

# UCLA

## UCLA Previously Published Works

### Title

Chinese infection-control strategies for COVID-19 prevention: A qualitative study with confirmed cases

### Permalink

<https://escholarship.org/uc/item/72g389dx>

### Journal

Public Health Nursing, 39(3)

### ISSN

0737-1209

### Authors

Huang, Feifei  
Chen, Wei-Ti  
Sun, Wenxiu  
[et al.](#)

### Publication Date



2022-05-01

### DOI

10.1111/phn.13017

Peer reviewed

# Chinese infection-control strategies for COVID-19 prevention: A qualitative study with confirmed cases

Feifei Huang RN, PhD<sup>1</sup>  | Wei-Ti Chen RN, CNM, PhD, FAAN<sup>2</sup> | Wenxiu Sun RN, MSN<sup>3</sup>  | Lin Zhang RN, MPH, MHA Nursing Director<sup>3</sup> | Hongzhou Lu MD, PhD<sup>4</sup>

<sup>1</sup> School of Nursing, Fujian Medical University, Fuzhou, China

<sup>2</sup> School of Nursing, University of California Los Angeles, Los Angeles, California

<sup>3</sup> Shanghai Public Health Clinical Center, Fudan University, Shanghai, China

<sup>4</sup> Shenzhen Third People's Hospital, The Second Affiliated Hospital of Southern University of Science and Technology, Shenzhen, China

## Correspondence

Wei-Ti Chen, RN, CNM, PhD, FAAN, School of Nursing, University of California, Los Angeles, Los Angeles, CA 90095.

Email: [wchen@sonnet.ucla.edu](mailto:wchen@sonnet.ucla.edu)

Lin Zhang, RN, MPH, MHA, Nursing Director, Shanghai Public Health Clinical Center, Fudan University, Shanghai, China, CA201500.

Email: [zhanglin@shphc.org.cn](mailto:zhanglin@shphc.org.cn)

## Funding information

Fudan University Science Establishment, Grant/Award Number: IDF162005; Novel coronavirus "2019-NCOV", Grant/Award Number: #2020YJKY01; Fudan-Fosun Nursing Research Fund, Grant/Award Number: #FNF202042; UCLA CTSI/SON Intramural fund March 2020; NIMH, Grant/Award Numbers: P30MH058107, R25MH087217

## Abstract

**Objective:** We aimed to describe how the prevention and controlling strategies have been experienced by COVID-19 patients in China, especially those who had passed through the suspected, diagnosed, hospitalized, and recovery stages of the disease.

**Design:** A descriptive qualitative study followed the Standards for Reporting Qualitative Research guidelines.

**Samples:** COVID-19 patients were recruited from a COVID-19-designated facility in Shanghai, China, from April to June 2020, by the purposive sampling method.

**Methods:** Semi-structured, in-depth interviews by cell phone were used and transcriptions were analyzed using inductive qualitative content analysis method.

**Results:** We recruited 26 COVID-19 patients. Three theme categories emerged from the data analysis. The first was "Consciously adhere to COVID-19-related controlling strategies." The second category was "Positive experiences of the COVID-19-related controlling strategies." These patients experienced a quick and adequate medical response, confident in the medical system, or received help from community workers. The third category was "Negative experiences of the COVID-19-related controlling strategies." These patients experienced psychological distress, stigma, privacy exposures, and inconveniences from the controlling strategies.

**Conclusions:** It is urgent to develop a culturally sensitive intervention to eliminate the psychological distress and stigma of patients with COVID-19 and to protect their privacy during and after the pandemic.

## KEYWORDS

China, COVID-19, patients, qualitative study, strategy

## 1 | INTRODUCTION

The novel coronavirus disease 2019 (COVID-19) pandemic has become a major global threat (World Health Organization [WHO], 2020b). China reached a period where not many new confirmed community-spread cases of COVID-19 occurred (WHO, 2021). However, a number of waves of outbreaks came in several cities and metropolitan areas in 2021, but they were brought under control through testing, contact tracing, and quarantines (Campbell, 2020). Thus, the strict infec-

tion prevention and control strategies deployed by China played a pivotal role in controlling the COVID-19 outbreak in that country (Ye et al., 2020).

The establishment and implementation of societal strategies and policies in China have been profoundly influenced by Confucian views ever since the philosopher lived (Cheng, 1990). "The ruler guides the subject" was one of the Three Cardinal Guides outlined by Confucianism as the hierarchy of responsibility for maintaining social order (Chen et al., 2007; Cheng, 1990). In contrast to Western countries, China has



a centralized and unified administrative system and can robustly motivate the administrative execution of national policies by all levels of governmental departments in response to major public health emergencies (Wang & Wang, 2020).

Beginning in early 2020, the Chinese government implemented a series of rigorous prevention and control measures to halt the spread of COVID-19, including lockdowns, traffic blockages, centralized quarantines and treatment, home confinement, social distancing, reducing the number of gatherings, and improving medical resources. The government also designated facilities and hospitals as isolation centers for patients and their close contacts and quickly built emergency hospitals—the “Vulcan Mountain” and “Thor Mountain”—for patients with severe cases and 11 “Cabin” hospitals for those with milder cases (Ding et al., 2020). In addition, China required all healthcare providers to use personal protective equipment (PPE) at all times (Zhou et al., 2020), increased testing capacity, and accelerated reporting (Li, Cao, et al., 2020).

Studies have found that a number of the control strategies implemented in China might have been effective in mitigating the COVID-19 epidemic (Dong et al., 2020; Taghrir et al., 2020). For example, one meta-analysis reported that, compared with the more permissive measures enacted initially in Italy and the United States, the early and aggressive isolation measures used by the Chinese government were more efficient and powerful in thwarting transmission of the virus (Dong et al., 2020). One study has indicated that if the Chinese government had delayed implementation of the control strategies—mass quarantines, strict travel limitations, and large-scale contact tracing—by 5 days, the epidemic would have been three times larger than it was (Yang, Zeng, et al., 2020). Another study has indicated that timely and multifaceted control measures—city lockdowns, health facility restrictions, traffic restrictions, and community isolations—were the key drivers for mitigating the trends of the epidemic in cities in China (Ye et al., 2020). However, within controversial debates, it has been argued that travel restrictions and city lockdowns during the COVID-19 epidemic in China have not been highly efficient (Taghrir et al., 2020) and are not considered humane in modern societies. Thus, policies can be efficacious but still warrant further study for greater effectiveness and ethical appropriateness.

Currently, the effectiveness of COVID-19 control strategies have been reported from several big data studies (Dong et al., 2020; Gong et al., 2020) or mathematical model predictions (Pan et al., 2020; Taghrir et al., 2020); however, limited studies have explored the influence of these infection-control strategies from the perspectives of COVID-19 patients. Furthermore, the significant psychological, emotional, and financial implications of the infection-control strategies on individuals, special for COVID-19 patients should not be ignored (Taghrir et al., 2020). Excessive use of infection-control strategies, such as mass quarantines, cause negative mental stress, such as fear, acute stress disorder, anxiety, and depression (Le, Yi, et al., 2020; Qiu et al., 2020), as do excessive self-protective behaviors such as disinfecting clothes every day or every other day, overly frequent hand washing or sanitizing, hoarding of PPE, and arranging for others to handle personal or work responsibilities should one get sick (Yang, Peng, et al., 2020).

To improve the ongoing infection-control strategies for preventing and mitigating COVID-19, it is necessary to gain insights, through a qualitative study method, into how individuals who directly experienced COVID-19 handled these preventive strategies (Huang et al., 2020). Therefore, in the present paper, we aim to describe how the infection prevention and control strategies have been experienced by recent COVID-19 patients in China, and by those who have gone through the suspected, diagnosed, hospitalized, and recovery stages of the disease.

## 2 | METHODS

### 2.1 | Study design and settings

A qualitative in-depth interview was conducted by cell phone with study participants. A thematic analysis approach was used to determine commonalities of experiences of patients with COVID-19 who were treated in a COVID-19-designated facility in Shanghai, China, on how implementation of the prevention and control strategies affected them. Throughout this study, we followed the consolidated criteria for reporting qualitative studies (COREQ) checklist (Tong et al., 2007). This research was approved by the institutional review boards of UCLA (IRB#20-000832) and Shanghai Public Health Clinical Center (YZ-2020-S037-01).

### 2.2 | Participants

From April to June 2020, the purposive sampling method was used to invite individuals to participate in the study. The inclusion criteria for study participants were as follows: (a) confirmed positive for COVID-19, (b) having been treated at the COVID-19-designated facility in Shanghai, (c) recovered and returned home at least 14 days, (d) at least 18 years of age, (e) without severe impairment in mental functions that would interfere with an in-depth interview, and (f) willing to share their personal stories. Seventy-three COVID-confirmed cases were contacted, of whom 26 of them were recruited after securing their oral informed consent (36% acceptance rate) (see Appendix A). Then, the research staff scheduled a time for one-on-one in-depth interviews. After interviewing 26 participants, a saturation point was reached, that is, the point where no new themes emerged from the participants' experiences (Blaikie, 2018). All study participants received a small stipend for their participation.

### 2.3 | Qualitative data collection

Two Chinese-speaking researchers (graduate student and registered nurse) who were not affiliated with the study site and had no prior relations with the participants, conducted the in-depth interviews by phone from April to June 2020. Each interview took about 40–60 minutes and was audio-recorded for transcription.



Participants' demographic data—age, gender, marital status, educational level, work status, place of residence, medical insurance, and discharge data—were obtained at the beginning of the interview. We pilot tested two participants to enhance the study's acceptability and credibility. Participants were asked the following questions:

“What were [the] COVID-19-related prevention and control strategies experienced by you?”

“What was your opinion of these strategies?”

“How compliant were you with these strategies?”

“Please share with us what strategy impressed you the most, both negatively and positively.”

and “Is there anything else you would like to share with me or tell me?”

## 2.4 | Qualitative data analysis

Data analysis occurred concurrently with data collection. The audio recordings were transcribed verbatim by nursing graduate students. To ensure confidentiality, the researcher pre-assigned an ID code to each participant and removed identifiable information from all the transcription. Safeguarding confidentiality of personal data was maintained through the use of ID codes instead of full names on all research materials. The full name was used initially if necessary, but is removed after initial review and replaced with the ID code. The list referencing code number to name was kept in a locked file cabinet in the research manager private office on site and coded data was stored in encrypted computers in locked offices to which only project staff have access. The list relating names to number codes was destroyed at the end of the investigation. Data analysis is done only in aggregate. No individually identifiable information from the data collected will be published.

After obtaining the transcriptions, we randomly selected 20% of the de-identified transcripts of participants to check the reliability of the transcriptions compared to the audio tapes. We used Atlas.ti software (Scientific Software Development Version 7.0, 2012) to code the data and then conducted qualitative thematic analysis (Nowell et al., 2017). The study team then looked for concept categories and code trees related to the patients' experiences of the COVID-19 prevention and control strategies. The team next inspected the transcriptions individually and assigned codes from the code list based on themes that were gleaned from those transcriptions. Three transcriptions were then randomly selected to check for coding reliability. Last, for uncertain quotes, the team met to discuss and resolve discrepancies to enhance the confirmability of the study.

Representative quotations related to the patients' experiences of the COVID-19 prevention and control strategies were selected from the transcriptions. After the process of coding the 26 transcriptions, the quotes were retrieved and translated into English and back-translated by two researchers to ensure that the translations were accurate. The dependability of this study was upheld by audits conducted by external experts, who were familiar with COVID-19 patients' care, throughout the process of data collecting, thematizing, and analyzing. These audits were performed to confirm the accuracy of the

**TABLE 1** Demographic characteristics (N = 26)

Characteristics	N(%)
Gender	
Male	12 (46%)
Female	14 (53.8%)
Education	
Above college diploma	20 (76.9%)
Employment	
Employed	19 (73.1%)
Unemployed	7 (26.9%)
Residence	
Shanghai	18 (69.2%)
Zhejiang province	2 (7.7%)
Hubei province	4 (15.4%)
Fujian province	1 (3.8%)
Guangdong province	1 (3.8%)
Marital status	
Unmarried	11 (42.3%)
Married	15 (57.7%)
Living with family members	
Yes	19 (73.1%)
No	7 (26.9%)
Family members infected with COVID	
Yes	5 (19.2%)
No	21 (80.8%)

findings and to ensure that the findings were supported by the study data.

## 3 | RESULTS

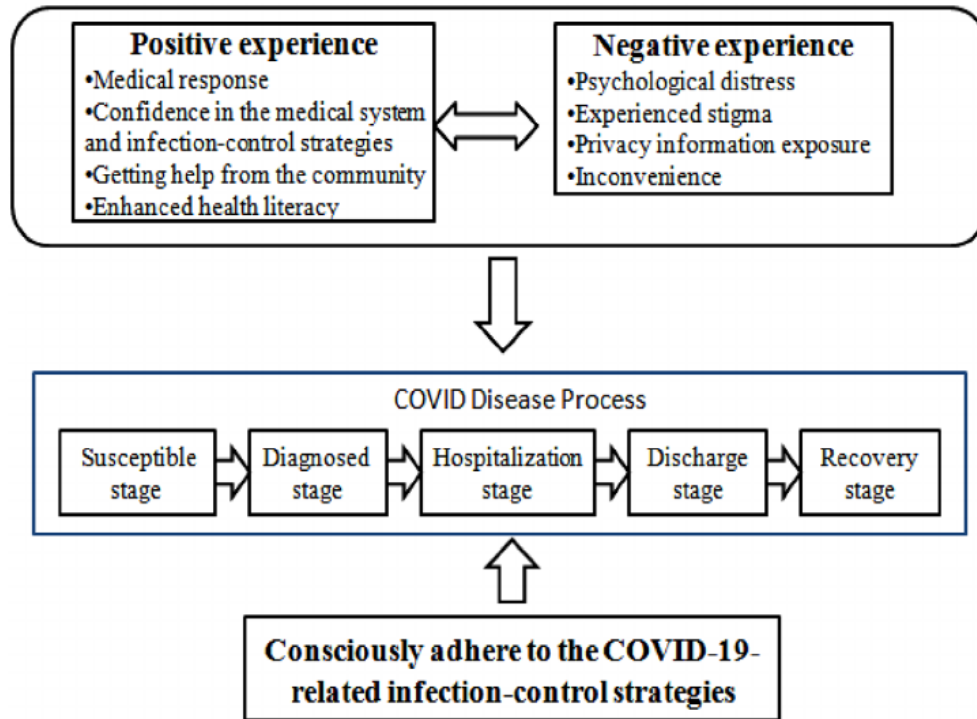
### 3.1 | Participant characteristics

Our final sample consisted of 26 COVID-19 patients. The patients' ages ranged from 22 to 56 years, with an average age of 35 years ( $SD = 7.73$ ). The detail demographic characteristics of participants was showed in Table 1.

### 3.2 | Thematic results

Three main themes include consciously adhere to the COVID infection control strategies, positive experiences of the COVID infection control strategies and negative experiences of the COVID related infection control strategies. Also, how these three themes influenced by the disease process were presented in Figure 1.





**FIGURE 1** Three main themes of the Covid policy affecting Covid confirmed cases

### 3.2.1 | Theme 1: Consciously adhere to the COVID-19-related infection-control strategies

A number of patients with COVID-19 said that they consciously followed the infection prevention and control strategies issued by the national government and local communities throughout the susceptible, diagnosed, hospitalization, and recovery stages of their disease.

**Susceptible to diagnosed stage:** A number of participants traveled to Wuhan, Hubei Province, within the 14 days preceding their confirmed diagnosis. After they came back to Shanghai, they strictly abided by the required community reporting system, social distancing, and a 14-day home isolation period. If they needed to go out of the house, they took precautionary measures, such as wearing masks and avoiding social gatherings.

“When I came back from Wuhan, I reported to the community [authorities], and the community workers informed me that I needed to be isolated at home for 14 days.” (31-year-old, male, married)

When participants developed symptoms such as a fever, they went to the hospital as soon as possible, following the “early detection or diagnosed” policy.

“When I woke up one morning, I was a little dizzy, then I had a pain in my neck and felt a little bit feverish. Then I went to the hospital right away. The hospital arranged for me to quarantine and took several tests, such as CT scans and blood testing. As soon as I was diagnosed, the treatment started.” (22-year-old, male, single)

**Hospitalization to discharge stage:** After being diagnosed, family members of study participants followed the centralized quarantine pol-

icy, that is, all susceptible persons or close contacts were placed in hotels. Factory work was suspended, and large gymnasiums were converted to isolation facilities.

“Because I was diagnosed with COVID-19, my husband was sent to the hospital by ambulance the very next day. On the third day, several other family members were also sent away to the isolation facility.” (30-year-old, female, married)

During hospitalization, participants followed the treatment and management strategies as laid out through governmental policies, such as taking certain medicines (e.g., antiretroviral therapy, traditional Chinese medicine), having daily checks of their vital signs and blood tests, and undergoing CT scans every 2 days.

“There were two people in my hospital room. The other lady took the flu medicine and some experimental Chinese medicine. I had to take the antiretroviral therapy for a whole week before I could stop. And then, I was assigned to take the experimental Chinese medicine...” (32-year-old, female, married)

**Discharge to recovery stage:** After discharge from the hospital, all participants were required to strictly follow the 14-day quarantine policy. After the 1st and 3rd week after discharge, patients with COVID-19 had to return to the hospital’s fever clinic to check their health status through another series of examinations (e.g., CT scan, blood test, and/or nucleic acid test). Several participants said that they had to participate in a cell phone chat group (WeChat) recommended by health-care providers for peer support and rehabilitation.

“When I went for a return visit, the doctor recommended a recovery group set up by several hospitals in Shanghai. He told me that inside the chat group, people would share lung rehabilitation exercise videos





and guide me on how to do the rehabilitation exercises.” (41-year-old, female, married)

During the recovery stage, a number of participants returned to normal life, including going back to work; despite their recovery, they still had worries and concerns. One 31-year-old married man said, “Currently, I have two major concerns; the first is the fear of my prognosis and the second is how to return to society.” Generally, participants complied with the governmental infection-control strategies, such as routine community screening, social distancing, self-isolation, and abiding by the health Quick Response (QR) code system for local travel. The QR system queries the user on their travel, suspected COVID-19 exposures, and symptoms and, after verification by authorities, informs the users whether they should be quarantined or have their travel otherwise be restricted. The system also tracks the individual’s movements and informs the user if they have been near a person who has, or is suspected of having, COVID-19 (Gan & Culver, 2020; BBC News, 2020).

### 3.2.2 | Theme 2: Positive experiences of the COVID-19-related infection-control strategies

**Medical response after confirmed diagnosis:** Participants said that when they were suspected of contracting COVID-19, they were sent to quarantine right away and underwent confirmation testing through nucleic acid testing and CT scans. After being confirmed as having COVID-19, patients were sent directly to the designated facilities.

“After I was sent to the clinic, healthcare providers took my blood and arranged for CT scans right away. Because I came from Wuhan, after being confirmed with the COVID-19 diagnosis, I was sent for isolation. On the same day, I was sent by ambulance to the designated hospital. During the period of quarantine, I took nucleic acid testing twice. The first time was negative, the second time was positive.” (35-year-old, female, married)

Even though some of the participants did not have the time to prepare to enter a hospital, they said that the designated hospital had made adequate preparations for them.

“I remembered I was in a hurry ... when I went to the designated hospital, I only brought some clothes and woolen slippers. The hospital indeed prepared very well. It provided us washbasins, slippers, toothpaste, toothbrushes, shampoo, body wash...” (40-year-old, female, married)

Furthermore, participants were grateful that the government covered all the medical expenses. For all patients diagnosed with COVID-19, health insurance covered part of the medical expenses and their personal out-of-pocket expenses were covered by governmental special support for COVID-19 care. As one 38-year-old married man said, “All nucleic acid tests were free ... the government was taking good care of us, and the free treatment policy was welcome for us.”

**Trust the medical system and infection-control strategies:** A number of participants expressed that the medical system and infection control strategies in Shanghai were comprehensive and that healthcare

procedures were standard. Thus, they trusted healthcare providers in Shanghai. Furthermore, the most authoritative COVID-19 experts were in Shanghai, and, consequently, the national treatment management was built by the Shanghai team of experts. One participant (30-year-old, female, married) said, “I know that the medical conditions in Shanghai were superior, and the resources were abundant. Thus, I felt relieved and [had] little stress. Indeed, the nurses were professional, and the standard of care was great in Shanghai.”

**Getting help from the community:** Participants also said that community workers provided many help during the quarantine period after their hospital discharge. The community workers delivered food, disinfected the house right before their discharge, provided disinfectants and “contaminate” garbage bags, recycled their cans and glasses, and handled entry permits.

One 32-year-old married woman said, “The community workers were good to us. During the period of isolation, [when we] were not allowed to go out, the community workers helped to buy food, provide alcohol-based hand sanitizers, and sent those items to our door. At the same time, the community workers delivered yellow plastic bags marked “contaminated,” so people wouldn’t accidentally handle it.” (32-year-old, female, married)

The community workers also provided medical services for the COVID-19-confirmed participants, including taking their temperature daily and contacting the recovered patients to provide an update to health authorities on their conditions. One 22-year-old single man mentioned, “After I was discharged, they specially arranged a community worker to contact me and reported daily to the center for disease control and prevention.”

**Enhanced health literacy:** A number of participants said that their self-protection awareness and behaviors were strengthened by the governmental COVID-19-related infection-control strategies. The health information provided by the mass media assisted in educating the population regarding the importance of wearing masks and gloves when going grocery shopping, keeping a social distance of more than 1 m, reducing unnecessary aggregation activities, and strengthening ventilation and disinfection at home and work places. Some participants also said that they used their own set of eating utensils and dishes after discharge.

“After discharge from the hospital, I ate separately from my family members... If I used the bathroom, I always sprayed with disinfectant after I was done.” (40-year-old, male, married)

Furthermore, participants’ attitude toward their health also changed. Many of them realized the importance of good health and said they would pay more attention to “their own and their family’s health status, as in ensuring they had regular exercise, vaccinations, and physical examinations.

“Now I am more used to wearing a mask. When I go out, especially taking the subway, I feel very uncomfortable without wearing a mask. I also wash my hands more often and go to a space with good ventilation. I also pay more attention to my personal hygiene, environmental hygiene, and then maybe later, I will also get a flu shot regularly. Yes, these are things that had not been considered before I had COVID-19.” (32-year-old, female, single)



### 3.2.3 | Theme 3: Negative experiences of the COVID-19-related infection-control strategies

**Psychological distress:** Some participants said that during their hospitalization, the communication between them and their healthcare providers, especially doctors, was insufficient, causing them uneasiness and uncertainty. Participants also experienced anxiety and stress when isolated.

“The communication between doctors and patients is very important. Patients should know their condition, but doctors didn’t say anything. With the PPE covering their face and whole body, they were really reluctant to talk to us. I didn’t know my condition, which made me feel very uneasy.” (32-year-old, female, married)

**Experienced stigma:** Participants shared their experience of stigma at the workplace, community, and in society, in general, due to contact tracing and reporting policies. Individuals experienced being marginalized by the public, rejected for services, driven out by the landlord, and forced to resign from their career.

“I felt discrimination after I recovered from COVID-19. I remembered that I went home by the high-speed train. When the conductor scanned my ID card, the screen showed that I was a cured COVID-19 patient. The conductor told me that I belonged with the concerned population and arranged separate seating for me. After I exited the train station, I also needed a special register and scanning before I could leave the station.” (32-year-old, female, single)

**Privacy information exposure:** Participants stated that their private information was exposed during the contact-tracing process. One 56-year-old married man said, “After I came home from the hospital, the county government arranged to install a telecom camera in front of my house for more than 14 days to track me...”

Also, the daily reporting policy was one of the important COVID-19 infection-control strategies in China. Some reported that during the reporting process, private information was disclosed. A 40-year-old married man said, “I told the community workers to keep my condition as secret as possible when I was under quarantine, and they agreed; however, after I completed the quarantine, I found out that everyone in my neighborhood had known. There was a bulletin in the community that provided all the residents’ information. My house number was pinned with a yellow color, which means the house was under medical observation. Don’t you think it was suspicious?”

**Inconvenience:** Some participants reflected on how every city uses a different health QR code system to show each individual’s health condition. Thus, when people traveled between cities, their green healthy QR code was not acknowledged. One 29-year-old single male participant said, “At that time, city officials rather believed more in the green code in Hubei Province than in Shanghai. That caused me a lot of trouble to go to every city that I needed to pass by.” In addition, participants shared that the traffic restrictions in different cities and return-to-work policies were not the same, which resulted in inconvenience and distress:

“At that time, while the traffic was restricted, I couldn’t transport my father, who was a confirmed COVID-19 patient in Wuhan. He could only ride his bike to the local hospital and back to his temporary housing

every day. Running back and forth, it had a bad effect on his recovery, maybe worse.” (32-year-old, female, single)

A 29-year-old single male said, “My company administrators asked for an official report for me to go back to work but I have had a hard time getting it. The on-call physician couldn’t write another report because he wasn’t the one to order the testing. Therefore, I am still staying home and can’t resume my work.”

## 4 | DISCUSSION

During pandemics, the efficacy of health policies is an important part of protecting the population (Taghrir et al., 2020), especially from the patient-centered point of view (Paternotte et al., 2017). This qualitative study highlights the need to understand COVID-19 patients’ positive and negative experiences while living under the governmental infection-control strategies in China to contain the epidemic. Our findings are an example of how COVID-19 patients experienced the strategies required by the Chinese government and local authorities for patients who went through the suspected, diagnosed, hospitalized, and recovery stages of the disease. Our findings provide evidence and the personal experiences of patients for the consideration of those developing future global COVID-19 prevention and control strategies. Also, this paper could guide the design and targeting of future interventions for preventing and mitigating COVID-19, or other, epidemics.

Consistent with previous studies on Chinese populations (Huang et al., 2020; Li, Cao, et al., 2020a), we found that participants followed the COVID-19 infection-control strategies from the onset of their illness to their recovery. This study implies that the health promotion and educational campaigns were effective in China and that further conducting through the online electric platform might be required, even in the second waves of pandemics (Huang et al., 2020). On the other hand, this finding reflects that individuals’ behavior was profoundly influenced by the Confucian tradition of morality. In China’s collectivistic-oriented culture, a person is taught about their responsibility for the family and society (Chen et al., 2007). In other words, the participants’ compliance with the COVID-19-related infection-control strategies were in accordance with their place in the social and familial hierarchy to facilitate the orderly and smooth functioning of society (Chen et al., 2007; Cheng, 1990).

The policy compliance of the patients in this study can also be attributed to their positive experiences of it. Participants noted the quick and adequate medical response to their illness, their confidence in the medical system, and that they received help from community workers. Our findings further confirmed the efficacy of the infection-control strategies implemented by the Chinese government, including allocating medical staff reasonably, triaging patients properly, providing adequate supplies, and providing testing and treatment within the same day of confirmed cases. The humanistic side of the policy was also needed and appreciated; participants described how community workers provided lots of help during the quarantine period, such as delivering daily living items and timely solving inconveniences caused by



the policy. Another positive impact of the COVID-19 infection-control strategies was the enhancing of health literacy in China, as all the mass media were constantly delivering information on measures to prevent the spread of the disease. This was very different from Iran's low health literacy related to COVID-19 (Hashemi-Shahri et al., 2020). Health literacy is as important for the prevention of communicable diseases as it is for non-communicable diseases (Paakkari & Okan, 2020). The enhanced health literacy of the Chinese population could be seen as part of their level of social responsibility and solidarity. As a result of the long-term moral and ideological education in China, the general public cooperated with the governmental orders without question (Li, Cao, et al., 2020; Paakkari & Okan, 2020).

Our findings also found some negative reactions to the infection-control strategies, which should not be ignored. Consistent with previous studies on community residents (Li, Ye, et al., 2020), we found that the study participants experienced psychological distress (e.g., uneasiness, anxiety, and stress) because of insufficient doctor-patient communication, disclosures of their health status to community members, and quarantine strategies. The first finding suggests the importance of timely and effective doctor-patient communications (Paternotte et al., 2017). Also, mental health interventions would be helpful for those suffering psychological stress (Chen et al., 2020). As participants revealed, stigma is a prominent issue associated with the contact-tracing and reporting strategies of infectious diseases, which can lead to unpleasant social hostility and discrimination (He et al., 2020). This stigma is associated with social panic and misconceptions about COVID-19 (Ding et al., 2020); thus, interventions targeting discriminatory practices related to the disease should be developed. Furthermore, the risk of having private information exposed is another urgent issue that needs to be solved. When implementing COVID-19 infection-control strategies, people should respect and protect personal information as a basic human right. In addition, avoiding privacy disclosures and maintaining the confidentiality of confirmed cases is in the interest of mitigating further COVID-19 transmission; when people fear such disclosures, they may be reluctant to seek testing and treatment (Ding et al., 2020).

Finally, we need to pay attention to the inconveniences of infection-control strategies that participants revealed, as well as possible solutions to those concerns, including the use of one health QR code system across municipalities, standardization of return-to-work policies, and solving the inconvenience caused by traffic restrictions. Taking the health QR system as an example, a green health QR is important for traveling between towns, but it is not mutually recognized among cities. An innovative health QR code system generated from big data analysis and mobile technologies to monitor people under quarantine for 14 days may be developed and tailored to suit various environments and locations. In addition, in areas with concentrations of COVID-19, confirmed and suspected cases could be signified by using yellow and red codes in the tracking system (Huang et al., 2020). The existing QR system did, however, help prevent the spread of COVID-19 in many cities in China and facilitate a return to normalcy in people's lives. Currently, China is revising the process of the health codes and has set up a "one code pass" to decrease the inconvenience and maximize

the efficacy of the infection-control strategies (Office of the Central Cyberspace Affairs Commission of China, 2020).

#### 4.1 | Limitations

There are several limitations to this study. First, all participants were interviewed by phone, which was an appropriate and convenient way for both the COVID-19 patients and the interviewers. However, establishing rapport with participants over the phone was difficult, and non-verbal cues were not discernible. Second, a small sample size study participants was recruited from one designated hospital in Shanghai during a short period of time, so results might not be generalizable to all COVID-19-infected patients in China. Although Shanghai has one of the premier public health systems in the country, it is also at the highest risk of potential COVID-19 eruptions, as many migrant workers from other provinces reside in the metropolitan area. Third, our studies focused on qualitative data; future studies should examine the influence of infection-control strategies on COVID-19 patients through quantitative studies, in order to triangulate study results. Last, as the validity and reliability in qualitative study represented by trustworthiness, which is achieved by credibility, authenticity, transferability, dependability, and confirmability. For future study, adding other study sites, for example, Beijing and/or Guangzhou will improve the trustworthiness of the data to show a whole picture for how the China COVID-19 policies impacting the COVID-19 confirmed individuals.

#### 5 | RELEVANCE TO PUBLIC HEALTH PRACTICE

The COVID-19 pandemic should be controllable as long as the right measures are implemented (Chatterjee et al., 2020). The joint efforts of the government and the people should all contribute to this endeavor (Li, Cao, et al., 2020). Considering the worldwide threat to public health and the global economy from the COVID-19 outbreak, this study shines a light on future infection-control strategies.

First, the efficacy of infection prevention and control strategies in China could provide for addressing a resurgence of the virus or future pandemics. However, the varying socio-economic conditions and cultural and ethical concerns of countries should be considered (Li, Ye, et al., 2020). In the context of COVID-19, some Western countries emphasize the individual's rights and freedom, such as the United States and Brazil, and so they did not strictly implement control strategies (Oliveira et al., 2020). Thus, it is worth thinking about which strategies or policies are more efficacious within different cultural contexts.

Second, despite some places having controlled COVID-19 transmission, people should not let down their guard and should continue sustainable and implementable epidemic prevention and control strategies. Also, when implementing COVID-19 infection-control strategies, the protection of private information and improvements in the convenience and flexibility of the utilized technologies should be considered.



For example, plans should include the implementation of standard protocols for the return of employees to work as well as the provision of alternative and safe transportation for people who are under traffic restrictions.

Third, psychological stress and stigma should be given more attention both during and after the pandemic. A reliable and valid warning system should be developed to detect mental stress, psychological assessment tools should be developed, and doctor-patient communications should be strengthened. Hotlines, cognitive therapy, and a stigma-reduction intervention should be integrated into the infection-control strategies to reduce COVID-19-related stigma within the general public and among healthcare providers.

## 6 | CONCLUSIONS

This qualitative study provides several insights regarding the positive and negative experiences of COVID-19 patients who were following the strategies in China to control the epidemic. Furthermore, our findings are an example of how patients with COVID-19 adhere to the infection-control strategies required by the Chinese government for suspected, diagnosed, hospitalized, and recovered cases. However, these patients also experienced psychological distress, stigma, privacy exposure, and inconveniences from the infection-control strategies. Thus, there is an urgent call for developing a culturally sensitive intervention to eliminate the psychological distress and stigma of patients with COVID-19, as well as protect their privacy, during and after the pandemic.

## ACKNOWLEDGMENTS

We gratefully acknowledge all the study participants, without them, it is not possible to complete these projects. This publication is a result, in part, from research supported by Fudan University Science Establishment (IDF162005), Novel coronavirus "2019-NCOV" research project (#2020YJKY01), Fudan-Fosun Nursing Research Fund #FNF202042, UCLA CTSI/SON Intramural fund March 2020 and NIMH (P30MH058107, R25MH087217).

## CONFLICT OF INTEREST

The authors have no conflicts of interest to disclose.



## ETHICAL CONSIDERATIONS

This research was approved by the institutional review boards of UCLA (IRB#20-000832) and Shanghai Public Health Clinical Center (YZ-2020-S037-01).

## DATA AVAILABILITY STATEMENT

Data available upon request.

## ORCID

Feifei Huang RN, PhD  <https://orcid.org/0000-0003-0197-8687>  
Wenxiu Sun RN, MSN  <https://orcid.org/0000-0002-3653-6443>

## REFERENCES

- BBC News. (2020). China launches coronavirus 'close contact detector' app. <https://www.bbc.com/news/technology-51439401>
- Blaikie, N. (2018). Confounding issues related to determining sample size in qualitative research. *International Journal of Social Research Methodology*, 21(5), 635–641. <https://doi.org/10.1080/13645579.2018.1454644>
- Campbell, C. (2020). China appears to have tamed a second wave of coronavirus in just 21 days and with no deaths. *Time Magazine*, <https://time.com/5862482/china-beijing-coronavirus-second-wave-covid19-xinfadi/>
- Chatterjee, P., Nagi, N., Agarwal, A., Das, B., Banerjee, S., Sarkar, S., Gupta, N., & Gangakhedkar, R. R. (2020). The 2019 novel coronavirus disease (COVID-19) pandemic: A review of the current evidence. *Indian Journal of Medical Research*, 151(2), 147–159. [https://doi.org/10.4103/ijmr.IJMR\\_519\\_20](https://doi.org/10.4103/ijmr.IJMR_519_20)
- Chen, Q., Liang, M., Li, Y., Guo, J., Fei, D., Wang, L., He, L., Sheng, C., Cai, Y., Li, X., Wang, J., & Zhang, A. (2020). Mental health care for medical staff in China during the COVID-19 outbreak. *Lancet Psychiatry*, 7(4), e15–e16.
- Chen, W. T., Starks, H., Shiu, C. S., Fredriksen-Goldsen, K., Zhang, F. J., Pearson, C., & Zhao, H. X. (2007). Chinese HIV-positive patients and their healthcare providers: Contrasting Confucian versus Western notions of secrecy and support. *ANS Advances in Nursing Science*, 30(4), 329–342. <https://doi.org/10.1097/01.ANS.0000300182.48854.65>
- Cheng, S. K. (1990). Understanding the culture and behaviour of East Asians—A Confucian perspective. *Australian and New Zealand Journal of Psychiatry*, 24(4), 510–515. <https://doi.org/10.3109/00048679009062907>
- Ding, Z., Xie, L., Guan, A., Huang, D., Mao, Z., & Liang, X. (2020). Global COVID-19: Warnings and suggestions based on experience of China. *Journal of Global Health*, 10(1), 011005. <https://doi.org/10.7189/jogh.10.011005>
- Dong, J., Zhou, Y., Zhang, Y., & Franz, D. (2020). A validation study for the successful isolation policy in China: A meta-analysis in COVID-19. *medRxiv*, 18(3), 1–15. <https://doi.org/10.1101/2020.04.15.20065102>
- Gan, N., & Culver, D. (2020). China is fighting the coronavirus with a digital QR code. Here's how it works. *CNN Business*. <https://www.cnn.com/2020/04/15/asia/china-coronavirus-qr-code-intl-hnk/index.html>
- Gong, M., Liu, L., Sun, X., Yang, Y., Wang, S., & Zhu, H. (2020). Cloud-based system for effective surveillance and control of COVID-19: Useful experiences from Hubei, China. *Journal of Medical Internet Research*, 22(4), e18948. <https://doi.org/10.2196/18948>
- Hashemi-Shahri, S. M., Khamarnia, M., Ansari-Moghaddam, A., Setoodeh-zadeh, F., Okati-Aliabad, H., & Peyvand, M. (2020). Sources of news as a necessity for improving community health literacy about COVID-19. *Medical Journal of the Islamic Republic of Iran*, 34, 63. doi: 10.34171/mjiri.34.63.
- He, J., He, L., Zhou, W., Nie, X., & He, M. (2020). Discrimination and social exclusion in the outbreak of COVID-19. *International Journal of Environmental Research and Public Health*, 17(8), 2933. <https://doi.org/10.3390/ijerph17082933>
- Huang, Y., Wu, Q., Wang, P., Xu, Y., Wang, L., Zhao, Y., Yao, D., Xu, Y., Lv, Q., & Xu, S. (2020). Measures undertaken in China to avoid COVID-19 infection: Internet-based, cross-sectional survey study. *Journal of Medical Internet Research*, 22(5), e18718. <https://doi.org/10.2196/18718>
- Li, B. Z., Cao, N. W., Zhou, H. Y., Chu, X. J., & Ye, D. Q. (2020). Strong policies control the spread of COVID-19 in China. *Journal of Medical Virology*. <https://doi.org/10.1002/jmv.25934>
- Li, S., Ye, Z., Du, C., Wei, Q., & He, C. (2020). The residents' mental health status and community's role during the COVID-19 epidemic: A community-based cross-sectional study in China. *Annals of Translational Medicine*, 8(20), 1321–1330. <https://doi.org/10.21037/atm-20-6687>





- Nowell, L. S., Norris, J. M., White, D. E., & Moules, N. J. (2017). Thematic analysis: Striving to meet the trustworthiness criteria. *International Journal of Qualitative Methods*, 16(1), 1–13. [1609406917733847](https://doi.org/10.1177/10497315166733847).
- Office of the Central Cyberspace Affairs Commission of China. (2020). One pass! Accelerating the process of exchanging and recognizing health codes in China. [http://www.cac.gov.cn/2020-04/14/c\\_1588409502738547.htm](http://www.cac.gov.cn/2020-04/14/c_1588409502738547.htm)
- Oliveira, W. K., Duarte, E., França, G. V. A., & Garcia, L. P. (2020). How Brazil can hold back COVID-19. Como o Brasil pode deter a COVID-19. *Epidemiologia e Serviços de Saúde*, 29(2), e2020044. 1–8. <https://doi.org/10.5123/s1679-49742020000200023>
- Paakkari, L., & Okan, O. (2020). COVID-19: Health literacy is an underestimated problem. *Lancet Public Health*, 5(5), e249–e250. [https://doi.org/10.1016/S2468-2667\(20\)30086-4](https://doi.org/10.1016/S2468-2667(20)30086-4)
- Pan, A., Liu, L., Wang, C., Guo, H., Hao, X., Wang, Q., Huang, J., He, N., Yu, H., Lin, X., Wei, S., & Wu, T. (2020). Association of public health interventions with the epidemiology of the COVID-19 outbreak in Wuhan, China. *Jama*, 323(19), 1915–1923. <https://doi.org/10.1001/jama.2020.6130>
- Paternotte, E., van Dulmen, S., Bank, L., Seeleman, C., Scherpbier, A., & Scheele, F. (2017). Intercultural communication through the eyes of patients: Experiences and preferences. *International Journal of Medical Education*, 8, 170–175. <https://doi.org/10.5116/ijme.591b.19f9>
- Qiu, J., Shen, B., Zhao, M., Wang, Z., Xie, B., & Xu, Y. (2020). A nationwide survey of psychological distress among Chinese people in the COVID-19 epidemic: Implications and policy recommendations. *General Psychiatry*, 33(2), e100213. <https://doi.org/10.1136/gpsych-2020-100213>
- Taghrir, M. H., Akbarialiabad, H., & Ahmadi Marzaleh, M. (2020). Efficacy of mass quarantine as leverage of health system governance during COVID-19 outbreak: A mini policy review. *Archives of Iranian Medicine*, 23(4), 265–267. doi:10.34172/aim.2020.08.
- Tong, A., Sainsbury, P., & Craig, J. (2007). Consolidated criteria for reporting qualitative research (COREQ): A 32-item checklist for interviews and focus groups. *International Journal for Quality in Health Care*, 19(6), 349–357.
- Wang, J., & Wang, Z. (2020). Strengths, weaknesses, opportunities and threats (SWOT) analysis of China's prevention and control strategy for the COVID-19 epidemic. *International Journal of Environmental Research and Public Health*, 17(7), 2235. <https://doi.org/10.3390/ijerph17072235>
- World Health Organization. (2020a). WHO Coronavirus Disease (COVID-19) Dashboard. Retrieved July 20, 2020. [https://covid19.who.int/?gclid=EA1a1QobChMloZ7Zj6uA6gIVxatBh190QrNEAAYAiABEglo3\\_D\\_BwE](https://covid19.who.int/?gclid=EA1a1QobChMloZ7Zj6uA6gIVxatBh190QrNEAAYAiABEglo3_D_BwE)
- World Health Organization. (2020b). WHO Director-General's opening remarks at the media briefing on COVID-19. Retrieved March 11, 2020. <https://www.who.int/dg/speeches/detail/who-director-general-s-opening-remarks-at-the-media-briefing-on-covid-19-11-march-2020>
- Yang, X. Y., Peng, S., Yang, T., & Rockett, I. R. H. (2020). Changing trends of excess self-protective behavior, and association with belief in prevention myths during the COVID-19 epidemic in China: A panel study. *medRxiv*, <https://doi.org/10.1101/2020.05.18.20102434>
- Yang, Z., Zeng, Z., & Wang, K. (2020). Modified SEIR and AI prediction of the epidemics trend of COVID-19 in China under public health interventions. *Journal of Thoracic Disease*, 12(3), 165–174. <https://doi.org/10.21037/jtd.2020.02.64>
- Ye, Y., Xu, X., Wang, S., Wang, S., Xu, X., Yuan, C., Li, S., Cao, S., Chen, C., Hu, K., Lei, H., Zhu, H., & Wu, X. (2020). Evaluating the control strategies and measures for COVID-19 epidemic in mainland China: A city-level observational study. *Bulletin of the World Health Organization*. 1–22. <http://doi.org/10.2471/BLT.20.264739>.
- Zhou, X., Wu, Z., Yu, R., Cao, S., Fang, W., Jiang, Z., Yuan, F., Yan, C., & Chen, D. (2020). Modelling-based evaluation of the effect of quarantine control by the Chinese government in the coronavirus disease 2019 outbreak. *Science China. Life Sciences*, 63(8), 1257–1260. <https://doi.org/10.1007/s11427-020-1717-9>

**How to cite this article:** Huang, F., Chen, W.-T., Sun, W., Zhang, L., & Lu, H. (2021). Chinese infection-control strategies for COVID-19 prevention: A qualitative study with confirmed cases. *Public Health Nursing*, 1–10. <https://doi.org/10.1111/phn.13017>

## APPENDIX A

### 知情同意书

版本号:1.1

版本日期:2020.2.27

**项目名称:**新型冠状病毒肺炎相关歧视感的变化轨迹的追踪研究

**研究者:**

您已经被邀请参加一项名为“新型冠状病毒肺炎相关歧视感的变化轨迹的追踪研究”研究。您的参加是完全自愿的。此项研究是由上海市公共卫生临床中心申办。

在您做出参与本研究的知情决定之前,您应该了解本研究可能的风险和获益。这个过程称为知情同意。上海市公共卫生临床中心伦理委员会已经批准该同意书中的信息,并且批准研究人员进行该研究。这份文件向您阐述了研究目的,步骤,给您带来的益处,您要承担的风险、不适,同时您有权利在任何时候退出研究;该同意书可能包含您不理解的文字,请让工作人员为您解释您不能清楚理解的任何文字或信息。在做出决定前,您可以将一份未签字的同意书带回家考虑或与家人、朋友或任何您选择的人进行讨论。如果您决定参与本研究,将要求您阅读并签署该同意书,以便确认您已经知悉了参与本研究需了解的内容,并且同意参加。您将获得一份已签署的同意书。

### 研究目的

本研究想要探究新冠病毒感染相关歧视变化,包括在不同时期歧视感的变化以及与歧视感相关的影响因素,以期为其他传染性疾病的歧视研究提供理论依据。

### 研究背景

新型冠状病毒作为一个未知的病毒,在尚无特效药物治疗的情况下,加上其高传染性,让大众对疾病产生的一定的恐惧感。这种恐惧感往往在一定程度上引起对感染者及其家属的歧视,甚至对从事新型冠状病毒治疗的一线医护人员及其家属产生不公的待遇。与艾滋病感染的不同,新型冠状病毒的感染具有时间的限制性,随着感染者的治疗及控制,感染人数逐渐的减少,最终新冠病毒感染将被完全控制。但是随着新冠病毒感染的控制,与新冠病毒感染相关的歧视的变化是怎样的?这种歧视对患者的到底会产生哪些影响?这些影响是暂时的,还是会长期存在?由于对新冠病毒感染相关的歧视研究较少,所以本研究想要探究新冠病毒感染相关歧视变化,以期为其他传染性疾病的歧视研究提供理论依据。

### 研究程序

本研究主要探究新型冠状病毒肺炎感染者的患者的相关歧视变化过程。研究分为两个阶段,分别为:第一阶段:新型冠状病毒肺炎患者歧视体验量表的编制。我们将通过对20名治愈的新冠病毒感染患者进行访谈,了解其在确诊,治疗以及治愈后出院所经历的歧视的体验,通过对《艾滋病患者歧视量表》进行修订,形成新型冠状病毒肺炎患者歧视体验量表。

第二阶段:对新型冠状病毒感染患者歧视变化的研究。该阶段我们将选取200名治愈的患者进行跟踪研究。分别在出院后第一年,第二年以及第三年使用新型冠状病毒肺炎患者歧视体验量表以及电话或面对





面访谈的方式收集感染者歧视体验的数据。前两年数据收集的频次为每年两次,第三年数据收集的频次为每年一次。最后进行数据的整理与分析,探究感染者歧视的变化以及影响因素。

### 风险

本研究主要的研究风险为个人隐私暴露的风险。

### 获益

本研究中获得的信息将有益于医学科学的发展,因此对于将来发生相同疾病的其他患者会有帮助。

### 保密

如果您决定参加本研究,您参加研究及在研究中的个人资料均属保密。研究中会用编号来标识您的研究信息。以可识别患者身份的形式获取您的个人健康信息的人仅包括研究团队中的实施研究的人员、支持研究或负责检查研究是否适当实施的申办方代表、伦理委员会和法律要求的监管机构。

### 退出/自愿参与

参与本研究是自愿的。您可以在任何时间停止参与本研究。如果您决定不参与本研究或退出本研究,您的医疗护理的质量或有权利获得的任何益处不会受到影响,不会对您进行任何惩罚。您的研究人员也可能终止您参与本研究,如果他/她认为这符合您的最大利益或如果您不能遵循本研究的要求

如在研究过程中发现问题或需要咨询有关问题时,可与研究者及我中心伦理委员会联系。

### 研究者:联系人及电话:

伦理委员会:沈洁 021-379903333-8349

### 同意

我已经阅读并理解了该同意书,而且相关内容也已得到了解释。我提出的问题都得到了满意的回复。我自愿同意参加本研究,也知道在研究过程中我随时有权退出研究。

受试者签名:日期:

联系方式:

### 研究人员声明:

我确认已向受试者详细解释了本研究的有关内容,包括受试者可能的风险与不便,并给受试者一份双方签署过姓名和日期的知情同意书副本。

研究人员:日期:

联系方式

Consolidated criteria for reporting qualitative studies (COREQ): 32-item checklist

