ensuring the availability of medicines, medical devices and disposable medical materials is maintained

a. Adjustment of the role of pharmacists in ensuring the availability of medicines, medical devices, and disposable medical materials (DMM)

During the COVID-19 pandemic, medicines and medical devices managed by pharmacists increased. Informants said that they struggled to maintain and manage large quantities of new medicines and medical devices related to COVID-19 that they had never managed before. Informants stated that to control the supply of drugs and medical devices, pharmacists should report online daily to the central database created by the Ministry of Health regarding pharmaceutical supplies and medical devices. The informant explained, "... the pandemic has increased the drugs that we have to handle... ..then devices such as face shields, google glasses, and boots, ...there are also drugs that we have never used before, for example like drugs for COVID favipiravir, tocilizumab, yes something new. For a year now we have struggled to focus on maintaining the availability of these items... That has become a new habit for us... We report internally to the management and even to the hospital director, daily report...we also submit it in a system developed by the Ministry of Health. (Informant C) . " Informants stated that pharmacists communicate directly with the DMM company to ensure that DMM supplies remain available to the hospital. One informant explained, " I even contacted the factory directly to make sure the masks were fulfilled...the factory manager to make sure that we got the masks (Informant D).

b. Additional roles of pharmacists in the managerial field during the COVID-19 pandemic

i. Pharmacists play a role in managing donated goods

Several informants reported their role in managing grants in the form of PPE and medicines, both allocated by the government and from the community. The number of donated supplies that pharmacists managed was quite large during the pandemic so that the management time exceeded working hours. Several informants stated that they submitted requests to the Ministry of Health officer, and then monitored, distributed, and reported grants. For example, an informant explained, "...we received quite a lot of donations, so the administration, storage, and distribution did require more time than usual working hours (Informant C) ."

ii. Pharmacists play a role in setting policies related to PPE

Some informants discussed their role in setting policies related to PPE. Several informants said that they selected PPE according to requirements, grouped PPE types in various installation areas in the hospital and made policies related to N-95 mask reuse. " In the past, there was still re-sterilization of N-95... So we made it like zoning in the hospital, which zones must really have N-95, which zones are sufficient with surgical masks... zones that need N-95, the N-95 is sterilized every few times, the procedure is like this... (Informant G) . "

iii. Pharmacists play a role in administering the COVID-19 vaccine

Informants play a role in vaccine management. Several informants stated that they were involved in vaccine management starting from planning, requesting, procuring, storing, and distributing to vaccination sites. The informant explained, " ...we plan, calculate the target of patients to be vaccinated...so we will take it to the health office according to the patient's needs,... we store it in our storage facility, we distribute it to vaccination locations...calculating the remaining vaccine stock... (Informant C)."

D. Factors that influence the role and behaviour of pharmacists in pharmaceutical services

a. Supporting factors for pharmacists in pharmaceutical services

i. Interprofessional collaboration between pharmacists and other healthcare providers during the COVID-19 pandemic

Informants collaborate with other healthcare providers such as doctors and nurses to improve the quality of health services by joining teams that treat COVID-19 patients. One informant said that pharmacists joined the Emerging Infectious Diseases (EID) team to treat COVID-19 patients with doctors and nurses. The informant ensured how to use Actemra, monitored antiviral drugs, discussed with doctors regarding the determination of therapy and gave drugs with nurses to COVID-19 patients. The informant explained, "... want to use Gammarass, we are asked to monitor, how should this be, how to use it, we ensure that. So if we are not there, our friends don't dare, our nurse friends don't dare to put it in. Then for monitoring antiviral drugs, we are involved once. We can also discuss with the doctors who are on duty, responsible there... (Informant D)."

ii. Pharmacists receive support from fellow pharmacists and other health workers.

The informant said that they provide motivation and information related to COVID to each other. The informant explained, "... how do we motivate our friends in Pharmacy? So during the pandemic, almost every day I asked someone to send a video, with a different theme every month... (Informant D)." "... we often share, for example, whoever gets the information first, we share it...we can only encourage, encourage and inform that there is information about this activity... (Informant A)." Informants considered that health workers appreciate the expertise and skills of pharmacists in contributing to the COVID-19 pandemic. One informant stated, "the team of doctors responsible for COVID, they really appreciate the pharmacy staff... (Informant D)."

iii. Pharmacist competency development during the COVID-19 pandemic

Some informants felt that the pandemic made it easier for them to access the latest knowledge related to COVID-19 and other diseases. Pharmacists received support from professional organizations that held or allowed online education. The informant explained, "... with the pandemic, it actually makes it easier for us to find the latest knowledge updates. There are a lot, almost every week if you want you can join zoom (Informant A)."

In addition, informants receive support to improve their competence through the Lexicomp application, the Ministry of Health website or other journal websites to find the latest journals or guidelines, webinars, colleagues or other health workers through WhatsApp groups. "...So since we were at the very beginning of the pandemic, we have been included in a kind of webinar from the Ministry of Health related to updates on therapy for COVID... (Informant C)."

iv. Utilization of technology to support pharmaceutical services during the COVID-19 pandemic

The informants felt that the COVID-19 pandemic conditions encouraged all services to use online- based information technology. The informants utilized information technology to carry out clinical and managerial services. The informants used e-medical records and e-prescribing, utilized the Hospital Management Information System (HMIS), online recording, reporting, and documentation. One informant felt helped in providing services with the development of technology. The informant explained, "... of course this pandemic makes information technology no longer an option but a necessity, you know, in hospital practice (Informant G)."

Informants utilized applications in hospitals and the Ministry of Health website to control drug stock by reporting on the availability of goods related to COVID-19 every day. Informants also used an automatically programmed system for drug procurement. Informants stated, "We

have to carry out updates on the availability of pharmaceutical supplies related to COVID ... we also convey it in a system developed by the Ministry of Health ... so we utilize all applications in our hospital to be able to detect stock in real-time (Informant C)."

- v. Pharmacists receive support from hospitals, governments, and donations.

The informants obtained facilities from the hospital to support pharmaceutical services. Informants felt helped by the additional facilities from the hospital. For example, the informant stated, "We have been given biological safety cabinet (BSC) up to 3 ... Finally we really use BSC so that it can be used for sterile compounding and chemotherapy compounding (Informant F)."

Informants received support to prevent the transmission of COVID-19 and strengthen their immunity. Several informants said that they received vitamins, food, drinks, and PPE from the hospital and from donations and COVID-19 vaccines. The informant stated, "So we get extra food and extra drinks from the hospital, maybe from the hospital... there are also grants from the community or agencies, additional food or drinks for employees at the hospital (Informant C)."

- b. Barrier factors for pharmacists in pharmaceutical services

- i. Dynamic changes in the need for drugs, PPE, and DMM

Informants experienced obstacles related to changes in the dynamic needs for drugs, PPE, and DMM. Informants said that drug shortages still occur in hospitals because they cannot make long-term contracts with drug distributor for COVID-19 drugs. Another informant said that the decrease in BMHP stock also occurred due to the increasing need for DMM in the COVID-19 room so that the non-COVID-19 room experienced a DMM shortage. The informant explained, "...drug shortages still occur. So, we cannot, what do you call it, make long-term contracts... (Informant A)."

Informants said that the pandemic conditions were uncertain and there were fluctuations in the supply of medicines and prices of medicines related to COVID-19. Informants found it

difficult to control the stock of supplies related to COVID-19 and had to work hard to control supplies efficiently. Several informants said that obstacles arose when the number of COVID-19 patients increased so that informants had to provide medicines and PPE in large quantities, so that they were constrained by the location for storing PPE, but what was also an obstacle was when the number of COVID-19 patients decreased, the stock of medicines and PPE piled up. The informant explained, "...now that COVID has decreased, the usual wards have increased again...the only thing that is difficult is controlling the stock of COVID medicines because we don't know how much the total can be covered. Sometimes it goes up, sometimes it goes down. So the orders...it's all over the place (Informant B)."

- ii. Pharmacists exposed to COVID-19

Several informants said that the large number of pharmacists exposed to COVID-19 caused the workload of these pharmacists to be transferred to other healthy pharmacists, resulting in an increase in the workload. Informants felt that this had an impact on the decline in the quality of pharmaceutical services such as longer patient waiting times and reduced enthusiasm and discipline of pharmacists. The informant stated, "...like now the cases are increasing again, honestly it's also confusing, because many friends are also exposed. We know that when our colleagues are exposed, well, that's it, so other pharmacists will work overtime (Informant G)."

- iii. Mental health of pharmacists and healthcare providers in serving COVID-19 patients

One informant felt that the stress and depression of healthcare professionals had an impact on pharmacists and patient therapy. The informant also said that the pandemic had caused pharmacists to be afraid to provide services so that their role had declined. The informant explained, "...but what really hit us was the invisible ones... the depression that made the therapy getting irrational. ...not wanting to use the guidelines... always using Actemra, Gammarass and so on, then antibiotics were inappropriately used,

this happened and it was quite emotionally draining (Informant D).” “... mental exhaustion is really undeniable. Especially if we hear bad news like that... (Informant G) .” “...they are more fearful. That’s what happens a lot. That’s why with this pandemic, doctors said that the role of pharmacists to be “lost” (Informant F).”

E. Pharmaceutical service innovation strategies during the COVID-19 pandemic

During the COVID pandemic, hospitals have limited number of people in outpatient setting. The strategy used by pharmacists was to create a drug delivery service for outpatients in order to reduce contact and patient waiting time. Informants work with third parties to deliver drugs to patients' homes. Several informants said that Drug Information Services (DIS) were still provided when patients are in the hospital, after which patients do not need to wait for drugs because the drugs will be delivered to the patient's home. The informant explained, " ... from collaborating with Gojek, moving again to Halodoc, now running with JNE, yes... with the delivery, thank God, there are fewer people waiting and the waiting time is also reduced... information was provided by the pharmacist, if you get the prescription, then, it will be delivered... (Informant B) ." " ... so patients... who are chronic don't need to come to the hospital. We call BPJS, if they are still eligible, and their card is active, we deliver the medicine to their home. We just call the patient, is there any a change in condition, is there an abnormal feeling, what is their pulse rate, what is their heart rate and so on, we try to discuss it with the patient. If it is safe, we will send the medicine immediately. So the elderly patient is happy ... they don't need to come to the hospital, they can still take medicine, so their chronic disease is under control (Informant D)."

Another service innovation strategy was telepharmacy services. In telepharmacy services, informants provide patient education services via telephone or WhatsApp messages. One informant explained, “ ... with telepharmacy, the patient previously had a telemedicine consultation with doctors. Then, yes, we send the medicine.... So we developed a system so that the medicine reaches the patient with proper information, meaning there is a follow-up... (Informant G).” “ So using WhatsApp, we will confirm

before we send the medicine, "Are you at home?", then "Yes, there is" "Okay, Ma'am, later-" then we take a photo of the medicine we want to send, "Here, Ma'am, later the medicine will be here ", so even though it looks like a delivery officer, the one sitting at the station is a pharmacist... because there is an educational session there (Informant G).”

4. DISCUSSION

This study produced 5 major themes: 1. the high commitment of pharmacists to their important role as a healthcare team member in providing the best service during the pandemic, 2. the role of pharmacists in clinical pharmacy services, 3. the role of pharmacists in ensuring the availability of medicines, medical devices, and disposable medical materials (DMM), 4. factors that influence the role and behaviour of pharmacists in pharmaceutical services, and 5. pharmacist innovation strategies in pharmaceutical services.

A. Pharmacists' high commitment to their important role as part of a healthcare team in providing the best service during the pandemic

This study shows that pharmacists are highly committed to their important role as healthcare team members in providing the best clinical and managerial services during the COVID-19 pandemic. This is in line with pharmacists in other countries that during the pandemic, pharmacists remain committed to providing pharmaceutical services and felt obliged to continue to provide support to the patient care team and provide care to patients (1). In addition, other studies also reported that pharmacists contributed to efforts to deal with the COVID-19 pandemic by being involved in the team responsible for creating COVID-19 management guidelines, being involved in the COVID-19 screening process for patients and managing supplies related to COVID-19 (3, 4).

B. The role of pharmacists in clinical pharmacy services

Pharmacists made several adjustments in pharmaceutical services during the COVID-19 pandemic. The adjustments made by pharmacists were to take preventive and mitigating measures to reduce the spread of COVID-19 by implementing health protocols and educating patients to comply with health protocols. This has also been reported in previous study in Europe involving clinical and community pharmacists that pharmacists took preventive and mitigating measures for the transmission of COVID-19 and were actively involved in educating patients and

the community regarding the correct use of PPE (5).

The next adjustment was that pharmacists continue to provide clinical pharmacy services to COVID-19 patients directly or indirectly such as drug reconciliation, monitoring of drug side effects, drug therapy monitoring through electronic medical records and electronic prescriptions, CCTV and intercom utilization. Patient education was carried out via intercom, telephone or through nurses who enter the COVID-19 room. This is in accordance with previous studies that clinical pharmacists can play an important role in identifying, preventing and treating drug-related problems using communication tools or through nurses to minimize the potential for COVID-19 transmission and save PPE supplies (6, 7).

In addition, pharmacists played a role in providing appropriate drug therapy for patients by discussing and providing advice to doctors regarding the selection of appropriate therapy, providing education regarding the safety of new drugs, providing recommendations for therapy for handling drug allergies in patients and ensuring that the drugs received by patients are following guidelines by providing recommendations regarding patient therapy by considering risks and benefits, monitoring side effects and monitoring drug therapy. According to Al-Quteimat et al. (2021) (6), clinical pharmacists must be aware of reporting symptom presentation, conducting initial examinations, ensuring that individuals have appropriate epidemiological risk factors that may indicate COVID-19, and providing appropriate management.

C. The role of pharmacists in ensuring the availability of medicines, medical devices and disposable medical materials

During the COVID-19 pandemic, several informants explained that pharmacists became more proactive in ensuring that supplies related to COVID-19 were maintained, communicating with pharmaceutical companies and playing a role in controlling drug stocks by reporting daily drug stocks to a central PPE created by the Ministry of Health. This is similar to strategies implemented in other countries where pharmacists were involved in drug management by conducting active supervision and establishing contact with pharmaceutical companies (7, 8).

The COVID-19 pandemic has caused a shortage of medicines and PPE. Medicines may be delivered late and there may be shortages due to logistical disruptions and production disruptions

for various reasons. To overcome this, it has been reported in previous studies that pharmacists perform several tasks, one of which is managing donated goods (9). This has also been found in this study that during the COVID-19 pandemic, pharmacists have additional tasks, namely managing donations in the form of PPE and medicines from receiving, recording, storing, reporting, distributing and ensuring that donated goods have complete and clear administrative documents, both those allocated from the government and the community.

Additionally, during the pandemic, pharmacists manage PPE in quite large quantities. In addition, pharmacists play a role in determining policies related to PPE such as selecting PPE obtained from donations and purchases to ensure the quality of PPE according to requirements, grouping types of PPE in various installation areas in the hospital to save PPE supplies and making policies related to reuse of N-95 masks. This is also in line with previous studies that pharmacists were responsible for managing PPE received from the community or organizations to ensure the quality of PPE received during the COVID-19 pandemic (7).

D. Factors that influence the role and behaviour of pharmacists in pharmaceutical services

a. Supporting factors

This study shows that pharmacists collaborated with doctors and nurses in the COVID-19 patient care team to improve the quality of patient care. Pharmacists discussed with doctors regarding drug use, determining patient therapy and selecting drugs related to COVID-19 that will be provided in the hospital, and providing drugs with nurses to COVID-19 patients. Pharmacists in hospitals are important members of the interprofessional healthcare team, especially during COVID-19, where pharmacists play an important role in infection control and drug therapy management for COVID-19 patients in hospitals (10).

Additionally, this study shows that pharmacists provide mutual support to colleagues in dealing with the COVID-19 pandemic by providing motivation and providing information related to the infections. This has also been reported in previous studies that other health professionals appreciate the expertise and skills of pharmacists in their contribution to the clinical care of COVID-19 patients (5).

Interestingly, pharmacists felt that the pandemic conditions made it easier for them to access the latest knowledge related to COVID-19 and other diseases. However, WHO announced that during the COVID-19 pandemic, there is a lot of information overflowing which makes it vulnerable to falsehoods and misinformation. Therefore, healthcare providers must carefully evaluate sources of COVID-19 information and utilize reliable resources to find information (10). In this study, it was found that pharmacists received support to improve their knowledge and skills from reliable sources from professional organizations, received support from hospitals in the form of premium journal applications, training, and government support in the form of official websites related to the latest information related to COVID-19 and COVID-19 management. This is in line with previous studies which stated that pharmacists in hospitals use reliable sources of information such as official websites (10). In addition, pharmacists also attend discussion forums between pharmacists and other health workers online and offline. This is also in line with previous research which stated that clinical pharmacists regularly participate in online discussion activities with other health workers to discuss COVID-19 management (7).

Furthermore, pharmacists felt that the COVID-19 pandemic conditions encouraged all services to use online-based information technology. According to Li et al., the online pharmaceutical service model not only effectively reduces the possibility of COVID-19 transmission acquired in hospitals, but also increases the efficiency of pharmaceutical services (2).

Also, pharmacists received facilities to support pharmaceutical services, procurement funds, nutritional support, vaccines and personal protective equipment. According to Chen et al., the most important thing that health workers need is the availability of resources and personal protective equipment to protect against exposure to the COVID-19 virus (11).

b. Barrier factors

Pharmacists stated that drug shortages still occur in hospitals because pharmacists could not create long-term contracts with drug distributors for COVID-19 drugs. The uncertain pandemic conditions and

fluctuations in drugs and drug prices related to COVID-19 have caused pharmacists to find difficulty in controlling COVID-19-related stock supplies. This has also been reported by pharmacists in other countries that pharmacists have experienced delays in availability and price increases (10). In this role, pharmacists must plan, identify, and address drug shortages during the COVID-19 pandemic. Therefore, pharmacists must work proactively, identify effective therapeutic alternatives, enforce the implementation of drug shortage mitigation strategies, and if necessary, prioritize drug stocks for patients who are most likely to benefit (12).

Another barrier factor was due to many pharmacy staff exposed to COVID-19. Pharmacists felt that this issue had an impact on the decline in the quality of pharmaceutical services such as longer patient waiting times and reduced enthusiasm and discipline of pharmacists. In this case, the hospital must be able to recognize the undesirable effects of the pandemic on health workers and be willing to reduce working hours, implement flexible schedules and clearly define the roles and responsibilities of health workers to distribute the workload of health workers evenly (13).

Also, informants felt that the stress and depression conditions of healthcare workers had an impact on informants and patient therapy because healthcare professionals sometimes provided therapy for COVID-19 patients who did not comply with guidelines. In addition, the pandemic caused pharmacists to be afraid to provide services so their role declined. This has also been reported in previous studies that fear and fatigue are common complaints among health workers during the COVID-19 pandemic (10). According to Chen et al., the things that health workers need most to maintain mental health are adequate rest, availability of resources and personal protective equipment, and training to overcome psychological problems that occur during the COVID-19 pandemic (11).

E. Pharmacist innovation strategies in pharmaceutical services

In this study, it was found that several pharmacists implemented innovation strategies in their services, namely drug delivery services for outpatients to reduce patient waiting times and

reduce the number of patients queuing at outpatient pharmacies. This service has also been implemented in other countries to minimize contact between pharmacists and patients, thereby reducing patient density in an outpatient setting (7). Another innovation strategy was telemedicine services which include telepharmacy services. Pharmacists provide drug education to patients via WhatsApp messages or telephone, but pharmacists have not provided telepharmacy services via video calls. This was different from previous studies which stated that pharmacists have used video calls in telepharmacy services such as Google Meet, Google Hangouts, and Zoom (14). Li et al stated that pharmacists play a role in providing education to patients about drugs, and drug therapy management to patients through various methods including telehealth (2). The online pharmacy service model not only effectively reduces the possibility of COVID-19 transmission in hospitals but also increases the efficiency of pharmacy services and effectively achieves therapeutic success for patients (2).

5. CONCLUSIONS

Based on the results of this study, it was concluded that pharmacists are highly committed to their important role as healthcare team members in providing the best service in the clinical and managerial fields. Pharmacists carry out innovation strategies in their services, in the form of drug delivery services for outpatients and telepharmacy. Supporting factors for pharmacists' services were interprofessional collaboration between pharmacists and other healthcare professionals, development of pharmacist knowledge, technology, support from colleagues, other health workers, hospitals, government and donations. Barrier factors included fluctuations in the number of drugs and drug prices related to COVID-19, pharmacists exposed to COVID-19 and the mental health of pharmacists and other health workers.

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