A Qualitative Study on the Working Experiences of Clinical Pharmacists in Fighting Against COVID-19

Xiaojuan Wang

Zhengzhou University First Affiliated Hospital

Xiali Yao

Zhengzhou University First Affiliated Hospital

Xuedong Jia

Zhengzhou University First Affiliated Hospital

Xiangfen Shi

Zhengzhou University First Affiliated Hospital

Jie Hao

Zhengzhou University First Affiliated Hospital

Yantao Yang

Zhengzhou University First Affiliated Hospital

Gang Liu

Guizhou Medical University

Xiaojian Zhang

Zhengzhou University First Affiliated Hospital

Shuzhang Du

Zhengzhou University First Affiliated Hospital

Zhao Yin (✉ yinzhao0601@163.com)

First Affiliated Hospital of Zhengzhou University <https://orcid.org/0000-0003-2589-0962>

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Abstract

Background: Along with the medical team, clinical pharmacists played a significant role during the public health emergency of COVID-19. However, to our knowledge, few studies on their work experience with combating COVID-19 have been published. Interviews with clinical pharmacists was conducted to better understand their roles. Through these interviews, further insight would be gained regarding the existing problems within pharmaceutical departments in medical institutions. This information could be used to amend emergency plans for when these departments encounter catastrophic public health events.

Methods: A qualitative study design was employed with face-to-face and audio-recorded interviews being conducted with 13 clinical pharmacists. This group included nutritional pharmacists from two hospitals that were fighting against COVID-19 in Henan. All interviews were transcribed verbatim, and the interview data were analyzed thematically using Colaizzi software (version 11).

Results: The results contributed to a deeper understanding of the clinical pharmacists' work experiences providing consultation for the medical department. Four themes emerged from interview data, including the role played by clinical pharmacists, experiences encountered by clinical pharmacists, psychological feelings of clinical pharmacists, and career expectations of clinical pharmacists.

Conclusions: This exploratory study provides preliminary evidence that some of the work experiences of clinical pharmacists were aligned. However, some deficiencies, such as lack of participation, were highlighted by the clinical pharmacists and these deficiencies are areas that need to be improved by the department of pharmacy.

Background

In December 2019, a novel coronavirus (2019-nCoV) was first detected in Wuhan, Hubei Province in China and led to a nationwide outbreak [1]. On February 11, 2020, the WHO officially named the disease as the Coronavirus Disease 2019 (COVID-19). Exactly one month later, on March 11, 2020, the WHO declared COVID-19 a pandemic. As of July 20, 2020, COVID-19 has caused 14,654,560 infections and 609,135 deaths globally. COVID-19 has become a public health event that requires worldwide attention and collaboration [2, 3].

Medical workers in China, including pharmacists, have been actively involved in the prevention and treatment of COVID-19 [4]. Alongside nurses, physicians, and respiratory therapists, clinical pharmacists contribute to COVID-19 management by participating in inpatient rounds and providing drug information [5]. Pharmacists also play a key role by ensuring sufficient medication supply by managing critical drug shortages [6]. Many drugs used in treating COVID-19 lack clinical evidence and need to be supported by clinical trials [7]. This includes antiviral drugs, antimicrobial agents, hormones, traditional Chinese medicines, and other adjuvant therapies. Pharmacists can help to enroll infected patients in these studies [8]. However, the role of clinical pharmacists during this pandemic tends to be overlooked by the public. Research on the working experiences of clinical pharmacists in fighting COVID-19 deserves to be

conducted [8]. In this study, we summarize the roles, responsibilities, and work challenges of clinical pharmacists in Henan, a city close to Wuhan, during the COVID-19 outbreak. We also offer reflections on how to improve pharmacy operations in fighting future public health emergencies.

Methods

Study design and participants

This was a qualitative study with a purposive sampling method being employed. Currently, three hospitals in the Henan province are designated for COVID-19. Two representative hospitals were selected as study samples. Thirteen clinical pharmacists were included in the analysis according to the information saturation principle. All audio recordings and transcripts were saved on a password-protected computer. Throughout this study, we followed the Standards for Reporting Qualitative Research guidelines.

Semi-structured, in-depth, face-to-face interviews were conducted by three trained interviewers convenient for participants between April and May of 2020. Each interview lasted for 20–60 min. All interviews were audio-recorded, and participants' non-verbal behaviors were noted. The participants' age, gender, years of work experience, education level, and professional titles were obtained during the start of the interview (Table 1). Four data-generating questions were asked at the interview: (1) As a clinical pharmacist, please tell me about your experiences in fighting against COVID-19. (2) As a clinical pharmacist, what else do you think we can do in the future? (3) "What challenges did you encounter? How did you respond? and (4) What external support have you received? What other support do you need? Probing questions, such as "Please tell me more about that" were used to enhance discussion depth.

Table 1
The demographics of clinical pharmacists.

ID	Age	Gender	Work experience, years	Education level	Professional level
1	35	Male	9	Bachelor	Intermediate
2	33	Male	11	Bachelor	Intermediate
3	35	Female	12	Bachelor	Intermediate
4	30	Female	5	Masters	Intermediate
5	32	Female	5	Masters	Intermediate
6	36	Female	10	Masters	Sub-senior
7	40	Female	14	Masters	Sub-senior
8	36	Female	11	Masters	Sub-senior
9	35	Female	9	Masters	Intermediate
10	43	Female	21	Masters	Sub-senior
11	38	Female	10	Masters	Intermediate
12	31	Female	4	Masters	Intermediate
13	40	Female	16	Doctors	Sub-senior

Data collection occurred concurrently with data analysis. The audio recordings were transcribed verbatim within 24 hours of the interviews and reviewed by the interviewers for accuracy. The interviews, original transcriptions, and data analysis were in Chinese. During the data analysis, all authors agreed with the results. All texts were translated into English and back-translated to Chinese to ensure accuracy.

Data analysis

The analysis included reading the transcripts multiple times to identify significant phrases, restating them in general terms, formulating and validating meanings through team discussions until consensus, identify and organizing themes into clusters and categories, and developing a full description of themes. Two members analyzed the transcripts independently by bracketing data on preconceived ideas and strictly following the adapted Colaizzi's method. Findings were then compared and discussed by the team until consensus was achieved.

Results

The following four themes were identified: clinical pharmacists' roles, working experiences, psychological feelings, and career expectations. The results are described as Fig. 1.

Theme 1: roles of clinical pharmacists

Clinical pharmacists' roles in the prevention and control of COVID-19 mainly involved two aspects: (1) Participation in consultation and case discussion; (2) Nutritional support; (3) Preparation of pharmaceutical books related to epidemic prevention and control.

1.1 Participation in consultation and case discussion

The primary way clinical pharmacists participated in consultations was over telephone when providers directly contacted the pharmacy department. Within the pharmacies, there were designated clinical pharmacists available for consultation. Clinical pharmacists of respiratory and cardiovascular specialties were also involved in the COVID-19 core expert treatment group. They conducted rounds and worked with clinicians in multi-disciplinary case discussions. Clinical pharmacists also joined the Henan COVID-19 Treatment Expert Group through the hospital telemedicine system.

"Clinical pharmacists also participated in the telemedicine consultation organized by the Health Commission of Henan Province, the expert group came back daily in the face of over 130 designated hospitals in the province to give remote guidance to such hospitals. Then three issues of expert consensus in Henan Province were published." [P13].

Clinical pharmacists were actively monitoring patients' drug therapies, adverse drug reactions, drug interactions, and adjustments to medication regimen for special populations.

"As I worked on the anticoagulation, one patient suffered from massive bleeding after being discharged from hospital due to poor management of medical workers in the hospital in which the patient was admitted, and the nurse didn't notice the coagulation indicators on that day when the patient was discharged from hospital. The coagulation indicator was extremely high on the day of discharge, and anticoagulants should have been given to the patient [P6]."

"Many critically ill patients were admitted in the hospital, some specialists were impossible to take overall consideration with respect to the medication and interaction, hence our pharmacists would be asked to adjust some regimens [P13]."

Pharmacists played an indispensable role in the clinical setting. Their responsibilities included ensuring drug compatibility, proper preparation and administration, completing medication reconciliation, and integrating clinical application of traditional Chinese medicine injections.

"Because the severe patients were complicated with infections in the end in most cases, and the adjustment on the anti-infection therapeutic regimen was proposed by us [P10]."

"Like the effects of continuous dialysis on drugs, and the effects of ECMO on drugs, if its concentration could reach their effective treatment concentration, and we were allowed to get involved in such issues [P9]."

1.2 Nutritional support

Nutritional support serves as the basis of treatment for patients with COVID-19. Clinical nutrition pharmacists participated in the daily multi-disciplinary consultation. They monitored patients' condition changes and assisted physicians in adjusting nutrition regimens.

"I could offer great guidance and improve patients' nutritional status by fully relying on my knowledge, and at least I could improve physical fitness even through no obvious improvement in one index was found [P11]."

1.3 Participation in the development of pharmaceutical books related to epidemic prevention and control

Pharmacists prepared COVID-19 guidebooks for providers and hospital management. These books included chapters on hospital COVID prevention and control, medication reference list, a quick search of therapeutic regimens, and medication information.

"We have also compiled the quick reference list for medications, which was equivalent to the pocket book, being easy for physicians to read. In addition, we participated in the verification and proofreading of Guidance Manual for COVID-19 Prevention and Control prepared by Clinical Pharmaceutical Society, Chinese Medical Association." [P9]

Theme 2: Working experience of clinical pharmacists

Clinical pharmacists' working experiences showed dual characters. Most felt that their professional value was well recognized by the medical team. However, some pharmacists thought they were not fully integrated into the clinical practice due to insufficient work experience.

2.1 Positive working experience

2.1.1 The medical team had strong demand for clinical pharmacists

Medical departments and medical teams actively invited clinical pharmacists to join the diagnosis and treatment discussions. They had great demand for pharmacists in managing patients' complex and quick-changing conditions.

"The medical department made it clear that clinical pharmacists must be involved in the expert group when it is expected to be set up, of course, this is a preliminary work; they may see the accumulation of the process for all these years and various works you participated in, and they accepted. They think it is useful to listen to the opinions from teachers in pharmacy during multiple key disease consultation, including consultation of various difficult cases in the hospital [P10]."

2.1.2 Cooperation with other medical workers

Departments with good cooperation with clinical pharmacists before the outbreak were more willing to work with pharmacists. Through early collaboration, these clinical teams have a more intuitive knowledge

and understanding of the pharmacist teams' professional quality and recognize clinical pharmacists' values.

"Furthermore, efforts for phone calls in practice have been made by us for many years, and they have got used to make a phone call and asked us to search information or for assistance if they have some problems, or they don't have time to query [P2]."

"Under such circumstances, as usual, you just come and participate in. Usually, we have done a good job, and basic work also has been done well, so it is recognized clinically [P13]."

"It is also increasingly dependent on our pharmacy; for sure, no matter what major you learn, you have what you focus on, you should think how it work, and how to let others accept us [P6]."

2.2 Negative working experience

2.2.1 Low degree of overall participation

The interview found that the degree of participation for clinical pharmacists were relatively low.

"They (physicians) considered efficacy first, then safety; save life first, because it is most important. Sometimes, you have to consider efficacy first, regardless of big adverse reactions [P5]."

"What I considered at that time was nursing or doctors' shortage, may be nursing was scarcer. What they focused more actually was people who needed treat their diseases, and refined treatment and pharmaceutical care were considered next.... Finally, we were not included in this respect [P7]."

2.2.2 Insufficient clinical work experience

Pharmacists had insufficient experience in recommending drug treatment. Most treatment recommendations were based on experiences against SARS in 2003 [9].

"Traditional Chinese medicine injection was not necessarily safe, so we reminded doctors which ones were less safe. However, what were recommended at that time was determined by expert consensus, which maybe had no evidence-based basis [P6]."

"Since diagnosis and treatment guidelines were modified every week, and large dose of ribavirin (more several times than daily dose) was recommended in the 5th Edition, which was very controversial. It remained controversial afterwards. After 5 days, this dose was changed again and again at a national level; actually a lot of attempts were done [P10]. "

Theme 3: psychological feelings of clinical pharmacists

Clinical pharmacists' psychological feelings were complicated during the fight against COVID-19. Positive psychology primarily showed that as members of a medical team, pharmacists were very proud of their contributions to the country. They also felt very happy when patients got better, and the number of

infected persons dropped. Negative psychology mainly arose when patients' conditions were complex, and there was no effective therapy. Clinical pharmacists and the medical team felt stressed, anxious, and powerless when patients died.

3.1 A sense of professional identity and pride

With the deepening of work, pharmacists feel that their professional value is reflected. Therefore, pharmacists have a strong sense of professional pride.

"I think I have a certain sense of professional identity and pride, because it's like a battle which all the people are involved. Our power is very limited, but I think I can find some problems and solve some by own professional knowledge. Moreover, I think it's very useful to give opinions about pharmacy from different perspectives [P10]. "

"The more you have done, the more confident you have. We can learn more, such as knowledge of other departments, which can be learned during consultation, and learn from each other [P6]."

3.2 A sense of the confidence

By participating in the treatment of patients on the spot and witnessing the recovery of patients, the professional pride of pharmacists has been further enhanced. In addition, positive media reports will also enhance the confidence of pharmacists.

"The happiest was that we received critical patients whose conditions were not good. But some people were cured and discharged from the hospital, and we were happy that those people recovered from critical disease. And I heard many reports from the front, including Wuhan, I was very excited and shed tears. I also feel it is very proud that you are involved, regardless of roles [P10]."

3.3 A feeling of psychological pressure

Due to the seriousness of the epidemic, it is very difficult for the medical team to treat patients, which will also bring great psychological pressure to the pharmacists.

"Then as the disease progressed, what you have seen that doctors were helpless. Actually, we were also helpless; although I have been engaged in this for many years, it was rare that all of us were at a loss. Actually, the whole process was quite depressed, everyone was very nervous and tired, and got a lot of pressure; for me, I almost had no rest [P11]. "

Theme 4: career expectations of clinical pharmacists

This pandemic exposed some problems related to pharmacists. These included insufficient knowledge reserve, little experience in emergency response, failure to work in heavy clinical tasks due to physical fitness, and failure to be competent at intricate clinical work due to inadequate professional skills. There are areas of future improvements for pharmacists and the profession.

4.1 Sufficient ability is the basis

Pharmacists are eager to participate more in clinical work, but sufficient ability is the basis for clinical work.

"Then I think we should be involved deeper and broader, but this involvement also has a premise. That is, your own professional ability should reach a certain level. As you know, for doctors, if you intend to be involved, they want you to solve the problem, if you cannot solve the problem, it doesn't matter if you are there or not [P10]. "

4.2 Ability is not sufficient enough

At frontline, pharmacists feel that their ability is not enough to help clinicians solve clinical problems. The reason may be that many pharmacists do not receive sufficient training and exercises, resulting in insufficient basic knowledge reserves and clinical experience.

"Only about one third of people throughout clinical pharmacy discipline can reach the current recognition, and the rest still need to be improved. Those with more advanced qualifications can reach this level, because they have been involved in the clinic since 2000. This is a very important point. Some other young ones have not yet reached this level [P13]. "

"Of course, there are a lot of things you don't understand, and then you have to learn [P6]."

4.3 Clinical skills of pharmacists should be proved in the future

Clinicians have high expectations for pharmacists and clinical pharmacists are expected to help them solve drug-related problems. Especially when clinicians encounter more complicated patients, they hope that clinical pharmacists will provide timely support in the perspective of pharmaceutical specialty. Therefore, improving the comprehensive ability and clinical skills of pharmacists is the direction of future development.

"But when you encountered this situation, they didn't care about (what your duty is), they thought you were a pharmacy worker, and you had come to help me. If I asked you for anything, you must immediately do it, and you must provide a solution for me immediately. This is something that I think is very difficult. The reserve of my entire knowledge and the professional ability of emergency response is (not enough) [P13]. "

"Because they didn't have your help at the beginning, they didn't think they needed you. If you have been providing help to them and you have achieved the effect they want, they will definitely want this kind of help [P6]."

Discussion

This qualitative study explored clinical pharmacists' work and psychological experiences in epidemic prevention and control in Henan Province, China. The expert consensus of the Chinese Medical Doctor Association (CMDA) proposed that in the treatment of COVID-19, clinical pharmacists who specialize in anti-infection should be involved. The roles of pharmacists in COVID-19 in other countries have also been reported [10, 11]. Pharmacists in Canada have been actively participating in COVID-19 management, such as resolving drug shortages, developing treatment protocols, participating in rounds, interpreting lab results, recruiting patients for clinical trials, and providing antimicrobial stewardship [7]. Clinical pharmacists in the United States have long been recognized by other medical workers and considered valuable team members. Experience from one U.S. hospital identified that COVID-19 patients received an average of 19.8 different medications, and pharmacists made an average of eight interventions per patient. A panel of U.S. physicians and six clinical pharmacists co-authored the National Institute of Health (NIH) treatment guidelines for COVID-19 [12].

However, in China, the roles of pharmacists in medical treatment need to be strengthened [13, 14]. The guidelines from the China National Health Commission made no mention of pharmacists getting involved in the treatment plan. Clinical pharmacists have not fully exerted their professional [15] values due to the following factors of 1) the demand for physicians and nurses in a public health crisis is generally far more significant than pharmacists [16] and 2) the shortage of medical resources [17]. During the outbreak, resources such as masks and protective clothing were in short supply [18–20] and must be provided to doctors and nurses [21]. The entry of clinical pharmacists into patients' rooms would be considered a waste of resources and increased infection risk [22, 23].

The results of this study offer some suggestions to pharmacists and the profession to prepare for future public health events in China. First, we need to improve the pharmacy professional level and maximize clinical pharmacists' roles [13, 24, 25]. Abundant professional knowledge is the basis for clinical pharmacists to gain a firm foothold in treatment teams [6]. Second, we need to provide platform support, spiritual support [23], and increase the clinical pharmacists' participation in team-based care [26, 27]. The work of clinical pharmacists is increasingly recognized by the medical team. Overall, the involvement of clinical pharmacists was not enough during the COVID outbreak in China. Only some clinical pharmacists in tertiary hospitals in China were exposed to the epidemic consultation work under the hospital platforms [28]. At the same time, leaders should encourage and support the work of clinical pharmacists. Third, we should pay attention to the mental well-being of clinical pharmacists [27]. There have been many published studies on the psychological stress of physicians and nurses. However, studies on the mental health of pharmacists are limited. Fourth, we should improve pharmacy emergency response plans and strengthen pharmacists' emergency response capabilities [6, 29]. It is worth mentioning that several medical institutions in China have jointly issued emergency plans for hospital drug management under the epidemic of novel coronavirus pneumonia [30].

Strengths And Limitations

The present study is one of the first qualitative researches in Mainland China to explore the work experience of clinical pharmacists in the prevention and control of the COVID-19 epidemic.

The results of this study provide a reference for the construction of pharmaceutical departments within medical institutions regarding their emergency plans for handling catastrophic public health events.

The limiting of this study is that the participants come from one province in central China. In the future, a nationwide in-depth study should be carried out.

Conclusion

Clinical pharmacists have played several roles in combating COVID-19 in China. Compared with physicians and nurses, clinical pharmacists' participation can be improved by addressing the problems uncovered from this study.

Abbreviations

COVID-19: Coronavirus Disease 2019; ECMO: Extracorporeal Membrane Oxygenation; SARS: Severe Acute Respiratory Syndrome; CMDA: Chinese Medical Doctor Association; NIH: National Institute of Health

Declarations

Ethics approval and consent to participate

The study was approved by the institutional review board at the First Affiliated Hospital of Zhengzhou University (KY-2021-0043). The objectives were explained to participants, and oral informed consent was obtained before the study began.

Consent for publication

Not applicable

Competing interests

All the authors declare that they have no conflict of interest.

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Authors' contributions

Z Y, X J W, X L Y, X D J and X J Z designed and performed experiments, acquisition and analysis of data, and drafted the manuscript. J H, X F S and Y T Y helped to prepare the manuscript. G L, X H Y and S Z D revised the manuscript.

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Availability of data and materials

Data are available on reasonable request. The thematic data that support the findings of this present study are available from the corresponding author on reasonable request.

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Figures

Figure 1

Four themes of clinical pharmacists' experiences of combatting COVID-19.

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