The experiences of nurses infected with COVID-19 in Wuhan, China: A qualitative study

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INTRODUCTION

SARS-CoV-2 has rapidly spread since December 2019 and has caused more than 39 million infections and 1.1 million deaths globally on 19 October 2020 (World Health Organization, 2020). Currently, COVID-19 is considered a main source of infection, and the transmission route is mainly droplet transmission and close contact with infected patients (Lin & Li, 2020). Countries across the world have quickly responded and used different strategies to

Abstract

Aim: To understand about the experiences and feelings of the nurses infected with COVID-19 when caring for patients with COVID-19.

Background: With the sudden outbreak of coronavirus disease 2019 (COVID-19), nurses take care of patients with COVID-19 and have a very high risk of being infected with severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) themselves.

Methods: This study adopted a qualitative design of hermeneutic phenomenology. A purposeful sampling was used, and all data were collected through in-depth semi-structured telephone interviews then analysed using interpretative phenomenological analysis.

Results: The interview data generated 4 topics and 14 secondary topics. Four major themes were identified from this study, including ‘experiences of infection’, ‘health belief’, ‘social support’ and ‘the pursuit of self-worth’.

Conclusions: Nurses infected by COVID-19 experienced a physical and psychological shock. They had a strong sense of responsibility and willingness to take risks. Providing professional psychological counselling and physical rehabilitation services are crucial.

Implications for Nursing Management: This manuscript provides nursing managers an understanding of the personal experiences and needs of clinical nurses in their work, especially during COVID-19. It is helpful for nursing managers to explore the greater driving force of nurses and prepare nursing human resources for greater challenges.

KEYWORDS
COVID-19, hermeneutics, nurse’s experience, qualitative interview, SARS-CoV-2 infection
contain the spread of COVID-19 and provide treatment and care for infected patients.

Patients with COVID-19 are hospitalized generally due to serious illness (Lai et al., 2020). As the primary health care workers fighting against the pandemic, nurses endure a heavy workload. These professionals not only provide treatment for infected patients but also provide daily care such as feeding, washing and toileting. In addition, nurses provide psychological support in the hospital wards, which can promote patients recover faster and better. Unfortunately, nurses continuously deal with infected patients and they have a high risk of infection with COVID-19 (Peng et al., 2020). During the early stage of the pandemic, some nurses were clinically infected during their work with COVID-19 patients.

Health care workers such as nurses have reported unprecedented psychological pressure and symptoms, including anxiety, fear and insomnia (Pappa et al., 2020). In more severe situations, nurses infected by SARS-CoV-2 find themselves vulnerable and uncertain about how the COVID-19 would threaten their lives or impact their family. As a high-risk profession, it becomes exceedingly crucial not only to provide targeted pandemic responses and coping strategies to help nurses infected with COVID-19, but also to build a more safe and protective work environment. An in-depth understanding of nurses’ experiences with and feelings about being infected with COVID-19 is crucial in setting up a solid foundation for taking specific and systematic clinical action. To the best of our knowledge, no qualitative work exists regarding the experiences of nurses who have been infected while taking care of patients during the COVID-19 pandemic. Thus, the purpose of this study in 13 February 2020 was to gain insight into the experiences of nurses who were infected while caring for patients infected by COVID-19.

2 | METHODS

2.1 | Study design

The study followed consolidated criteria for reporting qualitative research (COREQ) (Buus & Perron, 2020). This study used an explanatory phenomenology research design. Data collection was carried out using in-depth semi-structured interviews. A qualitative approach to research mainly focuses on the nature and significance of phenomena to understand natural phenomena in life (Pan, 2003). Qualitative research helps to show how society is made up of constantly changing social phenomena with different meanings with respect to time, space, culture and social background (Pan, 2003). As such, the present study has adopted a hermeneutic phenomenology approach to focus on the subject’s experiences and their ways of understanding their own lives (Annells, 1996; Chan, Brykczynski, Malone, & Benner, 2010). This approach uses an inductive and descriptive approach to describe the nature of the problem, and reflect the human experience in complex situations (Annells, 1996). During the present unique case of pandemic, we particularly focused on the nursing community and interpreted the deeper meanings behind nurses’ experiences of being infected by COVID-19 (Mackey, 2005).

First, we collected the general demographic and clinical information of the interviewees, such as age, gender, professional title and clinical position. Second, an evidence-based interview outline (with interview questions) was developed to conduct the interview. The interview questions were initially structured according to a thorough literature review (Zhu et al., 2019; Zhong et al., 2004) and then were revised after consulting five qualitative research experts. The specific interview questions were as follows: (a) How did you feel when you knew that you were infected with COVID-19? (b) What is your experience in isolation after the infection? (c) What do you think might have caused you to become infected with COVID-19? (d) What difficulties have you experienced and what kind of help are you seeking? and (e) Is there anything you would like to add about your experience with being infected in nursing work?

2.2 | Participants

The purposive sampling was used to recruit nurses who could provide the more valuable and appropriate information for our research questions (Zhou, 2017). Study participants were nurses who cared for patients with COVID-19 during the pandemic and were infected with COVID-19 themselves. All the nurses were recruited after obtaining their informed consent, who were from Zhongnan Hospital of Wuhan University in Wuhan City, Hubei Province, China. The sample size was determined by the saturation of information or no new information emerges (Zhang, 2017; Chen, 2000).

2.3 | Data collection

One researcher (JH) is a female postgraduate student and has obtained the national psychological counsellor certificate. She has certain psychological background knowledge and interview basics and skills. The other researcher (LL) has worked as a clinical nurse for 17 years with extensive work experience and cared for patients during the COVID-19 pandemic.

Data from this study were collected using semi-structured in-depth interviews via telephone. The interview duration ranged from 40 to 60 min, with an average of 52.6 min. All the interviews were completed between 13 and 21 February 2020. We reintroduced the research aims and procedures to the participants before the interview and obtained their oral informed consent for recording. The interview recordings and other materials were kept on two password-secured computers, which were kept separately by two researchers (JH and LL). To protect the privacy of participants, all the participants are given a subject ID (e.g., N1 = Participant 1). We asked participants to describe their experiences and true feelings after learning they were infected with COVID-19. During the interview, researchers were not limited by the interview outline and therefore
tried to obtain more information while striving to make the interview feel natural. During the interview, the researchers used interview techniques like repetition, clarification, induction and summary to obtain in-depth information (Chen, 2000). All the Chinese quotations were translated into English by one of the researchers and then back by another researcher to make sure the original meanings were retained. These two researchers are bilingual nursing researchers with PhD degree, and both of them have extensive research experience.

2.4 | Data analysis

Within 24 hr after the interview, two researchers (JH and LL) immediately organised, analysed, summarized and further supplemented the recorded materials with field notes. The two researchers listened to the recordings and transcribed them word for word using computer software (Luyinla). During the transcription, they made notes regarding the details of the interviewees’ modal words, pauses and so on. Transcripts were uploaded to NVivo to store, manage and analyse the data (QSR International Pty Ltd. Version 10, 2014) within 24 hr after the interview. Interpretative phenomenological analysis (IPA) was used in our data analysis (Smith et al., 2009). The IPA included re-reading textual material, preliminary annotation and analysis, generating themes, thinking about inter-topic associations, analysing the next case and exploring inter-case thematic connections. Our analysis was intended to clarify the themes and the relationships among them, after which we finalized it by coding, classifying, explaining the essential meanings of the phenomenon, and lastly, we further refined the central themes. The themes extracted from the final collation codes were sent back to the participants to confirm whether it indeed expressed their meanings.

3 | RESULTS

This study recruited nine nurses infected by COVID-19 themselves. All the nurses were infected while taking care of patients with COVID-19 and were in isolation in hospital until the end of the interview (Table 1).

The interview data were analysed and coded with 392 nodes. These nodes were further generated into 4 themes and 14 subthemes. Data are presented with four major themes: experiences of infection, health beliefs, social support and the pursuit of self-worth (Figure 1).

3.1 | Theme 1: Experiences of Infection

3.1.1 | Anxiety before diagnosis

Participants were assigned to care for patients with COVID-19 until they themselves were diagnosed with COVID-19. Nurses experienced a tremendous amount of anxiety, fear and trepidation when they have somatic symptoms, such as fever and headache.

‘When the symptoms appeared, I was very nervous. I have been very healthy before and rarely catch a cold.’

(N6)

‘When my partner (who had been diagnosed with COVID-19 infection) said, I’m like, yeah, I’m like that, that…pneumonia, and I… I got scared (sobbing sadly).’

(N3)

3.1.2 | Shock of diagnosis

When they learned that they were infected with COVID-19, nurses felt a psychological shock. They felt frightened, lost and even guilty, and started blaming themselves.

‘I was crashed (crying...). I’m very scared. I guess I had a cough, and then when they (clinical diagnosis) told me it’s a mild case, and it’s like someone hitting my head, and then I stunned.’

(N8)

<table>
<thead>
<tr>
<th>TABLE 1</th>
<th>Demographic and clinical information of the participants (n = 9)</th>
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<tbody>
<tr>
<td>Gender</td>
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‘(When I knew I was infected) I wanted to cry, and I felt very sad, so I cried.’
(N5)

In addition to worrying about their own conditions, participating nurses were more worried about their family and colleagues who had contacts with them and were afraid of spreading the virus to them, all of which led to more internalized stress and fear.

‘I also have my children and family. We had dinner together last night. I’m worried about infecting them.’
(N5)

Nurses blamed themselves for becoming infected and endangering their lives and others, and could not work.

‘The previous understanding of the virus is not enough. As one of the infection control managers I got infected by COVID-19, I feel so guilty. I do not want to tell others that I am infected.’
(N6)

When faced with their test results, they still exhibited a lot of skepticism at first, then struggle and even hope.

‘The CT result showed a suspicious of viral lung. I went to consult a lot of specialized doctors again and again. I am always wondering if I was the one being misdiagnosed.’
(N7)

Due to caring for the infected patients and intensively clinical workload, our participants thought that they may be infected. When they were infected, however, they still felt frustrated.

‘I feel that I have a history of contacting with a patient. I have symptoms of fever and dizziness. I feel like I might have been infected.’
(N4)

3.1.3 | Response after diagnosis

After confirming that they were infected with the COVID-19, nurses reported feeling uneasy, anxious, uncomfortable and suffering from insomnia.

‘I didn’t know why I kept my eyes open until two o’clock in the morning. My head was totally empty, and I couldn’t sleep. I didn’t think anything either. My eyes were not tired, and I could not sleep for several nights.’
(N5)

Participants were reluctant to tell their families the truth about the infection because they were afraid that their families would be worried, thus putting too much stress on them.

‘The department director said the lung infection was serious and suggested telling my family. Well, my main pressure was that I didn’t want my family to worry about me.’
(N9)

3.1.4 | Recall the probable cause of the infection

Participants become high risk for infection. When they were infected, they had a deep reflection to think about the possible reasons of being infected. Close contact with infected patients, night shifts, heavy workloads and lacking of adequate knowledge of the
virus in the early stage of the outbreak together gave the virus an opportunity.

‘When you’re tired, your body immune system goes down and you’re more susceptible to infection. I felt dizzy on that night of night shift.’

(N2)

‘Maybe now the pandemic is very serious, medical staff are specially in need. But I... I personally think that the workload is too heavy for us (nurses).’

(N1)

3.2 | Theme 2: Health beliefs

3.2.1 | Knowledge of the virus

In the face of the COVID-19 outbreak, the initial perception of the virus was mainly fear.

‘I think this disease was really horrible, so I was scared for a while.’

(N3)

‘You don’t know how it’s transmitted. It’s so horrible and scary.’

(N4)

However, when participants became more and more familiar with the coronavirus, their fear of the virus gradually decreased. They said that as long as they wore appropriate personal protective equipment (PPE), they could effectively prevent.

‘I don’t think it’s that scary. Don’t be panic so much. As long as you’re doing the right thing, like wearing a mask, and then you’re wearing a protection gown to work, it’s really not that scary.’

(N1)

3.2.2 | Struggles during treatment in isolation

During the treatment, the participants felt fear, nervousness, restlessness and sensitivity to the possible progression of the disease due to their own obvious symptoms.

‘To be honest I was scared. I was afraid my lungs would turn to white (very bad situation). The first case of using ECMO (Extracorporeal Membrane Oxygenation) was in my own department, and I have also seen some severe cases.’

(N6)

Participants expressed discomfort, weakness, helplessness, breakdown and pain when they felt bad, and described physical and mental distress during the treatment.

‘I had a fever and headache, so I took one Diclofenac Sodium Sustained Release tablets. I was very nervous and uncomfortable.’

(N2)

‘It (the infection) is a destruction of my body, but also my spirit, and I feel so miserable.’

(N6)

Despite the difficulties they encountered during the treatment, the participants promoted their recovery by encouraging themselves and by getting adequate nutrition and adequate rest.

‘Because the disease requires a lot of nutritional support, I want to, and I hope I get better soon, well, and then I’m very motivated in eating three meals a day and some other food.’

(N9)

3.2.3 | Expectations and faith in recovery

During treatment in isolation, participants were worried that the disease could not be cured, but most of them were full of hope. They went through the most difficult moment and encouraged themselves to face it with a positive attitude.

‘I have always encouraged myself to keep on living. This virus infection may not have a specific cure, I need to rely on my own, mentality is very important.’

(N6)

‘Now I think it is the greatest happiness to be alive. I want to be alive.’

(N5)

3.3 | Theme 3: Social support

3.3.1 | Discrimination against

As a result of the diagnosis of COVID-19, participants reported feeling excluded and discriminated against from the outside world. Especially when they were isolated at home at the beginning, they had a lot of psychological pressure and then suffered from anxiety and insomnia.
3.3.2 | Loneliness

Because of the infectious nature of the virus, the participants were hospitalized and treated in isolation, which left them with a strong sense of loneliness and restrictions.

'It felt like I was being shut down in the hospital. I could not contact with the outside world, and I was a little scared.'

(N5)

'I felt terrified and excluded. People around sometimes tell some jokes, ‘ah... see you, you stay away from me, you don’t stay close to me’. Although probably a lot of those are just jokes. It can cause a lot of psychological stress. The feeling of being thrown out of this society (sigh heavily...).'

(N7)

3.3.3 | Lack of understanding from the family

Participants were very afraid and often showed unwillingness to tell their families about their infection. They wished for their family’s understanding and support because the alternative—their family’s excessive worrying—would bring them more psychological pressure.

'As a medical worker, I actually accepted it quite calmly. But my family think it’s very scary and highly contagious. So, the pressure from the family is more than I think. Because my family didn’t understand and their excessive worry caused me more psychological stress (a higher tone of voice).'

(N7)

3.3.4 | Care and encouragement

All the participants said they were touched by the caring and attention they received from their families, friends, colleagues and other members of society. They believe they were not alone in their fight against the COVID-19, and the outpouring of encouragement and support has increased their confidence in recovery.

3.3.5 | Security of hospital isolation

The hospital provided an isolation ward for infected nurses, and participants said they felt safe with doctors and nurses close by and avoided infection to family members.

'If I am at home, my husband will be in danger. There are doctors and nurses in the hospital to keep an eye on me, right? No matter what happens, it will be treated in time.'

(N8)

'I went to the isolation ward, and I felt quite reassured. The hospital has all kinds of equipment and devices to save us.'

(N6)

3.4 | Theme 4: Pursuit of self-worth

3.4.1 | Look forward to returning to work

In order to protect the people in such a severe pandemic, nurses have been working on the frontlines in places fraught with danger. Even though the participating nurses were infected with the virus, they still kept in mind their social responsibilities and aspirations, and hoped to return to work as soon as possible.

'I am a medical worker. In fact, I still hope that I can do what I can for the patients’ rehabilitation in the clinical frontline.'

(N7)

'I think the traditional Chinese medicine tastes good. I want to get well soon. In the WeChat (Chinese version of WhatsApp) group, I saw all my colleagues in the department supporting the Cabin hospital (built for the COVID-19). I also want to go and be a hero.'

(N5)
3.4.2 | Conquer fears and solve problems

Participants said the most immediate and profound feeling they felt was fear when they learned they had the virus. But in the face of the pandemic, their professionalism and sense of social responsibility helped them to conquer their fears, stick to their posts and face the difficulties head on.

‘... very anxious and scared. At the beginning, I hesitated, could I skip work? But if all healthcare workers don’t go to hospital, the pandemic will be out of control, and no one will be survived. I’m just a normal person. I just want to back off sometimes. It was such a contradiction, but I kept on (working).’

(N8)

4 | DISCUSSION

Nurses are the core of and largest group among health care workers. Due to unknown knowledge about COVID-19 and protection strategies, there were a large number of cases of infection among health care workers in the early stage of pandemic, among which nurses accounted for the largest proportion (State Council Information Office of the People’s Republic of China, 2020). COVID-19 has caused life-threatening and psychological stress to nursing staff who cared for and contact with infected patients (Sun et al., 2020).

By learning about the experiences of infected nurses charged with caring for patients with COVID-19, they have gone from fear of infection to confidence in recovery and felt overall a sense of honour and responsibility for their profession (Truesdell et al., 2020). The nurses were well aware of the seriousness of COVID-19 and its potential threat to their own lives and their families. In this study, all the nurses infected by COVID-19 suffered from various psychological symptoms, such as loneliness, helplessness, anxiety and fear. In order to ensure the mental health of nurses infected with COVID-19, timely psychological evaluation was conducted and effective psychological intervention was carried out depending on the team of psychological experts (Lam et al., 2019). It affirmed the efforts of the infected nurses, recognized the emotions of the nursing staff and provided positive psychological counselling (Kang et al., 2020). All these psychological interventions helped the nursing staff to overcome various difficulties and finally return to their normal work and life.

When infected, health care workers such as nurses need not only medical treatment in isolation, but family support and community support are very important (Yin & Zeng, 2020). Nursing managers take care of the nurse’s work arrangements and living conditions, and create facilities for the nurses in this particular situation. They also provide care and timely screening, treatment and psychological counselling to the infected nurses to maintain their emotional stability (Tzeng, 2003).

To reduce the infection rate among nurses, clinical managers should strengthen the training of nurses in infectious disease response and protection knowledge. The content might include the ability to respond to public health emergencies, the latest nursing knowledge of COVID-19 and knowledge related to protection (Guo et al., 2020). Hospital administrators and head nurses should constantly optimize the allocation of human resources, arrange shifts in a scientific and reasonable manner and create conditions that ensure adequate sleep and nutrition for caregivers. On the premise of avoiding the waste of human resources, the safety and effective protection of clinical nurses should be ensured. The workplace environment should be arranged in a scientific way to improve the nursing capacity, ensure safety and reduce the risk of infection during the epidemic period (Lam et al., 2019; Wang et al., 2020).

This study has shown that nurses who were infected with COVID-19 experience not only the virus but also unprecedented levels of psychological symptoms and struggles. All the participants in this study expressed a sense of responsibility, pride and professional honour that reflected their self-worth.

5 | LIMITATIONS

There are several limitations in this study. First, compared with face-to-face interviews, telephone interviews could not capture participants’ facial expressions and body language, which may have an impact on the depth of interview data. Second, at the time of interview, the participants were all in isolation and did not continuously understand the development of the disease or the experience of post-recovery. A follow-up experience of these nurses will be very valuable in the future. Lastly, this study only small number of interviewed nurses; thus, additional studies of more infected nurses of working in other hospitals in China may need to be confirmed and other medical care workers’ experiences are unknown. Future work should compare these experiences so that we can provide comprehensive and systematic support for these health care workers on the frontlines.

6 | CONCLUSIONS

Nurses infected with COVID-19 experienced a sort of psychological tsunami abated by a desire for life, both for their patients and for themselves. In spite of their struggles, fear, worry and symptoms of depression, they expressed the noble quality of their profession, social responsibility and a spirit of sacrifice for patients, families and the society as a whole. Health care managers are therefore strongly encouraged to pay more attention to the mental health and unique life needs of nurses infected with COVID-19.

7 | IMPLICATIONS FOR NURSING MANAGEMENT

Qualitative research provides insight into the physical and psychological state of nurses infected with COVID-19 during infectious
public health events. This study provides nurse managers with more attention and an understanding of the personal experiences and needs of clinical nurses in their work, especially during COVID-19. Nurse managers can provide specific management of the outbreak and better assist clinical nurses to respond to COVID-19. It also helps nurse managers explore greater driving forces for clinical nurses and prepare nursing human resources for greater challenges.

In addition, nurse managers should actively carry out training on relevant equipment, infectious disease knowledge and nursing clinical work, to help nurses improve their clinical work ability, so as to better cope with the epidemic. This will help clinical nurses to better avoid COVID-19 infection and get to work to help more infected patients.

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CONFLICT OF INTEREST
The authors declare that we have no conflict of interests.

AUTHOR CONTRIBUTIONS
All authors had full access to all data in the study and are responsible for the integrity of the data and the accuracy of the data analysis. XC, BQ, YL, YZ and JB performed the study concept and design. All authors involved in acquisition, analysis or interpretation of data. JH, LL, YL and JB drafted the manuscript. All authors involved in critical revision of the manuscript for important intellectual content. YL and YZ performed the administrative, technical, or material support.

ETHICAL APPROVAL
This study was approved by the research review committee at Zhongnan Hospital of Wuhan University (No. 2020043).

Data Availability Statement
Author elects to not share data.

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